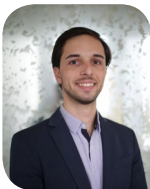# WAVESTONE

CONNECTED CARS
A REVOLUTION DESTINED TO FAVOR LONG-STANDING CARMAKERS

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Accustomed to receiving digital services on their smartphones, consumers today are looking to have this access extended to other spheres of their lives and more and more customers are calling for similar functions and services in their cars.

For several years now, carmakers have seen the emergence of, and sharp rise in, consumer demand for digital connectivity and associated functions in their automobiles: two features that prospective car buyers look for in addition to the more traditional vehicle purchase criteria (mechanical reliability, design and affordability, as well as service and maintenance options).

Embedded electronic systems have been a feature of the automobile for over twenty years now. Essentially designed to ensure the functioning of the vehicle (to improve performance, as well as to resolve and even anticipate malfunctions), these systems are becoming more widespread and connected to the outside world. The connected car is set to become the norm and will account for 100% of new vehicles by 2025[1].

1- *Secure by Design*, 2012

A TREND THAT IS FORCING THE MARKET TO ADAPT

While this trend in consumer demand clearly implies the need to adapt vehicles, it also requires that market leaders change their positioning so that they can reap the full benefits of this opportunity.

The vehicle has three main channels enabling connectivity with the outside environment, namely:

/ **Standard telephone connections** that are already available on smartphones (4G, 5G) supply most of the required Internet services.

/ **Short-range technologies** which are used to interact with objects in the vicinity.

/ **New technologies**, that are still being developed, such as Vehicle-to-Infrastructure (V2I) and Vehicle-to-Vehicle (V2V).

These channels give access to digital embedded solutions (Telematics) that enable vehicles and their users to communicate with the exterior environment (houses, objects, roads, web services, etc.).

The types of electronic equipment required to ensure vehicle connectivity come in two forms: that which is not visible to the user, and that which is available via a connected box. While this equipment can also be added to the vehicle at a later stage, it is usually integrated during vehicle assembly, a factor that offers carmakers an opportunity to play a central role in the connected vehicle market.

The following sector players are now mobilized to reap the full benefits of this trend:

/ **Long-standing carmakers,** which naturally occupy a central role in designing and marketing new functionalities and related services.

/ **Parts suppliers** (the long-standing partners of carmakers) which are investing heavily in connectivity and have adopted vertical integration strategies in the hope of capturing a part of the revenues associated to these new services.

/ **New partners and start-ups** which develop innovative solutions to be integrated by carmakers at the vehicle assembly stage.

/ **Digital majors** which are focused on the development and widespread deployment of new technologies and services so that they can cash in on their digital expertise and maturity.

Among these players, carmakers are, and will continue to be, faced with the biggest challenges to maintain and optimize their key market positions. It is essential they adapt so that they can capitalize on increased connectivity in automobiles and the availability of digital services.

The three main vehicle connectivity channels
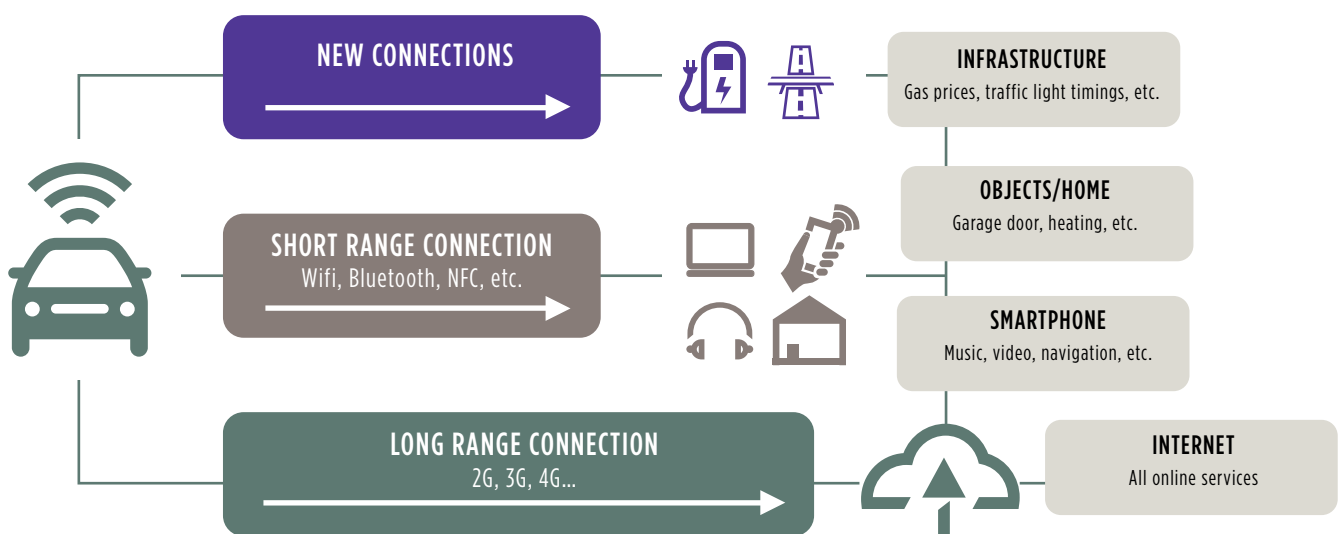
TREMENDOUS OPPORTUNITIES FOR CARMAKERS

Establish direct relations with users

Relations between carmakers and final clients (both individual and professional) are somewhat limited throughout the automobile's life-span and with regard to vehicle utilization. The widespread deployment of connected vehicles therefore offers carmakers a unique opportunity to establish a direct contact with all users of the same vehicle throughout its life-span.

Some of the collected data can be useful for the carmaker's core business. New functionalities will therefore enable manufacturers to take user practices and opinions into account to improve vehic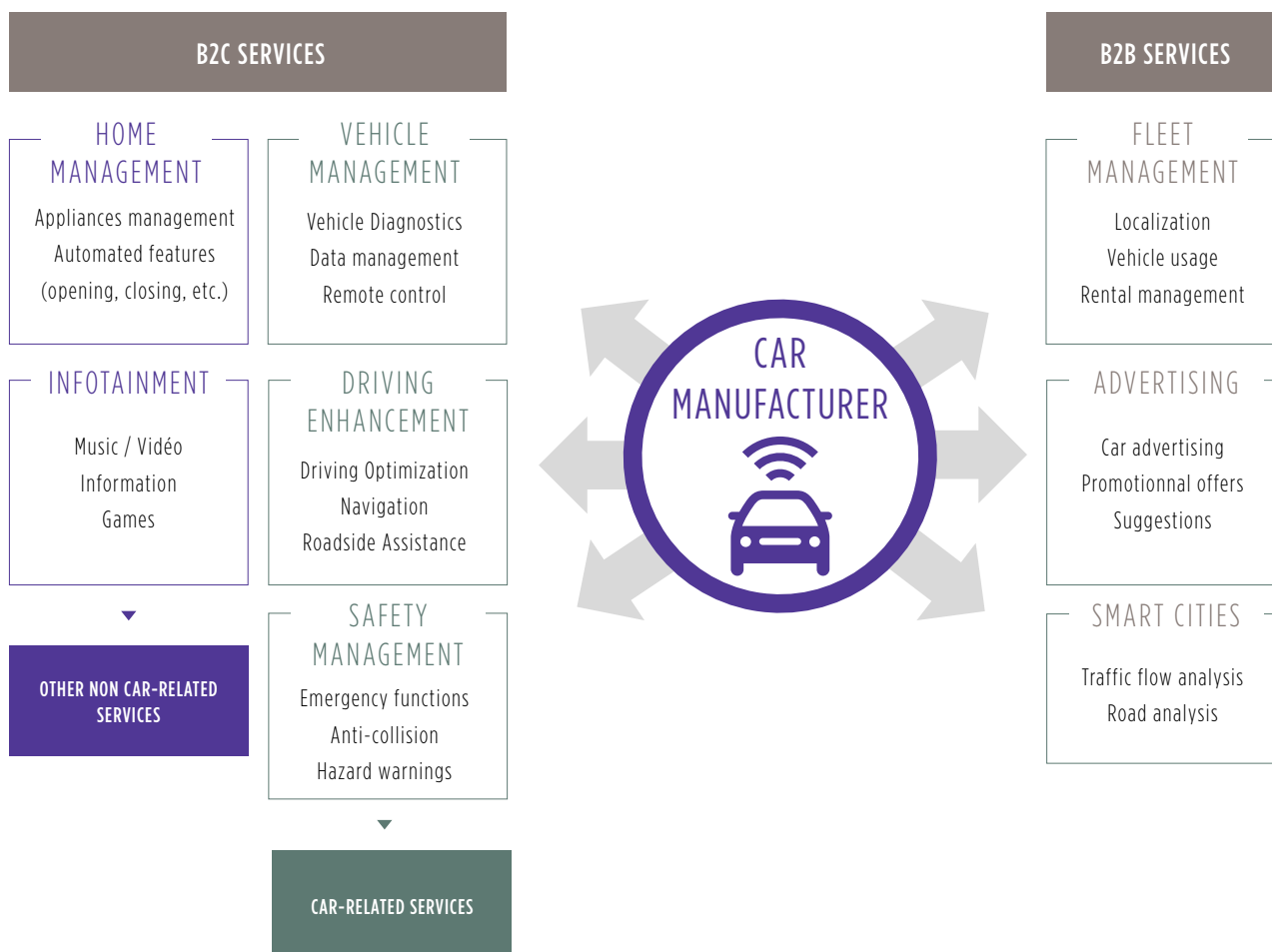le design in line with their continuous improvement strategies, and offer new services designed to meet customer expectations. In addition, this digital approach, which is similar to that available on our smartphones, captures and analyzes user habits on a continuous basis for the purposes of fine-tuning the ergonomic choices and services proposed.

Sale of new services

By relaying information collected by vehicles, carmakers can also offer numerous services associated to the vehicles and their environment (predictive maintenance, available parking spaces in the vicinity, etc.). These services can be billed directly to the customer or used to makes sales pitches (to attract customers and motivate them to upgrade).

These new services are not, however, limited exclusively to the domain of the automobile *per se*, since when a connected vehicle is used for travelling purposes it can also function as a services platform in the same way the smartphone does today. With the roll out of the Internet of Things (IoT) and the growth in the number of resulting connections, it is, or soon will be, possible to access a vast amount of applications (such as home automation, security and weather forecast information, etc.) from one's car. The vehicle could, therefore, centralize access to all of these services, provide customized user profiles and, as such, continue to collect more data.

Panorama of potential types of services provided by carmakers

B2C SERVICES

HOME MANAGEMENT
Appliances management
Automated features
(opening, closing, etc.)

VEHICLE MANAGEMENT
Vehicle Diagnostics
Data management
Remote control

INFOTAINMENT
Music / Vidéo
Information
Games

DRIVING ENHANCEMENT
Driving Optimization
Navigation
Roadside Assistance

OTHER NON CAR-RELATED SERVICES

SAFETY MANAGEMENT
Emergency functions
Anti-collision
Hazard warnings

CAR-RELATED SERVICES

CAR MANUFACTURER

B2B SERVICES

FLEET MANAGEMENT
Localization
Vehicle usage
Rental management

ADVERTISING
Car advertising
Promotionnal offers
Suggestions

SMART CITIES
Traffic flow analysis
Road analysis

Data validation

Collected data provides a real source of value that carmakers are perfectly positioned to use, as well as to build on with third companies.

Data collected from the numerous auto resale outlets that already exist, or are planned, could be used by:

/ **Insurance companies**: to gain insight into consumer driving habits, adapt their risk premiums, and identify factors that provoke accidents, etc.

/ **Smart cities**: to determine the state of road infrastructures, identify danger zones, and monitor real-time traffic flows to adjust traffic regulations, for example.

/ **Advertisers** (all sectors of activity): to better understand consumer centers of interest and habits (journeys travelled, the most popular radio stations listened to, etc.).

NEW MOBILITY SITUATIONS

The fact that cars are used only 5% of the time on average[2] has caused a shift in consumer needs from car ownership to on-demand use. This change is even more pronounced in Asia and South-American countries where the automobile culture of the masses is still a recent phenomenon: individual car ownership in these regional markets is not as widespread as it is in Europe and the United States, and is less of a status symbol.

This shift in consumer needs has also been underpinned by changing trends in user-practices and technologies (smartphones, applications, geo-localization, etc.). For example, this has contributed to the surge in car-pool platforms (which improve vehicle occupation rates) and car-share platforms (which boost utilization rates). Increased connectivity in vehicles (and thus the greater amount of information concerning localization, journeys travelled and utilization rates, etc.) and expertise in associated technologies should also enable carmakers to address these new markets, which are currently controlled by digital start-ups (Drivy, Getaround, Blablacar, etc.) and major public-transport players (with specialized subsidiaries).

In addition, these new usages are strongly promoted by major agglomerations to meet growing ecological and economic challenges and mobilize an increasing amount of carmakers' B2B clients (companies and local authorities alike). While this offers carmakers the opportunity to provide new services, such as vehicle fleet management, to their B2B clients, it also imposes more demanding cost control requirements. Carmakers will therefore be prompted to revamp their offering and client segmentation strategies so that they can specifically meet these new needs.

2- *ADEME, 2016*

Modeling of connected vehicle data flows
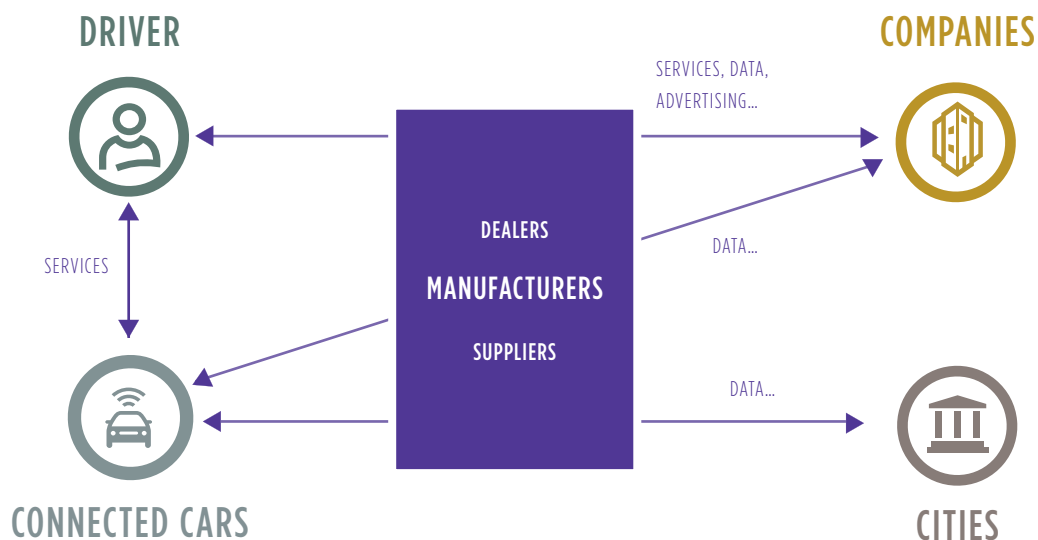
ENDOGENOUS AND EXOGENOUS ISSUES

Dealing with new entrants

Given that most opportunities arising from connected vehicles stem from digital functionalities, the Internet majors are determined to carve out a place for themselves on this burgeoning market. These players:

/ already benefit from their **innovative image** and **solid expertise**; two assets they can draw on not only to offer a digital and fluid experience that is coherent, but also to capture the value of the collected data;

/ have an irrefutable advantage: **the standards** they have established in the Telecoms and IT sectors. To simplify connections and data transfer, most consumers now want their cars to be equipped with the same Operating System (OS) as their smartphone.

The threat from these players, particularly from the GAFA giants (Google, Amazon, Facebook and Apple) is even more serious for carmakers since these later do not have the same culture and skills set, which is intrinsically digital.

Other digital newcomers, however, include:

/ Players that are already established on the market and looking to expand by adopting a horizontal growth strategy;

/ Other start-ups, such as Eliocity, Drust, and Mobileye, which are aspiring to become pioneers in the automotive aftermarket (retrofit equipment installed after vehicle purchase).

The Eliocity start-up, which notably markets the Xee box, is looking to establish itself as a connected services platform for vehicles (that were not connected initially) of B2C clients.

Source- *voiturecommunicante.blogspot.fr*

Find the right balance between internalization and externalization

In the highly competitive connected services sector, which goes beyond the carmaker's core activity, auto manufacturers should be able to rapidly integrate the technologies associated to these services.

To achieve this, **carmakers must forge strong partnerships while bringing back in house high value-added activities in which they are skilled and that offer them strategic advantages.**

A fully integrated model is not possible in an open digital world where new-service rollout cycles must be rapid to ensure the propagation of innovative ideas and make it possible to select and implement those which are the most promising. Because of this, carmakers must choose their battles wisely and prioritize their activities to ensure a high level of innovation and competitiveness.

Carmakers looking to outsource some of their activities **must work with the open communities of developers and manufacturers** (via Fab Labs and Hackathons, for example), **as well as with start-ups** that could become suppliers (such as Kuantic in the connected box segment) to equip vehicles during assembly.

Develop a strong innovation culture

To bring the maximum amount of key skills back in house, manufacturers must adapt their organization and culture to be able to integrate new digital talents (who have to be recruited) and new modes of functioning.

It is difficult for carmakers to compete with the mature and often free digital services provided by smartphone mobile applications. Auto manufacturers seeking to implement services that are at once useful for, and used by, consumers must base their innovations on the real needs of their customers. This, therefore, requires developing and deploying a real digital innovation culture based on an experimental and test & learn approach. This will cause a transformation in players' core models making them based more on operational excellence and risk control.

This trend in corporate culture is also a necessary condition for carmakers seeking to build up a complete services offering in conjunction with their new partners and the digital suppliers mentioned above. This also entails removing the last barriers existing between teams, notably in the marketing and technologies departments, so that a product and services roadmap that is coherent and aligned with client needs can be developed.
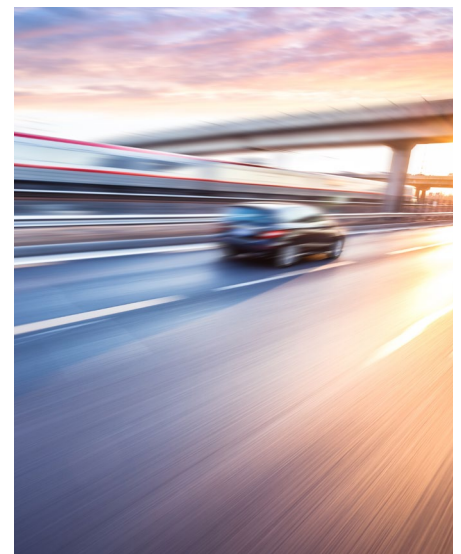
Become a connected fleet operator

To ensure a high level of service for their customers, carmakers must also be able to operate as connected fleet operators. This requires addressing several technological and organizational challenges, such as setting up infrastructures that enable the reporting of collected information and organizing data processing and interpretation so as to improve the quality of customer relationships, etc.

While the majority of players are currently undergoing the transformation process to become connected fleet operators, several questions remain unanswered, namely:

/ What model should be implemented between the entities responsible for the design and for the functioning of embedded systems?

/ How to manage the speed of development cycles - and associated obsolescence - of digital automobile services?

/ What new indicators (in terms of quality for example) need to be put in place to monitor the availability of connected services?

CLEAR ADVANTAGES

Industrial clout

Long-standing car manufacturers can draw on the considerable industrial means at their disposal and their extensive experience and expertise (on average, the top ten global carmakers have been in existence for around a century) to produce the connected vehicles of the future on a mass scale. Their established organizations also allow them to react rapidly to complex regulatory changes which could impact the approval process of their vehicles in countries where they will be marketed.

In addition, their credibility and in-depth knowledge of how vehicles function give them a voice in major auto alliances where they can exert influence on the definition of standards (technological, security, etc.) and applicable regulations. This also enables them to make the most astute and efficient choices, notably in terms of technologies and partnerships, as early as the drawing board stage.

These two points are major barriers to entry for potential newcomers, notably for those wishing to rapidly attain the productivity and quality levels required by the market.

Expertise in mass production

Meeting market demand primarily requires having the capacity to mass produce vehicles while ensuring a high level of security and reliability; two prerequisites on which consumers are not, and never will be, willing to comprise. Car manufacturers could capitalize on their expertise in this domain, and use it to their advantage to integrate new requirements linked to cyber security, a major issue for connected vehicles.

Moreover, with their in-depth knowledge of the automobile, carmakers are clearly the best placed to collect and exploit vehicle data securely. They can also draw on their mechanical and digital expertise to design innovative services that are feasible and continue to target a reduction in TCO (Total Cost of Ownership) for their customers.

Scope of the client base

Given their historical presence, market share and large brand portfolios of past and current clients, carmakers have all the elements necessary to craft and pitch a convincing business plan to inspire partners to design new service offerings based on their technological platform.

They can, therefore, position themselves as audience aggregators and as such offer their partners access to potential markets of several million customers.

The capacity to manage a partner network

In addition, carmakers historically know how to operate in an open ecosystem to design, produce and innovate, particularly with their parts suppliers. This requires working, both at the contractual and operational levels, with numerous players, some of which are often their rivals. Through this, manufacturers have become accustomed to

facilitating their partners so as to optimize budgets and production schedules while maintaining durable and constructive commercial synergies with them.

This capacity will be essential for carmakers to integrate an even larger and more diverse ecosystem of partners.

A STRONG TREND... AMONG OTHERS

The widespread deployment of connected vehicles is a fundamental trend that will provide users with an enhanced driving experience offering open connection with the outside world. For carmakers, this raises numerous issues that need to be addressed in terms of technological innovation, culture and partnership strategy.
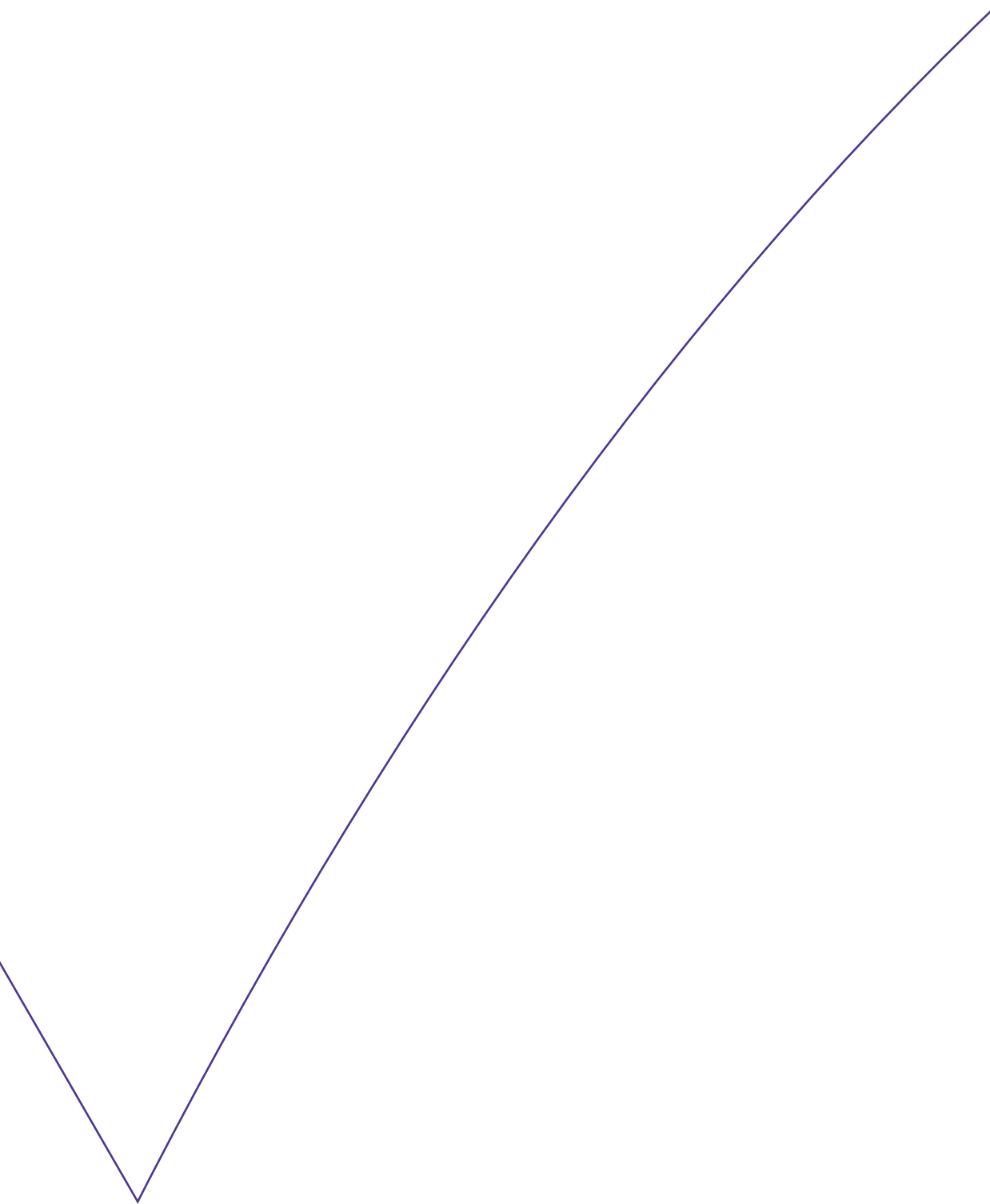
The development of technologies that connect the vehicle to its environment via the exchange of large amounts of data, is paving the way for the advent of the autonomous car, which is destined to disrupt the status quo. Customers who still own and drive their

own cars will gradually become mobility-service users. These autonomous cars are set to completely revolutionize perceptions of a car ride and the associated activities.

In addition, the digitalization of the automotive sector (and the new, related mobility usages), as well as trends in the choice of technologies used (such as the electric vehicle which is currently the most mature solution on the market) will contribute to reducing CO_2 emissions in the long term. This is a major issue for the sector and cause for concern for an increasing number of public players and drivers alike.

To maintain their top-tier positions, therefore, carmakers must pursue and step up transformation to ensure they will be equipped to play a leading role on several fronts.

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