CHOUCAS CONSULTING
Improve your performance

DATA,
THE MOST VALUABLE RESOURCE

« The world's most valuable resource is no longer oil, but data. ».

This 2017 [article](#) from *The Economist* sparked the conversation on data and its importance for the 21st century.

For better or worse, data has indeed become the central element of our societies.

In this document, we focus the impact of data on the mobility sector, and all its implications.

WHO WE ARE

Philippe Clogenson,
Founder & Senior Advisor of Choucas Consulting

« I witnessed the evolutions of marketing: from direct do database oriented marketing, going through data, then multicanal, the digital and omnichannel marketing.

Focusing on operational actions, I have a ROI and customer-centric approach of the projects I manage. I base these traits on my previous experiences from industry and service companies, as well as all kind of sectors. I worked in major French and international companies, and with startups.

In 2019, I launch my own business, a consulting agency in performance improvement with an expertise in client experience and usage transformation: Choucas Consulting. »

- Philippe Clogenson

What we do

We help companies complete their digital transformation successfully:

Taking into account client expectations during the engineering phase of the product/service

Understanding the expectations and needs of the clients

Developping and reinforcing the relationship with the client

Creating and sustaining a real User Experience

The vehicle of the future will be **CASE**

The vehicle of the future will be drastically different from what we know today. The vehicle of the future will be CASE:

- ✓ **C**onnected
- ✓ **A**utonomous
- ✓ **S**hared
- ✓ **E**lectrified

What does it mean and what are the implications regarding data?

DATA AND CASE

Definition of
CASE

Connected

Vehicles become an extension of our smartphones. The drivers are connected via the replication of their smartphone on the dashboard screen. Vehicles will be connected to the driver, as well as to other cars.

The vehicle emits and receives data about the environment, infrastructures, etc. The data is used for maintenance/repairs and to propose services offered via the screen, which also emits data. This is a whole connected environment.

Definition of CASE

Autonomous

Autonomous driving is the key innovation in the mobility sector. ADAS (Advances Driver-Assistance Systems) are the first step towards automation. The first objective of ADAS is safety. Quick response is vital, any lag could have serious consequences. We now understand that it is fundamental to reduce the real-time low latency (the amount of time between the input and the output) for safety reasons.

We have 5 automation levels, 1 being no automation and 5 being fully automated. Today, we are at level 2. Going further, to levels 3 and 4, represents many challenges. This gap will be the hardest to pass as it poses several safety, technological and ethical issues.

The 1949 Geneva Convention and the 1968 Vienna Convention shape the road safety regulations. They are still among the main international regulations that impact the production and use of autonomous vehicles. Of course, these standards were written in a context where autonomous vehicles were not part of the equation. So updates are necessary.

Definition of CASE

Shared

Sharing vehicles is becoming more common, and we might not purchase cars anymore, but rather use them only when needed.

Developping this sharing economy would help reduce congestion and pollution in **Big Cities**.

In rural areas, where owning a car is vital, the goal is to offer multimodal solutions to make mobility easy and practical despite the greater distances and the lower density of the population.

Offering mobility options depending on *need* and not *ownership* is called **Mobility as a Service (MaaS).**

Data helps to anticipate the usage of transports. By extension, data contributes to the optimization of the experience and to the reduction of costs.

Definition of CASE

Electrified

Finally, electricity appears as a solution to tackle the pollution issue. Electric vehicles promote emission-free driving, reduce pollution. Hydrogene motors can also contribute to this goal.

Another positive effect of data in the case of electric cars, is that it helps **determine the exact needs of electricity**: when, how much and where. It will be then possible to adjust the delivery of electricity depending on usage. Electric cars could be in regular contact with this *smart grid*, to provide information on its needs of electricity. The era of immutable electric networks would be over.

We can clearly see how **data impacts every component of transportation.**

Some companies in the CASE mobility industry

UNITED STATES

EUROPE

ASIA

The laws in the
United States

As of September 2021, the US have **no federal law** that monitors the use of private data. In most states, companies can use/share/sell private data without notifying the person.

The laws in **Europe**

Europe has the GDPR. It requires companies to ask for some form of consent before collecting data, to present the third parties and the goals of the data collection. A recent update makes it possible to refuse the collect of data with just a click.

France passed a law in April 2021 to legislate on data: infrastructures, authorities, the police, manufacturers, emergency assistance... each actor will have access to specific anonymized data that cannot be used to prove a road infraction or to promote ads.

But only a few types of data are important to keep. They will be uploaded to the Cloud, while the others (for active driving) don't need to be kept.

The law in China

China doesn't have a tradition of policing private information. However, the country did pass laws to legislate the use of private data.

The **« Information Security Technology – Personal Information Security Specification »** law (March 2020) requires consent to collect biometric information. This information shall be deleted once the subject is identified.

A new environment

With the **5G** coming in, the era of the **Internet of Things (IoT)** has started. 5G accelerates the exchange of data and creates new possibilities, such as Smart Cities that are on their way.

Right now, 4G has an average download spead of 8-10Mbits/second. With 5G, it is 2Gbits/second, so 200x faster!

Another key strength of 5G is that it provides accurate geolocalisation (less than a meter radius) with low latency.

New means of selling emerge. With a **faster, more accurate Internet,** companies can now collect an unprecendeted amounf of data. We can also foresee the rise of new services and usage. Imagine walking around the shopping district of your local town, and receive real-time discounts. Or passing by a museum that would send you a notification on its latest exhibition that you had never heard of... but now maybe you will go!
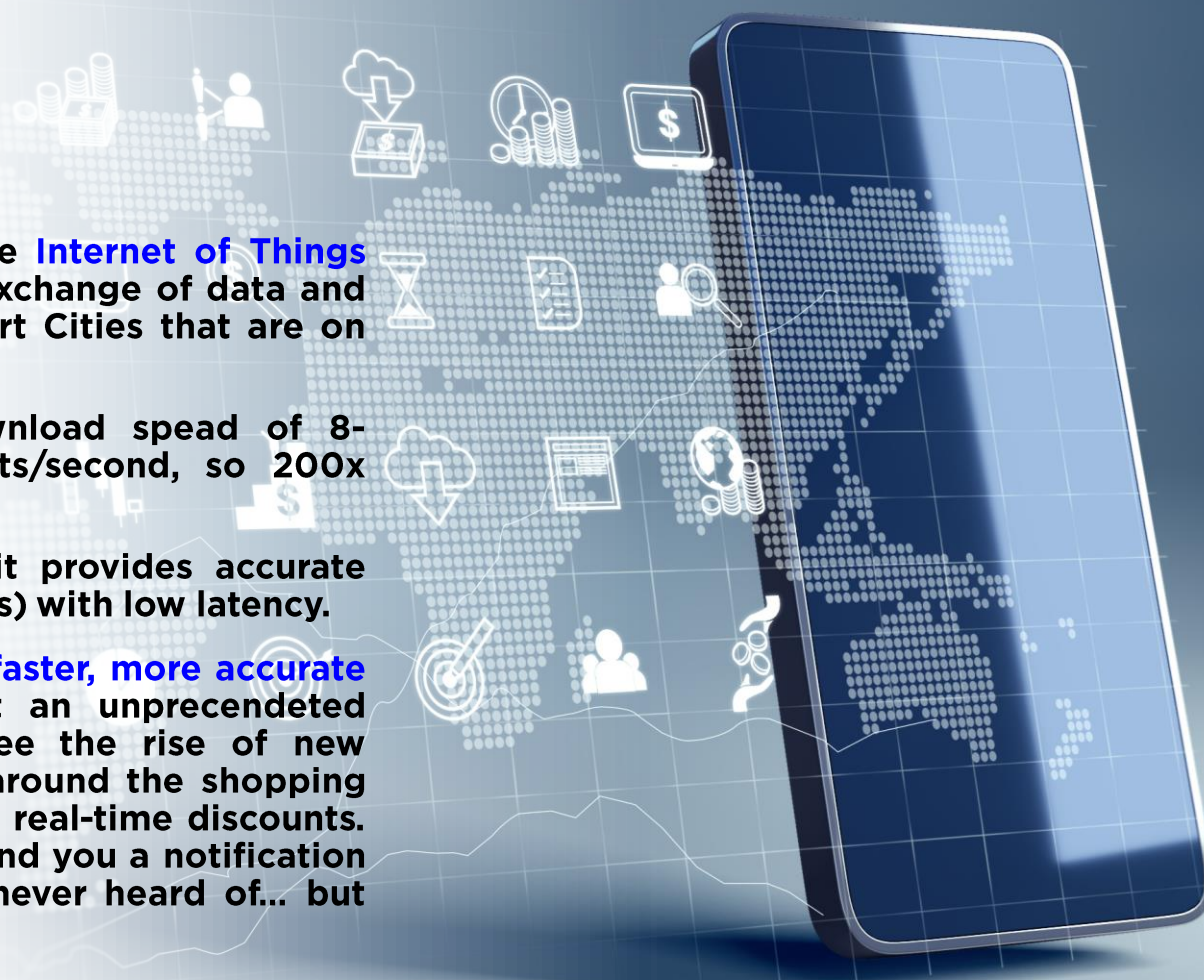
The transformation of usage

We are witnessing a **shift from ownership to usage** in our economy, and in particular in the B2C mobility market.

People tend to **possess less** vehicles (cars, scooters, bicycles) and use **more shared** or public services. This is valid in B2B, B2C, B2B2C markets.

The digital, and data, are essentiel in this matter. Most of these shared services can be booked online thanks to an app. A wellknown example is Uber.

A **new way** of doing business

As new behaviors come into place, the companies or public services must adapt. That is where data comes into action.

Data is used to fully **understand the evolution of expectations and needs.**

What do clients want? What are their frustrations that we could aleviate? Data is important to **detect risks and opportunities.**

This means that a product/service is **never completely operational.** It must change and evolve to meet expectations. Implementing a data collection system is, in consequence, fundamental for businesses.

The amount of data and challenges

CASE vehicles produce a **tremendous amount of data.** It collects real-time information about the environment, the vehicle, and needs to make instant decisions.

100 cars with 5 cameras will generate 1 million hours of video recording per year. One autonomous vehicle will generate [4 terabytes](#) of data everyday. All these hours need to be captured, transported, stored and processed. And we are yet to see a sustainable process.

Autonomy and the technical challenge

Microsoft developped **Azure**, a high performance computing (HPC) that generates simulations to accelerate the conception of autonomous vehicles.

We also have the example of **Hadoop**, an open source framework using Java designed to treat huge amounts of data. It is used by LinkedIn, Twitter, eBay, Amazon. But a **key difference** between AVs and these platforms, is that the later can't harm you in case of defect!

And let's not forget the GAFAs that massively invest in data in autonomous vehicles, such as Google and Amazon.

Data from the
clouds

Satellites become a way to exchange vast amounts of data with AV. Today, most new cars have a **modem** connected to a tower. So areas with low Internet coverage represent a danger. That is why satellites appear as a great solution.

The consequence? The start of a new **space race!**

As of September 2021, there **7,941 satellites in orbit**.

Between the years 2000s and 2010s, humanity would launch roughtly 100 satellites every year.

In 2021, by September, we have already sent more than 1,400 satellites into space. We can clearly see that **countries are claiming more vividly ownership over Earth's orbit.**

Machine learning

Autonomous vehicles must be able to **face any situation** in a very complexe environment (weather, infratructures, other vehicles, walkers, unexpected situations).

We also must add the amount of data that is collected. Machine learning appears as a perfect solution, and a lot is invested in it.

Machine learning relies on **autonomy and connectivity features** of vehicles. One car confronted to a specific situation could communicate about it to the other cars, and so millions of cars would virtually learn collectively and become more accurate.

Artificial Intelligence

Artificial intelligence is a key element to make vehicle autonomous and to tackle a fundamental problem: to reduce traffic accidents.

According to the NHTSA, **94% of serious crashes** are the result of human error. We can see the clear **benefit** of having autonomous vehicles that use AI.

However, as the European Union Agency for Cybersecurity (ENISA) reports, there is a serious **threat** related to AI as it can be easily **tricked or hacked.** Pedestrians could be misclassified. We can easily imagine the havoc that would cause.
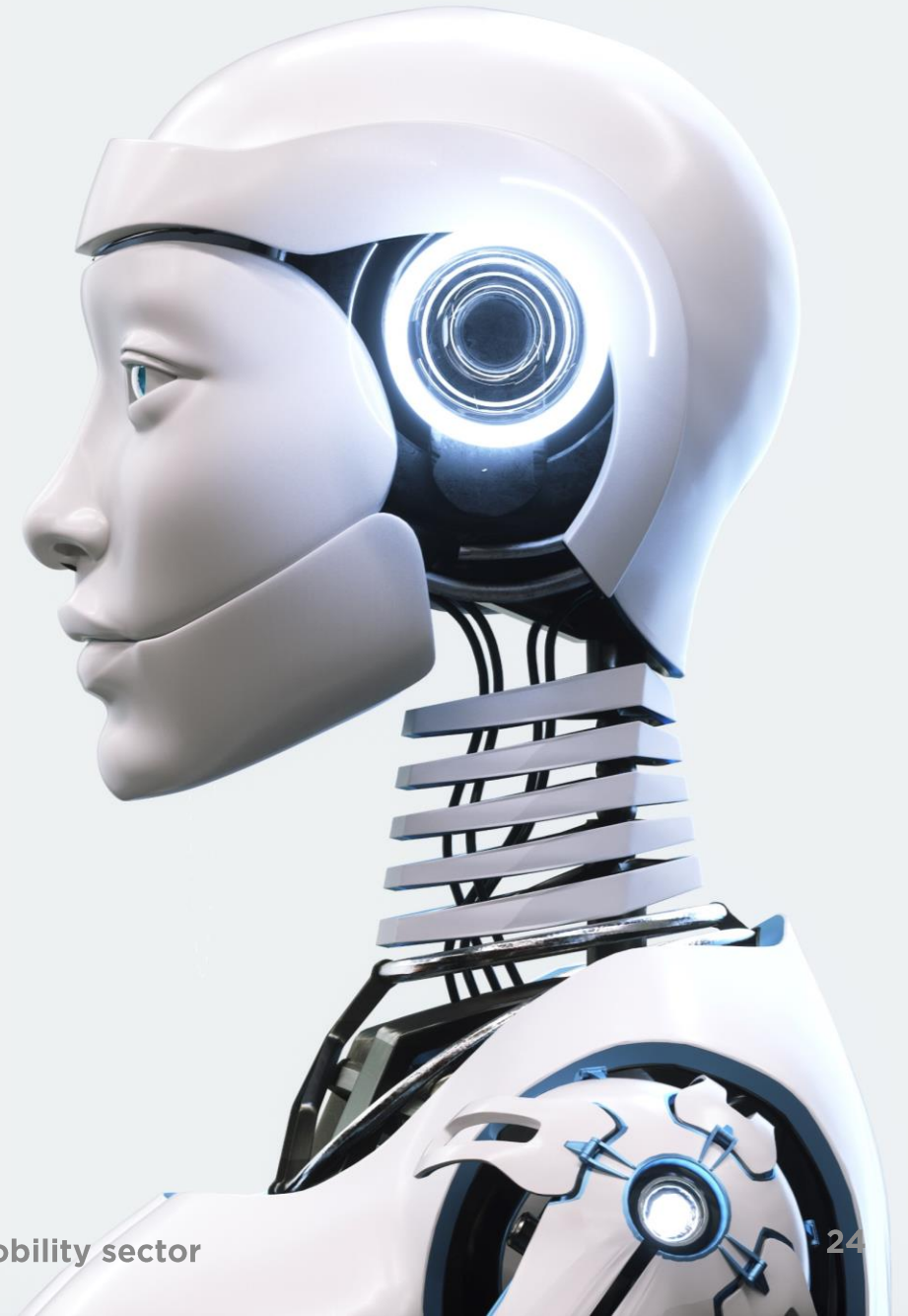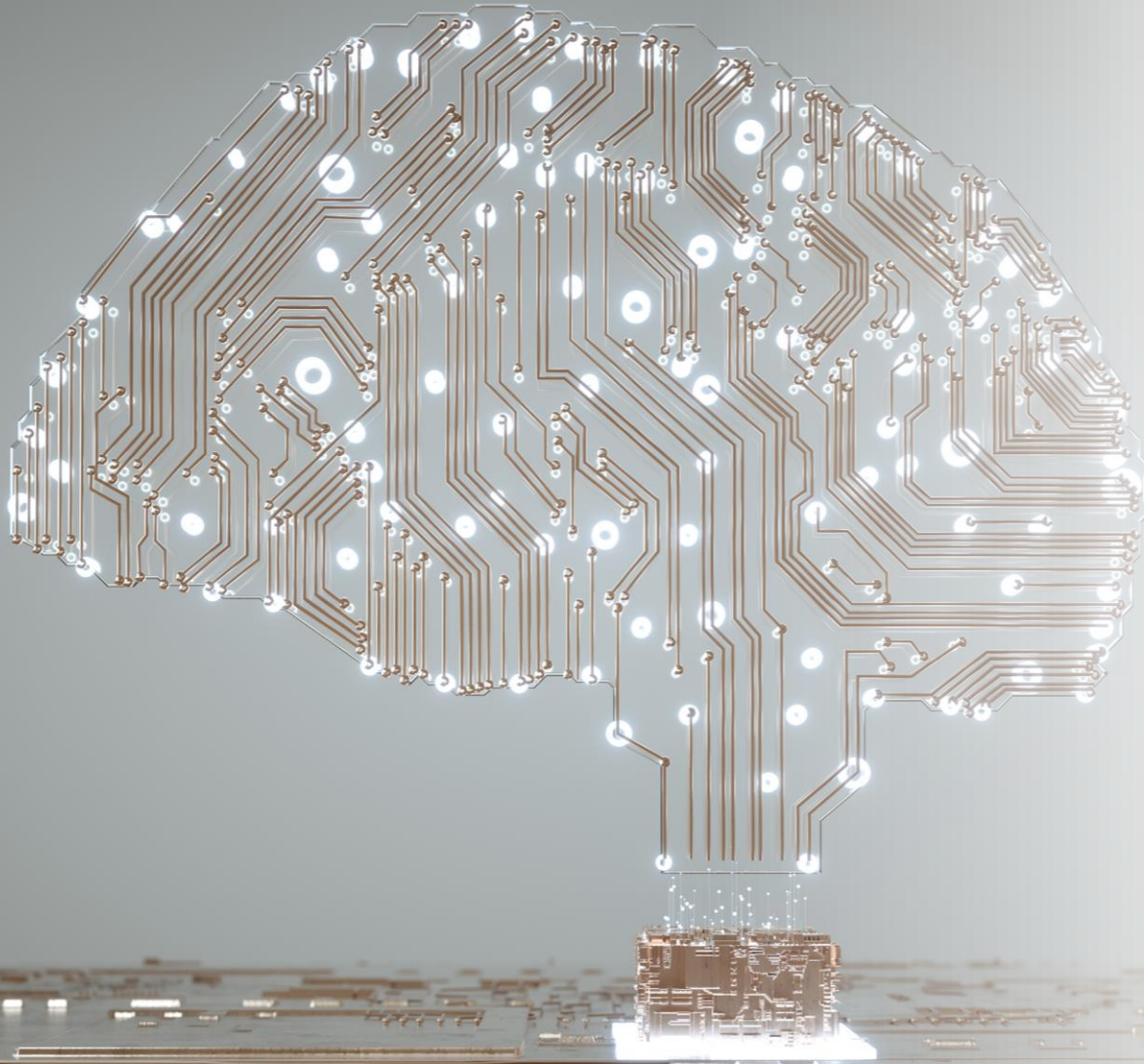
The foundation for **innovation**

The production of such an amount of data is a **tremendous opportunity** for companies and their departments (marketing, R&D, sales...). The analysis of the car can provide **valuable information** regarding its usage by the passengers, the evolution of the battery, etc.

This is the **foundation for the definition of data-drive business models.** This impacts management, with the rise of Agile and Scrum methods, as well as the relationship between the different departments. The Marketing, R&D, and Sales divisions work in closer collaboration in data-driven companies.

Safety

Our very **lives** depend on the correct processing of data. The systems must be perfectly accurate and flawless, regardless of the conditions.

Also the equipment must be **top of the art**: a minor change in lightning can affect deep neural networks.

Another security concern is the risk of **hacking**. Cars being connected, can hackers access them?

But at the same time, **the data collected by CASE cars could save your life.** In case of emergency, the car could directly contact 911 and provide vital information (location, number of passengers, cause of accident...). In less dramatic circumstances, CASE cars could simply warn other cars of potential hazards (weather, traffic, incidents...)

Security concerns on **privacy**

In 2018, Canada's Level One Robotics and Controls (supplier) had blueprints, schematics, NDAs and contracts of +100 manufacturers **leaked**. This shows that all the companies involved, even subcontractors, must implement the necessary tools and methods to **secure** the data they manage.

Guaranteeing the respect of our private information is a critical issue. For example, will constructors, mechanics or governments be able to see where our cars have been?

The US Army has **bought data** from prayer apps, so will it buy data from constructors to monitor people that go to places of worship?

We have seen that the European Union implemented the GRDP, but that the USA don't really have regulations. With growing concerns regarding the respect of our privacy, **this issue is at the center of the future of mobility and a lot is expected from companies.**

The human factor

AI and data don't have empathy. There is an example of an autonomous car that intentionnaly hit pedestrians to avoid a pile-up.

This shows that data, machines and technology have their limits too. It is important to keep the human factor into account.

Personnalization & customization

Humans must remain at the center of all this data.

Connectivity is used to adapt the car to the driver's needs. For example, with the shared service of VolksWagen, We Connect, you can upload your preferences (seat position, colors, favourite radio channels, language…) on the Cloud.

All the vehicles of the company will adapt their features depending on what **you** want and need.

Conclusion

This document is a overview of data in the mobility sector. It addresses several underlying issues, such as the definition of new data-driven business models, the collection and processing of such an amount of data.

One thing is for sure: the future of mobility will be CASE.

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