



FUTURE OF DATA & A.I. 2019



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DATA & AI: THE ERA OF MAN/MACHINE COLLABORATIONS

Although in the past it felt like science fiction, AI has now been integrated into our society. Voice and face recognition, robots and drones, autonomous vehicles, Smart Cities... we're steering toward a transversal and omnipresent kind of artificial intelligence.

It's easy, and somewhat tempting, to get carried away with our imaginations, and the movies also play their part in painting a portrait of a dark future where mankind often finds itself overrun by machines when they're not controlled.

However, we're still a long way from having AI with fluid robotic abilities that could overpower us. If you were thinking of West World when talking about robots, or HAL when talking about voice AI, you can relax. First of all, we're still a long way off from technologies that will allow us to get to that point; second, there is no indication that these intelligences will seek to dominate us.

The issue for companies today is understanding that current AI, an AI that is still qualified as weak, has extensive repercussions on consumer habits, as well as on their expectations. In fact, AI offers several advantages that startups with 100% digitalized services have understood: customization on a large scale, service flexibility and fluidity, speed, ubiquity...

At this moment, the strongest trends in AI to be employed are HR applications: enhancing employee abilities with robot assistants or software that's been boosted with AI, product applications, chatbot services with 24/7 client accessibility to handle simple situations, voice and visual recognition to make it easier to use a product with personalization and security, voice assistants to make interactions more fluid and to make multi0tasking easier.

In this report, we will explore the latest trends in technologies and companies that feature AI at the center of their business. Initiatives, technologies,... we'll explore the market from all sides, and conclude this report by broaching the conversation on ethics, a major topic for AI, which divides experts and loses some of the public.



Sandrine Matichard
Content and insights Director - HUB Institute



AI TRENDS 2019

INTRODUCTION
DEFINITIONS

6 SECTORS
TRANSFORMED
BY AI

ETHICS & AI

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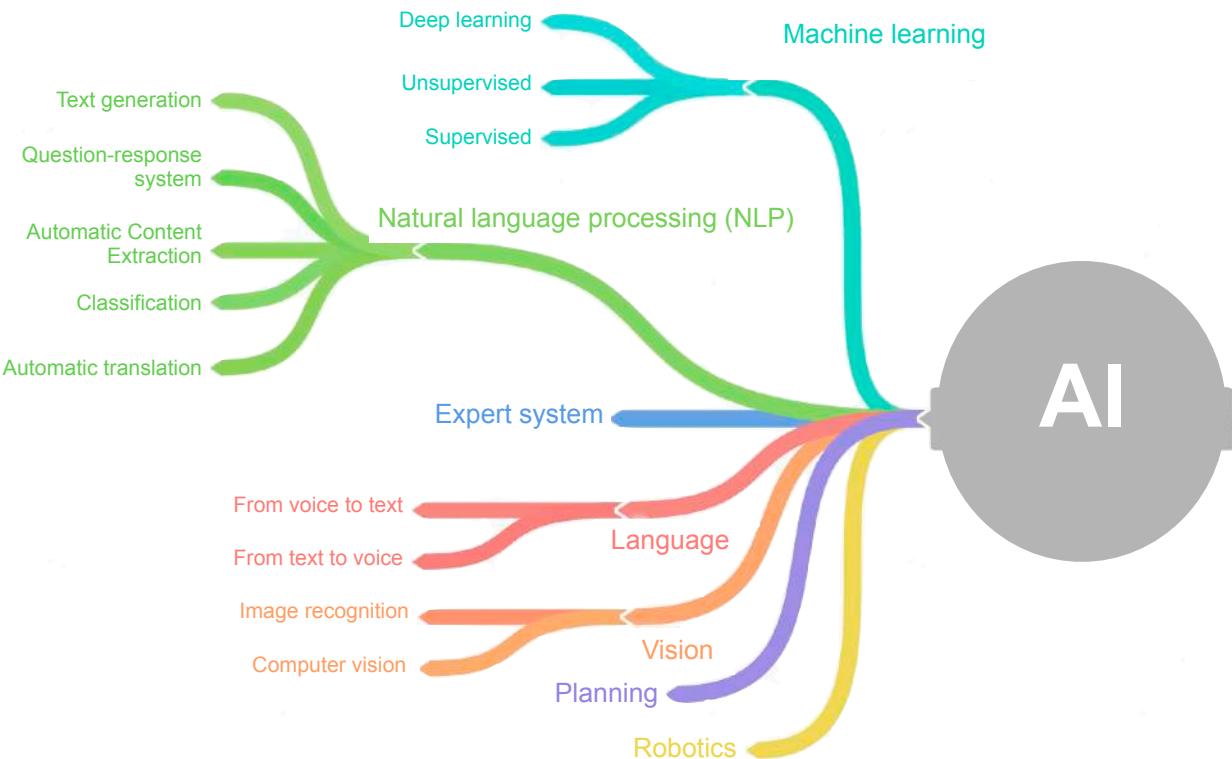
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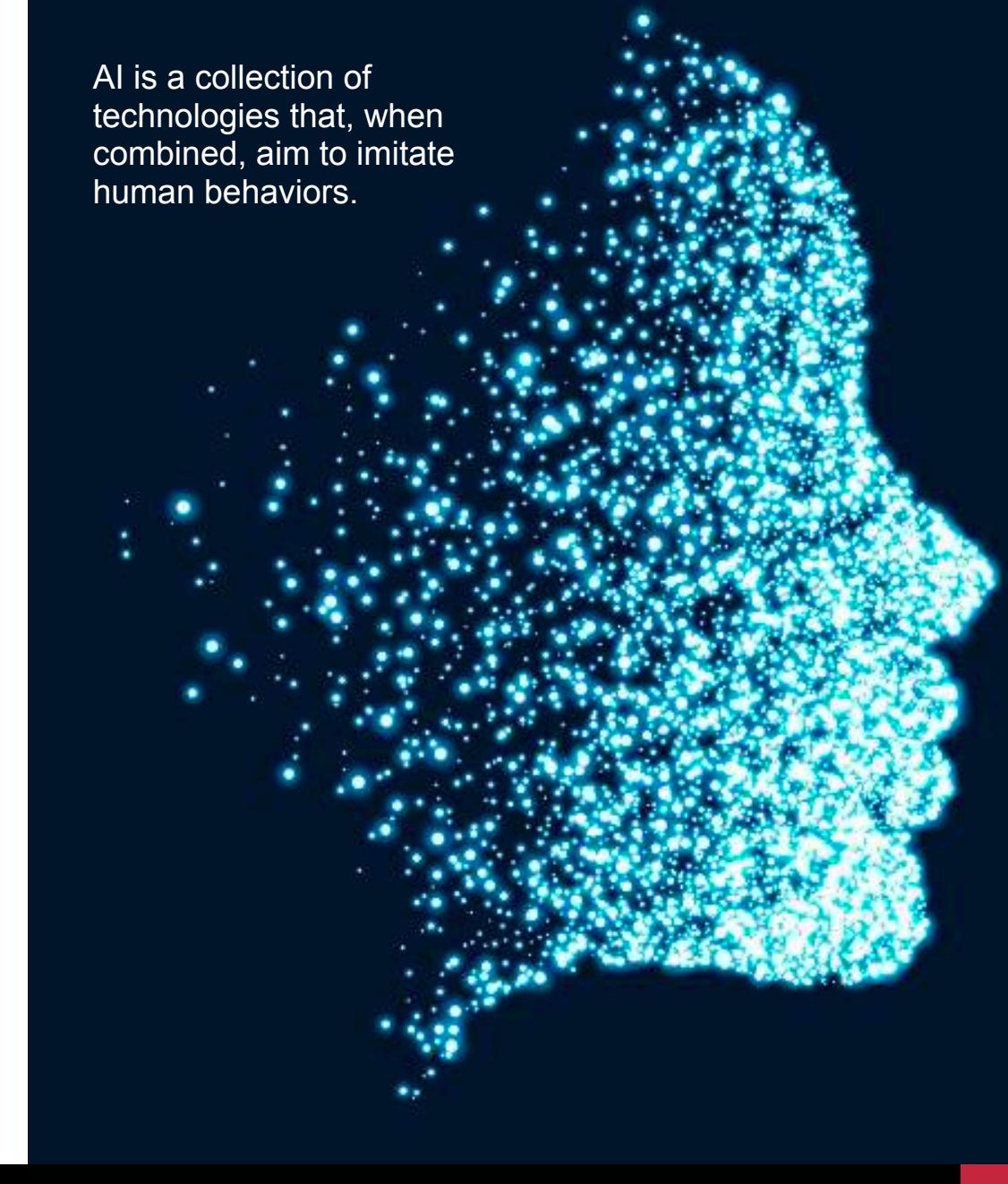
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INTRODUCTION

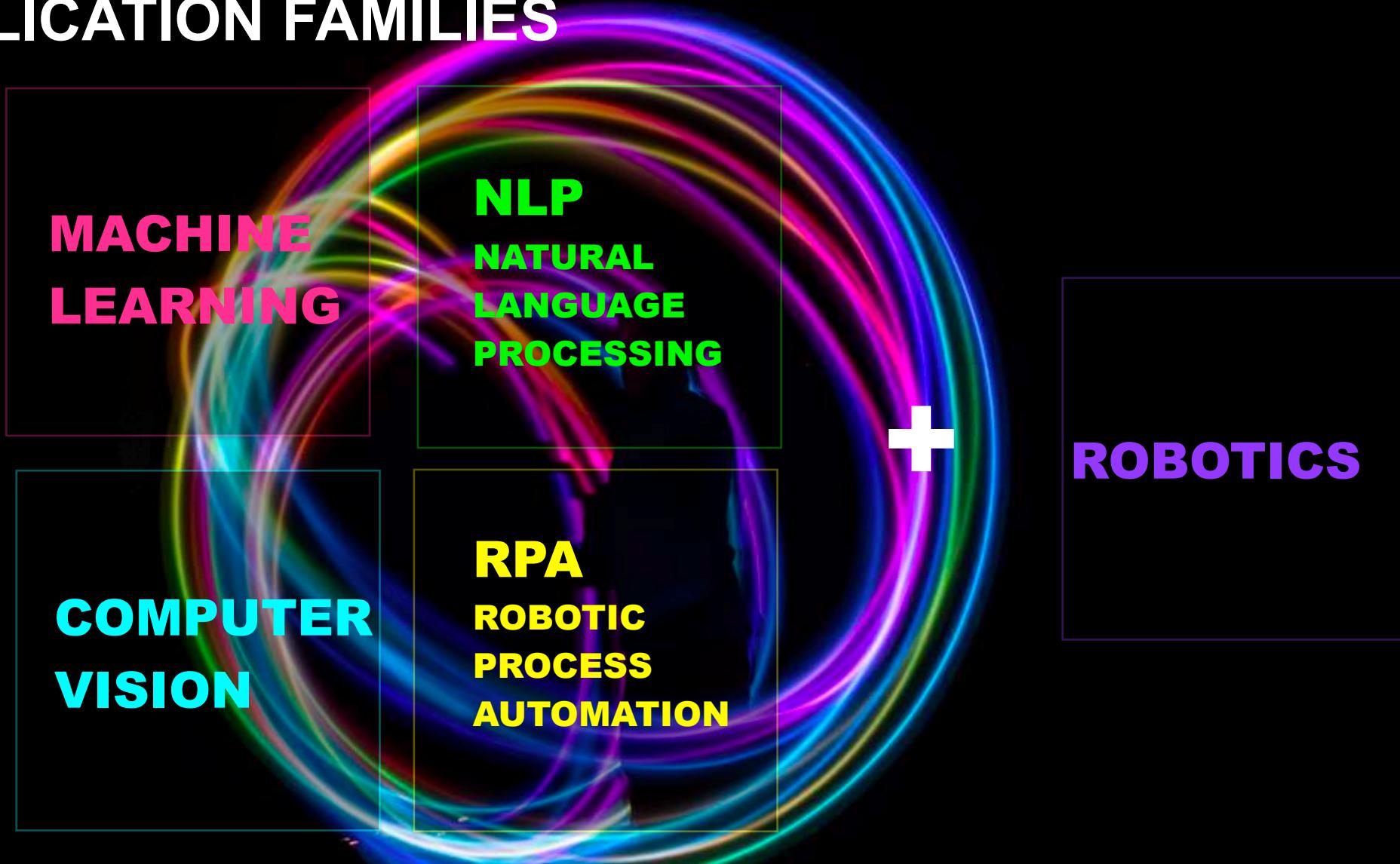
WHAT IS AI



AI is a collection of technologies that, when combined, aim to imitate human behaviors.



5 BIG APPLICATION FAMILIES



AI: TO INFINITY AND BEYOND

IT'S MORE THAN A TREND; IT'S A PROFOUND TRANSFORMATION OF OUR FUTURE WAYS OF LIFE.

Artificial Intelligence (AI) is a major topic that will cause our daily lives to evolve significantly and transform whole sectors.

AI has already been at work for several years; however, it is now reaching the next level, due to 3 factors:

- 1 Increasingly powerful computers**
- 2 Less expensive and more efficient storage**
- 3 More data and investments in research**

Today, the fundamentals of AI are already established, and this technology will be able to bring about new possibilities in every business sector.

The global worth of commerce derived from artificial intelligence will reach 3.9 billion dollars in 2022, as opposed to 1.2 billion dollars in 2018.



MAJOR PLAYERS: GAFA AND BATX'S MONOPOLY OVER AI

MARKET DOMINATION OF TECHNOLOGICAL GIANTS; THE BIGGEST INVESTORS IN AI ARE GAFA AND BATX. BETWEEN 2012 AND 2017, APPLE ACQUIRED 7 STARTUPS; FACEBOOK, 5; AND GOOGLE, 12. AT THE SAME TIME, BAIDU FINANCED 48 AI COMPANIES; TENCENT, 37; AND ALIBABA, 31.



Overview of the market by segment

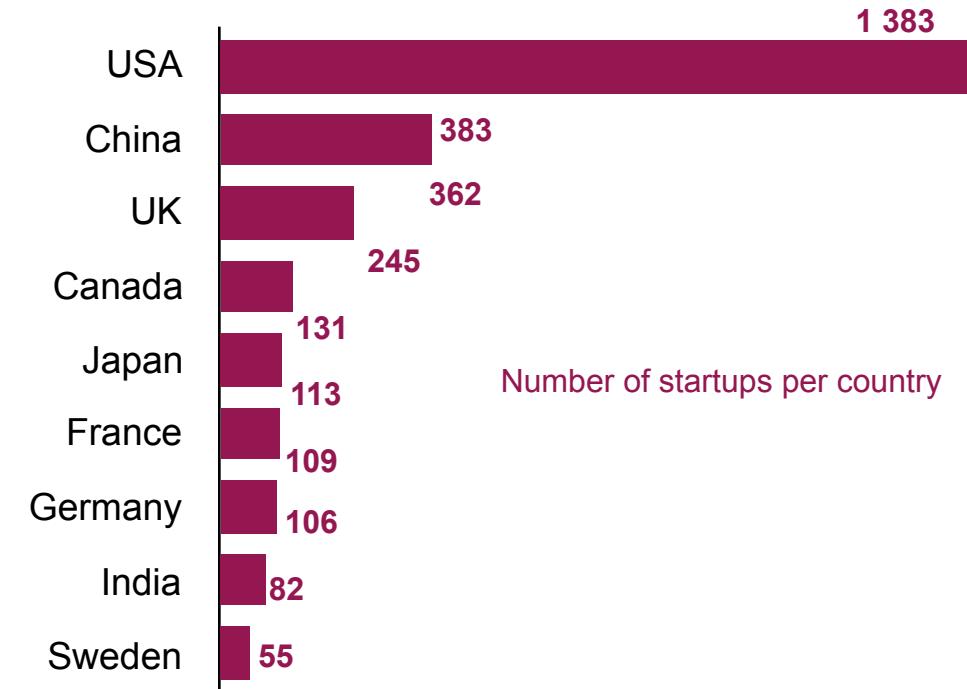
A TWO-WAY GEOGRAPHICAL SPLIT

MOST PLAYERS IN AI ARE CHINESE OR AMERICAN.



"We're caught in the crossfire between GAFA and BATX (...). Without platform creators at the same level as the Chinese and the Americans, we're going to be the Zimbabwe of 2080."

Laurent Alexandre



Source : Prospective - intelligence artificielle - État de l'art et perspectives pour la France - Ministère de la cohésion des territoires et de l'économie des finances - Février 2019

WITH INVESTMENTS, AI IS A MARKET THAT RAKES IT IN

EUROPE IS LAGGING BEHIND CHINA AND THE UNITED STATES.
FRANCE IS IN THE LEAD IN EUROPE.

48%

Investments made
by China

38%

Investments made
by the US

11%

Investments made
by the EU

3%

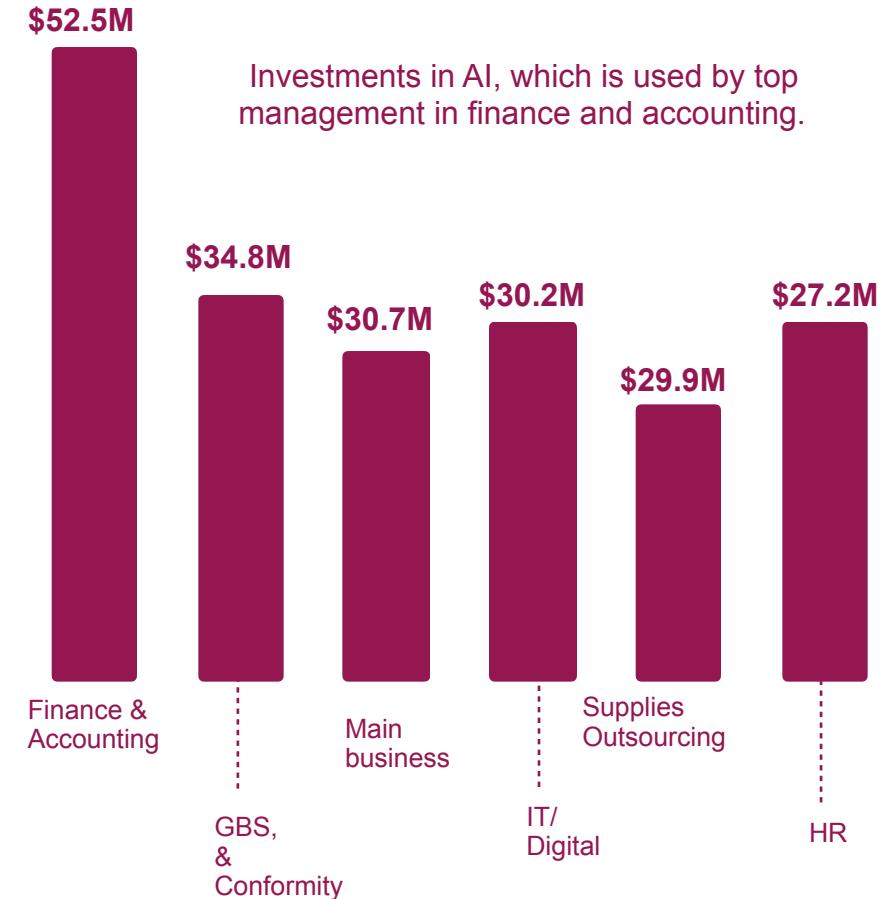
Investments made
by France
Around 400 million euros



Sources : *Top AI Trends to watch in 2018* - CBInsights - 2018

Sources : *Artificial Intelligence the next Digital frontier?* - McKinsey global institute - 2017

N°1, THE FINANCIAL SECTOR REPRESENTS 20% OF INVESTMENTS IN AI



Sources : Les prédictions IDC 2017 : du Big Data au cognitif - IDC analyze the future

Sources : Easing the pressure points : The state of intelligent automation - KPMG - March 2019 Sources : Artificial Intelligence the next Digital frontier? - McKinsey global institute - 2017

FRANCE'S POSITION

Though France doesn't lack in minds, which are often recruited abroad to the advantage of GAFA, it doesn't have the financial means to keep up. The programs and investments made aren't enough to contend with China and the United States. France will have a hard time competing on their own, against the means and broad legislative flexibility of other countries.

X10

Investments in AI over the last 4 years

109

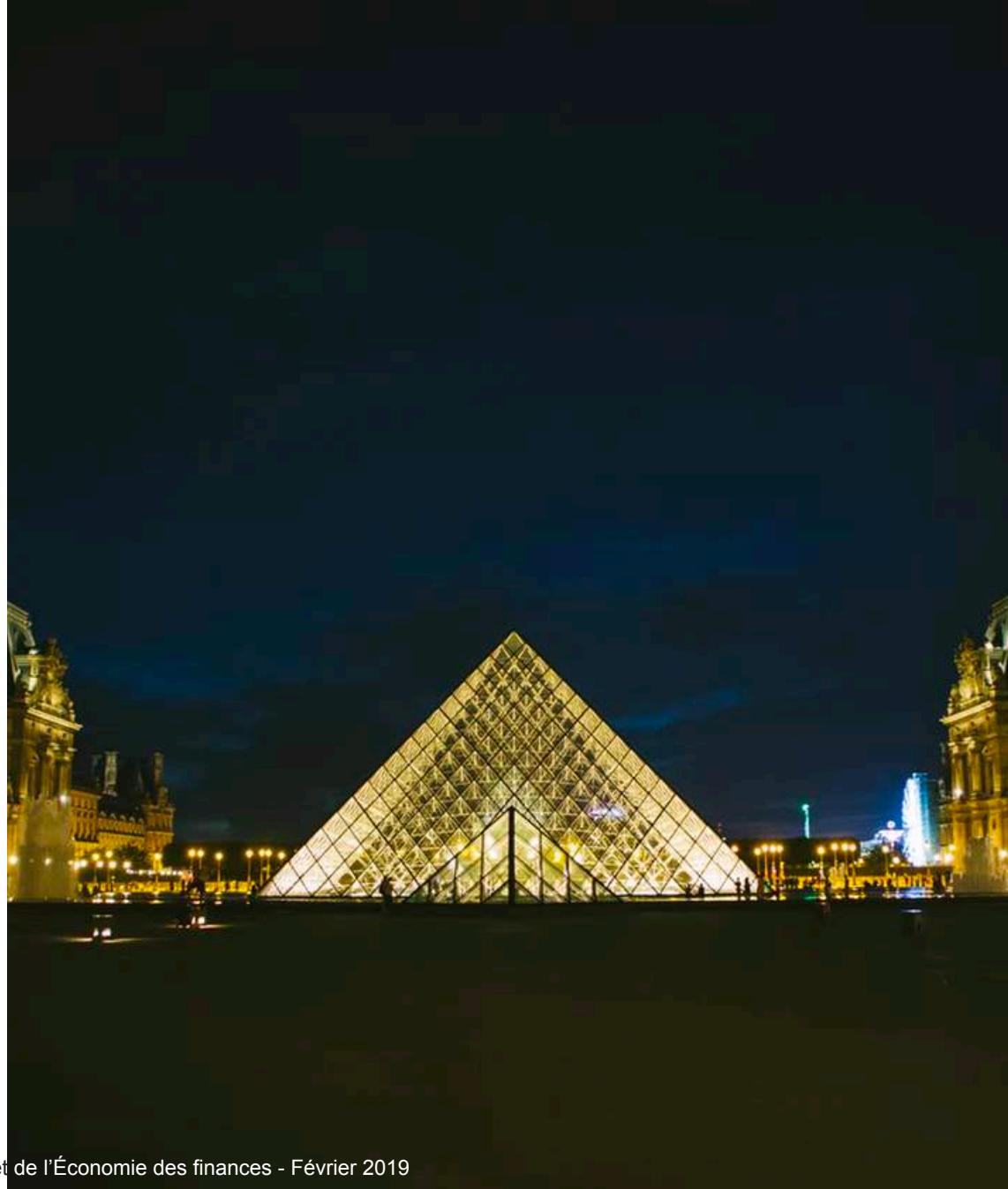
Number of startups in AI

1.5B €

Investments in AI by the government by 2022

5,300

Number of researchers



Sources : *Top AI Trends to watch in 2018* - CBInsights - 2018

Source : *Prospective - intelligence artificielle - État de l'art et perspectives pour la France* - Ministère de la Cohésion des territoires et de l'Économie des finances - Février 2019



“When it comes to artificial intelligence, we’re a third-world country.”

“The current issues are social issues, sovereignty, and economic issues.”

*Laurent Alexandre
Surgeon, Urologist,
Founder of Doctissimo*



FRENCH PEOPLE AND AI

FRENCH PEOPLE ARE CURIOUS AND POSITIVE ABOUT THE CONCRETE ADVANTAGES, BUT WORRIED ABOUT PERSONAL AND PROFESSIONAL IMPLICATIONS, IMAGINING A WORLD WHERE ROBOTS HAVE SUPREMACY OVER MANKIND.

94%

Have already heard
of AI

80%

Believe that AI is
already part of their
daily lives

54%

Think that AI will have
a positive impact on
their daily live

48%

Think that their job will
be replaced by a
machine

70%

Think that AI is a threat to
data protection

4 in 10 French people

Think that robots will overthrow
humans one day

Sources : Les Français et l'I.A. - Institut CSA Janvier 2018

THE FRENCH AREN'T THE ONLY ONES TO BE WORRIED

A global study shows that, generally speaking, consumers are curious to see what AI could do for them. However, the concern about AI still persists, thereby making it necessary to reassure consumers and help them see the light, more particularly regarding personal data, and increasingly regarding the real abilities of AI.

33%

Are worried that AI won't know them as well as a human

24%

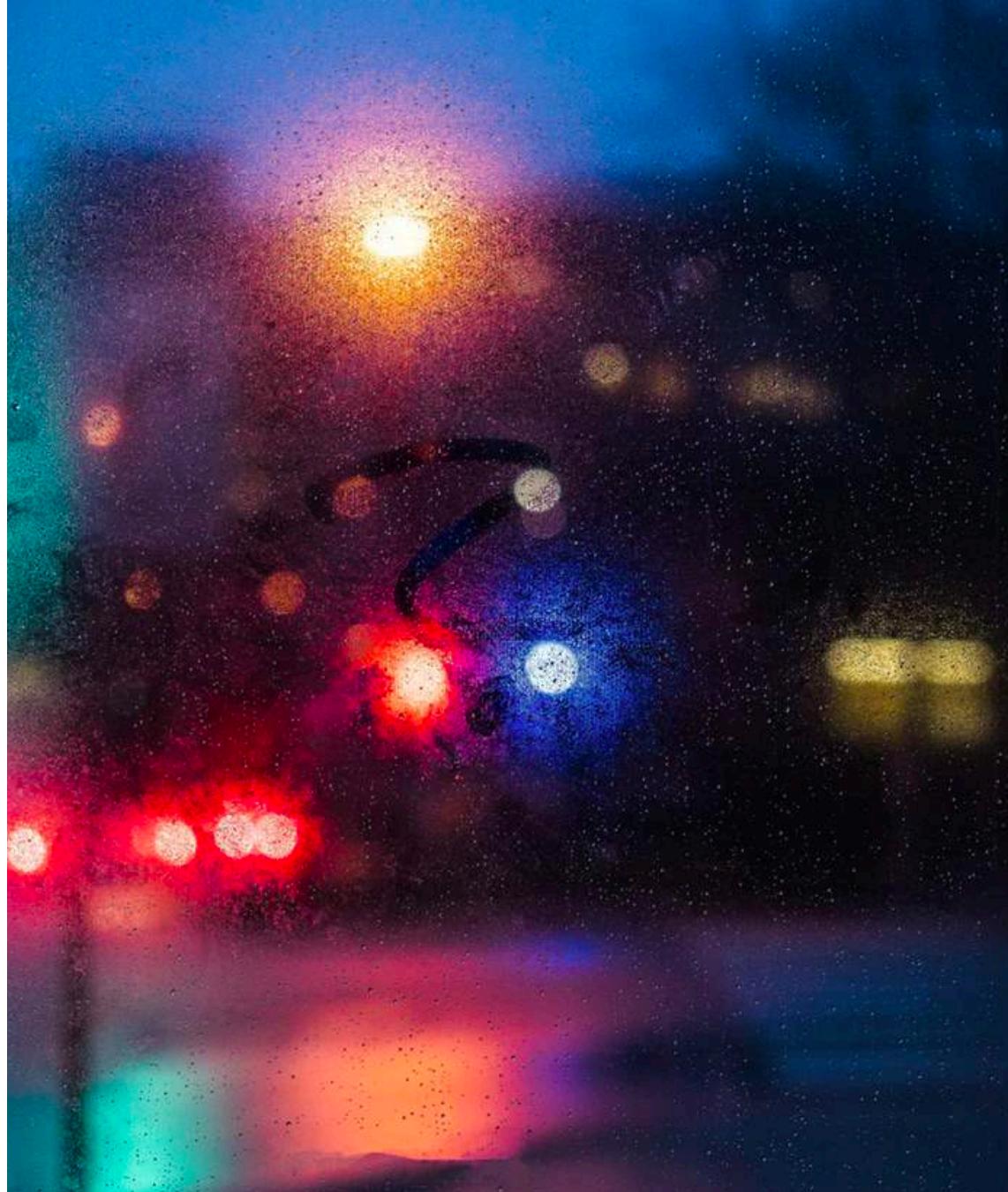
Are worried about robot domination over humans

Only 27%

Are open to sharing their data

68%

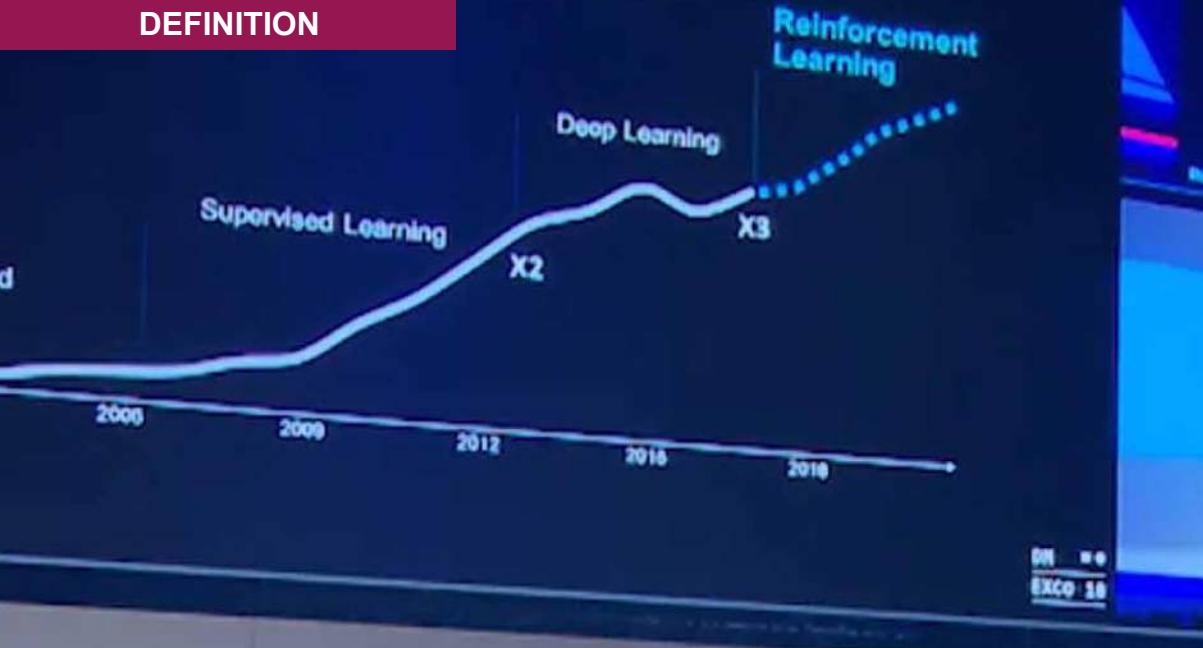
Would be open to using AI if it simplified their daily lives



Sources : *What consumers really think about AI : A Global Study* - Pega 2019

1.1

DEFINITIONS



MACHINE LEARNING & DEEP LEARNING IN THE COMPUTING EVOLUTION

THE LOGICAL NEXT STEP, WHICH IS GETTING MORE AND MORE POWERFUL

ARTIFICIAL INTELLIGENCE

All the techniques that allow machines to imitate human intelligence.

Decision trees
Genetic algorithms
Expert systems

MACHINE LEARNING

Learning algorithms based on complex statistics, allows machines to use experience to improve their performance of a task, controlled by humans.

DEEP LEARNING

An algorithm capable of training itself without human intervention by basing itself on a collection of overlaid neural networks

EVOLUTION COMPUTING

Program capable of creating and finding solutions.

1950

1960

1970

1980

1990

2000

2010

2020

Need explicit programming



Not much progress in problem resolution

Doesn't need explicit programming



Insufficient computing power

Creation

Sources : HUB Institute 2019

MACHINE LEARNING

MACHINE LEARNING

A program capable of learning from data provided, and of developing precise prediction and/or analysis abilities.

Through prediction, we mean to be able to distinguish the nature of an image, or instance, or a text or sound.

The difference from classic software is that there is no computer code to tell the program “what is what;” the program learns to make the distinction by itself via the quantity of data available.

IMPORTANT

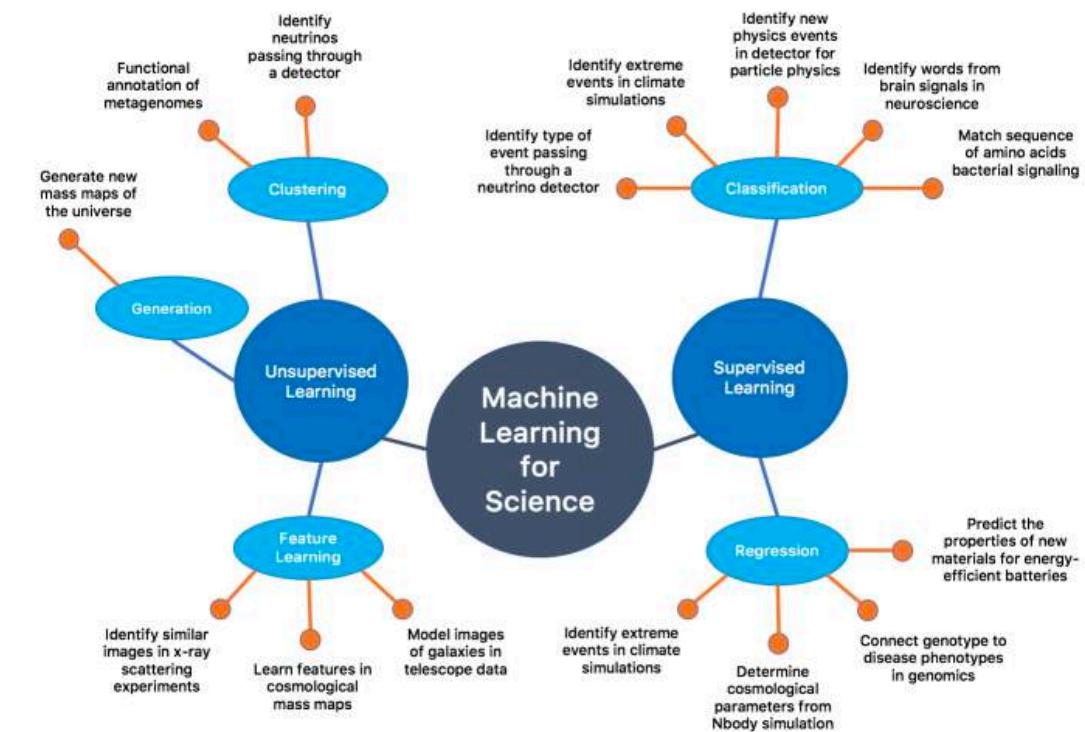
For the system to function, it needs a large amount of quality data with easily recognizable parameters and a balanced number of trials.

TYPOLOGY OF MACHINE LEARNING

Supervised: learning by example. The data is labeled. This system requires millions of labeled data points. This labeling is done manually by humans.

Unsupervised: here, an algorithm has to identify data patterns to find similarities and separate the data into different categories.

Semi-supervised: the idea is to use a small amount of labeling data (reducing the time humans must spend on processing it) and a large amount of non-labeled data. The program learns via the small amount initially, and ends its learning process with non-labeled data.



Source : Science use cases - NERSC Documentation

DEEP LEARNING

DEEP LEARNING

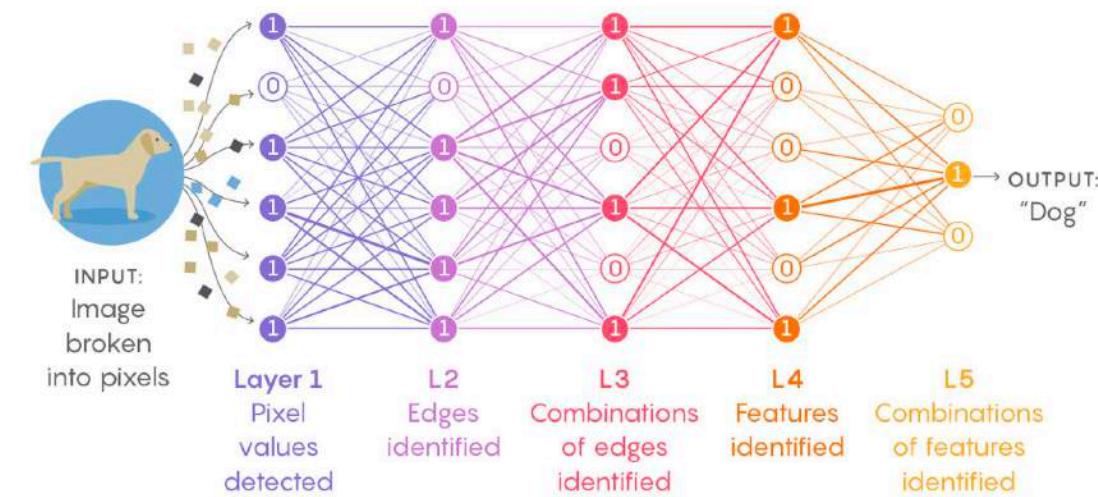
Deep learning is a subcategory of machine learning that is considered to be more advanced. It's based on several layers of neural networks that process a massive amount of data.

IMPORTANT

With these deep learning abilities that don't require labeled data, AI can truly progress into new abilities, such as voice and face recognition, computer vision, etc.

NEURAL NETWORKS

Inspired by how the brain works, it involves layers of interconnected algorithms that feed each other with the data provided. The data that goes through the first layer becomes the base for the second layer, and so on and so forth. Each layer can recognize a different parameter in the analyzed object.



Source : Foundation Built for General theory of Neural Network - Quantamagazine

EVOLUTIONARY COMPUTATION

EVOLUTIONARY COMPUTATION

A program's ability to find solutions, and therefore create things. It's based on the concept of biological evolution, and starts with a randomly generated code that is duplicated into multiple versions. Each created code is tested to solve a problem, and by luck (just like in biology), some pieces of code are better.

The codes that work the best are then chosen and reproduced with a mutation or are combined with others, tested again, and so on.

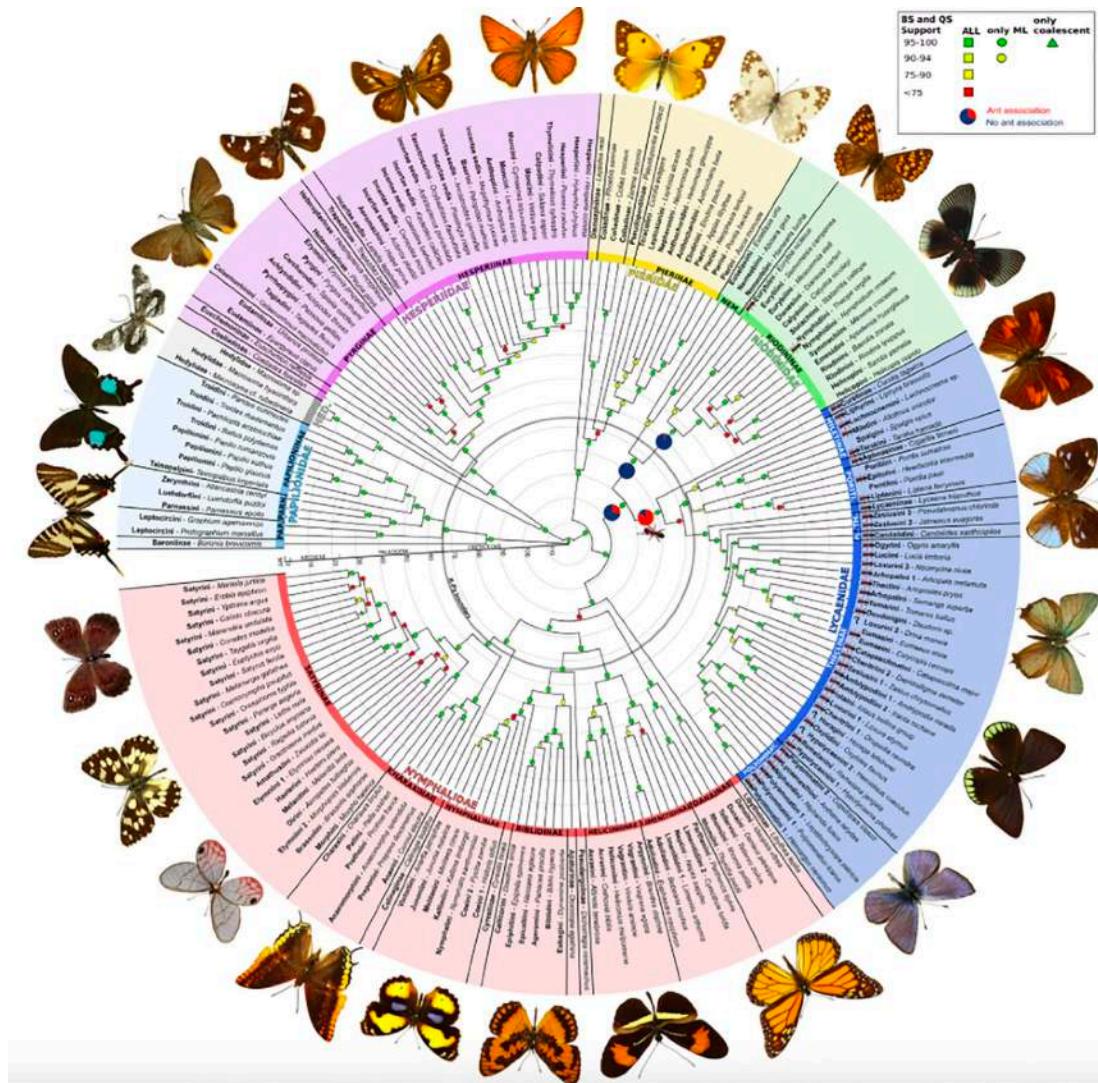
IMPORTANT

Evolutionary computation today represents the future of AI. It will allow AI to become truly autonomous and to create without a program telling it what to do. For the moment, this method is expensive, and sometimes slow due to lack of processing power, and also has its limits. Since the field of possible solutions is too broad, the tool can't manage to get past the local optima stage.*



PREMIÈRES APPLICATIONS

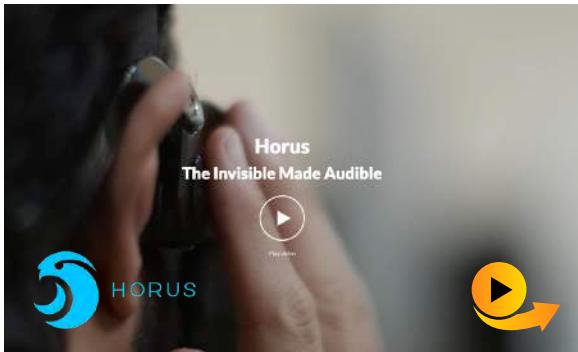
These programs could initially fulfill trade strategies, find the best routes for a trip, or design a technical object more precisely than a human.



Source : Map of butterfly evolution - Mental Floss

EXAMPLES OF MACHINE LEARNING & DEEP LEARNING APPLICATIONS

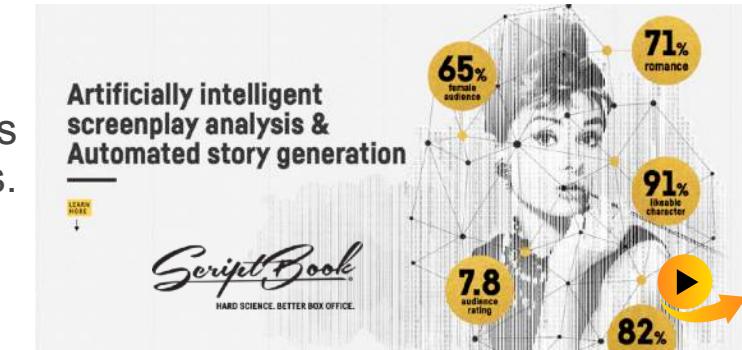
RECOGNITION



A wearable that helps the visually impaired to see.

Generates scripts and screenplays.

CONTENT GENERATION



ANALYSIS



Analyzes medical X-rays.

Compares and secures predictions with what really happens.

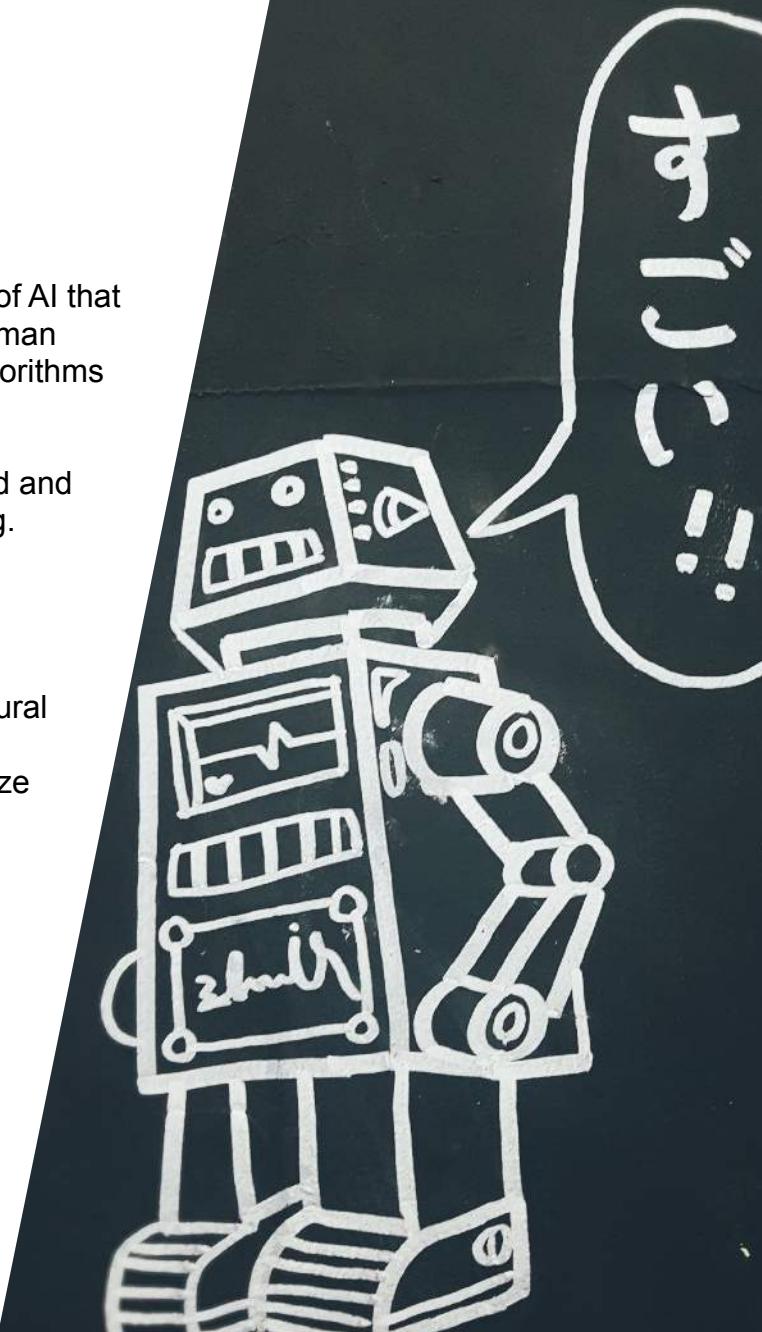
PREDICTION



NLP

WHAT IS IT?

- Natural Language Processing (NLP) is a category of AI that processes interactions between computers and human speech. NLP is used to apply machine learning algorithms to text and speech.
- It involves giving machines the ability to understand and use human speech in writing as well as in speaking.
- NLP is comprised of two subcategories:
 - NLU, Natural Language Understanding: with natural language understanding, computers can deduce the meaning of a sentence, and not only recognize words.
 - NLG, Natural Language Generation: it involves the reverse of NLU technology. It's not about understanding language, but producing it. This lets machines communicate with human beings.
 - NLI, Natural Language Interaction: a combination of these technologies. Understanding a query and generating a response.



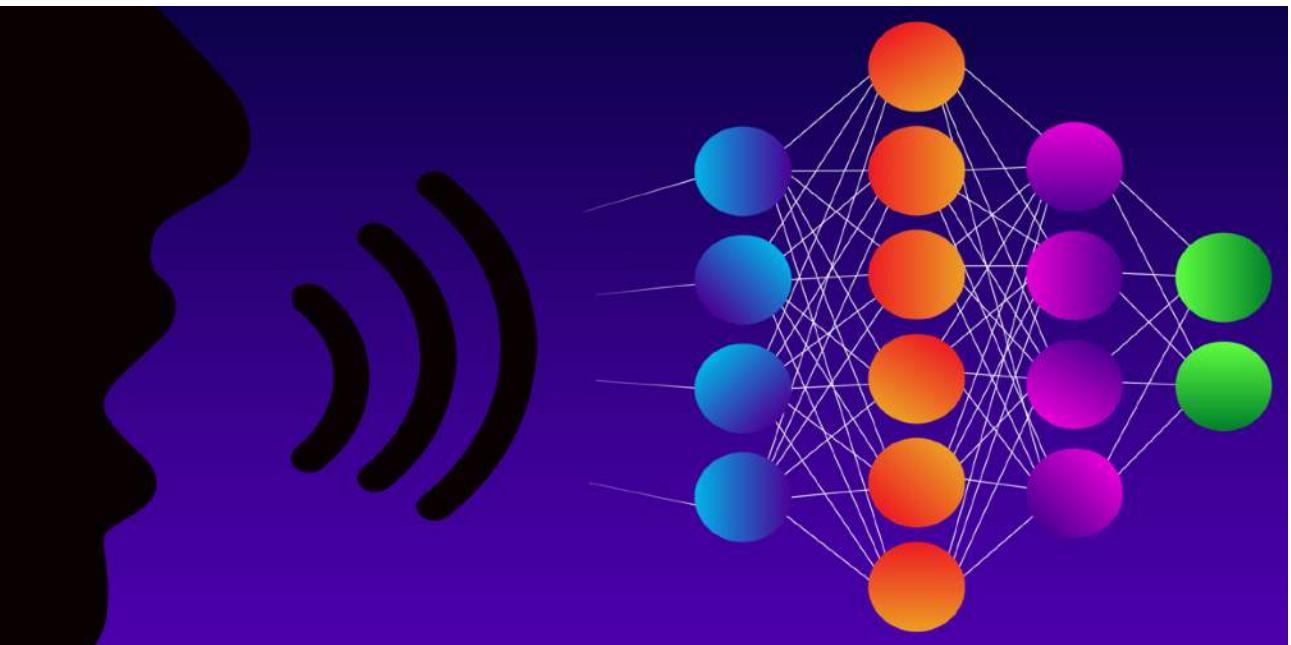
The global NLP market will have a
CAGR* of 17.1%
between 2018 and 2023

* : Compound annual growth rate

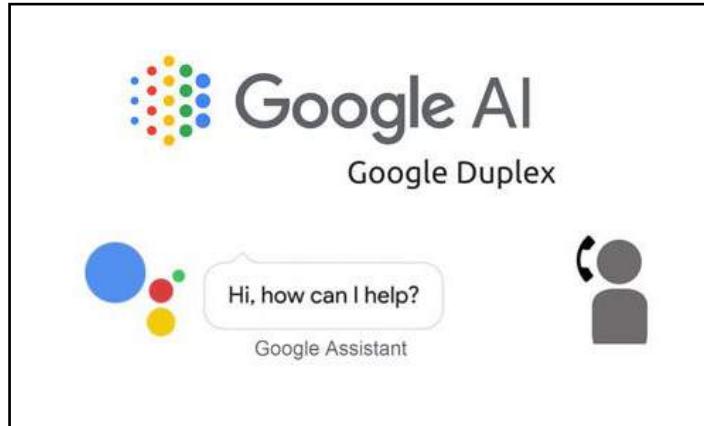
Source : Global Natural Language Processing Market 2018-2023, Business Wire 2018

HOW DOES NLP WORK?

- NLP is a technology that's been developed over several decades, but has always been limited in its comprehension due to the complexity of human language.
- In fact, human languages contain several unique linguistic features: wordplay, the same words having different meanings...
- The most successful recognition systems use deep neural networks (Cf: slide deep learning). That helps them take these subtleties into account.

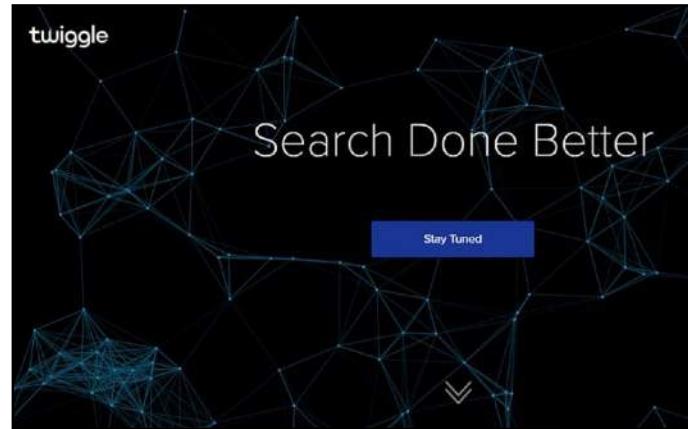


EXAMPLES OF APPLICATIONS



Conversation agents

Google Duplex is an assistant that can make phone calls and reservations in the user's name. The agent can also interact with another conversation agent.



E-commerce searches

Contextual understanding of search terms. Twiggle, a company developed by Alibaba, is developing a semantic API that can be added to existing E-commerce searches that can respond to very specific searches made by the buyer.

...

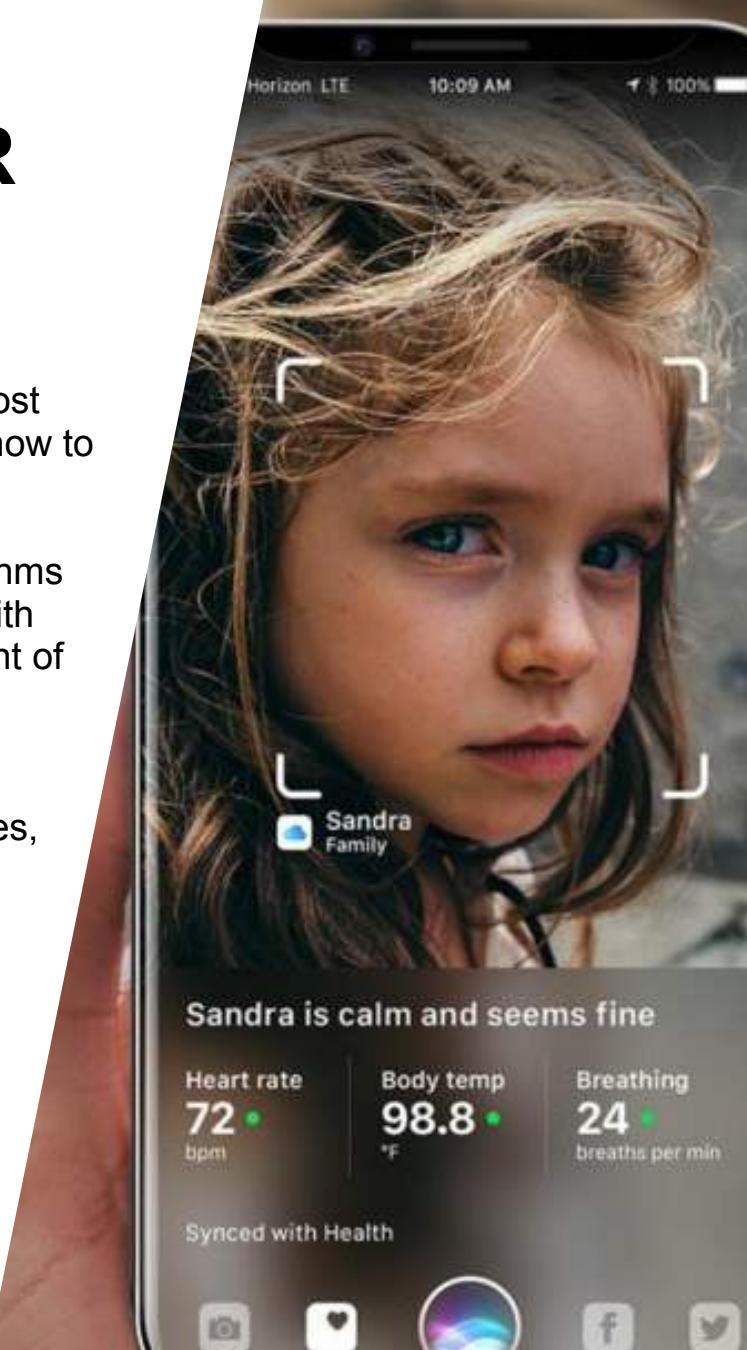


Translation

Baidu recently announced the launch of its new translation headphones, similar to the Google Pixel Buds, which will be able to translate 40 languages in real time. For the moment, only Chinese, Japanese, and English are included.

WHAT IS COMPUTER VISION?

- Vision is the sense that can capture the most information about one's environment and how to act within that environment.
- Computer vision is the ensemble of algorithms and software that can provide machines with the sense of vision and interpret the content of images and videos.
- The goal is to teach machines to name objects, identify people, perceive 3D shapes, and understand relationships, emotions, actions, and intentions.
- Computer vision, or artificial vision, is a component of AI in its own right.



The value of the global computer vision market will experience a growth of

+45.56%

between 2018 and 2023, to reach an estimate of \$17.38 billion

Source : Computer Vision Market by Component, Product, Application, Vertical Global Forecasts to 2023, Report Buyer 2018



*“Just like hearing
isn’t the same
thing as listening,
taking a photo
isn’t seeing. By
seeing, you can
really say that
you understood.”*

Fei Fei Li
Director of Stanford’s Artificial Intelligence Lab
and Vision Lab



TEACHING COMPUTERS TO SEE OBJECTS: CONVOLUTIONAL ALGORITHMS



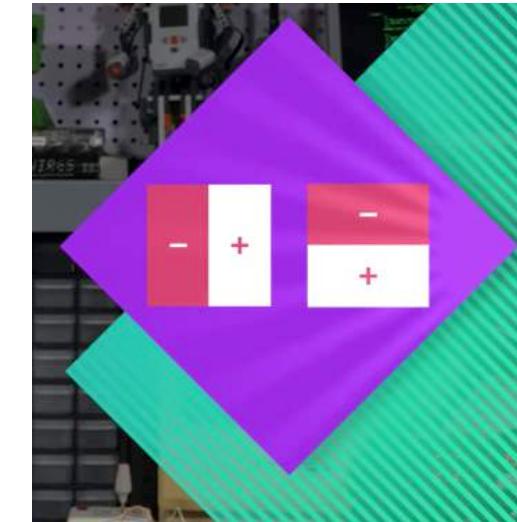
- Cameras and sensors transmit raw data, like pixels, to the machine. The machine must then be able to interpret and understand it using AI algorithms and software.

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107	106	107	106	108	106	225	233	242	249	253	101	165	195	196	192	190	192
106	106	106	106	106	106	224	233	242	248	252	101	165	195	196	193	190	191
106	106	105	106	106	106	224	233	241	248	253	101	165	196	196	193	190	192
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105	106	105	106	106	106	224	233	242	247	253	101	165	195	195	192	190	192
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108	106	106	106	106	106	224	233	242	247	253	101	165	195	196	193	190	191
107	106	105	106	106	106	224	233	242	247	252	101	165	195	196	193	190	192
106	105	105	106	106	106	224	233	241	247	253	101	165	195	195	193	189	192
106	105	105	106	106	106	224	232	242	247	253	101	164	195	196	193	190	192
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106	104	103	104	106	106	224	233	242	246	252	101	165	196	196	193	190	192
106	105	104	106	106	106	224	233	242	246	253	101	165	197	196	193	190	192

Each pixel in an image is assigned a colorimetric value.
The machine then analyzes these values in zones of pixels.

106	106	106	109	106	106	224	233	242	249	253	101	165	195	196	193	190	192
107	106	107	106	108	106	225	233	242	249	253	101	165	195	196	192	190	192
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106	104	103	104	106	106	224	233	242	246	252	101	165	196	196	193	190	192
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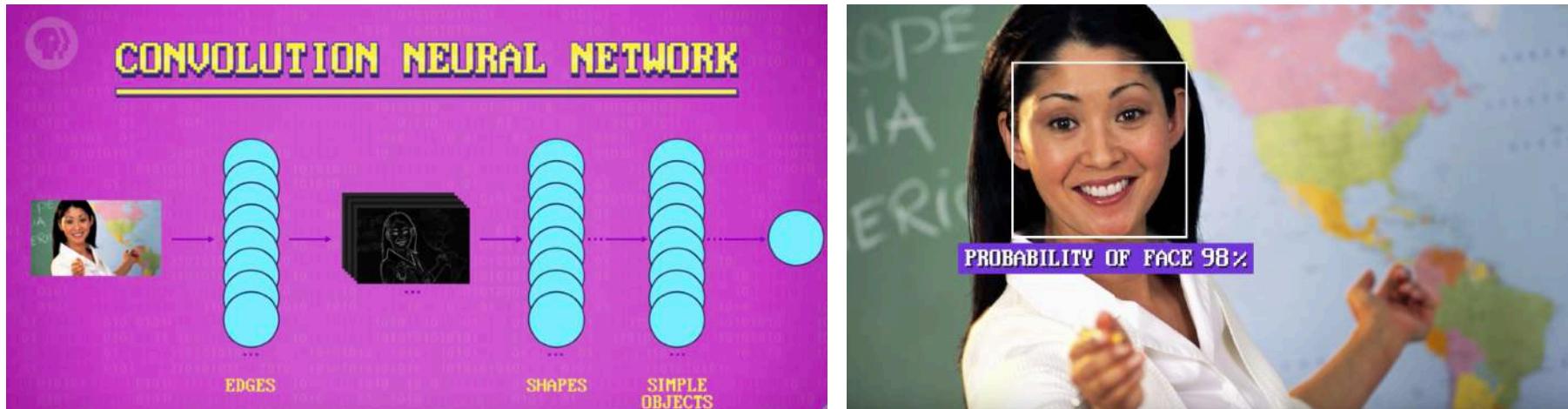
Algorithms can perform mathematical calculations based on these values; this is called a kernel.



There are several different kernels determined by what we want to identify in an image.



TEACHING COMPUTERS TO SEE OBJECTS: CONVOLUTIONAL ALGORITHMS



The most used algorithms are convolutional neural networks that identify which kernels are the most relevant so they can be used to recognize a subject in an image. Each neural layer uses a different kernel.

The different elements that are identified according to networks are then placed end to end to identify the subject.

- These neural networks can be more or less complex based on what has to be identified, which is why this technique is considered deep learning.

SORTING IMAGES



- No one teaches a child to see; it learns through experience, through daily examples.
- Machines need a significant number of images to learn, and they also need these images to be good quality. Above all, they must be catalogued.
- This observation gave rise to the *Imagenet* project, which involves a database of reference images, also called a “dataset.”
- It was created to be used in computer vision research projects in 2009.
- Today, there are 1.2 million shared images in 1,000 categories.

Reconnaissance faciale : des centaines de milliers de photos utilisées sans autorisation

[Annabelle Laurent](#)

Like 1 1 6



CURRENT STATE OF COMPUTER VISION: EXAMPLES OF APPLICATIONS & ISSUES



Facial recognition

In December 2018, 7-Eleven Japan opened a corner store that uses facial recognition to authenticate buyers. This system was implemented in response to a lack of workers.



Helping the visually impaired

In December 2018, Huawei launched the “Facing Emotions” app. By using the camera on a Huawei Mate 20 Pro, the app recognizes facial expressions and transforms them into auditory cues based on 7 different emotions: anger, happiness, sadness, fear, disgust, surprise, and contempt.



Autonomous cars

In September 2018, the city council of Potsdam collaborated with Siemens to launch the first autonomous tramway in the world. It reacts to danger more quickly than a human by using an assortment of sensors that are integrated with lasers and a computer vision system.

...



Surveillance

In January 2018, two Australian teens were saved thanks to a rescue drone. The Little Ripper drone got to the boys in 70 seconds and dropped down an inflatable rescue pod. The government of New South Wales has invested \$340,000 in drones.

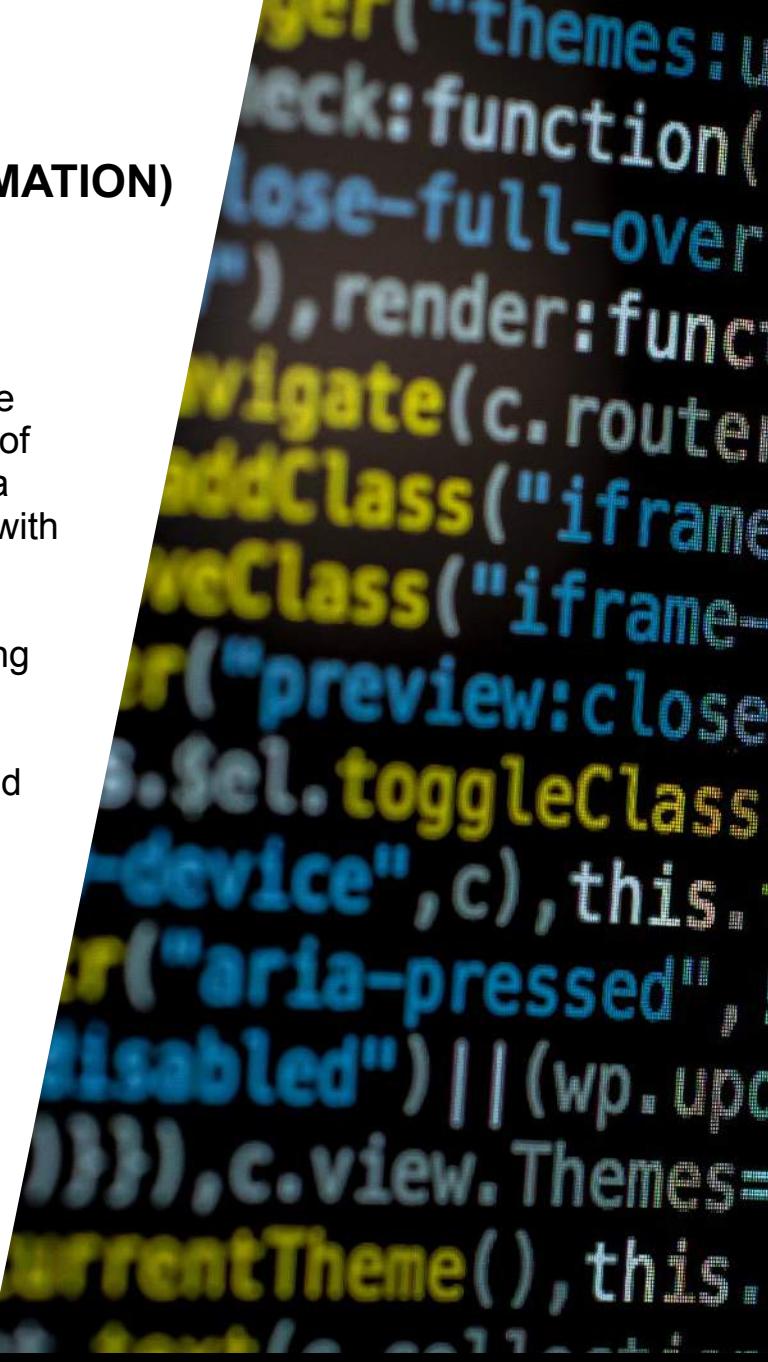
RPA (ROBOTIC PROCESS AUTOMATION) WHAT IS IT?

RPA is a technology that can automate repetitive tasks. Also called “robot software,” it is capable of imitating human behaviors such as completing a transaction, manipulating data, communicating with other machines, etc.

It automates several repetitive tasks, thus helping to:

- save time and money
- guarantee conformity to certain regulations and standards

Employees can therefore concentrate on higher value-added tasks, and offer better customer service.



RPA software will replace
**230 million
workers in total**

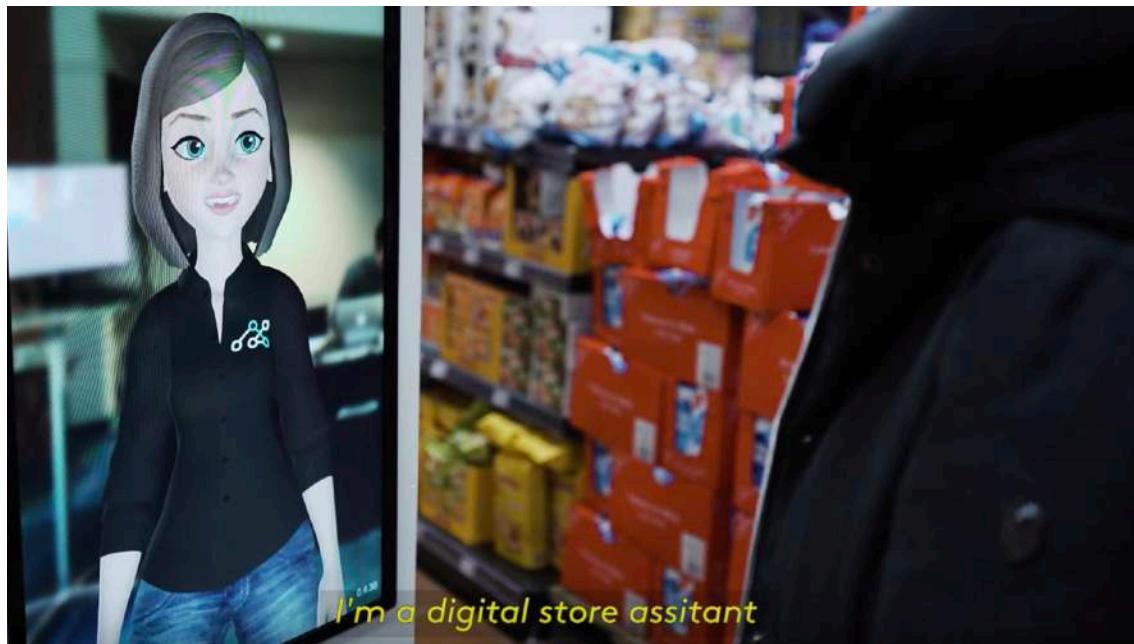
Or around 9% of the world's
labor force.

Source : The Forrester Wave: Digital Process Automation Service Providers, Forrester Research Q3 2018

MORE HUMANIZED DIGITAL ASSISTANTS



- Millie is the first **digital avatar in the world that's aware of its environment**. Powered by AI, Millie is a **life-size** assistant that interacts with people while observing and understanding their actions and the environment. This assistant offers personalized advice, from greeting customers and promoting products to personalized coaching. A little drawback: the voice assistant sometimes malfunctions due to **noise** in the store.



- They put their trust in Millie:



KEOLIS



ROBOTICS WHAT IS IT?

A robot is a programmable machine that can affect its environment by executing automated tasks. **Today, the vast majority of robots complete tasks that are often repetitive or thought to be taxing for people**, but thanks to artificial intelligence and the global development of new technologies, robots are gaining more processing power, intelligence, and autonomy.

Even though these “smart” robots are still in the prototype phase, they could lead to a wide range of possibilities as to applications that would profoundly change our societies and ways of life.

But for the moment, and still for a number of years to come, in light of technological, and especially legislative evolutions, the robots in our daily lives are still machines that help humans save time and “delegate” tasks with low value-added tasks in their professional field.

In other words, today’s robots free up time for our minds.



ROBOTICS, TRENDS & TECH

Robots are being put to work in more and more sectors to alleviate, guide, or even optimize human tasks. A study by the DGE predicts 264 million units in the world by 2016. However, we're still a long way from humanoid "replicant" robots.

1 COBOTS

Cobots, or cobotics, are robots designed for human-robot collaboration. By using AI, they can now safely evolve in the same space as humans to make the collaboration more fluid, and allow for new applications.

In 2019, robots and cobots are becoming accessible to SMBs for a starting price of around 15K, and with more versatility.

A d v a n t a g e : competitiveness, less strenuous work, increased physical and technical abilities, response to personalization issues.



2 ROBOT ASSISTANTS

Robot assistants are especially employed in service sectors as greeters, information stations, and delivery 'personnel'. The tourism, food, and public service industries are highly interested in these powerful R2D2s.

Advantage: time savers, sources of information, customer satisfaction, lower costs.



4 ROBOTS AT HOME

While we're no longer surprised to see smart and automated vacuum cleaners, we'll soon see the arrival of domestic robots. Current applications cover assisting the elderly and pet care, but it is possible to imagine robot au pairs, housekeepers, etc. in the near future.



3 MEDICAL ROBOTS

Medical robots are booming. The market represents a wide selection of applications between helping doctors and surgeons, and helping patients (surgical robots, laboratory assistants, tele-surgery, physical therapy, etc.).

Advantage: lower risk of infections, more specializations and skills everywhere in response to the need for decentralization, enhanced precision.



5 A LITTLE FOCUS ON SENSORS

The development of AI and sensors will play a primordial role in robot deployment. Sensors themselves will be equipped with AI (edge computing) to allow for faster and more fluid interactions, as well as robots that are increasingly intelligent and autonomous.



1.2

NO DATA, NO AI

**MONEY, STORAGE PROBLEMS, PROCESSING,
POWER, AND LEGISLATIVE CONSTRAINTS...
DATA IS A THORNY SUBJECT**



“
DATA IS THE RAW MATERIAL OF THE INFORMATION AGE... HE OR SHE WHO OWNS THE DATA [...] ARE GOING TO BUILD THE MOST POWERFUL BUSINESSES OF THE FUTURE
”

Alec Ross
Former advisor for Obama

AI CURRENTLY REQUIRES A LARGE AMOUNT OF DATA

Today, no data means no AI. In fact, new learning technologies like **deep learning need more and more data** to be able to learn faster and better, and **thus become more autonomous and intelligent.**

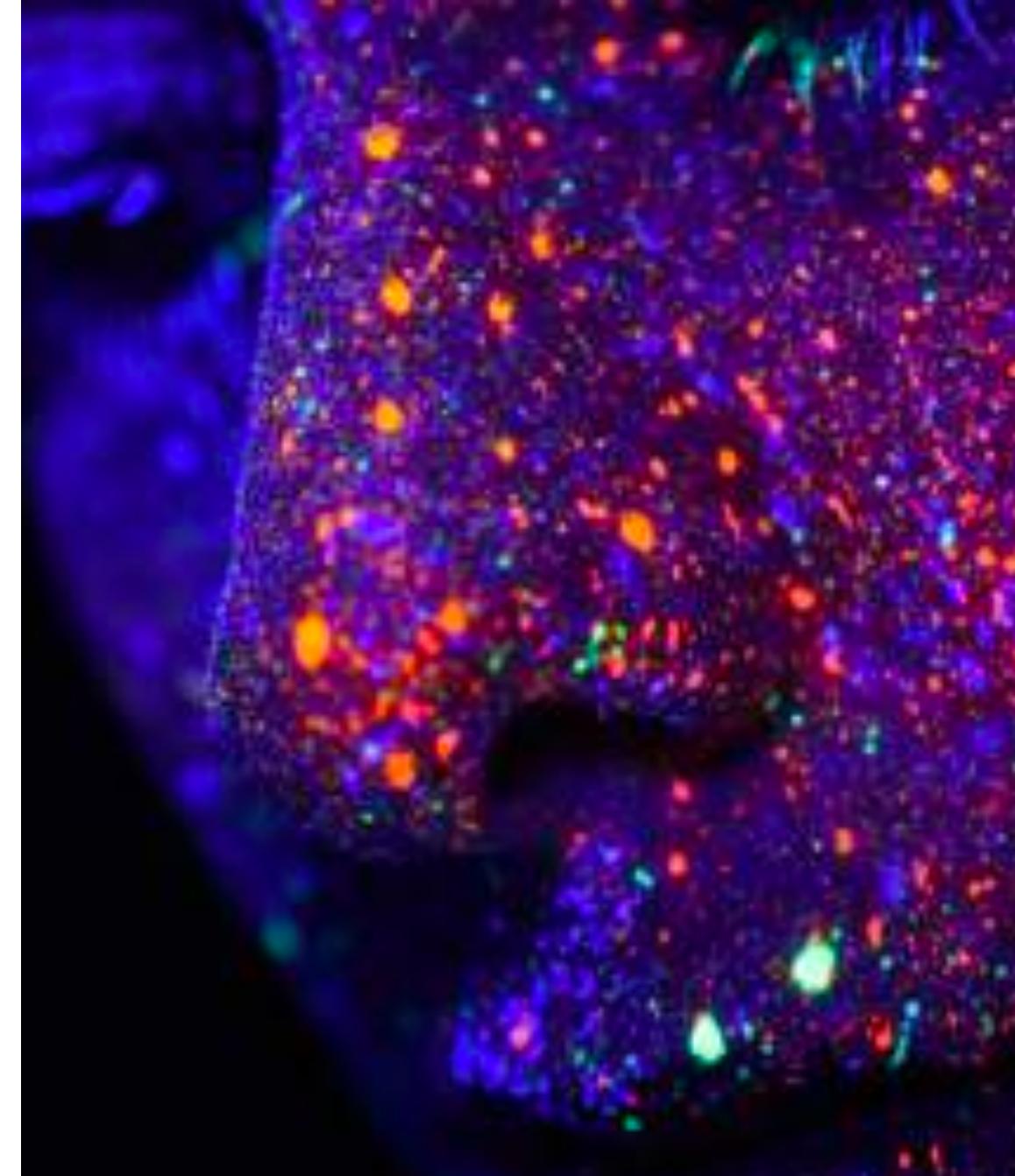
And that works out fairly well, since humans are producing more and more data each day...

However, this production and growing need for data to go further in what AI has to offer **poses certain logistic and legal problems.**

Today, we're faced with multiplying issues concerning data collection (technical as well as ethical), **storage, and processing.**

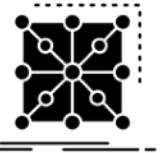
Though some researchers are working on learning systems that can produce results with smaller amounts of data, we're currently (and will be for a while yet) dependent on large amounts to move artificial intelligence forward.

In this section, we will reveal the issues that we're facing, and the technologies developed in response.



FACING THE ISSUE OF THE 5 V'S

STORAGE AND PROCESSING ISSUES



Volume
More and more data



Variety
In a multitude of formats



Velocity
Produced more and more quickly



Veracity
Risk of falsifiable data



Value
Data with financial worth



DATA STORAGE



DATA LAKE

Data lakes can store unstructured data in any format. The advantage: faster and more flexible.



NVMe SYSTEM

The Non-Volatile Memory Express system can reduce latency for high-performance storage systems. Optimized for flash. The advantage: real-time processing.



HYBRID CLOUD

It combines the public and private clouds in the same infrastructure. By the end of 2019, around 69% of companies will switch to hybrids. The advantage: transfers a workload from one cloud to another, offering more flexibility when introducing and using data.



VIRTUALIZATION

Data isn't put back into storage, it stays where it is and the user can access it in real time. It involves viewing the data rather than storing it. The advantage: doesn't cause the data to deteriorate, makes it easier to access data.

MAIN PLAYERS:



PROCESSING DATA 1/2

EDGE & FOG COMPUTING

Can process data as close to the source it comes from as possible, instead of having to go to find it in the cloud. It's decentralized cloud processing. Edge computing will be fully realized as soon as 5G is rolled out.

Advantage: lower latency, particularly useful for the IoT and autonomous cars, among others.

STREAM PROCESSING

Can process and analyze data in real time. The system is based on a continuous series of queries that process data even before it gets to the base. The most visible scenario is Uber, with its real-time geo-location capabilities.

Advantage: computing power and speed.



DATA COMPRESSION

Compression skills are evolving to make data storage and processing easier. Facebook is launching Z, its open-source compression platform that can compress data twice as quickly.

Advantage: saves space, faster processing.

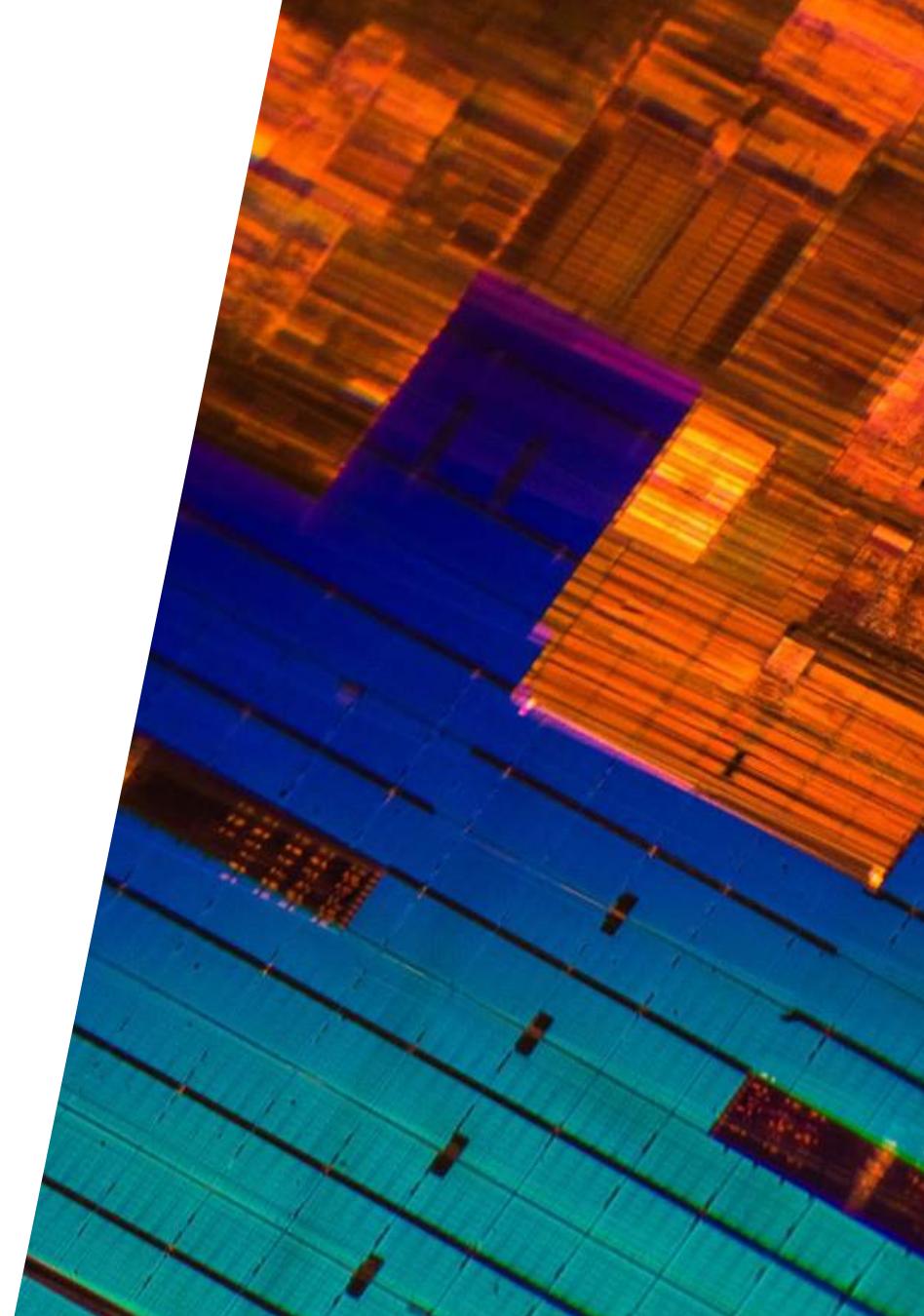


SELF DRIVING DATABASE

AI for AI. Managing databases is automated to free up time for administrators.

Advantage: more reliable, efficient, and safer, lowers management costs.

MAIN PLAYERS:



PROCESSING DATA 2/2

GPU - PARALLEL COMPUTING

Although before, Graphic Processing Units were an option favored by gamers, today they have become indispensable for the computing power required by AI.

GPUs work based on the division of calculation schemas to perform different calculations at the same time.

New developments in the field include GPGPUs (General Purpose Computing on Graphic Processing Units), which are similar to programs for GPUs and CPUs (Central Processing Units).

Advantage: fast calculations and analysis.



ILLUSTRATION VIDEO



MAIN ACTORS:



FOCUS ON PIM DAM DMP & CMP

1 TO BETTER MANAGE YOUR DIGITAL DATA

DAM: DIGITAL ASSET MANAGEMENT

Storage and management of visual data such as photos, videos, etc. (sorting, indexing, correction, distribution, research, etc.).

Advantage: managing thousands of data points, multiple formats, secured the platform.

CAN FEED INFORMATION

3 TO BETTER MANAGE THE DATA PRODUCED

PIM: PRODUCT INFORMATION MANAGEMENT

Can: create, stores, and manage all the data produced in one place and all at once.

Advantage: centralized information to distribute multichannel data, consistent data across all platforms.

PRODUCT

Ein Produkt als eine erzeugte Ware oder Dienstleistung ist ein Begriff der Kaufkommunikation. Insbesondere im Marketing kann allerdings englischsprachig zwischen Produkten und Goods unterschieden werden.

2 TO BETTER TARGET YOUR AUDIENCE

DMP/CDP: DATA MANAGEMENT PLATFORM/ CUSTOMER DATA PLATFORM

Storing, processing, and activating versatile client data, especially for those with multiple profiles. CDP platforms can gather client information in real time for better understanding of movements and behaviors, leading to optimal activation.

Advantage: personalizing products and composing communications

INTEGRATES

4 TO SUPERVISE AND SECURE DATA

CMP: CONSENT MANAGEMENT PLATFORM

Manages procedures for collection, authorization, data access, and solving issues. CMPs have burgeoned with the arrival of the GDPR regulations. They can be integrated into DP-style platforms.

Advantage: Making it legal to obtain data, saves time.

PIM AND DAM: TWO COMPLEMENTARY SOLUTIONS

They enhance customer knowledge, and more particularly the client experience in order to understand their behaviors, and how each person functions. Thus, brands can adapt and personalize their offer very precisely, and provide benefits that are relevant to each of their clients.

- PIM allows DAM to reduce the **time spent** indexing content by **automatically enhancing the media files**.
- DAM contributes to PIM with the **newest media files** that can be attached to product sheets.
- When a company uses a PIM and a DAM, it's the **PIM that contributes to the E-commerce platform**.

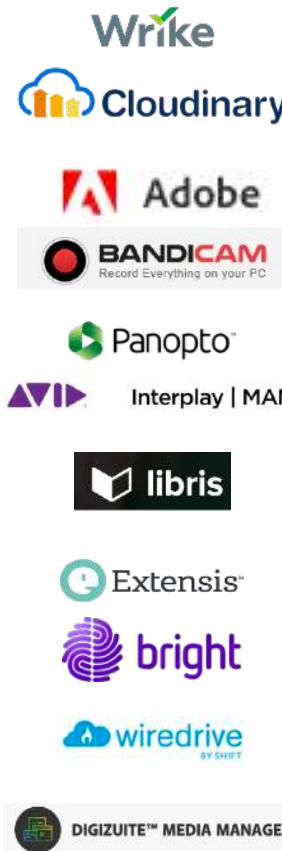


THE MAIN PLAYERS IN THE MARKET

PIM



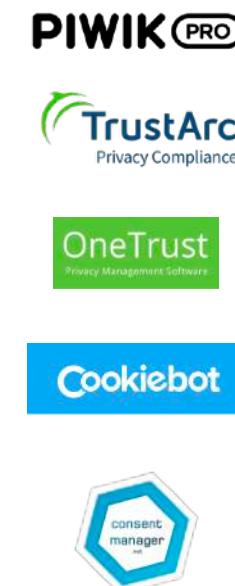
DAM



DMP/CDP



CMP



7 SECTORS TRANSFORMED BY AI:



2

BUSINESS USES OF AI

7 SECTORS TRANSFORMED BY AI



Tuncay Isik
CEO & CO-FOUNDER - PREVISION.IO

BUSINESS APPLICATIONS OF AI

THE MAJOR TRENDS
&
EXAMPLES



Prevision.io

2.1

TOURISM

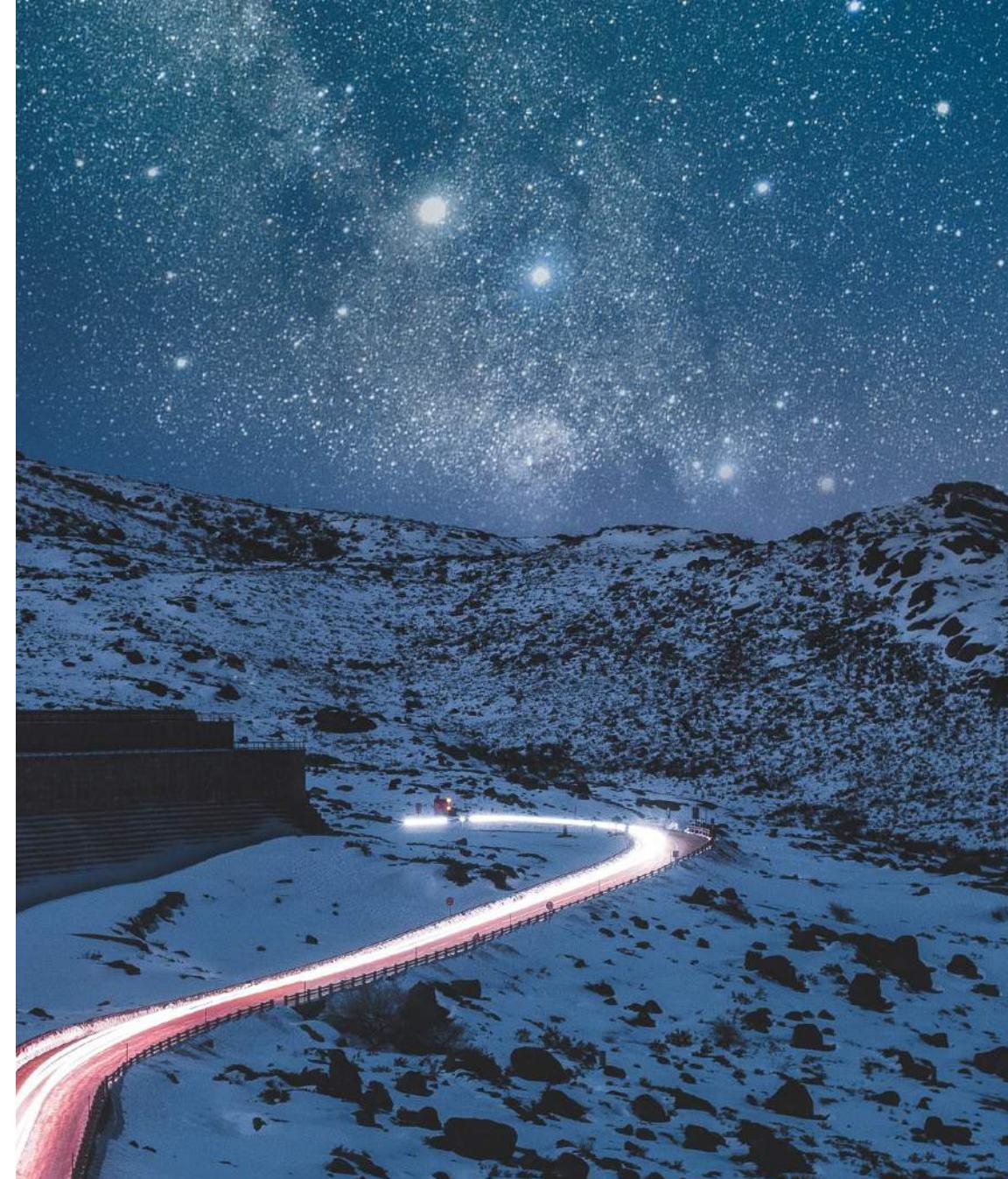
WHEN AI MEETS TOURISM FOR AN INCREASINGLY FLUID EXPERIENCE

Artificial intelligence, a novelty for the tourism sector?
Not really!

It's already been in play for a long time, behind the scenes, on the marketing side. **The sector is one of the most digital, with more than 60% of trips sold and more than 70% of hotel rooms reserved online.** As a result, tourism is a major player in online advertising; with programmatic buying, it relies on increasingly sophisticated recommendation and targeting algorithms.

The novelty today is the deployment of artificial intelligence in all the phases of a traveler's trip, be they tourists or professionals. From optimizing passenger flow at the airport to customer service, by way of hotel rooms or predictive train maintenance, AI is finding applications everywhere. But it is often done discretely.

On top of everything, there is **the promise of an optimized, wrinkle-free trip, to better lead to a truly human experience.**





TRAVEL, A GROWING MARKET...



1,326

billion international tourists in 2017

or

+7%

of growth compared to 2016



10%

of the world's GDP depends on it directly or indirectly

Source : UMWTO Tourism Highlights 2018

AI IS ALREADY AT WORK IN DIFFERENT PHASES OF TRAVELING, FOR INSTANCE:



Voice command

Expedia has its Alexa skill, which allows the user to ask for information about a destination, set a date, choose an airport and how long the trip will be, and even reserve a car.

Robots

Connie is the first concierge robot, developed in 2016 in McLean, VA Hilton. It uses IBM's artificial intelligence Watson, and can give guests information about local attractions and the hotel's amenities.



Chatbots

SNCF launched OuiBot, the travel assistant chatbot that can find and reserve train tickets, with a natural language interface.



Biometric recognition

Eurostar passengers can opt for facial recognition when going through border control at the Paris-Nord train station.



Push notifications

The startup Accengage can send personalized push notifications to OUI.sncf (based on the weather, their purchasing habits, etc.).

And soon: Autonomous transportation/hotels, entirely automated hotels, à la carte vacations designed by machines, etc.

Source : Un service Travel optimisé grâce à l'IA, Traveldoo/ Escaet 2018
Source : Tourisme : comment voyagera-t-on dans 20 ans ? Usbek & Rica 2017

... ESPECIALLY IN THE TOURISM SECTOR!

Historically, tourism was among the first sectors impacted by digital: reserving trips online is now the third most common online purchase for French people, behind buying clothes and show tickets, according to figures from FEVAD (the Federation of E-commerce and Distance Selling).

As such, artificial intelligence plays an increasingly important role in this sector's transformation. From optimizing the reservation process to managing customer services, AI is finding a place in each phase of the tourism value chain.



58 %

of major French decision makers in tourism (agencies, tour operators, airlines, accommodation, comparison websites), believe that AI will be a decisive innovation in the sector by 2020.

23 %

of tourism players in France completed "significant" projects on AI and data in 2018.

Source : FEVAD 2018 ; Observatoire de l'e-tourisme, KPMG/Next Content 2018

AI: AN ISSUE THAT WILL IMPACT ALL TRAVEL STARTUPS AND PLAYERS



GENERAL BOOKING & SEARCH



HOME SHARING & RENTALS



ACTIVITIES, TOURING & INFO



SPECIALIZED BOOKING & SEARCH



TRAVEL ANALYTICS & SOFTWARE



CAR SHARING & RENTALS



SMART LUGGAGE



LUXURY & PERSONALIZED TRAVEL



PRIVATE JET BOOKING



B2B TRAVEL SERVICES



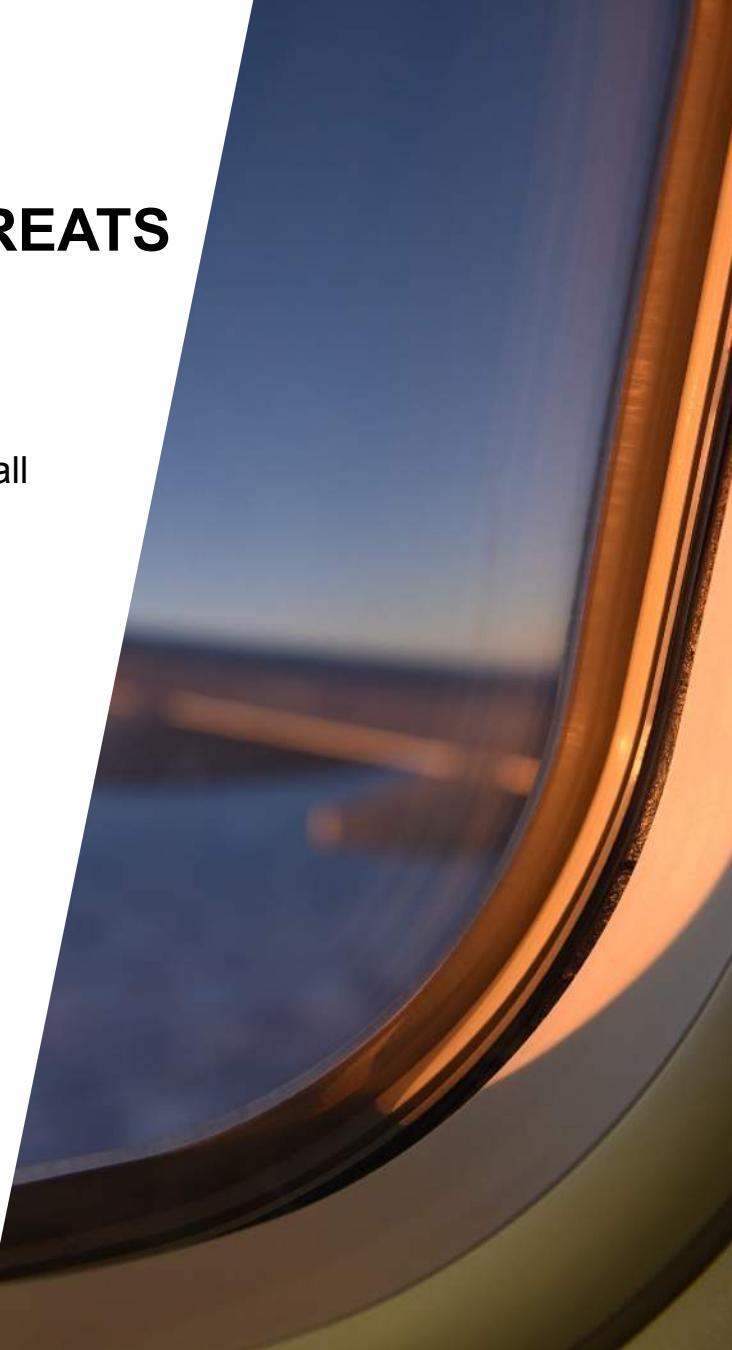
CB INSIGHTS

EVOLVING SOURCES OF OPPORTUNITIES... AND THREATS

With artificial intelligence, the possibilities for personalization and optimization are growing in all stages of the traveler's journey.

It's an opportunity for sector players to reinforce their value proposition and better serve their clients, via the alliance between humans and technology.

But it's also a threat, with the arrival of newcomers to the field. In fact, thanks to their mastery of data and the user experience, digital platforms are now being used by aggregators, transportation, accommodation, and first-hand experience providers, to offer integrated and personalized packages.



71 %

of business travelers think that artificial intelligence will revolutionize traveling.

53 %

of tourism decision makers in France believe that the conversational Internet (chatbots, voice assistants) will have a decisive impact on their business.

Source : Dans la tête des voyageurs d'affaires, FCM Travel Solutions, 2018
Observatoire de l'e-tourisme, KPMG/Next Content 2018

AI IN TRAVELING: AN IMPACT THAT COULD AFFECT THE ENTIRE PROCESS FOR THE TRAVELER

BEFORE THE TRIP



WHEN TRAVELING



AT THE DESTINATION



CUSTOMER SERVICE



Before the trip

AI helps people discover, purchase, and plan.

Inspire and orient themselves
Anticipate their needs
Suggest customized offers
Make reservations fast

When traveling

AI is used for operational excellence and traveler information.

Ensuring security
Making flows smoother
Handling luggage
Giving information

At the destination

AI transforms the tourist's experience once they arrive at the destination.

Makes experiences easier
Helps travelers discover activities

Customer service

AI makes customer service easier, and can even anticipate problems.

Anticipates problems
Reacting proactively
Automating customer service

USING AI TO SELL AND INSPIRE

Targeted advertising, personalized recommendations, and chatbots all feed off of the same ingredient: data.

With algorithms and artificial intelligence, these support tools are growing in relevance and efficiency, but the work of learning must be done throughout the process.

Another constraint: regulations, which limit possibilities for cross-referencing and use of personal data, especially in Europe since the GDPR came into effect.



65 %

of travel players have set up a team dedicated to using data.

9.5 %

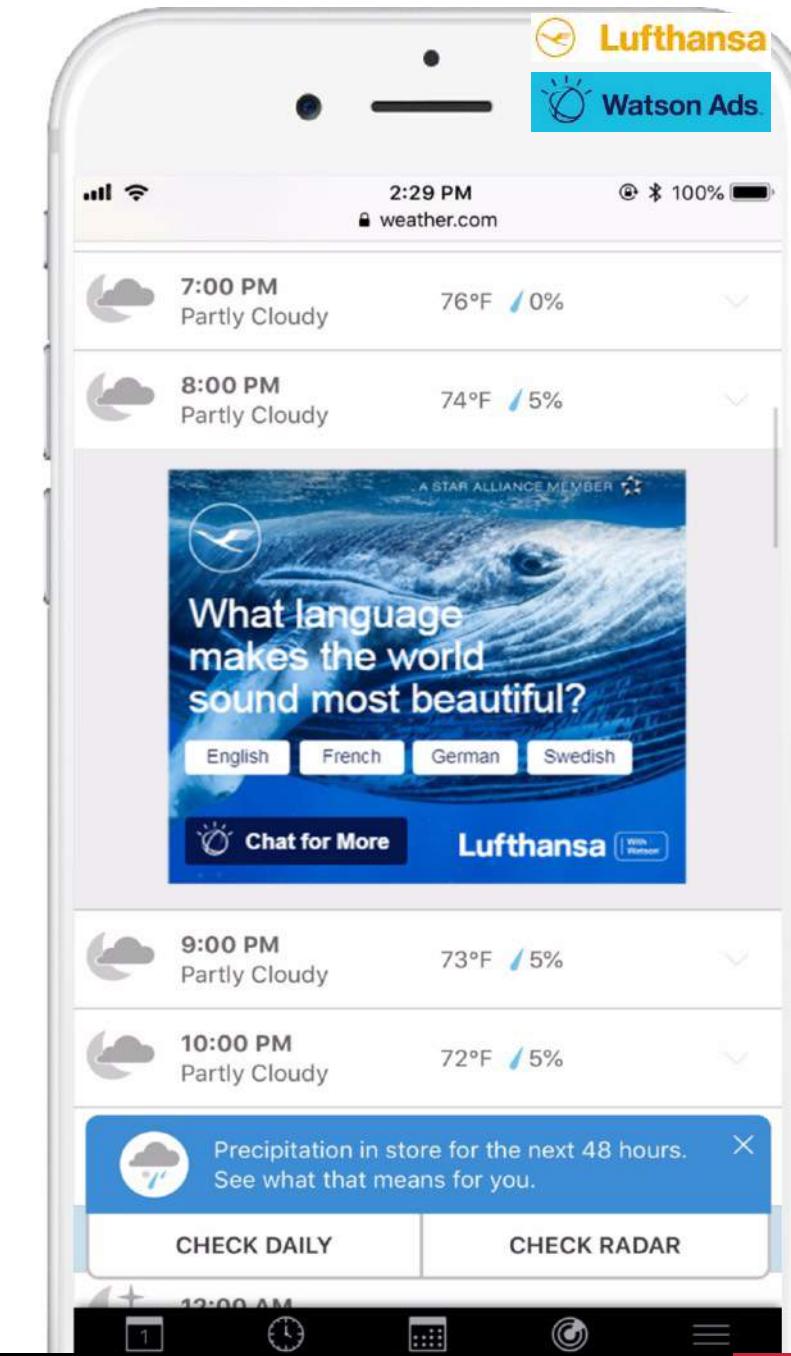
of them say they're able to follow their customers through all the points of digital contact.

Source : Dans la tête des voyageurs d'affaires, FCM Travel Solutions, 2018
The State of Data and Analytics in Travel Report, Deloitte, 2017

LUFTHANSA AND IBM WATSON ARE PERSONALIZING THEIR ADVERTISING



- Digital represents a third of the marketing and communication budget for players in E-tourism in France in 2018. In a context of heightened acquisition costs, each player is looking for ways to optimize their investments while standing out from their competitors.
- The goal is therefore to improve conversion rates for online advertising campaigns by using more personalized and engaging formats that reach browsers as of their inspiration phase.
- In October 2018, Lufthansa led the "#SayYesToTheWorld" campaign: personalized and interactive, it relies on IBM's artificial intelligence, Watson. On a selection of websites, banner ads invited browsers to interact with the company by asking them questions. With AI, the browser could then have a dialogue in natural language and get detailed and personalized information, such as photos or information about local tourism, for 15 destinations. If they were interested, they could reserve their flight directly from the banner.
- These interactive advertisements, supported by AI, allowed Lufthansa to have individualized conversations with each of its potential clients, wherever they were in their purchasing process. Throughout the interactions, the campaign also offered the airline the possibility of gathering information on travelers, with the goal of piloting its future commercial and marketing strategies.



USING AI FOR OPTIMIZATION

AI is also finding a place in tools that are being rolled out by players in E-tourism to convert their visitors into buyers, and to make reservations easier.

Fighting payment fraud, dynamic price management, designing personalized travel packages... optimization algorithms are at work behind each reservation in real time to make the customer's experience more fluid.

On top of that, they have better customer satisfaction, lower acquisition costs, and boosted conversion rates.



53 %

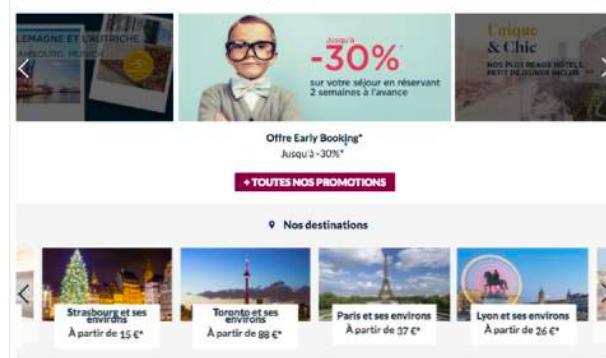
of travel players in the world believe that their organizations are able to act in real time thanks to data.

75 %

will up their budgets for data usage by 2019.

The State of Data and Analytics in Travel Report, Deloitte, 2017

3 USES OF AI AT ACCORHOTELS:



“SMART PRICING” SOFTWARE

It uses machine learning to set its rates based on their records and the competition. Thus, the group can offer the guests the best price and maximize the occupancy rate of its establishments.



A VOICE ASSISTANT

Available on Google Assistant, it can inform the user, in French, of the available amenities (parking lot, meeting room) or practical information concerning the selected hotel (schedule, address, etc.).



A CONVERSATION AGENT

It advises, helps make reservations, and responds to customer service requests directly from Facebook Messenger for the group's Australian customers.

USING AI FOR TRAVELER INFORMATION

Geo-tagging and data usage allow transportation operators and tour operators to create new services to better assist travelers during their travels, due especially to having more complete information.

Transporters, airports, travel agencies, and online reservation services are taking a position on the subject... but players in digital, with GAFA in the lead, want to play their cards right by taking on an intermediary role.



82 %

of world travelers want to have real-time access to flight information on their smartphone.

49 %

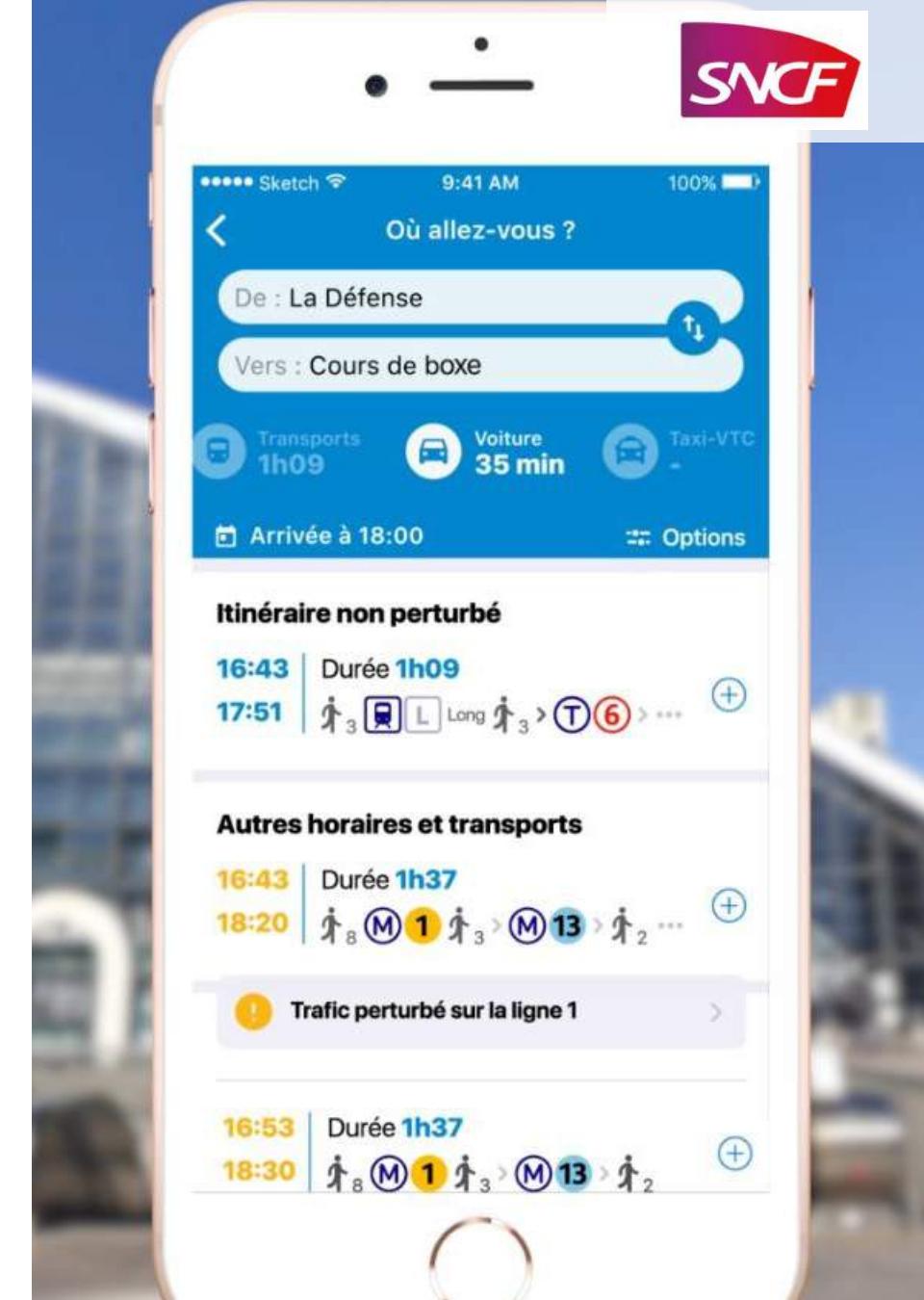
wants to access information on their luggage in real time.

Source : IATA Global passenger survey 2018

SNCF IMAGINES AN ALL-IN-ONE MOBILITY ASSISTANT



- To organize their trip from door to door, travelers have to juggle different applications (public transportation applications, directions, ridesharing, taxis, carpooling, free floating...).
- SNCF wants to provide an all-in-one “personal mobility assistant” intended to make daily travel easier throughout all of France. It will replace the current SNCF assistant application, and should become a veritable digital Swiss Army knife for any trips in France.
- The public group assembled its digital teams for travelers into a new program called “Voyageurs SNCF.”
- The new application not only offers directions, but will also give access to different mobility offers, operated by the group or by other companies (ridesharing, taxis, bike sharing, parking lots, etc.). Artificial intelligence will help to adapt the service to each user’s habits, especially by identifying the trips they’ve made and by anticipating journeys.
- In October 2018, the application was available for 500 cities. Its development is continuous, to integrate even more services, and eventually to offer a unique mode of payment for all modes of transportation.



AI, A TOOL FOR OPERATIONAL EXCELLENCE

Although autonomous vehicles, trains and planes are still in the realm of science fiction, AI will as of now be playing an increasingly important role behind the scenes, to ensure the correct functioning of transportation infrastructures.

Predictive maintenance, optimized plane and train traffic, making passenger flow smoother, managing security... there are several uses of AI, and they're all part of the larger framework of the "Smart City" and the mobility of tomorrow.



62 %

of senior executives in the transportation sector believe that their organizations are currently undergoing profound transformations.

Source : Logistics, supply chain and transportation 2023: change at breakneck speed, Forbes Insights 2018

ZOOM IN ON NEW USES OF AI AT THE AIRPORT

In 2036 at the latest, the number of passengers will have doubled against the backdrop of a rise in the middle class in emerging countries, the development of low cost airlines, and point-to-point connections. To keep up with this demand and improve flow management, artificial intelligence is being welcomed into airports.

Security



Orlando, FL, USA airport

The biometric *Smart Path* scan solution by SITA at the Orlando airport in the United States uses facial recognition at gate security checks. For the moment, the solution is being tested for British Airways flights.

Flow management



Phoenix Sky Harbor International, AZ, USA

The Phoenix airport uses SITA's *Queue Analyzer* system. It can analyze the flow of people in the airport to give real-time estimates of waiting times. Display boards adapt to show these results in order to orient travelers to the lines with the lowest waiting time.

Luggage management



Changi airport in Singapore

Terminal 4 of the Changi airport in Singapore offers a passenger experience that is nearly void of human intervention. Passengers can check their own bags without going to the counter, among other things.

AI EVERYWHERE, ALL THE TIME

Once they arrive at the destination, the traveler, who is increasingly connected, expects personalized real-time services.

They're accustomed to the seamless experiences and fluid interfaces offered by Uber, Google, Netflix, and Amazon... and they expect the same from their various providers: public transportation, accommodation, service providers...

At the heart of these new services, AI can connect the data, use it, and transform it into concrete applications that make travelers' lives easier, be it in their hotel room, onboard a cruise ship, or in the streets of the cities they're visiting.



only 9 %

of French people turn off their smartphones when traveling

22 %

use it continuously, 24/7

Source : Kayak Mobile Travel Report 2018

MARIOTT IS USING ALEXA TO INTEGRATE VOICE INTO ITS HOTELS IN THE UNITED STATES..



In June 2018, Amazon launched its “Alexa for Hospitality” offer, which allows hotels to integrate voice assistant features into their rooms.

The voice assistants have taken advantage of the development of voice speakers to launch new services for their guests.

The Marriott International hotel chain is the first partner of Amazon to deploy the “Amazon for Hospitality” solution: hotels can configure the voice assistant as they like, in order to allow guests to place voice orders for room service, reserve a massage, or more simply to control the lights, air conditioning, or TV in their room. Each hotel can customize the assistant by adding features and content that correspond to their clientele (meditation sessions, running advice, etc.).

The first tests conducted by Amazon have proved to be convincing: Daniel Rausch, VP of Amazon, announced that 90% of this solution’s users ranked the experience “Good” or “Excellent.” In satisfaction surveys, 70% of users indicated that they would be happy to choose rooms that integrate Amazon Alexa for their future reservations. Soon, Amazon will allow clients to connect to the device with their own Amazon accounts during the length of their stay.



USING AI TO IMPROVE CUSTOMER SERVICE

Though chatbots are the most visible face of artificial intelligence, their “intelligence” is still fairly limited: the most effective (or the least frustrating) for users are those that rely on decision trees and a limited use of natural language recognition.

But artificial intelligence is finding more immediate applications in the back office of customer service departments, to help operators respond more quickly.



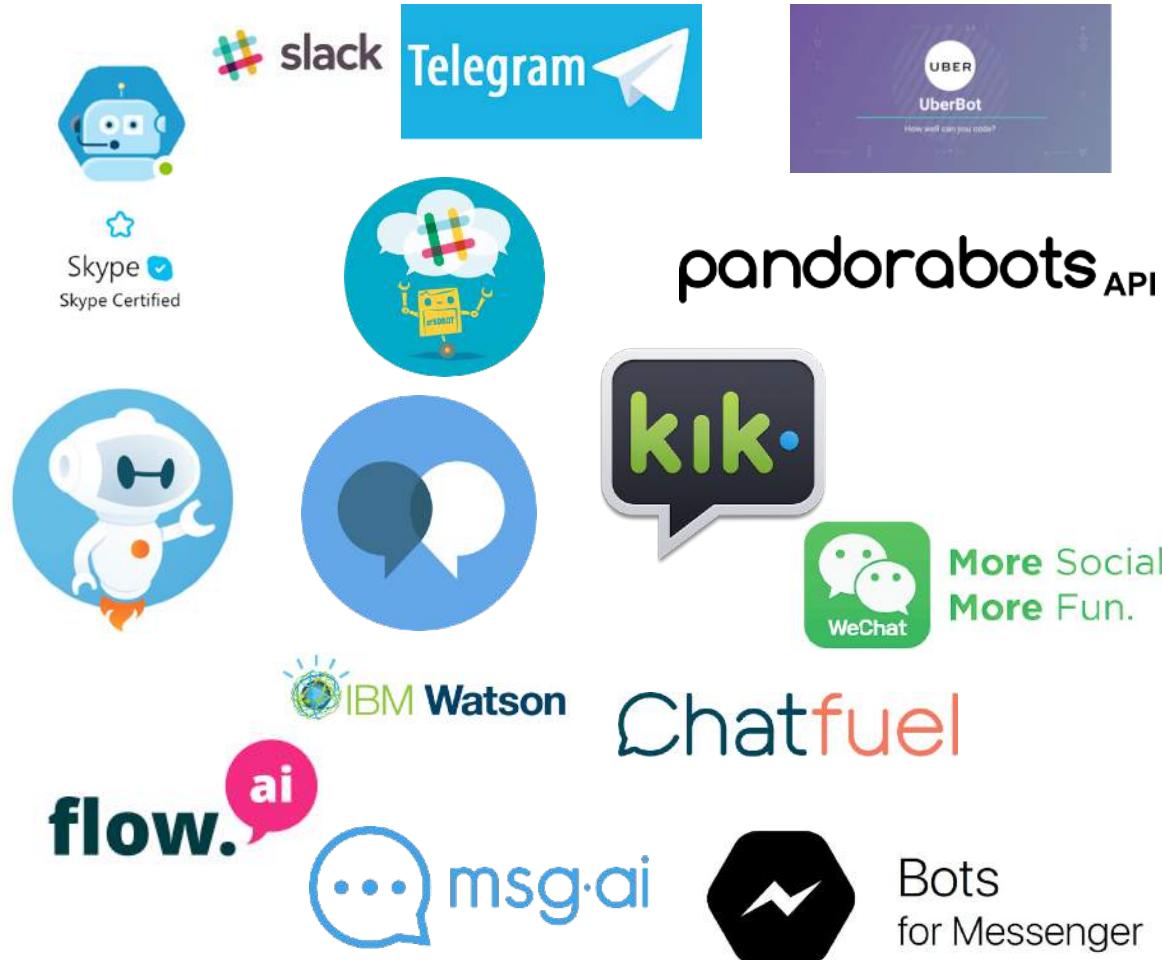
25 %

of companies will use virtual assistants in their customer service departments by 2020

Source : Gartner 2018



BOTS AND CHATBOTS: AUTOMATED OR SEMI-AUTOMATED CUSTOMER SERVICE



- With these apps, we will have a new way of interacting with the service of any company by utilizing the user's preferred channel: messaging applications, but also websites, text, and email.
- It isn't necessary to create an account with a login and a password. Since these conversational interfaces are integrated into existing interfaces and don't have dedicated applications, they're qualified as "invisible apps."
- These chatbots provide 24/7 availability, and processing that is personalized as well as automated. With AI, large amounts of conversations are thus processed at low cost.
- In the coming years, the level of intelligence in these interfaces will evolve to become true personal assistants.

USING AI TO AUTOMATE DISPUTE MANAGEMENT

Another concrete application of artificial intelligence: automated settlement of disputes and concerns, such as compensation in the event of a delayed flight.

Insurers are starting to offer parametric insurance, wherein compensation is automatically triggered upon the occurrence of an unforeseen circumstance (delays, weather...), and startups are offering to automate grievances for transporters.



40M euros

are paid every year to passengers by airlines due to delays or traffic disruptions

Source : Indemnisation des retards et des annulations, IFTM 2016

AXA IS TESTING AUTOMATIC REIMBURSEMENT



- Common in the agricultural sector for covering weather risks, parametric insurance is now being applied to other sectors, as data flows and API logistics are developing. In parametric insurance, the insurance product is designed to ensure that compensation of damage is automatically triggered once the threshold that the insurer and client established has been reached.
- The point is to be able to automate and speed up compensation payments in the event of delayed or canceled flights, to maximize customer satisfaction.
- In 2017, AXA launched Fizzy, a travel insurance program intended for the general public, in which claims are automated by a “smart contract”: once the flight is definitely going to be two hours late, the compensation is wired directly to the client.
- Fizzy allows AXA to perform experiments on “Blockchain” topics and parametric insurance for the general public.
- The service, initially limited to transatlantic flights, is growing progressively by integrating more destinations and different coverage levels. The service was designed to be offered as a white-label product to its distribution partners, like travel agencies or airlines.



Powered by 

2.2

INDUSTRY AND AUTOMOTIVE

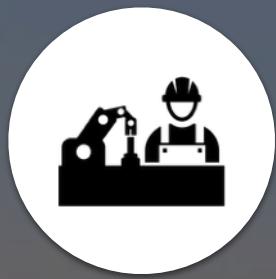
FOUR REVOLUTIONS THAT HAVE TRANSFORMED THE INDUSTRY



1st Industrial
Revolution

MECHANIZATION

End of the 18th
century



2nd Industrial
Revolution

ELECTRIFICATION

Start of the 20th
century



3rd Industrial
Revolution

ELECTRONIC

Start of the 1970s



4th Industrial
Revolution

CYBER-SYSTEMS

Today

CONTEXT

In the industry sector, AI, and more particularly AI paired with robotics, represents colossal advantages: boosted productivity, lowered costs, and economy of scale on personalization thanks to access to data and capacity for augmented production.

In the years to come, the industrial sector will be greatly transformed, and would be well advised to invest in AI and robotics (cobots, predictive maintenance solutions, enhanced analyses, authorizing personalization, digital twins).

The industry where AI will naturally absorb into production as well as into the product is the automotive industry. Today, cars already present low-level versions of AI that are integrated into the dashboard with voice, optical, and gestural command.

The first autonomous vehicles are appearing in beta testing in certain cities. It's nothing more than an assistant, but it's a more advanced AI that can evolve and understand a changing environment.

Autonomous cars respond to important regional, environmental, and social issues. They could significantly redefine our modes of transportation and ways of life.

\$16 B

Global market weight of AI by 2025

46%

of global AI market shares pertaining to industry are covered by GPUs

44%

of AAGR ** predicted globally by 2025 for industry in predictive maintenance tools

45%

of AAGR ** predicted globally by 2025 for industry in computer vision tools

*: Graphics Processing Unit - **: Average annual growth rate - Sources : *AI in manufacturer Market - Global market Inc 2019*

IN FRANCE

AI applied to industry is still fairly limited in France. **In fact, French industry is lagging** in terms of diffusing digital technology and digital industrial transformation compared to its European neighbors. However, it is necessary for industry to get moving in order to remain a serious competitor, even more so since **the results of a digital revolution will have an impact on the very short term on productivity and costs.**

Why are they so far behind?

Dubious industrialists.

Safety requirements are critical in industry, causing a sort of **reticence from different stakeholders to entrust production, maintenance, and quality processes to artificial intelligence.**

However, the advances made in technology are unprecedented. It's important to know that today, **it's not about replacing engineers, but using technology to give them a helping hand in order to enhance their skills and free up thinking time for better and faster management.**

A large industrial ship with yellow cranes is shown against a backdrop of a city skyline at sunset. The sky is a gradient of orange and blue. The ship has the number '415' visible on its side.
54%
of French directors believe that Industry 4.0 is an opportunity for their company

83%
of French directors believe that Industry 4.0 boosts personalization

87%
of French directors believe that Industry 4.0 carries risks of cyber attacks

26%
of French directors believe that Industry 4.0 is a threat to their employees

Sources : *Les dirigeants face à l'industrie 4.0* - Mazar et Opinionway - Juillet 2018

WHEN DATA COMES INTO THE FACTORY...

- Industry 4.0, or “Smart Industry,” corresponds to the 4th Industrial Revolution. After mechanization, electrification, and electronic, we are now making way for digitization when organizing means of production for more flexibility and personalization.
- IoT, robotics, augmented reality, 3D printing, artificial intelligence; all these technological innovations are put to use to optimize production time and costs for manufacturers and suppliers.
- Several players are taking a position on the subject, with data collection and use at the core of their attention, in order to make certain practices easier, such as modular production, predictive maintenance, automated quality control, or monitoring logistics.



**\$115.7
BILLION**

**WILL BE INVESTED
IN DRONES AND
ROBOTICS IN 2019**

+17.6%

**COMPARED TO 2018
IN THE WHOLE
WORLD**

Source : Worldwide Spendings on Robotics Systems and Drones, IDC Spending Guide, 2018

SENSEYE BRINGS YOU INTO THE ERA OF THE AUGMENTED ENGINEER



- **WHAT?**
Senseye is cloud software that performs predictive maintenance analyses for machines. It detects different anomalies and predicts breakdowns and when different pieces of equipment will stop working.
- **WHAT'S THE POINT?**
Thanks to Senseye, you'll be able to cut down on maintenance costs and breakdowns, thus improving productivity and allowing engineers to concentrate on more in-depth issues.

Senseye announced a return on investment in 3 months.



DRONE SURVEILLANCE OF INDUSTRIAL SITES



WHAT?

Uavia allows industrialists to connect their drones and robots to the cloud. To adapt to the needs of industrialists, Uavia has developed the Uavia Robotics Platform solution, a collaborative platform designed to allow several users throughout the world to control miscellaneous fleets of drones and robots in real time, and also to process, analyze, and share the data taken from using drones.

WHAT'S THE POINT?

To make the solution as reliable as possible, the company has developed artificial intelligence algorithms so that the drone can detect a lost connection as quickly as possible, and thus make decisions in light of the fact.





AUTOMATING ITS WAREHOUSES



- In January 2019, **Amazon** signed a **7-years deal** with the French startup **Balyo**, offering the possibility to raise **the company's capital by up to 29%**.
- Founded in 2005, the company has developed a **navigation system** that can transform **forklifts into automatic vehicles**.
- Amazon already uses **robots created by Kiva Systems**, a company that they acquired in 2012 for 775 million dollars (671 million euros).



T-SORT, THE AUTONOMOUS SORTING SYSTEM

 **TOMPKINS ROBOTICS**

NRF 2019
RETAIL'S BIG SHOW

- **WHAT?**
Tompkins Robotics has developed the first **portable automated sorting system** in the world, called T-Sort.
- **WHAT'S THE POINT?**
This new innovative robotic technology helps to create **more flexible supply chains**, at an **unmatched speed**.





A PARTNERSHIP FOR GROCERY LOGISTICS



- In 2017, Monoprix announced its alliance with Ocado, a pure player in grocery E-commerce in Great Britain, to develop a new **logistic chain in France**.
- Ocado has in fact developed a **robotized warehouse technology**, which can prepare **orders in under 6 minutes**, as well as **manage the cold chain**.
- A 36,000 m² warehouse, entirely automated, is being built in Fleury-Merogis, with an expected delivery for the second quarter of 2019.



COLLABORATION OF ROBOTS & HUMANS AT AMAZON



- In September 2018, Amazon opened a new order processing center in Staten Island. It has an area of 80,000 m² where humans and robots work together to optimize productivity.
- Employees wear a “Tech Vest” that lets robots detect where they are while moving around, so that the robots can maneuver safely around people. Moreover, the vest can control the robots’ speed and path.
- The benefits for Amazon: a considerable amount of time saved, some tasks go from taking a day to under an hour, and a significant reduction of storage space.
- Amazon also explained that the robots help humans concentrate on solving problems and performing higher value-added tasks, and to reduce strenuous work.

FOCUS ON COBOTS

The use of cobots, or collaborative robots, is booming, and is today being used beyond industrial applications. Their capacities and precision are broadly improved, allowing for a more efficient close collaboration with humans.

However, we have to keep in mind that we're still a long way from robotic employees; there's no C3PO or Tars in sight for the moment, but mechanic arms are programmed to assist in tasks that are meticulous, physically demanding, or repetitive.

Cobots are becoming attractive to more and more sectors, especially industrial ones. They contribute to a significant increase in productivity while saving money, their average ROI is generally between 4 months and 1 year, they offer better reliability and safety, reduce arduous work, and help develop personalized assembly lines (two concepts that shouldn't be able to exist in the same sentence).

\$3,548 M

Revenue generated by the global cobot market by 2023

Applications



Blood draws
Managing samples



Carrying heavy loads
Cargo



Controls
Piloting



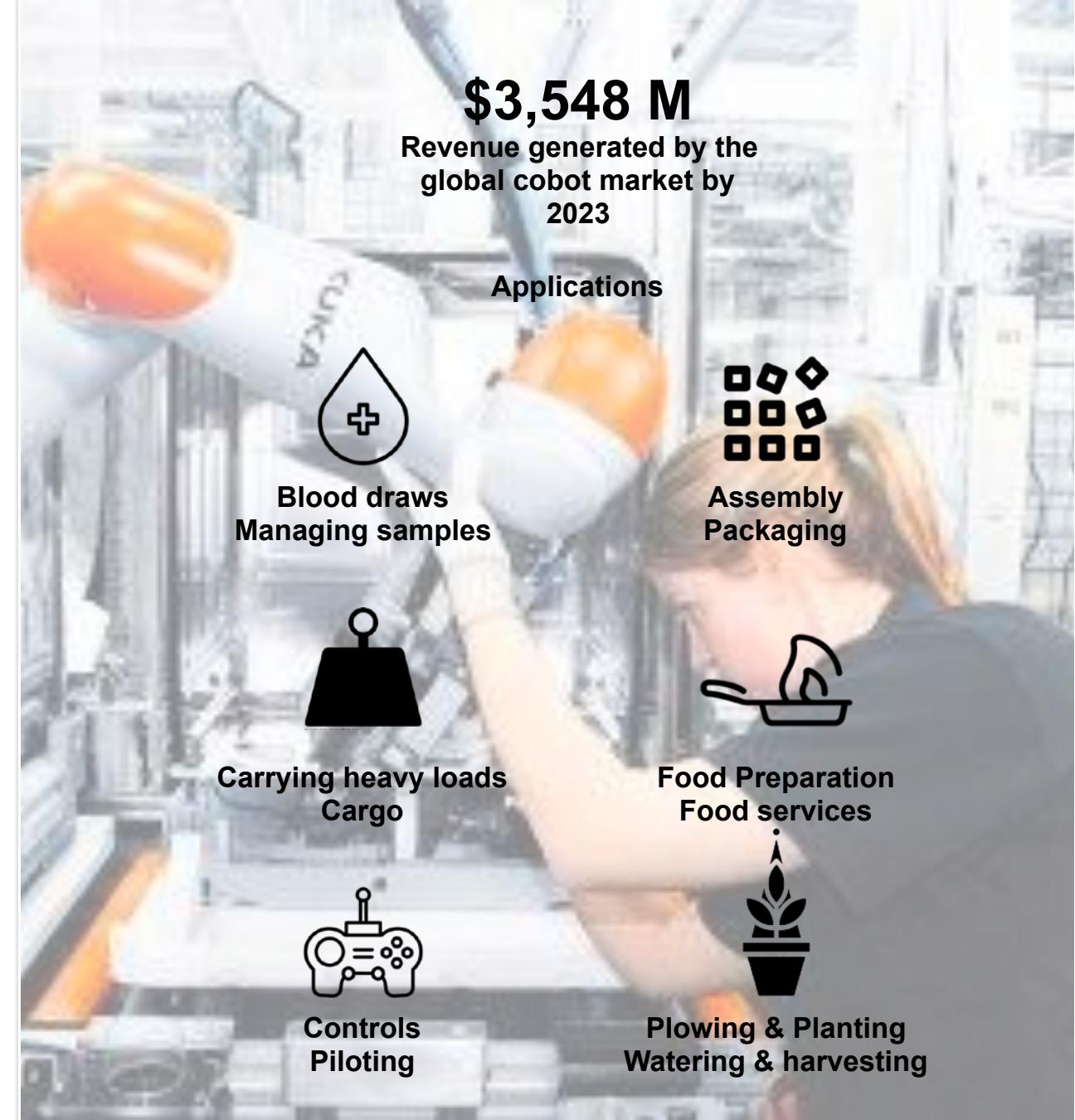
Assembly
Packaging



Food Preparation
Food services



Plowing & Planting
Watering & harvesting



FOCUS ON COBOTS: MAIN PLAYERS



MRK-SYSTEME GMBH



FOCUS ON COBOTS: 4 APPLICATIONS OUTSIDE OF INDUSTRY



EVA, THE VERSATILE ASSISTANT



AUTOMATA

WHAT?

Cobot Eva, basically intended for production chains and laboratories, is a multipurpose robot. Eva is presented as a compact, lightweight robot that can be installed on a desk and programmed by the employees themselves very easily, in 15 minutes.

“She” can fix other machines, assemble and test products, handle vials and other laboratory instruments, manage packaging, inspect final products via an integrated camera, draw, perform research, etc.

WHAT'S THE POINT?

An assistant robot for repetitive or meticulous tasks that can be tiring, or have low added value for humans. Eva therefore helps save a considerable amount of time and energy.



FROM SMALLEST TO BIGGEST, FANUC HAS A MULTITUDE OF PERSONALIZABLE ROBOTS



FANUC

WHAT?

- Fanuc is a global leader in industrial automation. It offers a wide range of industrial cobots and robots, CNC systems, and electrical discharge machines.

WHAT'S THE POINT?

- Fanuc develops all its components itself, allowing it to guarantee a high degree of quality, monitoring, and after-sales service from A to Z. The company has an advisor for each client to ensure training and support. Programming software is also entirely customizable, to create a customizable robot.



AUTONOMOUS VEHICLES, 3 BILLION VEHICLES BY 2050

The car still constitutes THE means of transport that we see as being indispensable. However, driving isn't thought to be a delightful activity, especially in big cities. Autonomous cars will therefore provide comfort, and possibly transform our ways of getting around. Additionally, they will help respond to major civil engineering and environmental issues, especially if they're paired with sustainable technologies.

68%

of French people deem
cars to be indispensable

86%

of French people think that
new innovations will make
mobility more pleasant

10%

of new vehicles will have
autonomous capacities by
2021

69%

of French people believe that
AI will be useful in the
automotive sector to make
safer cars

+21%

of AAGR** by 2028 for the
autonomous vehicle
market

Sources : ASD Report

Sources : Les Français et l'I.A. - Institut CSA Janvier 2018

Sources : Les Français & l'automobile - Kantar 2018

Sources : Les Français et la mobilité de demain - CSA mondial de l'auto 2018

FOR AUTONOMOUS VEHICLES, THE GOAL IS LEVEL 4 BY 2022 IN FRANCE

LEGISLATION

Cybersecurity
Testing stage
Traffic laws
Responsibility
GDPR

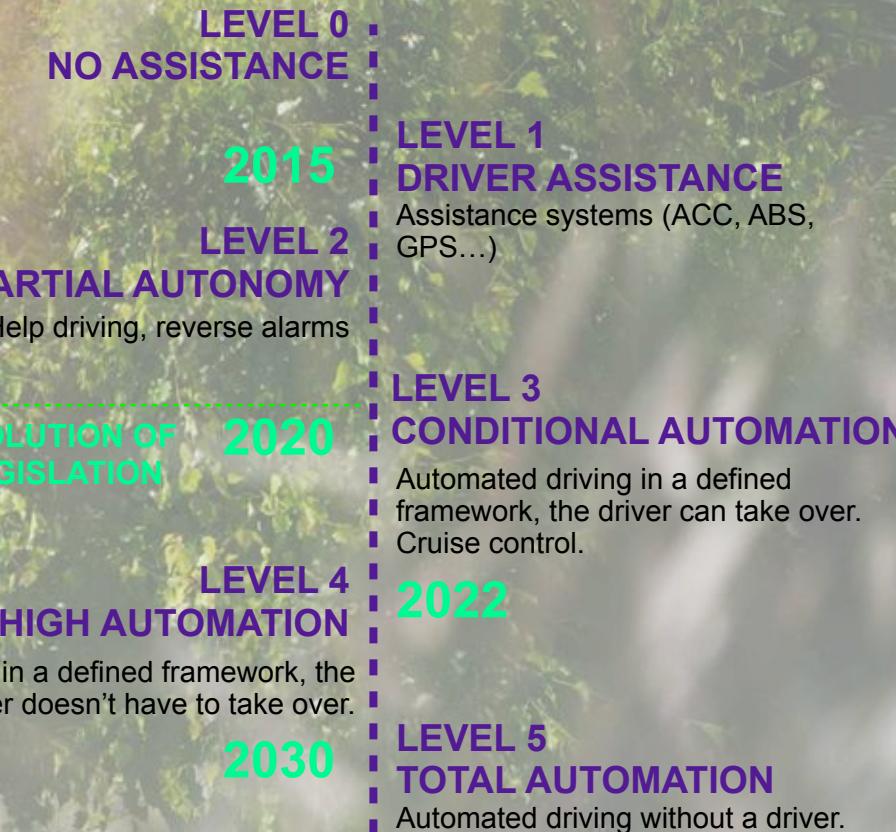
TECHNOLOGIES

Sensors
Radars
Cameras
Ultrasound
AI computing power

CONNECTIVITY

5G
Connecter les infrastructures
Cartographies numériques

TOP 4 PLAYERS





MOVING TOWARD MORE NATURAL HUMAN-MACHINE INTERACTIONS



- In 2021, BMW will launch iNEXT, an SUV equipped with a brand new, more intuitive AI that can respond to voice, movements, and looks to control different features in the vehicle (radio, roof, ventilation).
- The idea is to allow the driver not to be constricted by the technology, but to have technology at hand to make interacting with the vehicle easier.
- The voice and gesture recognition system is integrated into the dashboard, and uses machine learning to adapt to the car's owner.
- Moreover, the AI in iNEXT helps the driver interact with the surrounding environment so they can get reviews, opening hours of nearby establishments, and even make reservations.

USING AI TO MONITOR THE DRIVER



EYE SIGHT



WHAT?

The Israeli startup is developing technologies that use deep learning and artificial intelligence algorithms intended for vehicles, the home, and connected objects. For vehicles, Eye Sight has developed an embedded solution that can determine if the driver is in a fit state to drive or not. For instance, when the driver is falling asleep, the steering wheel starts to vibrate to alert them to danger.

WHAT'S THE POINT?

In 2020, new Euro NCAP (New Car Assignment Program) rules will come into effect, requiring each manufacturer that wants to achieve a 5-star security rating on its models to install a driver monitoring system.





AI COPILOTS: PUTTING DEEP LEARNING TO USE FOR DRIVERS



- Volvo will start producing new Level 2+ vehicles as of 2020, which will be equipped with the Nvidia Drive AGX Xavier system, a powerful AI tool that provides options for assisted driving that go beyond controlling the passenger compartment.
- We're talking here about a driving aid by Volvo that will in the near-to-moderate future aim to develop into an autonomous car. The brand has already forged a partnership in this area with Uber, as well as with the University of Nanyang and Singapore's bus system, with the intention of developing an autonomous 12-meter bus.
- Nvidia's technology can: monitor the driver, provide 360° analysis and detection of the surrounding environment, access connected services, and even manage the vehicle's energy consumption.



TOYOTA UNVEILS THE P4, ITS AUTONOMOUS TEST VEHICLE

- At CES, the Japanese manufacturer unveiled a new, more powerful autonomous test vehicle as a part of its “Guardian and Chauffeur” program.
- The Toyota Research Institut (TRI) presented the new generation of its autonomous test vehicle. The P4 fits within the scope of a global automated driving system called “Guardian and Chauffeur,” with two levels of assistance: the Chauffeur mode is meant for autonomous driving, while the Guardian mode will amplify the driver’s performance behind the wheel, without completely replacing them.
- The design of the P4 is based on the Lexus LS500h sedan. It’s equipped with two extra cameras to improve its lateral perception, and new image sensors in the front and rear. Its new LIDAR radar system extends its range of vision by using an eight-sensor system. With a higher computing power, its systems can run more machine learning algorithms at the same time to ensure a faster learning process. It analyzes and reacts more quickly to data gathered by the sensors.
- The P4, which is made in Michigan, in the United States, will join the fleet of Toyota’s test vehicles in the spring of 2019. The Japanese manufacturer is hoping to get its first autonomous cars on the road by 2020.

Sources : *Toyota Rolls Out P4 Autonomous Driving Test Vehicle*, PCMag, 2019. Communiqué de presse Toyota.



VALEO PRESENTS 2 INNOVATIONS IN AUTONOMOUS CARS

- Valeo is showcasing its technologies to make the Range Rover Evoque Valeo Drive4U completely autonomous. Its cameras, laser scanners, sonar, radar, and LIDAR (the only mass-produced LIDAR technology on the market) work in harmony for a seamless experience.
- **Artificial intelligence guided by a tele-operator:**
Places that are “offline” will be mapped with a high degree of precision so as to be integrated into the databases that autonomous vehicles will consult while traveling. The robot will ensure that the profile of the road in front of the sensors fully corresponds to the 3D high-resolution outline stored in the cloud.
- The tele-operator steps in when the robot passes control over to the driver: a remote assistance service lets the operator take control of a vehicle that is several hundred kilometers away. This system relieves the driver of certain tasks, and helps them in the event of the unexpected (a sudden meteorological phenomenon, or a health problem).
- The Valeo Voyage XR augmented reality system helps the operator see what's happening in the cabin. It can also make a passenger in an autonomous vehicle feel less alone by showing the avatar of a loved one on the screen and central rear-view mirror. To do so, the vehicle must be equipped with a virtual reality headset and controller.

Sources : Valeo vous "téléporte" à bord d'un véhicule!, Cardisiac 2019

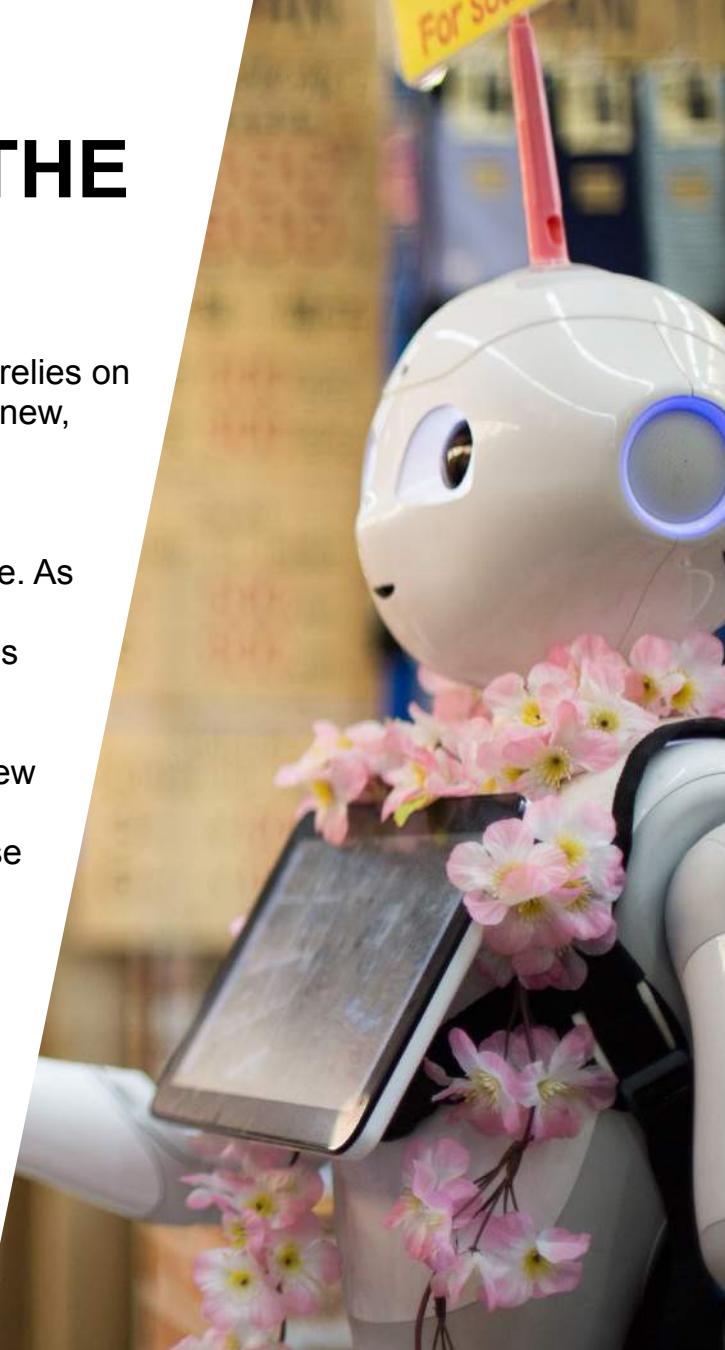
Au CES, Valeo met un peu d'humain dans la voiture autonome, Challenges 2019

2.3

MARKETING & RETAIL

A NEW DYNAMIC IN THE RETAIL SECTOR

- The dynamic of the retail industry is evolving. It relies on new **experiences that are driven by data** and new, higher expectations from consumers, who want **personalized offers**.
- But it's not so easy to provide this kind of service. As **digital and physical channels are blending**, retailers that can respond to these new demands are taking leading positions.
- **AI and cognitive services** are becoming the new tools of commerce. They allow retailers to significantly **improve their output** and make use of their analyses of consumer behaviors.
- The resulting **operational acceleration** helps retailers boost their expertise in customer service throughout all channels.



\$340 billion

could be made in yearly savings by 2022 by using AI

80%

of savings made by optimizing supply chain and return processes

Source : Capgemini, Août 2018

IN REACTION TO AMAZON'S LEAD AND INFLUENCE



In 2016, Amazon got into consumer product sales with an offer of **delivery in one hour or less**.



Developing **micro-fulfillment centers** that are close to urban zones to fill online grocery orders, like Commonsense Robotics and its **compact robots**.



Amazon opened its first physical “unmanned” point of sale in 2016 in the United States: Amazon Go.



Several startups have imitated the model of an “unmanned **Grab & Go shop**,” or even **Alfi’s Nanostore model**, as well as that of the French startup **XXII**.



Several AI innovations are appearing in an attempt to rival their transparency and visibility, be it in computer vision to monitor **in-store inventory**, or in **neural networks** to monitor items throughout the supply chain, for example.

Source : AI Trends in Retail, CB Insights 2019

THE STAGES OF THE AMAZON GO PROCESS

Identification via Smartphone

1 After downloading the Amazon Go application, and inputting their bank information, the visitor opens the application, a QR code appears, they scan it at the stations at the entrance, which identify the visitor and let them into the store.

Cameras that track their path

2 Located in the ceiling, cameras track the visitor's path, analyzing colors, depth, and movements.

Sensors in the aisles

3 Located on the shelves, cameras detect and interpret the visitor's movements, the objects that they take are recognized and added to the application's virtual basket.

Probabilistic calculations are used to compare the data in Amazon's cloud

4 Behind these data-gathering technologies (here, cameras), powerful algorithms compare the data in the Amazon Web Services cloud to verify that the products picked up by the cameras are actually those that the customer chose.

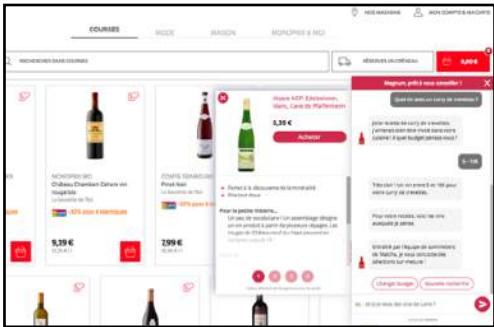
Free departure, instant billing

5 The visitor leaves with their products in a bag or in their hands, the security door opens when the visitor approaches without needing to show their phone a second time. The bill appears immediately on the application.



Source : La technologie d'Amazon GO décortiquée, LSA, 2018

AI IS ALREADY PLAYING A ROLE IN IMPROVING RETAIL PROCESSES...



Chatbot

The startup Matcha has developed the chatbot Magnum, a virtual wine seller that can help consumers find the best wine for their meal and budget on E-commerce sites and in stores.



Voice orders

In the summer of 2018, Carrefour teamed up with Google to get into voice commerce. As of March 2019, Carrefour consumers will be able to make their shopping lists and order their purchases directly via voice.



Visual recognition

The Chinese startup Yi Tunnel has developed a register powered by artificial intelligence. It recognizes merchandise (with or without packaging) placed on a tray.



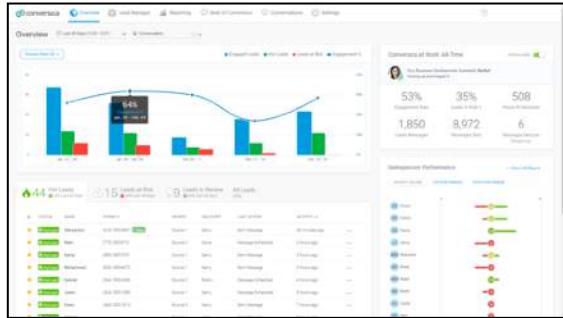
Robot

The platform combines the autonomous Continental Urban Mobility Experience (CUbE) vehicle and a team of delivery robot-dogs to deliver small packages.

...

Coming soon: delivery by autonomous truck, AI and voice become assistants for businesses, drone delivery will become more popular, etc.

... AND IMPACT THE ENTIRE SALES FUNNEL



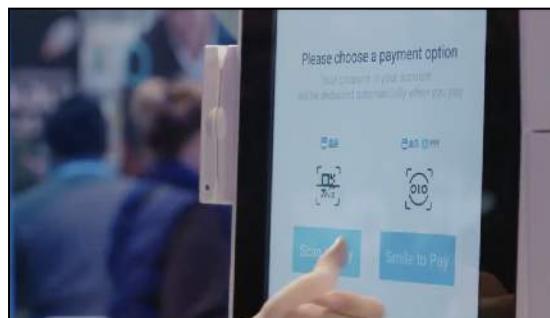
CRM Sales and Applications

Identifying and converting the right leads, automating and improving sales operations...



Client recommendations

Providing offers that correspond to the right profiles at the right time...



Payment and payment services

Biometric payment to remove the need for registers, AI helps remove this point of friction...



Logistics and delivery:

AI solves the challenge of the last mile...

PERSONALIZED PROMOTIONS VIA AI



- **WHAT?**
This **artificial intelligence** solution deduces consumer preferences. By using an application that indexes recently made purchases, **personalized offers and coupons are suggested** to the user by email, online, on social networks, and on Facebook Messenger.

- **WHAT'S THE POINT?**
Created **for supermarkets**, this application helps distributors get to know their regular consumers better, based on **the identification of their repeat purchases or their loyalty card, for instance**. In Germany, some Penny supermarkets use the application to personalize prices for their clientele. The communications sent to the clients are targeted, and don't require **any particular intervention** from the chain.



TARGETING THEIR CAMPAIGNS IN SHOPPING MALLS

ENGAGEMENT AGENTS

- **WHAT?**
This agency uses **artificial intelligence** to evaluate the audiences of existing campaigns for chains and brands in **shopping malls**. *Engagement Agents* collects campaigns, displays them to as many people as possible, gathers the analyzed data from **real-time reports**, then extracts relevant exposure opportunities: **place, time of day, year, targets, etc.**

- **WHAT'S THE POINT?**
Making the investment in already existing campaigns profitable by optimizing their exposure.

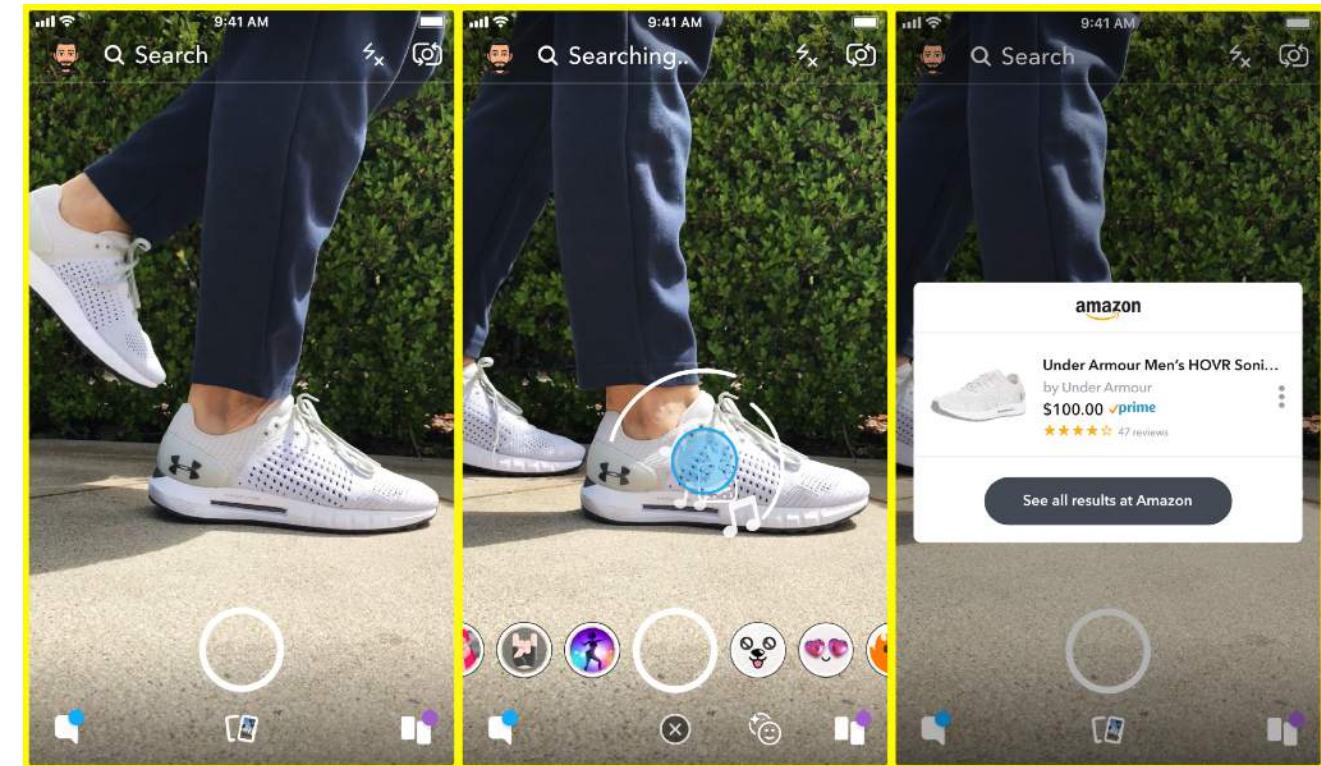


engagement agents



SNAPCHAT IS DEVELOPING VISUAL SEARCHES WITH AMAZON

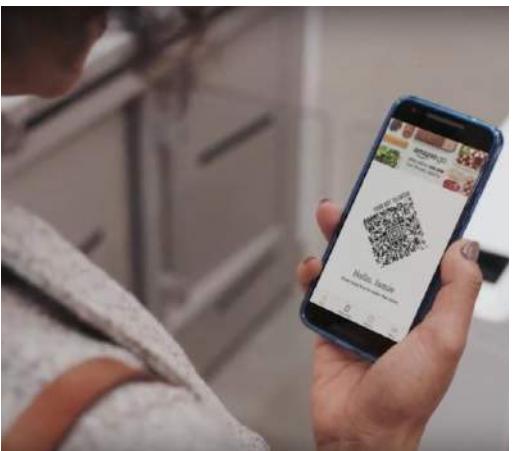
- As of September 2018, Snapchat's camera can also be used to **recognize a product** thanks to its partnership with Amazon.
- The user holds down on the screen for a few seconds in front of an item or a barcode. An **Amazon product sheet** appears with a link redirecting them to the product or a similar product on the Amazon application or website.



Source : Découvrez la recherche visuelle, Snap.com, 2018

APPLICATIONS, AT THE HEART OF THE IN-STORE EXPERIENCE

- Distributors are reinforcing the services offered by their applications: it's a faster way of **improving the customer experience** than costly implementation of digital programs in stores.



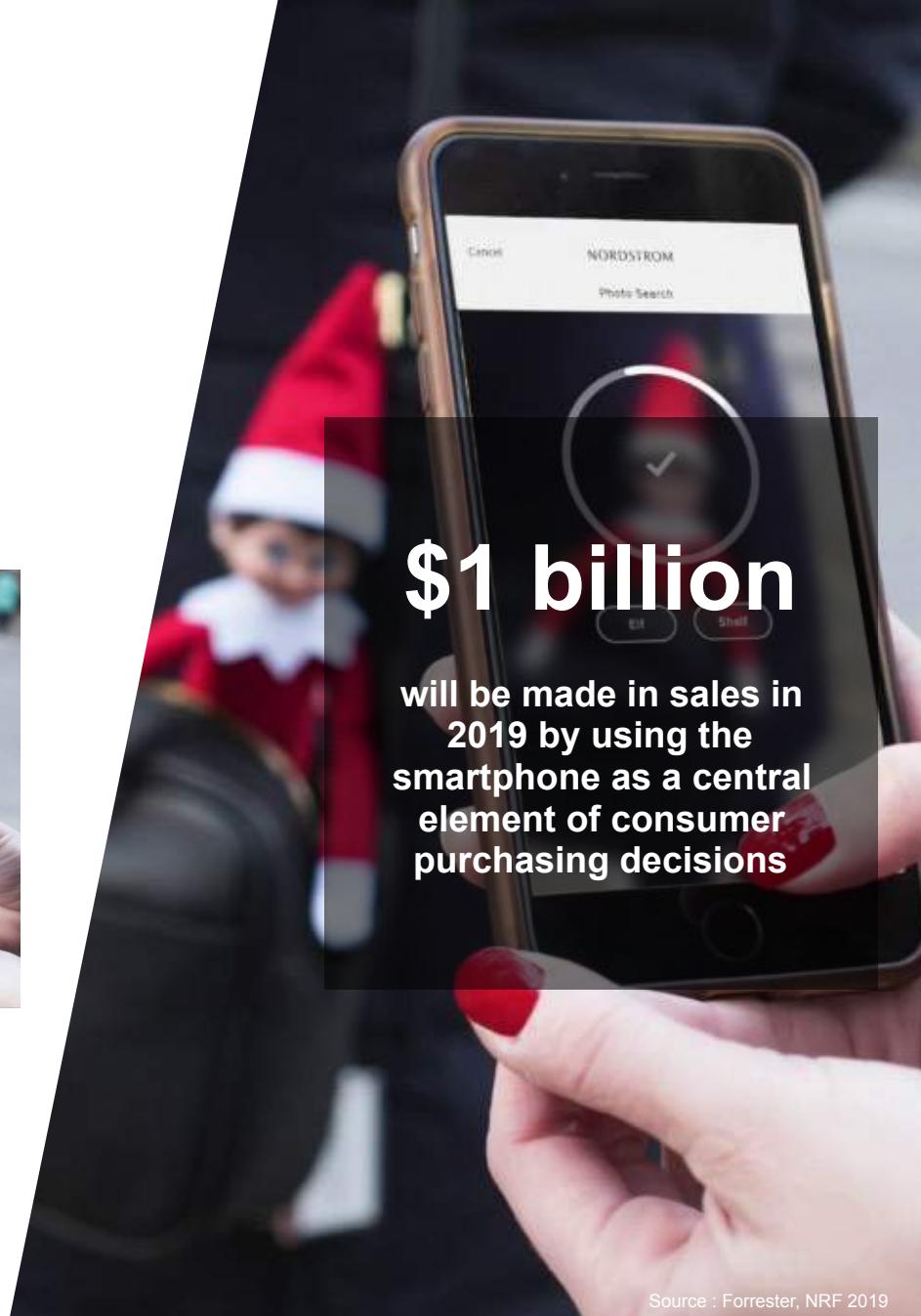
Scan & Go
Amazon Go



Store mapping
Target



Visual searches
Nordstrom



Source : Forrester, NRF 2019

VOICE COMMERCE: A TREND WE SHOULD KEEP AN EYE ON

- Although smart speakers are playing an obvious role in the expansion of home automation, they also represent a huge opportunity for distributors. After stores, the E-commerce platform, and mobile, **voice could become the 4th sales channel.**

Among connected speaker users, in the last year:

37% 

have **searched for an item** they wanted to buy

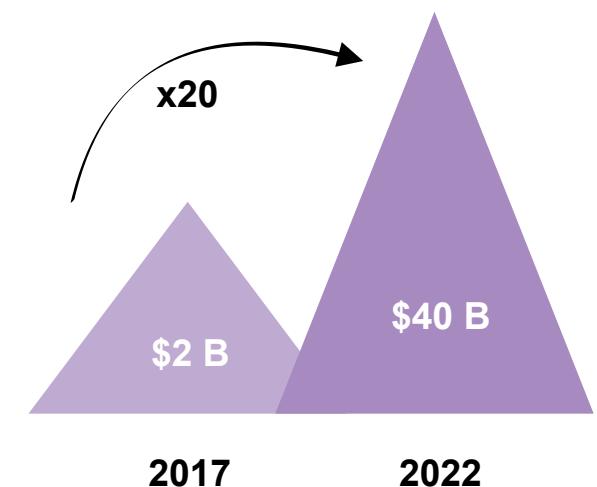
25% 

have **added a product to their basket** to buy later

16% 

have **repurchased a product they'd already bought**

Estimate of V-commerce market revenue in the United States



Source : OC&C Strategy Consultants, 2017
*Survey conducted on a panel of 1,500 Americans who own a connected speaker

Source : *The Smart Audio Report*, National Public Media et Edison Research, 2018
*Survey conducted on a panel of 909 Americans who are over 18



OCADO, A PRECURSOR TO VOICE COMMERCE ON AMAZON ALEXA



- A British pure player in groceries, Ocado was the first supermarket to launch an application on Amazon Alexa in 2017.
- This “skill” mainly adds or removes items from a basket that is ordered online (a simpler process than filling your shopping basket by voice alone), but can also ask questions about seasonal fruits and vegetables. It’s even possible to ask for recipes.
- In France, distributors are still hesitant to use the platform of one of their fiercest competitors; but Monoprix has followed Ocado’s example by piggybacking onto Google Assistant as soon as it came out. Carrefour recently announced a similar collaboration

PERSONALIZATION, THE HOLY GRAIL FOR BRANDS AND CHAINS

- Mass commerce has had its time; consumers now expect brands and chains to provide **more personalized relations**, and even **unique products** that correspond with them perfectly. This is now possible thanks to **data and technology**.
- The first step is **collecting behavioral and personal data**; although the practice has long been in effect online, it's now being applied in the real world with the help of sensors. This data can personalize relations **at the individual level**, with advice and targeted offers, or **at a more general level**, with ranges and products that correspond more to local specifications.
- Vendors, who are **better informed**, can thus make sure that their advice component is reinforced. But at the same time, western consumers are increasingly **informed and demanding** on how their personal data is processed; brands and chains therefore have to handle these matters **with care**, or else risk breaking the trust they've built with their customers.



Source Cap Gemini 2018

A SCANNER FOR PERSONALIZED RECS

lele.lululab



LELE LULULAB



WHAT?

Lumini is a face scanner powered by artificial intelligence. Its technology uses light to analyze and assess the condition of the face's skin: wrinkles, pigments, blotches, pores, sebum, acne, etc. The solution then suggests products and services that are best adapted to the skin. The machine learning can then improve the diagnosis process with each use.

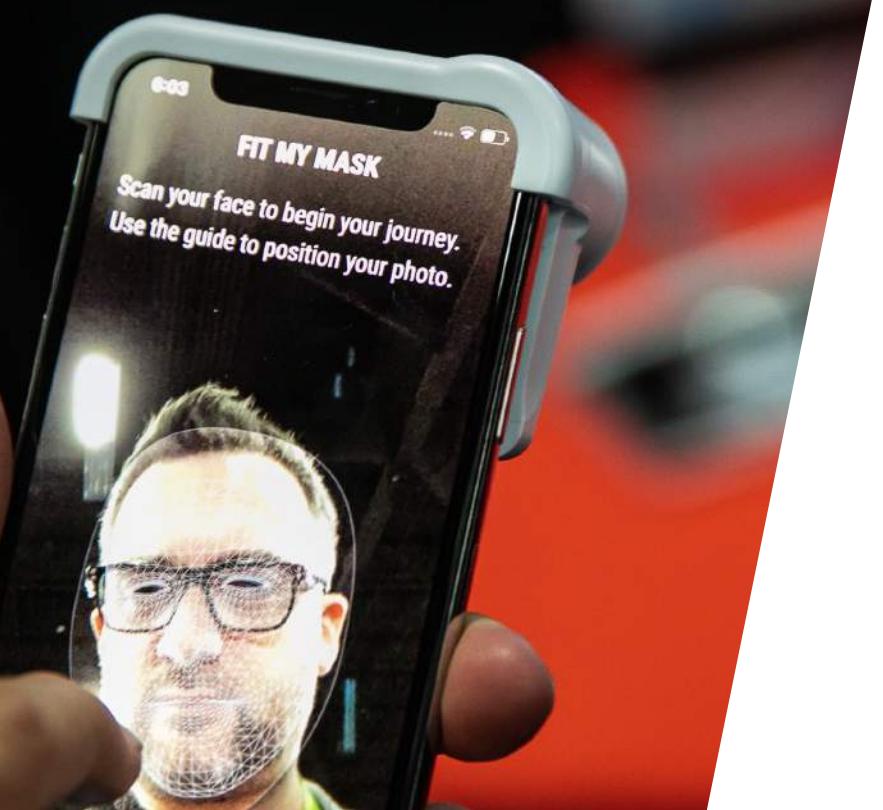


WHAT'S THE POINT?

This subsidiary of Samsung Electronics aims to connect all the companies in the beauty industry with its "skin data."



NEUTROGENA LAUNCHES MASKID, A PERSONALIZED FACE MASK



- At CES, Neutrogena presented MaskID, a 3D printed mask personalized from data of the user's epidermis and morphology.
- A 3D camera integrated into a smartphone analyzes the shape of the face to take all the physical facial characteristics into account. The application then determines what the skin needs, and the mask is 3D printed.
- Thus, Neutrogena can offer totally unique and personalized products that correspond exactly to the needs of their clients.

VISUAL PRODUCT RECOGNITION

**YI TUNNEL**

WHAT?

The Chinese startup Yi Tunnel has developed a register powered by artificial intelligence. It recognizes merchandise placed on a tray. This product recognition system doesn't need a barcode or a cashier.



WHAT'S THE POINT?

It has ultra-fast and precise product recognition, with a success rate of 99.7%, thus accelerating the checkout process and improving the customer experience.



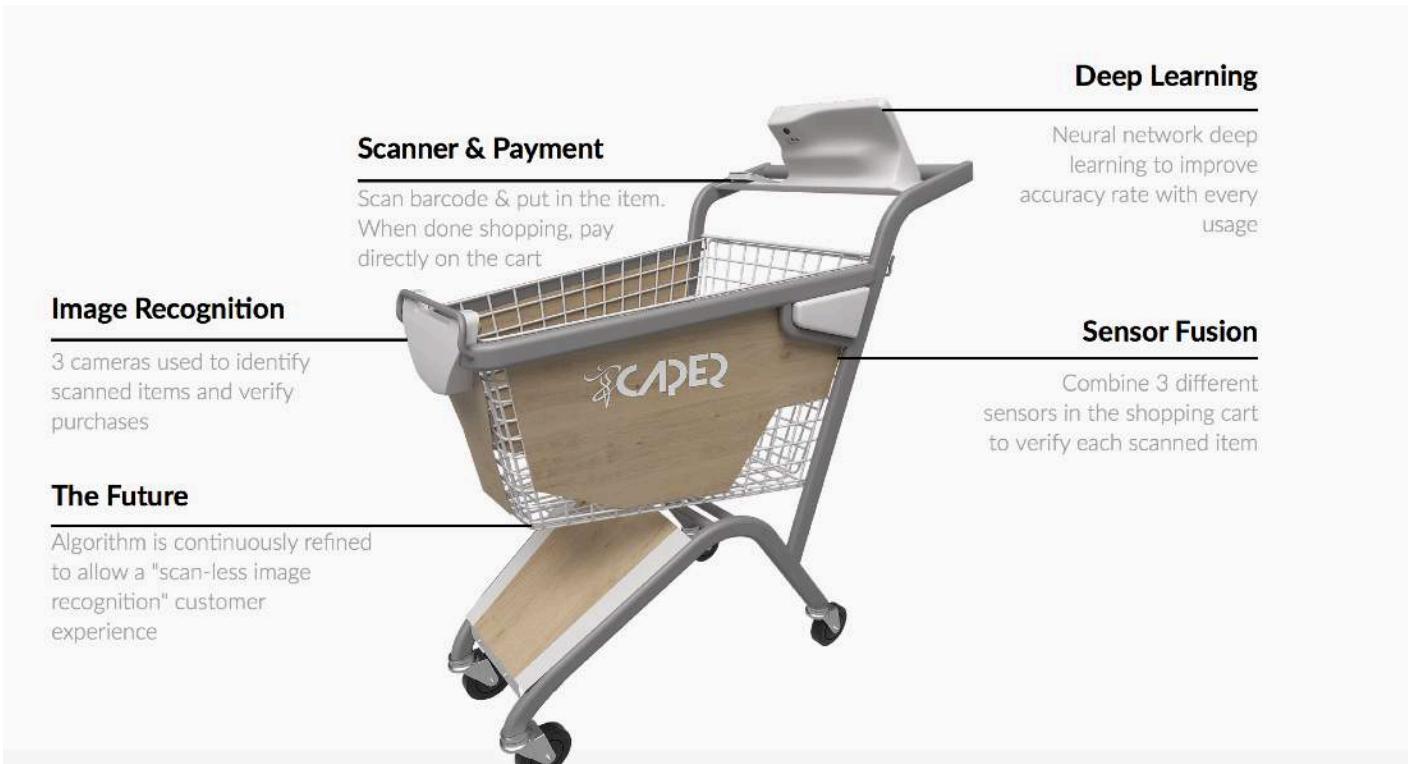
SMART SHOPPING CART



NRF2019
RETAIL'S BIG SHOW

caper

- Caper is concentrated on **pooling Amazon Go technologies (image recognition, sensors, and artificial intelligence)** in a **smart cart**, which lets shoppers put items into the basket and do a **self checkout** without going to the register.





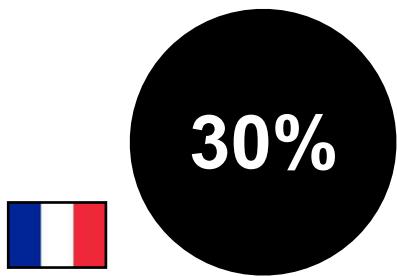
“Customers always demand more - faster and better. That’s why AI can help not only in the warehouse, but in last mile delivery.”

Hui Cheng
head of robotics research in Silicon Valley
JD.com



USING AI TO SOLVE THE CHALLENGE OF THE LAST MILE

- Last mile delivery is very **expensive** for E-retailers and delivery players. It's also a source of **friction** and **frustration** for customers.



of logistics costs: that's what **last mile delivery** represents.

Source : *La logistique saura-t-elle relever les défis de 2018 ?*, Décision-Achats, 2017



ROBOTS AND DRONES FOR THE LAST MILE

- With robots and drones, distributors can reach **new populations** and **accelerate their logistic flows**.
- Automating delivery is a way for retailers to save money, and for clients to save time and gain in practicality. Nearly half of American consumers are open to the option of **same-day delivery of their order by drone**.
- JD.com maintains that they are able to deliver **90%** of their orders throughout all of China same day or next day...



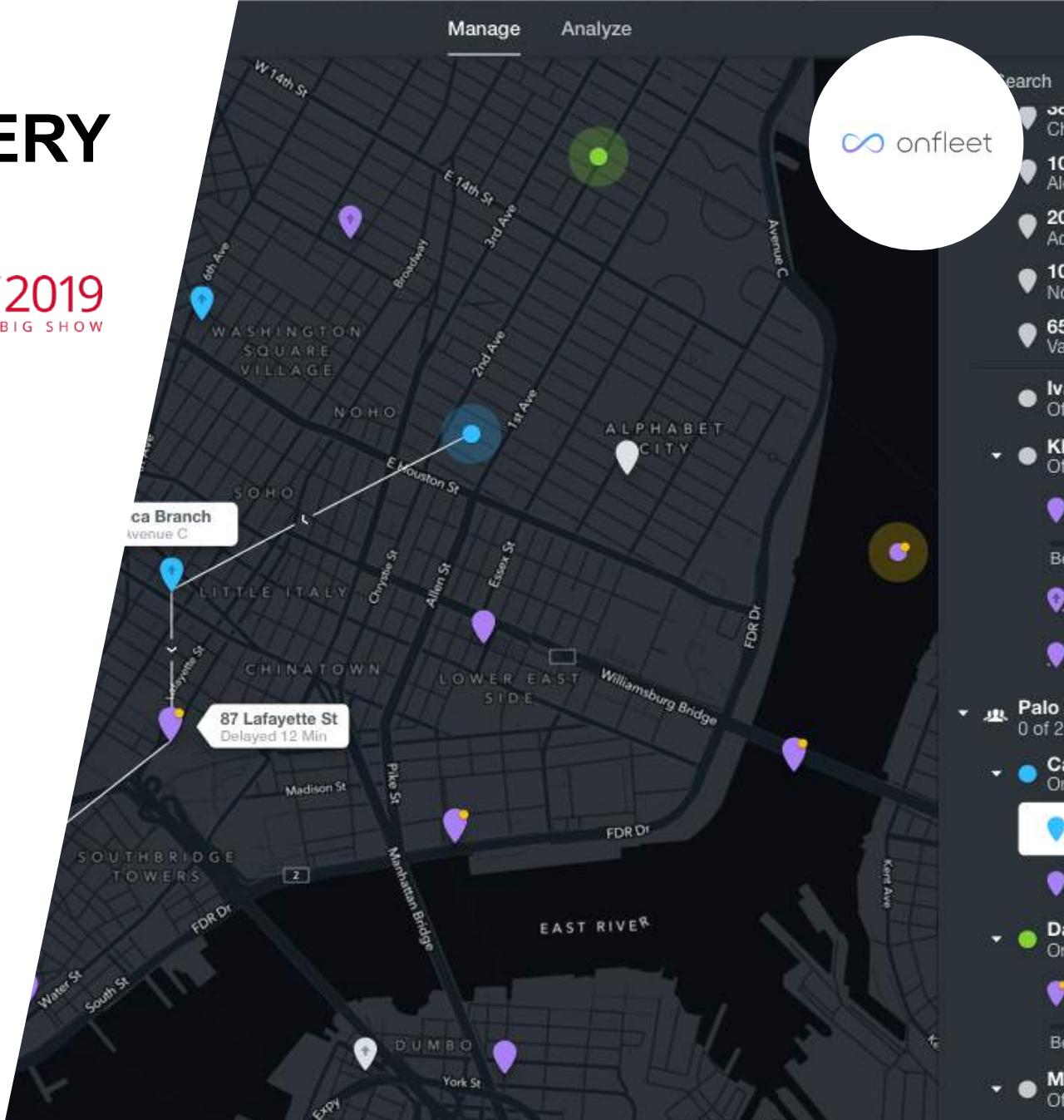
Source : Last mile delivery Challenge Capgemini 2018

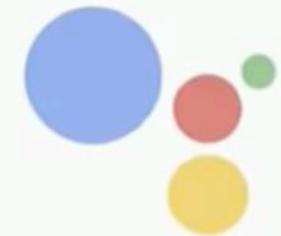
OPTIMIZING LAST MILE DELIVERY



NRF 2019
RETAIL'S BIG SHOW

- **WHAT?**
Onfleet is a specialized solution in last mile logistics. It includes a **dashboard to track delivery routes**, package distribution, and data **analysis**. The solution is available on an **application** for drivers and clients.
- **WHAT'S THE POINT?**
This solution lets distributors **optimize their logistics** to reduce **costs**, as well as their delivery **times**. As for consumers, they can easily track their orders and get **real-time** information on where their package is.





"Hello, how can I help you?"

AND TOMORROW, AI + VOICE FOR BUSINESS OWNERS?

GOOGLE DUPLEX:
ARTIFICIAL
INTELLIGENCE BECOMES
AN ASSISTANT FOR
BUSINESSES



2.4

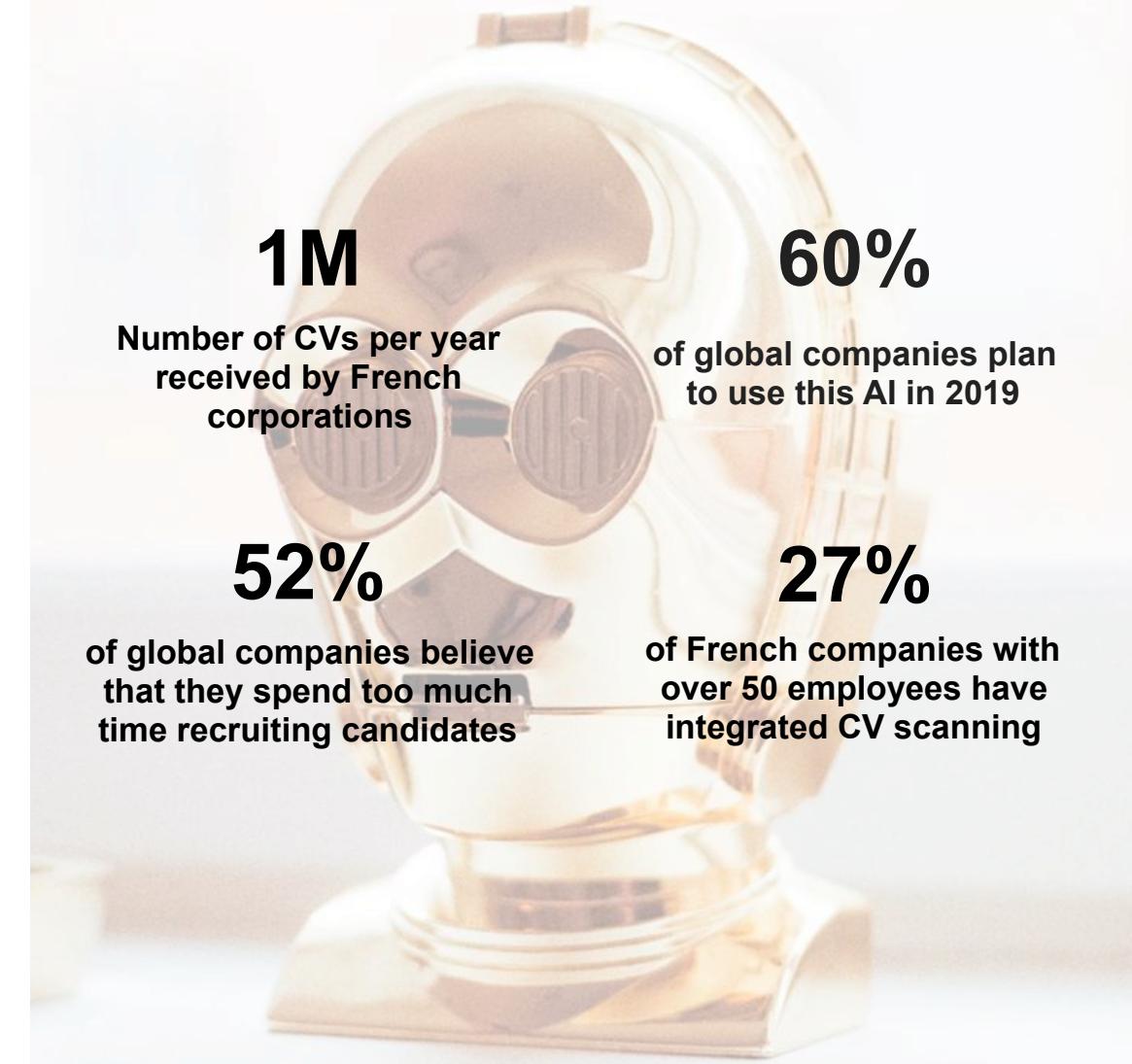
HUMAN RESOURCES & ORGANIZATION

AI IS AN HR OPPORTUNITY TO SAVE TIME AND GO BEYOND TRADITIONAL THINKING...

AI represents a large potential for HR departments in corporations. In fact, corporations are often swamped with a high number of applications that they have to read, analyze, and rank. **AI would therefore find talent more easily and efficiently** by using data to identify specific skills required; in other words, finding a needle in a haystack.

In addition to processing issues, **AI could also help select candidates by finding the most relevant profiles** for the company, especially when it involves identifying soft skills and knowing if candidates match the company's culture outside the realm of their academic degrees.

From textual analysis to facial recognition, AI could eventually revolutionize recruitment procedures.



Sources : Enquête mondiale 2019 préparation des organisations à la transformation - Mercer - 2019

Sources : Les progiciel de recrutement en 2016 - APEC - 2017

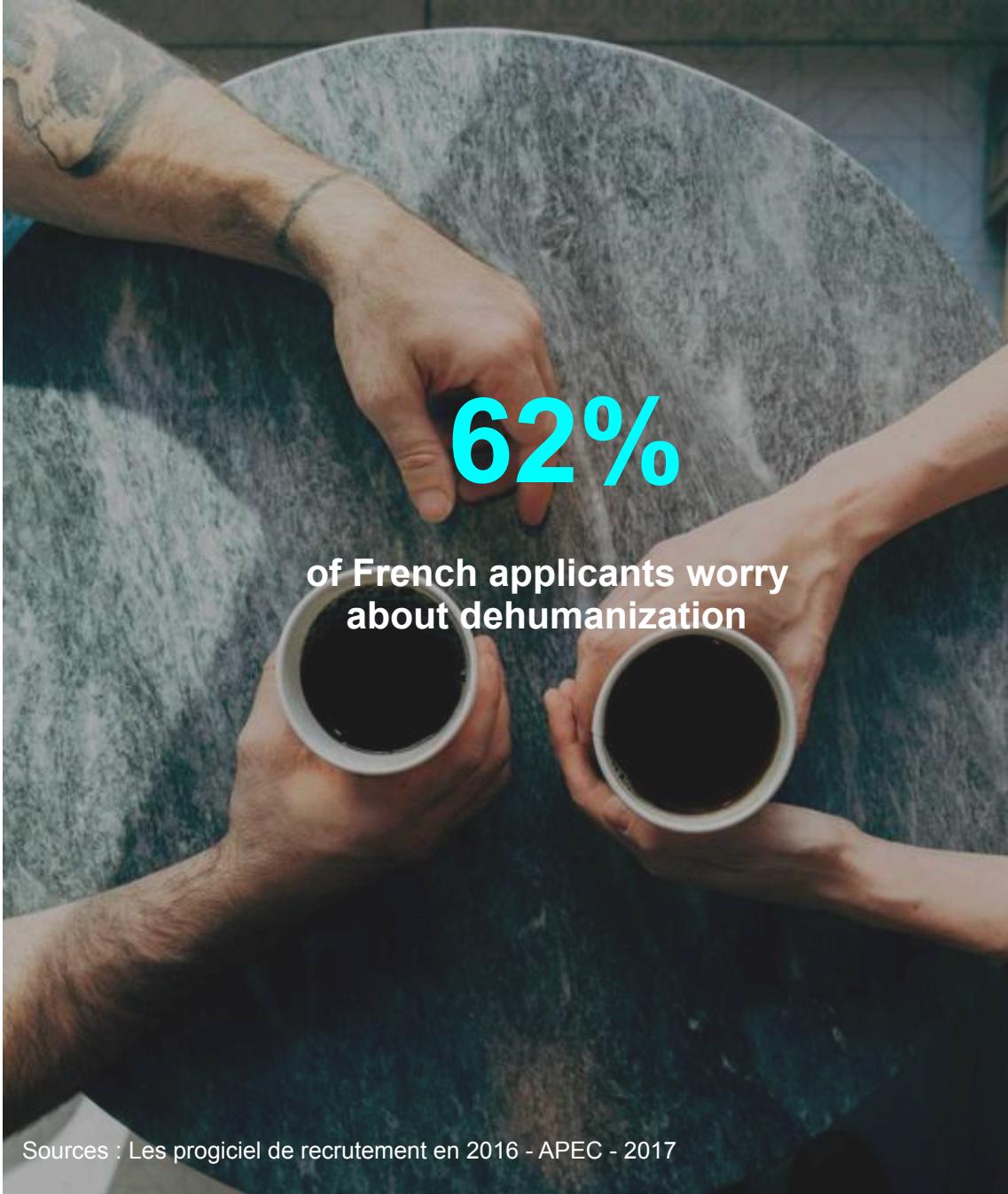
...BUT BEWARE THE RISK OF DEHUMANIZATION, WE NEED REAL CONTACT TO FORGE RELATIONSHIPS

In fact, candidates aren't **comfortable with the idea of doing interviews with machines**. Several factors concern them:

- Dehumanization
- Biases and misinterpretations
- Discriminatory biases
- Doesn't portray the spirit of the company

Moreover, these AI systems still present several biases for some technologies, **if they can actually identify soft skills that aren't related to a candidate's degree in a pool of applicants, when will they begin to put this pool together themselves?**

We've seen that AI is still a child that repeats what its parents do, and isn't endowed with its own conscience. **Therefore, it learns the biases we impart to it, which can lead to recruitment discriminations** against women, older applicants, or people of color. They must also be careful not to recruit the same exact profiles.



PREDICTIVE SOLUTIONS FOR HR DECISIONS



SAVENSIGHT

WHAT?

SavenSight is a predictive recruitment test that explores 7 cognitive resources. The test analyzes essential dimensions that could determine a candidate's professional success.

WHAT'S THE POINT?

This solution helps recruiters select the best and most effective candidates for the job.

SavenSight also helps users visualize their final decision after the interviews are over, save time by pre-selecting candidates, and enhance the candidate-recruiter relationship.



MA CARRIÈRE : LES 4 RÈGLES DU JEL

Découvrez les quatre règles du jeu fondamentales dans le domaine professionnel : la contribution au travail, la relation aux collègues, la relation à la carrière et la relation au marché du travail. Vous découvrirez ensuite votre évaluation pour chacune de ces quatre règles. Cette évaluation est basée sur une comparaison avec des personnes de même âge, de même niveau de formation que vous. Vous découvrirez ensuite comment progresser concrètement et vous rapprocher de vos objectifs professionnels.

Résultats

Test passé le 12/11/2015: Test1_12-11-2015



Entrez votre code promotionnel

Passer le test

Télécharger le rapport

Besoin d'aide ?

I'm looking for case studies that combines data and creativity.

Data and Creativity are integral to a lot of work at Publicis. I found 271 pieces of work that match that criteria.

Digitas provided data insights and visualization to London's population via real time tweets. These seem to be trending right now.



MARCEL BY PUBLICIS: CONNECTING EMPLOYEES THROUGH AI



Publicis unveiled its digital assistant, "Marcel," at VivaTech 2018. It is designed to put all of the group's 80,000 employees in 130 countries in touch with one another.

The application will be accessible to 90% of employees by 2020. It will help them access all of the group's knowledge, and will offer personalized information or content that they should know every morning.

By using AI to provide better access to information within the group, Publicis is making integration into the group easier for newcomers, while developing a feeling of belonging. The group thus hopes to increase productivity and efficiency.

USING AI FOR LIVE DECISION-MAKING



WHAT?

An expert in data science and petroleum engineering, Fieldbox offers solutions based on artificial intelligence, including a platform that can warn of anomalies and optimize production cycles. Since 2016, Fieldbox has provided solutions for the Total Group.

WHAT'S THE POINT?

Making industrial projects easier by processing data in real time, to help with fast decision-making.

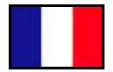


Source: SUDOST, FIELDBOX.AI AU CES 2019





MAKING IT EASIER TO ACCESS HR INFORMATION



CLEVY

WHAT?

The French startup Clevy designs chatbots to make it easier to access HR information within corporations.



WHAT'S THE POINT?

With the development of the web and mobile, individuals are used to having direct real time relationships with brands and companies in their personal lives. Thanks to Google, information is accessible in just a few clicks. In companies, access to information is more complicated...



Tools such as Clevy, which rely on artificial intelligence and natural language interfaces, help make internal exchanges easier, especially regarding HR subjects.



Hello, I am Clevy, I am here to answer your questions regarding your onboarding. Go ahead, ask me a question.



How do I apply for parental leave ?

On the company intranet, you can directly apply for leave. [Click here to access the dedicated webpage.](#)



Great. Thank you !

PUTTING ARTIFICIAL INTELLIGENCE TO WORK FOR SMB'S

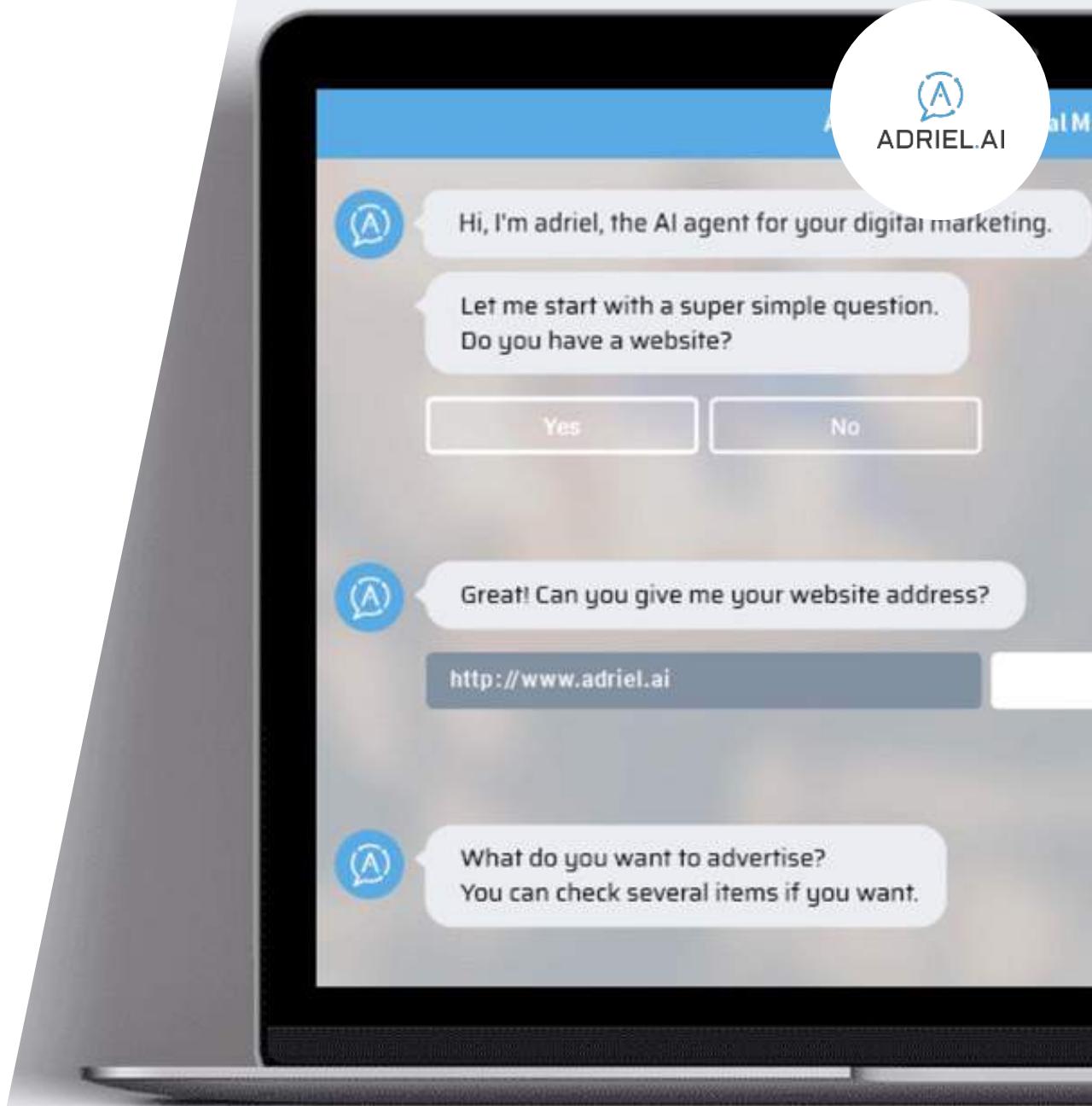
**ADRIEL AI**

WHAT?

- > This Korean startup, incubated by Facebook in Seoul, wants to make artificial intelligence possibilities open to small businesses to help them optimize their online communications.

WHAT'S THE POINT?

- > With a chat-like interface, Adriel drastically simplifies the experience for companies whose advertising isn't the center of their business. The artificial intelligence engine then generates campaigns on Google, Facebook, and Instagram, then optimizes them progressively according to the advertiser's goals.



USING AI TO EVALUATE CANDIDATES THROUGH VIDEOS

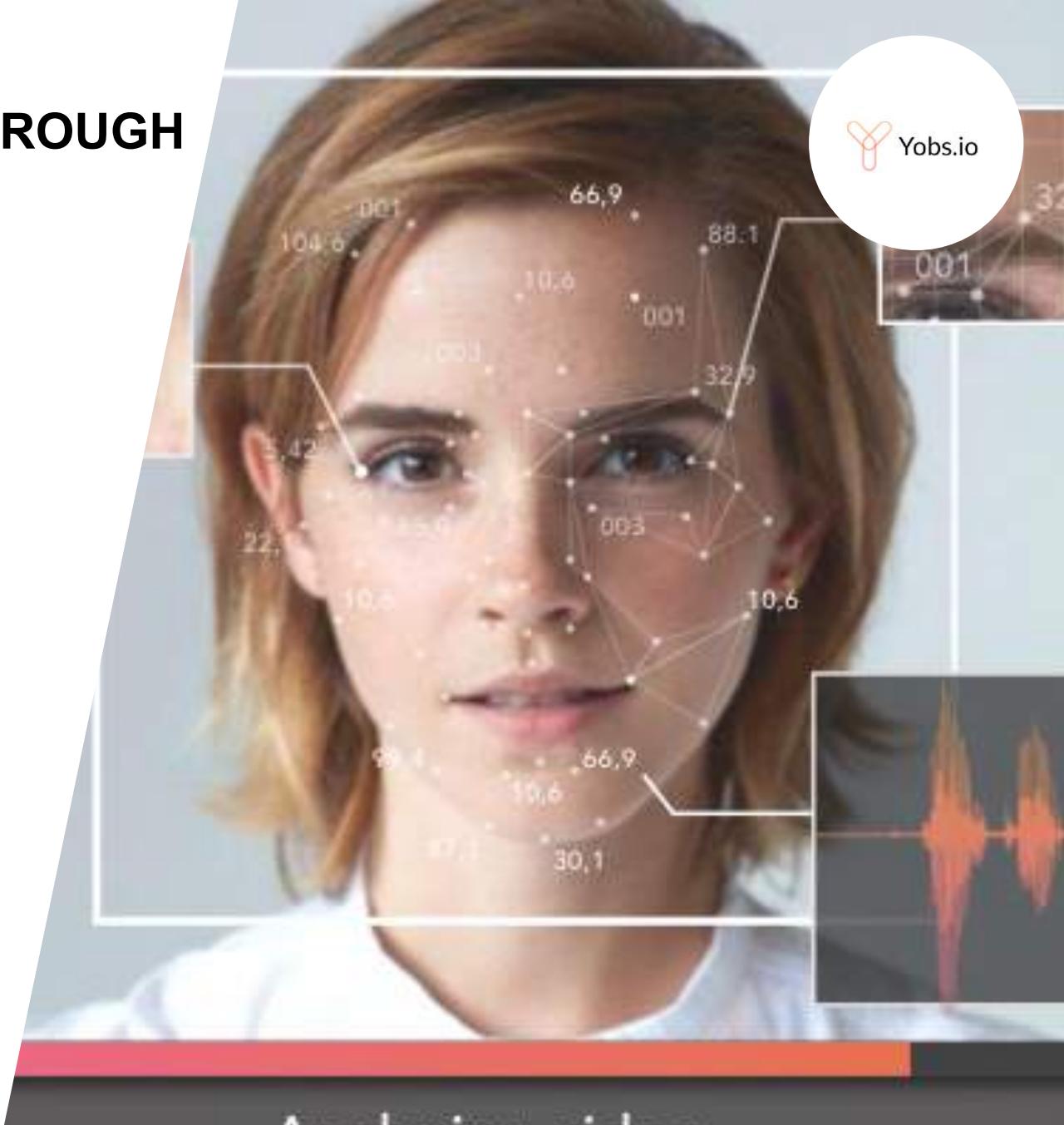


WHAT?

- The American startup Yobs uses facial recognition and artificial intelligence to evaluate candidates through videos of their interviews.

WHAT'S THE POINT?

- Recruiters are constantly searching for tools and solutions to save time during the candidate screening process and prevent recruiting errors. Artificial intelligence is playing an increasing role in the recruitment process to simplify recruiters' jobs, so that they can then concentrate on the stages where human analysis and relationships can make a real difference.



FROM AUTOMATED PAYMENT TO SMART PAYMENT



WHAT?

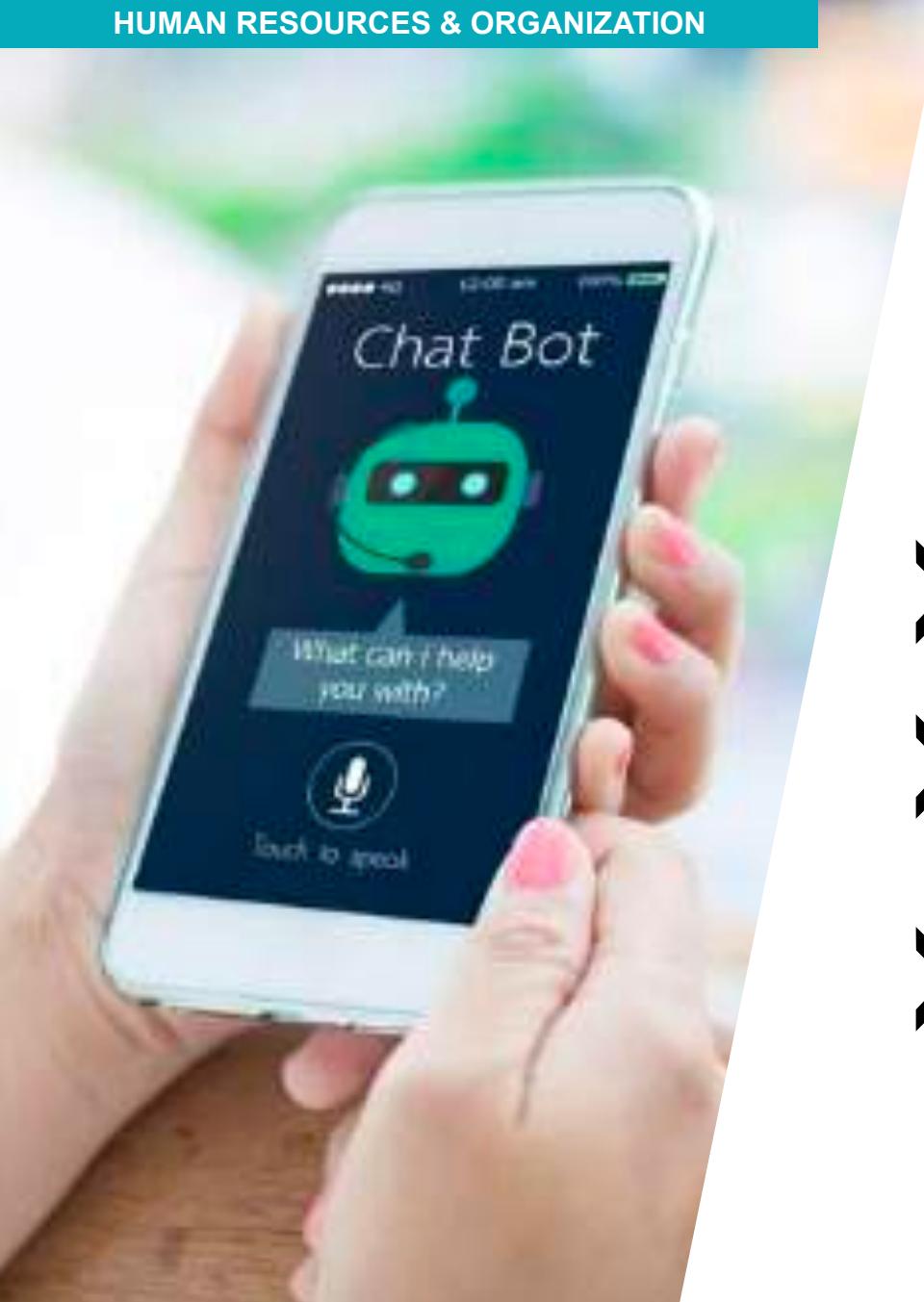
ADP is going even further in managing pay stubs. Via its ACE “Assistance Control Expert” algorithm, it assists HR employees in management of pay stubs en masse. AI highlights possible anomalies and learns from each human validation for the next month.



WHAT'S THE POINT?

It saves a considerable amount of time for managers and reduces errors. Moreover, ADP plans to go even further by investing in the connection between big data, higher salaries, taxes, number of hours in a working day, etc. It allows its clients to be more competitive in their recruitment in the near future.

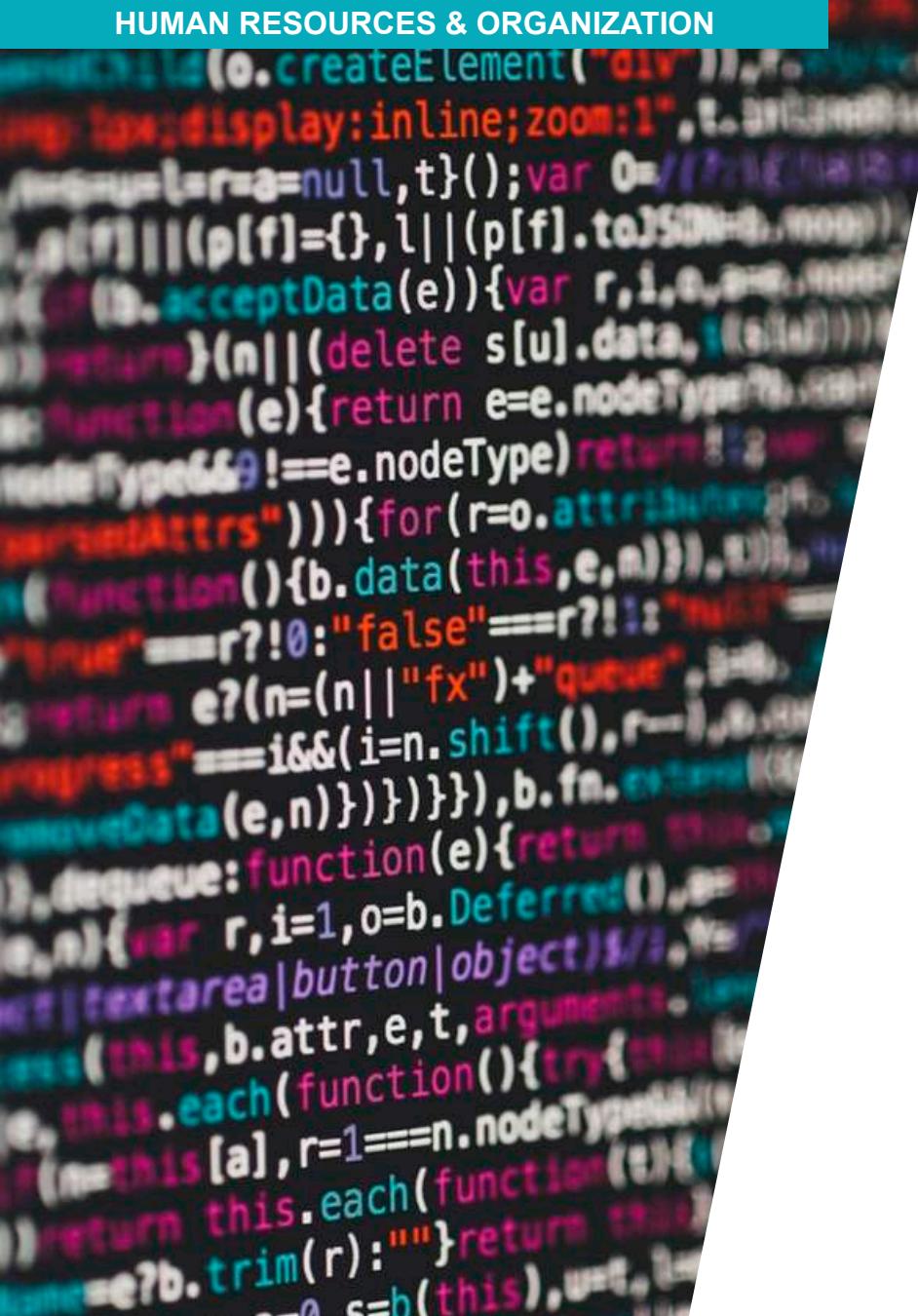




BOOSTING ITS RECRUITMENT CAPACITY BY USING AI



- After opening its new center, Pitney Bowes used AI to boost its recruiting power.
- Applicants began the process with a chatbot that was responsible for preselection and plans interviews based on the results.
- This allowed Pitney Bowes to accelerate its recruitment process and refine its searches to help it respond to urgent hiring needs.



WITH AI, L'ORÉAL IS DIVERSIFYING ITS PROFILES AND FINDING HUMAN INTELLIGENCE BEYOND UNIVERSITY DEGREES



- L'Oréal is trusting Seedlink to process internship applicants. With nearly 30,000 requests per year for the French company, saving time is significant, but it's not the software's only advantage.
- Developed by the Chinese startup Seedlink, the software uses artificial neural networks paired with machine learning to analyze candidate responses. A score is then assigned, which can be evaluated by the recruiter.
- L'Oréal uses open questions to determine if an applicant matches the company's culture. AI then processes these responses, thus saving time, and also going beyond CV lines and education (a fast method used by recruiters). L'Oréal can therefore access to a higher degree of profile diversity and a selection based on human intelligence, instead of where the degree was obtained.



USING FACIAL RECOGNITION TO HELP MAKE DECISIONS



EASYRECRUE

- Crédit Agricole has worked with Easyrecrue and their Smart Ranking software based on facial recognition since October 2018.
- Candidates are filmed during their interview, and then the software analyzes their expressions and gives them a score.
- For the company, it's a tool to help them make decisions. The software provides a careful and in-depth analysis of a candidate's behavior, and most of the time it's the recruiter who decides to hire them or not.



APPEL MEDICAL BOOSTS ITS SOURCING CAPACITIES WITH RANDY, A SMART CHATBOT



- Appel Médical launched its own recruitment chatbot, developed in collaboration with Illuin Technology to better connect with candidates that are difficult to find in the health field.
- Appel Médical's goal is to be able to pre-recruit 1,000 candidates in 2019. In 6 months, the chatbot has initiated 1,800 conversations, and has preselected 350 profiles.
- In addition to using artificial intelligence to analyze a candidate's skills, soft skills, and experience, Randy offers a new experience based on gamification, which is accessible to all kinds of devices and different sources (randstad.com and Facebook Messenger).
- Appel Médical explains that the bot is part of a Tech & Touch strategy that aims to join human and technological forces. For them, it's not about replacing consultants who are in charge of doing the final interviews, but rather boosting their sourcing capacities.

2.5

BANKING AND INSURANCE

CONTEXT

In banking and insurance, the impact of AI involves several facets. Talking about a “double-edged sword” would be to underestimate the number of repercussions.

We're now in an era of dematerialized services. Consumer behaviors and habits are evolving quickly, and the need for fluidity and transparency is being reinforced. Insurance and banking are now facing competition that is 100% digital.

Digital players who have access to strategic data can develop their offer with AI.

AI therefore represents a major issue for companies to remain competitive in their offers. Using AI to understand and get to know their clients, giving advisors AI so they can provide **personalized service and offers that are increasingly adjusted and relevant.**

But with these advancements and ways to save time and money, there are also new risks: **cyber attacks, data fraud, and data protections.** We will therefore have to think about how to use AI, but also how to protect ourselves from it.

Sources : vers la finance 3.0 - Capgemini - 2018

Sources : Technology vision for insurance 2018 - Accenture 2019

Sources : CFOs green light tech investment - Grant Thornton 2019

Sources : Nouvelles compétences transformation des métiers horizon 2025 - Observatoire des métiers de la banque - 2019

Sources : Rapport annuel de l'ACPR 2018

67%

of French browsers use their bank's digital services

75%

of French people are interested in a mobile agency close to their home

4.4 M

of French people are already clients of an online bank

+30%

in efficiency in processing client requests

+\$243 B

in annual global insurance revenue by 2020

+\$269 B

in annual global banking revenue by 2020

SOME FIGURES TO GO EVEN FURTHER

83%

of insurers think that **technology** is totally **integrated into users' daily lives**

80%

of banking directors think that **AI will have a positive impact on the sector**

77%

of insurance directors think that **AI is progressing more quickly than it's being adopted by the sector**

80%

of insurance directors think that **AI brings about new risks**

26%

of insurers think they're **not in a position to validate data as much as they should**

84%

of insurers think that **AI will redefine interactions with their clients**

Data that is biased
Manipulated
Inexact

SOME FIGURES TO GO EVEN FURTHER

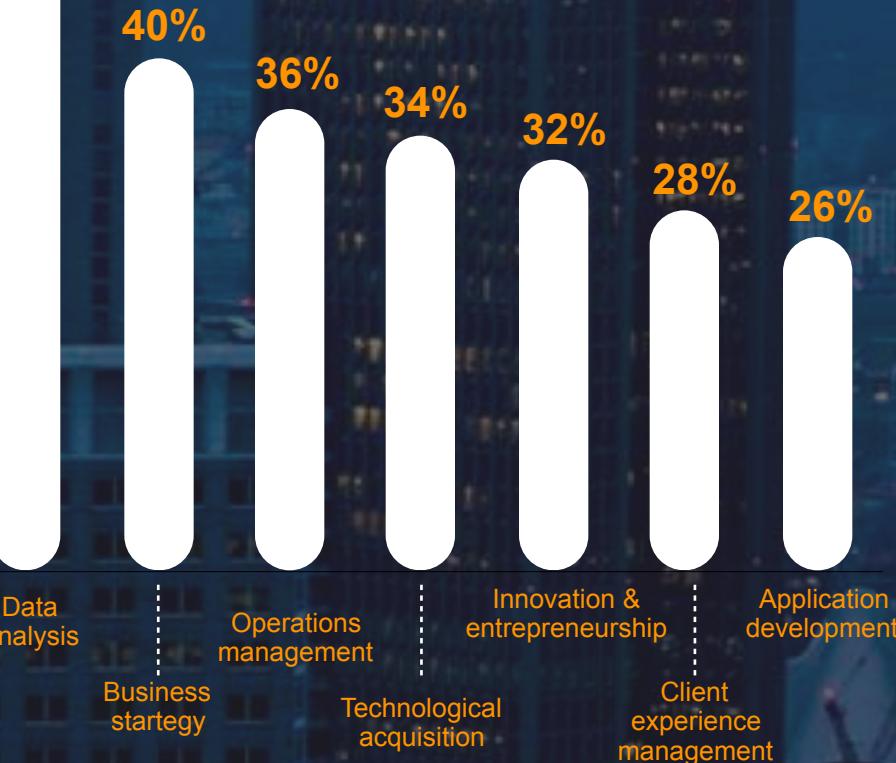
% of directors who are planning to establish new tools in 2019

Advanced analytics	38% +14pt*
AI	25% +22pt*
Drones / Robots	21% UNK**
Machine learning	30% +28pt*
Optical recognition	27% +7pt*

* : Growth since 2018. ** : UNKNOWN

55%

Skills that are prioritized in the finance sector



Sources : CFOs green light tech investment - Grant Thornton 2019

CHATBOT ASSISTANT ENHANCES CLIENT RELATIONS

ZELROS



WHAT?

A chatbot based on two technologies, natural language and machine learning serves as an assistant to employees. The chatbot responds to a consultant's questions using big data that helps it define the best solution for the client.

WHAT'S THE POINT?

In the domains of banking and insurance, this helps better target what the client needs, and provide custom or highly adapted offers in a very fluid manner.

Having access to data and processing it with AI extends a consultant's capacity for memory and analysis, in a sense. They can access precise knowledge on all of their clients, and therefore concentrate on sales and relations.

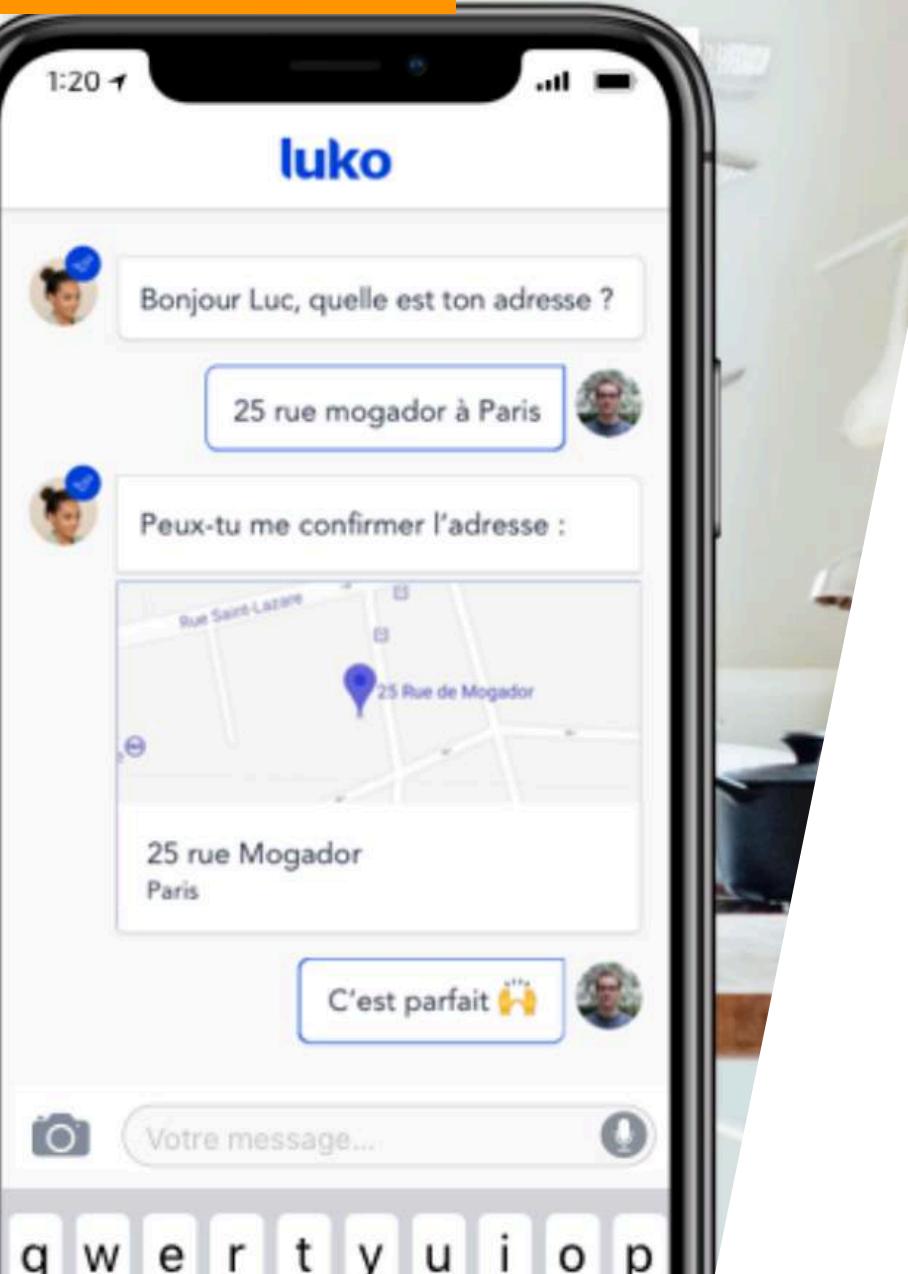




ZELROS & CNP, A TEXTBOOK CASE



- CNP uses a solution from Zelros, with the following figures:
- 600 employees use the solution
- 30,000 queries to the assistant
Deployed to 120 people in call centers in 2019
- CNP will continue to invest in the solution, which develops additional databases.



LUKO, THE MINORITY REPORT OF HOUSE INSURANCE



- Luko is a form of Neo Assurance, an alternative and very connected insurance system. Luko's promise is that it takes 2 minutes to sign up, 2 hours to get reimbursed, and 2 days to get something fixed. The insurance is 100% online and uses AI to anticipate the risk of home accidents.
- How does it work? Sensors are placed in strategic places in the home (the water and electricity meters, doors, etc.), collect data to anticipate risks, send warnings (via SMS), and save money.
- Luko's concept is based on the notion of "better safe than sorry." The idea is to eliminate accidents by using AI and deep learning to identify the accident and avoid it. The tool also learns the consumers' and owners' living habits.
- Luko's young and fun touch is its scooter insurance. They've thought of everything, and consumers especially appreciate their online service and the reactivity and simplicity of their customer service department. They also like the transparent and attractive prices.

THE ERA OF AUGMENTED CONSULTANTS AND ANALYSTS

YSEOP



WHAT?

- Data analysis and automated reports. Yseop generates texts in natural language (French, English, German, and Spanish). In addition to writing the report, Yseop also offers recommendations.

WHAT'S THE POINT?

- Yseop offers banking consultants a way to save time, and also gives access to precious analyses of data gathered that, without the help of AI, wouldn't be usable for pressing deadlines.





DANSKE BANK DOESN'T WANT TO FALL BEHIND WITH MACHINE LEARNING AND THE HUMAN-MACHINE COLLABORATION



- The Danish Danske Bank uses a machine learning tool developed to flag technical bugs before they can impact the clients.
- The AI learns and adapts to the company's IT configuration as necessary. Employees are already seeing the benefits of this human-machine collaboration.
- Basically, the success of this first implementation has led Danske to plan for an expansion of AI into its customer service department in the form of a chatbot assistant (IBM's Watson) to come to the aid of consultants.
- Danske explained that they preferred to take an early position on AI technologies, even though they're still not fully developed, so they don't fall behind, and remain ahead of their competitors when AI grows and reaches its full power.



AI IS OPENING DOORS TO A NEW LEVEL OF STRATEGIC DATA



- Citigroup is investing in machine learning to boost their portfolio recommendations. The idea is to be able to quickly react to announcements and fluctuations in the financial market.
- What consultants like about the solution is the rationality of the recommendations and the lack of emotion, which helps them in decision-making and analysis. Moreover, AI gives them access to data that they wouldn't have had otherwise.
- The solution can also anonymously share how these portfolios are managed.
- AI offers exciting perspectives for financiers, who are already confident that they will soon be able to tackle issues that up to now were impossible to solve. Much more than saving time, AI is more appreciated still for giving access to actionable strategic information.



AUGMENTED PERFORMANCE, THE ADVISORS AT CRÉDIT MUTUEL ARE DELEGATING TO WATSON, (ELEMENTARY...)

Crédit Mutuel

IBM

- In the event of an incident, compensation from insurers usually takes several long weeks. It's the required amount of time for the claim to be analyzed and verified.
Reducing the processing time for compensation claims to increase customer satisfaction.
- Launched in April 2015 in New York, the startup Lemonade is concentrated on house insurance. With artificial intelligence, it relies on a conversational interface to manage accident claims, and 18 fraud detection algorithms to reimburse their clients more quickly. The startup has adopted a unique business model: it debits a fixed fee from the insurance policies, and the rest is used to reimburse damages. If there's any left over at the end of the year, it's given to charitable associations. It's a model that allows Lemonade to show that they have to interest in dragging things out.
- Lemonade maintains that 25% of their insurers are reimbursed in 3 seconds or less. The startup has raised no less than 180 million dollars, and is now tackling a new area: rewriting insurance contracts to make them as simple as a blog piece.

ING INVESTS IN PREDICTIVE ANALYSIS, BUT DIDN'T PREDICT THE MARKETING BENEFITS OF THIS ACQUISITION



- ING uses the big data tool Katana to determine the best prices when buying bonds by using predictive analysis.
- Katana performs a combined analysis of historic and real-time data to refine its predictive analysis. It then determines repetitive data schemes, on which it bases its predictions.
- ING doubled down on its choice and recently announced that 90% of its transactions were accelerated by using AI, and their costs were cut by 25%.
- But it's possible that ING didn't predict that its investment in AI would earn it free advertising and new clients. Basically, the buzz generated by these new technologies, which at the time were still new, sparked by enthusiasm and curiosity, and drew in new clients.



PING AN IS CONSTANTLY TESTING AI AND CONNECTED TECHNOLOGIES, WE'LL HAVE TO KEEP AN EYE ON THEM



中国平安
PING AN



- Ping An is an insurance and financial services holding group. It recently announced its partnership with Singularity Net to inject AI into its services.
- Ping An has already been working on concepts of worker-less clinics that are entirely run by AI (tested in 8 Chinese cities).
- Ping An is investing a lot in these new technologies, and in AI in particular (predictive, cognitive AI, decision-making, biometrics) and has developed Ping An Technologies.
- They've introduced this investment into their insurance offers, such as an application that allows drivers to manage their claims from their smartphone. The AI will then determine the extent of the damages and will immediately be able to reimburse the client.

OMNI:US: A STARTUP DEDICATED TO INSURERS

OMNI:US



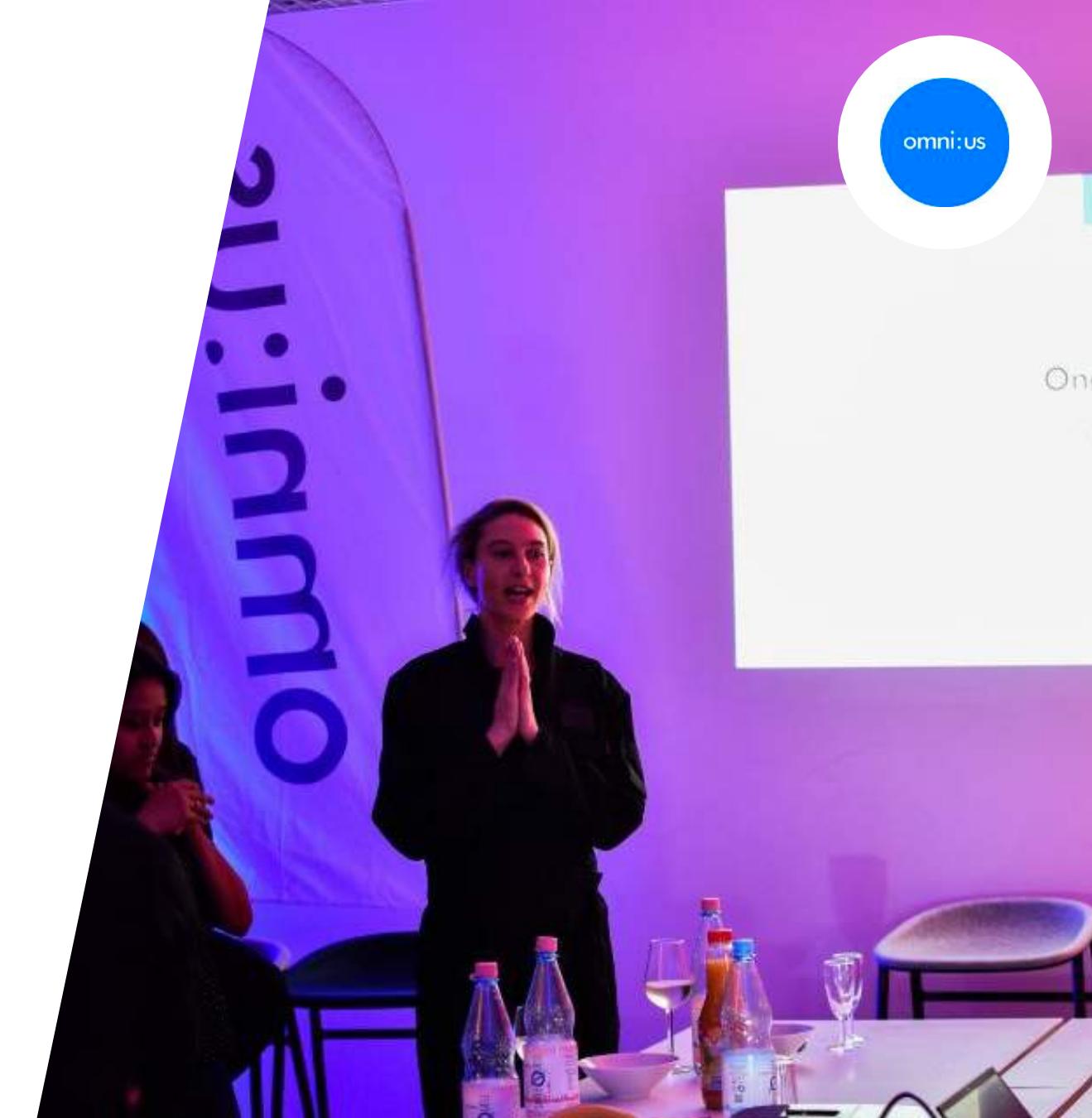
WHAT?

The Berlin startup is concentrated on developing AI intended for insurance companies by developing automatic document categorization, structured data extraction, machine learning, NLP, computer vision, text recognition, and regional recognition.

Omni:us is working actively on developing new technologies, including, among others, recognition of handwriting.

WHAT'S THE POINT?

Accelerated contract analysis, optimized accident processing, reduced waiting times and costs. Omni:us wants to help insurance companies go digital and respond to consumers' demands for transparency and reactivity.



2.6

CREATIVITY AND CONTENT



AI AND CREATIVITY

USING AI TO FREE UP CREATIVITY



Vincent Luciani
CO-FONDATEUR & DG - ARTEFACT

WHEN AI GETS CREATIVE

GANs, **Generative Adversarial Networks**, consist of programming devoted to creative **generative** models, meaning that they can construct unique and feasible productions from the data in their original collection. This clever combination of two neural networks is similar to the process of **human creation** in all formats. Ending Schubert's 8th symphony, creating a new Rembrandt (without Rembrandt) or even writing a novel is possible for GANs...

Though today, we don't see many business applications in the art world, this innovation could very well change the **future of advertising creations** and **journalism**. Basically, the first **written advertisements** by artificial intelligence have surfaced, and some **newspaper articles** can be completely written based on a simple editorial lead-in.

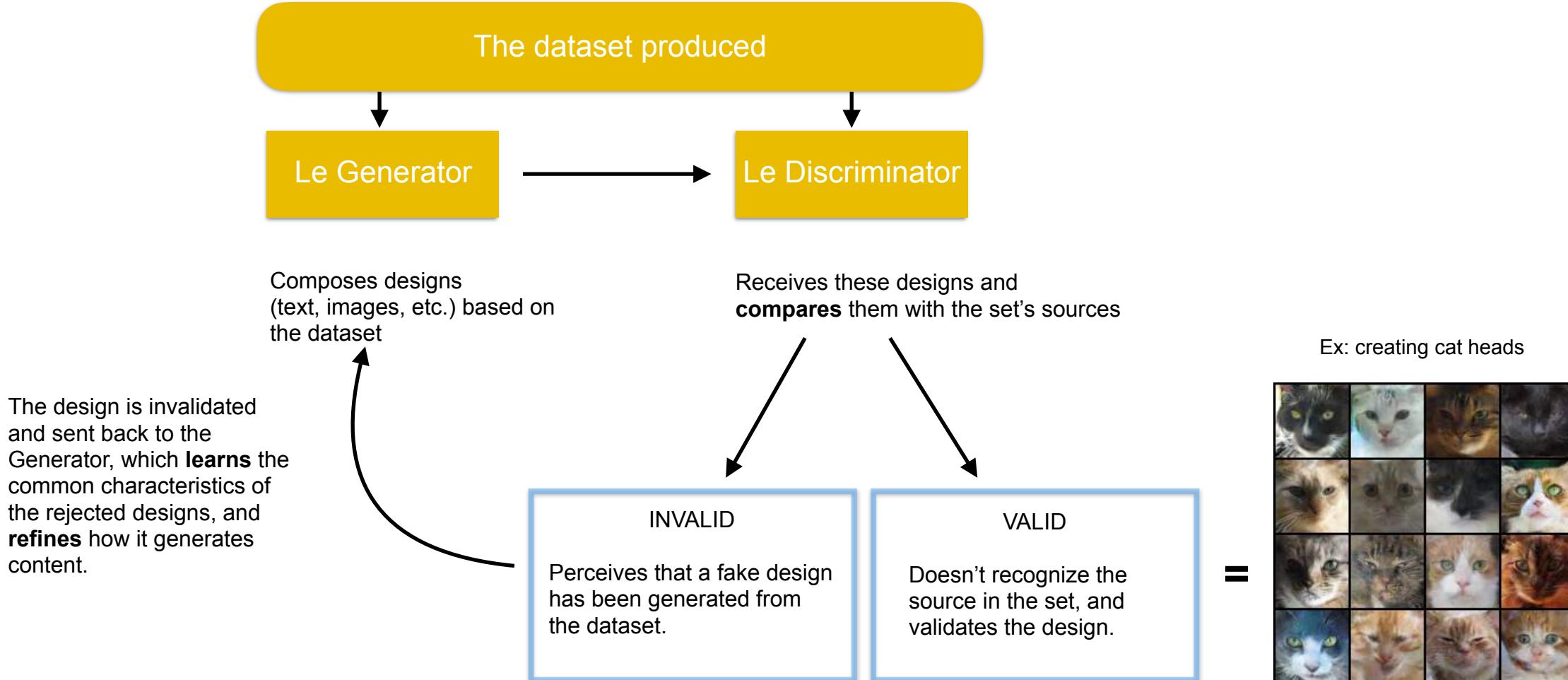
Capable of creating **coherent stories** in the fields of painting, audio, video, or writing, the danger of GANs lies in the **credible** creation of materials that they can generate. Identity theft, fake news, imitations... Some professionals have announced that it could possibly involve the most powerful example of artificial intelligence yet.

However, let's remember an old philosophy: it's not the technology that's dangerous, it's **what we do with it**. In the meantime, there are already several tips to avoid being tricked by creations made by GANs.



HOW GAN'S (GENERATIVE ADVERSIAL NETWORKS) WORK

The principle lies in forging unsupervised communications between two artificial neural networks: the Generator and the Discriminator.



Source : *Quand la Data Science devient créative avec les les GAN*, Wintics

THE CONCEPT OF DEEPFAKES

What is it:

Deepfakes, also more learnedly called ‘smart facial permutations,’ are video images that imitate a real element almost perfectly.

More concretely, it’s the possibility for AI to generate fake images, videos, and sounds based on real people or places.

The potential danger of such a capacity goes without saying.

How it works:

It involves a technique of synthesizing elements”, wherein these elements are superimposed.

But be careful, the technique of image generation is not in itself a deepfake. The idea behind the concept of deepfakes is wanting to deceive, mislead.



*elements: only in the context of this slide indicates elements like images, videos, or sounds



COMPLETING SCHUBERT'S UNFINISHED SYMPHONY WITH AI



- On February 4th, 2019, at Cadogan Hall in London, the English Session Orchestra performed Schubert's 8th symphony in B minor, which is famous for being unfinished. The piece that was left incomplete in 1822 was performed as part of the full symphony in 2019 thanks to artificial intelligence.
- Huawei equipped its Mate 20 Pro smartphone with artificial intelligence composed of two NPU (Neural Processing Unit) networks. It was trained to analyze the *Unfinished Symphony* and compose the final two movements.
- The meter, pitch, and timber of the first two movements were analyzed by AI. After this stage, the last two movements were generated based on the existing movements.
- However, the final portion, which was performed in London, is the result of a collaboration between humans and machines, since the Chinese giant appealed to Lucas Cantor, a composer with many awards, to rework the digitally generated symphony and ensure that it is faithful to the style of its initial composer.

Source : L'IA de Huawei termine la Symphonie inachevée de Schubert, lebigdata.fr



ONE LAST REMBRANDT CREATED BY ARTIFICIAL INTELLIGENCE



Three centuries after the death of the Dutch painter Rembrandt, a new 'Rembrandt' was created thanks to a collaboration between historians, painting specialists, and artificial intelligence.

Data collection

346 Rembrandt paintings were carefully studied and analyzed with the help of **very high-resolution 3D scans**, capable of determining color, materials, and the sensitive nature of the painting. **Deep learning** algorithms were then created to process this data in order to maximize the resolution and quality of the future painting.

Choosing the subject

The format of the portrait was chosen based on statistical estimates: the painter did several portraits, and there are many faces in his works. They chose to do a portrait of a man, which was statistically more common: 51% vs 49% women. Finally, the clothing, age, and Caucasian skin tone were also chosen on the same basis by algorithms designed to recognize recurring themes in the painter's works.

Credibility

Software then undertook the process of understanding the geometry, composition, and materials, and then a facial recognition algorithm sorted the painter's most emblematic facial features. Learning programs replicated the style and generated new facial elements. Another algorithm measured the distance between the elements of the face and calculated new ones based on percentages. Light and shadows were also processed in the same way.

Source : www.nextrembrandt.com



CREATING ADVERTISEMENTS WITH ARTIFICIAL INTELLIGENCE

The&Partnership



VISUAL VOICE®



- > The script for the promotional film “Driven by Intuition” for the new Lexus ES was entirely written by artificial intelligence. Should agencies ‘creatives’ be worried about serious competition? Possibly...
- > The advertising agency The&Partnership collaborated with its technological partner Visual Voice, IBM Watson and researchers in cognitive science, neuroscience, and emotional intelligence in order to feed into the body of data as much and as precisely as possible. The goal was to devise the **ideal advertisement for Lexus**. Academic studies were conducted on the **human intuitions, emotional reactions, and decision-making practices** of the audience when faced with visual stimuli. The results were encoded in the body of data and cross-referenced with **15 years of archives** of video advertisements that won Cannes Lions awards in the category of automobiles and luxury.
- > After all that, artificial intelligence wrote **the whole script, scene by scene**, as a **completely drafted storyboard**. It tells the story of a *Takumi*, a craftsman at Lexus, who sends his creation, a model of the autonomous car ES, off to do a televised crash test. He watches the test on TV, full of emotion, until its eventual success. 
- > **Kevin Macdonald**, the director behind *The Last King of Scotland*, and the biopic *Whitney*, was chosen to direct this film that was written by artificial intelligence, which resulted in a successful **human-machine collaboration**.



Watch the promotional film

Source : AI Tried to Write the Perfect Lexus Ad. Here’s a Scene-by-Scene Look at What It Was Thinking, AdWeek, November 2018

CREATIVITY & CONTENT

ience. These four also spoke that the creatures were previously unknown to federal government was taking far too much power away from the state e any information. The Nuclear Regulatory Commission did not immediate any property." "The federal government had ensure it doesn't happen again. " Our top priority is to secure the country. Both state governments are both co ket, black jeans, black sandals. The singer was also wearing a pair of looked blue, with some crystals on top," said Pérez. "By the time the creatures also spoke some fairly regular English. While examples 'Lines' on the front and 'Fashion Police' on the back. The singer's 'lines' were created when a human and a unicorn met each other take the question of why the Civil War happened quite seriously. There was a conflict between states' rights and federalism. You're not fully solved. Now, after almost two centuries, the mystery's Research Triangle Park nuclear research site, according to a distinctive horn, Ovid's Unicorn. The scientist named the population d blue, with some crystals on top," said Pérez. "By the time it is inadequate to the government of any other." It is wholly inadequate the question of why the Civil War happened quite seriously. This common 'language,' something like a dialect or dialectic.' Paying for a moral and religious people. In 1791, Thomas Jefferson. She was carrying a pair of black and white striped gloves. Day's most prominent political cartoonist, in the desolate streets of Hollywood Boulevard today (pictured) Shoplifting: Miley Cyrus to be quite common." According to Pérez, "In South Africa, it is equate to the government of any other. It is the first time that and his friends were astonished to see the hearing that sparked this odd phenomenon is finally solved. Now, after Blurred Lines' on the front and 'Fashion Police' on the back, having to move too much to see the words.

DEEPFAKES FOR TEXT?



OpenAI

The non-profit research company Open AI, supported by Elon Musk, among others, has created GPT-2, a new model of artificial intelligence capable of generating textual content from an extract that is consistent with both the style and the content.

With just a few words, GPT-2 can write an entire page in the same style as the provided extract, with a consistent syntax and on the same subject.

For instance, by giving it the first words in George Orwell's novel *1984*, OpenAI's artificial intelligence completed the piece with a plot that respected the author's futuristic style by placing the story in... China. It was also able to consistently complete the beginning of an article on Brexit by the [Guardian](#).

Designed to generate 40 gigabytes of text, GPT-2 has the capacity to write the equivalent of 35 copies of the novel *Moby Dick*.

However, the entirety of the research hasn't been published due to potential dangerous uses of the technology: generating fake news, identity theft, spam, false comments on social networks, etc. It was a critical decision by the specialized community, which called into question the initial project with the same name as the company, "OpenAI": making research on artificial intelligence accessible.



Source : *New AI fake text generator may be too dangerous to release say creators*, The Guardian, Février 2019

REPEATING ISN'T CREATING INTERVIEW WITH JEAN ALLARY

Jean Allary explains to us that talking about creativity when discussing AI is a misuse of language if we believe that creativity is, above all, "a different reflection of a phenomenon."

For him, AI is actually very far from creating anything, since it doesn't have its own intention. All it does is repeat, and copy elements from a database that humans have provided.

There is no intention behind the creation, AI doesn't have the conscience to create, and it doesn't have a point of view on what it generates. It isn't capable of giving meaning, explanations, or strategies.

For Jean Allary, **AI isn't able to grasp its environment and understand a brand's issues and context**. It doesn't know how to read the world's connotations.

And for this reason, AI is a good optimization tool for the client process, providing for personalization of content and visuals, but it can't replace human skills in the field of artistic creation or content. Moreover, **it still requires too much time and means to be implemented for most players**.

"AI is Plato's cave. It sees the world in a rearview mirror, while creators are looking toward the future to imagine the world of tomorrow."



Jean Allary
Partner Artefact

ARTEFACT

"There's no creativity in repetition. There's creativity in accidents, in the imagination that comes from the unknown. AI only knows how to repeat, it doesn't know how to imagine."

2.7

CIVIL ENGINEERING & SMART CITIES

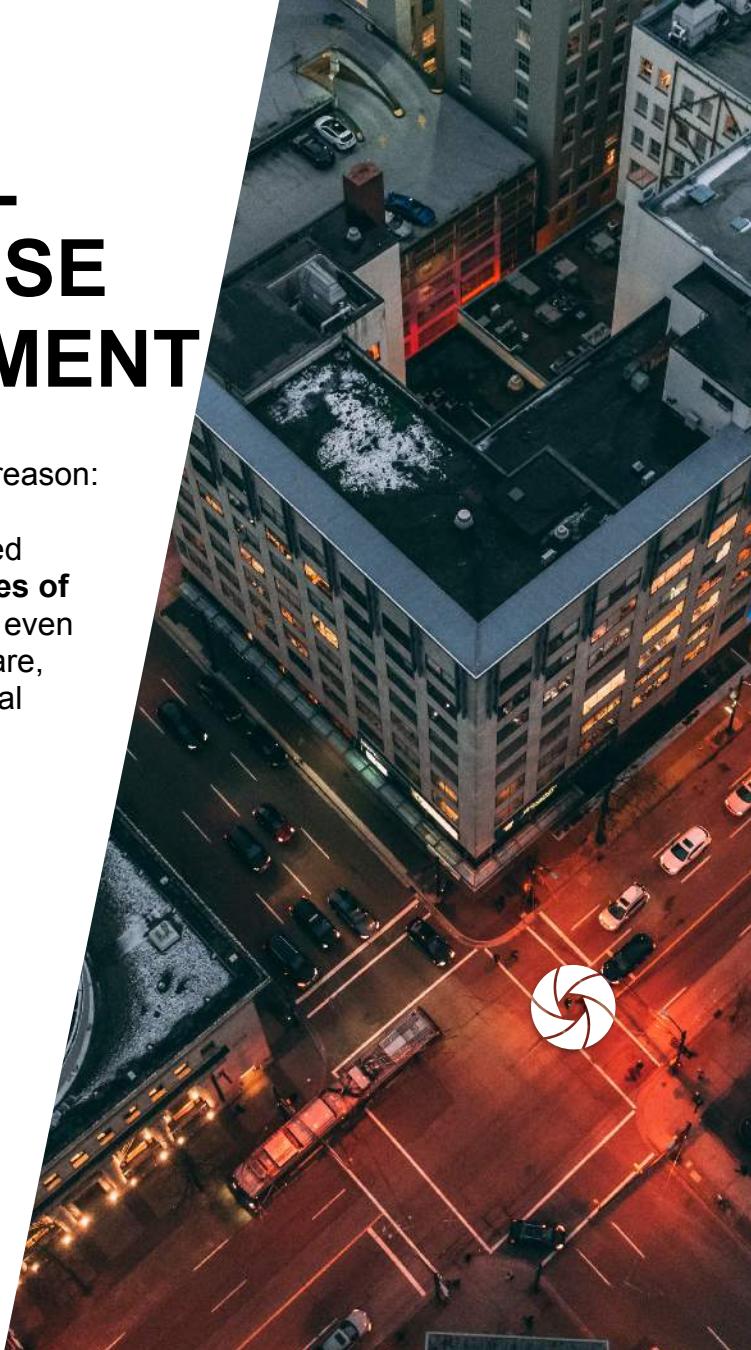
PUTTING ARTIFICIAL INTELLIGENCE TO USE FOR CIVIL MANAGEMENT

Some cities claim to already be “**smart**,” and for good reason: some are investing more and more in connecting their infrastructures, and have already formulated established needs for artificial intelligence to manage **huge volumes of data**. The perspective of 5G equipment is accelerating even more toward these needs, and major players in hardware, as well as some operators, are already on the proverbial case.

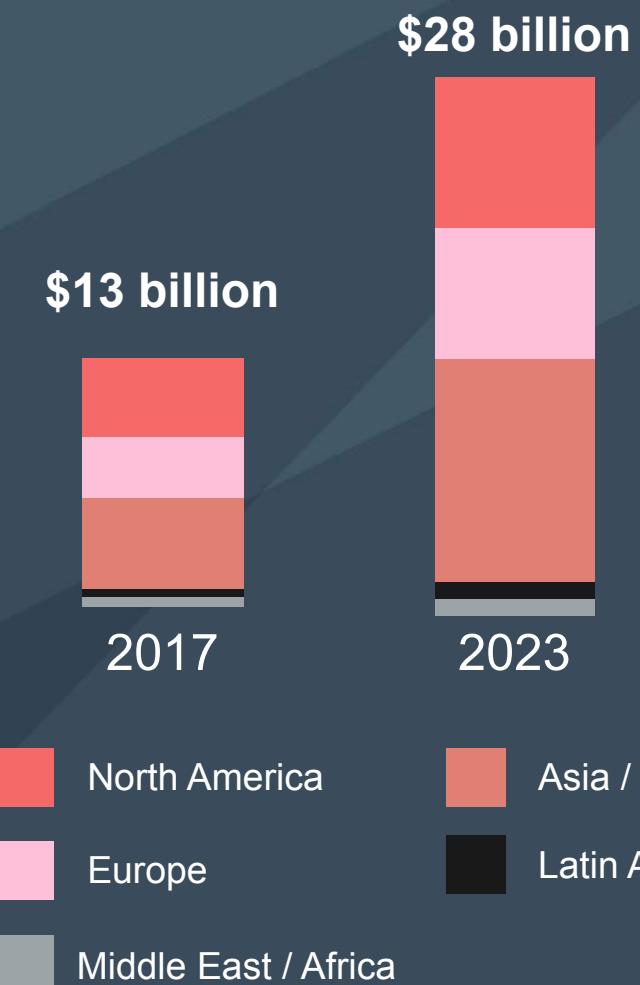
Rural areas are also equipping themselves, with computer vision in particular to monitor farming.

As for **buildings**, we have to talk about BIMs (Building Information Systems), a kind of track record for buildings capable of updating equipment data from conception to maintenance.

Finally, **homes** are also becoming smart by connecting more and more devices. Voice assistants are increasingly penetrating the home, and will soon be able to control the entire house.



Global market for solutions dedicated to Smart Cities



Source : Research: Smart Cities Tech Will Improve Urban Life, CTA 2018

HOW DO YOU MAKE CITIES SMARTER?



- One of the challenges for transitioning toward smart cities is how to modernize existing, “legacy” infrastructures while integrating smart technologies into new constructions.
- Developing smart cities involves creating partnerships between public and private, like the one launched in 2018 in Dallas, where Ericsson will install and house an advanced traffic management system. This will help users aggregate and analyze various data points from traffic sensors in real time.



SMART CITIES ARE REACHING A 4TH STAGE: AI INTEGRATION

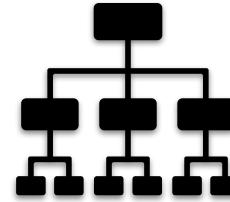
According to Huawei



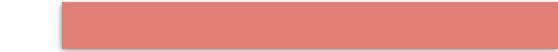
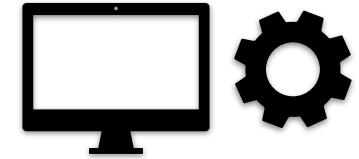
**Breaking down data
silos**



**Online mobile
applications**



**Deploying IoT networks
to collect massive
amounts of data on
cities**



**Integrating AI solutions
capable of exploring and
using all of this data**

Source :Huawei unveils artificial intelligence smart cities platform, ZDNET 2019

HUAWEI: A CROSS BETWEEN THE PHYSICAL AND DIGITAL WORLDS

Huawei is launching its first platform capable of integrating Cloud & Edge, AI, IoT, Big Data, converge communication technologies, video, and GISs*. The goal is to create digital ecosystems for a digitalized world.

*Geographic Information Systems

The platform will allow the concept of Smart Cities to gain traction and be able to start building itself up. In fact, it will help connect infrastructures and humans, as well as infrastructures with others, thus leading to a connection between the digital world and the physical world. Today, it has been installed in 160 cities.

Sensors are situated in the infrastructure, or in the city, and collect data, which is centralized in what Huawei presents as the "City Brain," namely an operations center where data is processed and stored. The platform is therefore able to create a digital twin for the city that can monitor the connections and make them more fluid.

For the civil engineering sector, the platform aims to go beyond connectivity to reinforce safety, better protect the environment, improve traffic flow, and improve citizens' access and interactions with public transportation.





TIANJIN, FACIAL RECOGNITION FOR CITIZEN SAFETY



- Huawei is forging a partnership with Tianjin Binhai New Area to develop visual and voice recognition in cities.
- It's a residential protection system based on visual recognition of citizens, places, and vehicles to improve security in cities. Beyond secretory aspects, this also allows cities to offer personalized services to match everyone's habits.
- To implement the system, 7,000 HD cameras were installed, as well as 34,000 security cameras in infrastructure (stores, parks, gas stations, etc.). Police officers were given smartphones with dedicated applications.
- These installations seem to be paying off: robberies have gone down by 53%, and closed cases have gone up by 45% in one year.



CLOUD CITY, THE CITY OF THE FUTURE



- > Cloud City is the Smart City project launched by Alibaba in Hangzhou. The site aims to be a “window into artificial intelligence for the world.”
- > Cloud City is basically the “ET City Brain System” program, but life-sized. The city has 1,300 traffic lights, 4,500 cameras, and automatic optimization of street traffic.
- > Cloud City is the optimization of a city’s public services and way of life. For instance, in the event of an incident, the system can trigger green lights along an ambulance’s route. The length of the light adapts to the age of pedestrians with facial recognition.
- > Beyond the AI infused into the city, Alibaba also presents the features of an autonomous car with AI that adapts to the driver’s habits to suggest restaurants, movies, and other activities.
- > However, there is one question that comes up: how will Alibaba reuse this data? And can it blur the line between economic interests and what consumers really want, which could cause a critical loss of faith if they don’t want to be guided by technology that’s controlled by corporations.

IMPROVING LIFE FOR CITY DWELLERS WITH ARTIFICIAL INTELLIGENCE



WHAT?

Qucit is offering to improve the user experience for city dwellers by using **prediction tools** based on artificial intelligence. The different solutions use data in the form of **modular interfaces** and can automatically clean up various sources of data and create **predictive models for machine learning** to be able to organize urban spaces and create programming interfaces that are adapted to citizens' movements. Some of the emotional analysis can also give **indicators of citizen satisfaction**.

WHAT'S THE POINT?

Today, Qucit has developed four kinds of products: **BikePredict**, to optimize the availability of bike-sharing systems; **ComfortPredict**, for urban planning; **RoadPredict**, for traffic maintenance systems; and **ParkPredict**, for smart parking spaces. Able to provide materials to create ready-to-use APIs, the startup has raised 1.7 million euros in the 4 years after its creation in 2014.



AI FOR A CLEANER CITY



WHAT?

Cortexia is a solution that can monitor a city's cleanliness to use the right means at the right time in the right place. The surveillance is done with the help of mobile cameras powered by AI that can recognize 50 kinds of trash, especially cigarette butts, how full garbage cans are, etc. A user platform indicates the zones where the cleanliness index is lower or higher than the target in order to deploy the appropriate cleaning measures.



WHAT'S THE POINT?

Improving cleanliness while reducing cleaning costs and carbon footprints.



REDUCING WASTE WITH AI



NRF 2019
RETAIL'S BIG SHOW

WHAT?

The forecasts made by AI are based on millions of data collection points to provide precise predictions on what items will be in demand. Predictions are converted into **restock recommendations**, which take **supply chain constraints** into account, and help **optimize profit margins**. These restock suggestions are integrated into the operator's workflow to maximize efficiency and operations.

WHAT'S THE POINT?

Afresh is the first supply chain company to use **AI** to **reduce food waste** and **increase profits**.



MANAGING PUBLIC SERVICES WITH DATA



- **WHAT?**
FYbr offers a data management platform that's adapted to issues in Smart Cities. The goal is being able to condense and interpret data from public services and sensors (via machine learning systems) that will make up the cities of tomorrow in order to derive viable interpretations for regulators.
- **WHAT'S THE POINT?**
The goal is to optimize smart grids (managing water, energy, and potentially traffic, etc.), and solving problems as soon as they're detected.

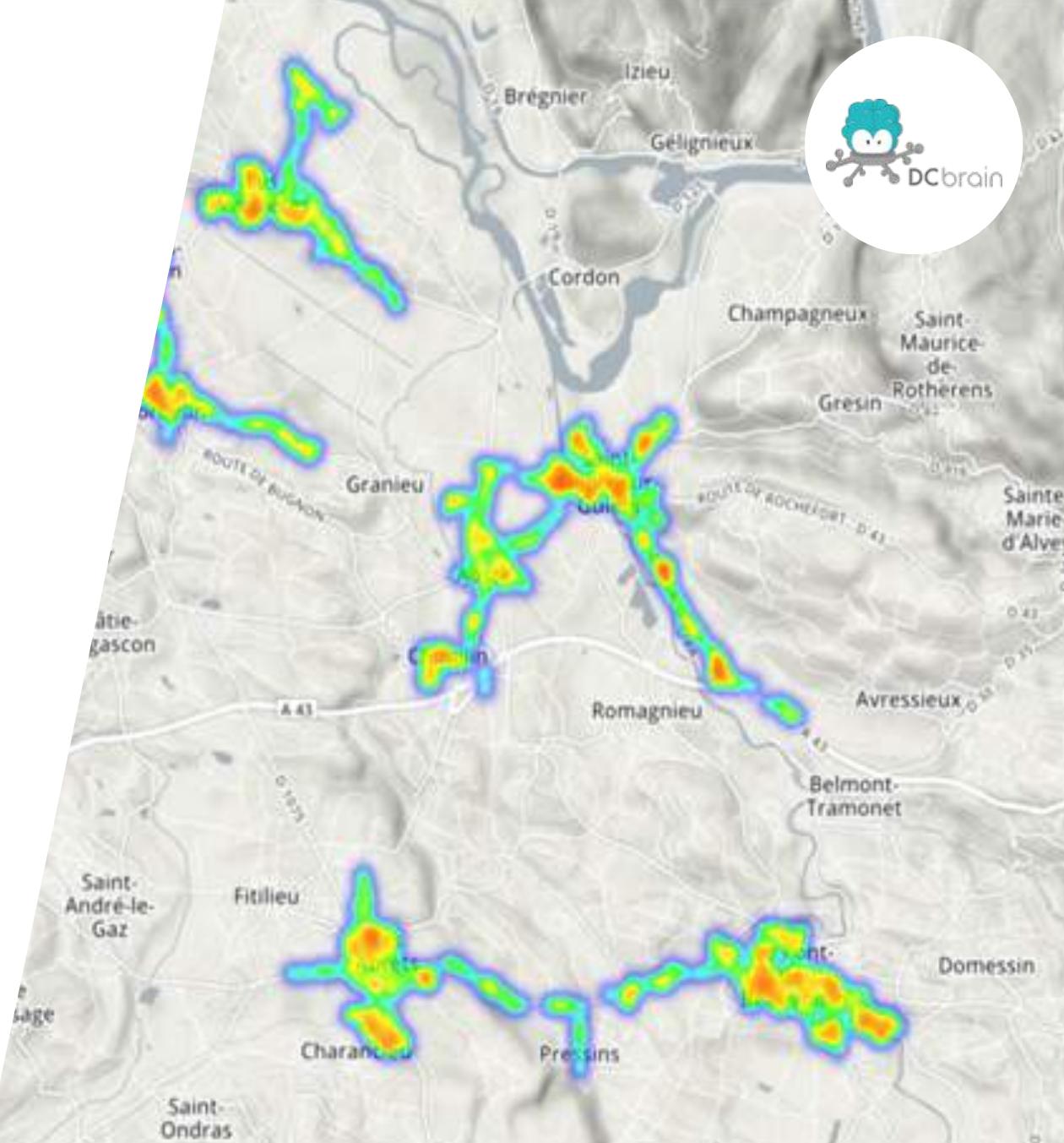


PUTTING AI TO USE FOR NETWORK MANAGEMENT



- **WHAT?**
DCbrain is an artificial intelligence solution dedicated to issues relating to now complex networks, such as gas, water, electricity, and steam, operate. Software transforms data flows to model physical networks in real time. It presents 3 major features: optimizing flows and consumption, identifying and warning about anomalies in the network, and simulating network evolution.

- **WHAT'S THE POINT?**
Companies will have to reconsider how they manage their networks in light of the diversification of modes of production and consumption. The solution helps them master these networks by letting them optimize operation processes, reducing maintenance plans and controlling and making flows more reliable.



PUTTING AI TO WORK FOR AGRICULTURE



WHAT?

Dilepix is a Rennes startup that is directed toward farmers, agricultural cooperatives, and insurers to offer them artificial intelligence solutions. Its platform can automatically generate alerts for dangers or threats (disease, insects, ...) gathered via sensors that are situated on the ground. Thus, the platform offers real-time diagnostics that make surveillance easier.



WHAT'S THE POINT?

Better anticipating threats that could alter production on a farm, and enhancing agricultural productivity.



Source: Usine Digitale, CES 2019

SMART HOME: AI IS COMING TO YOUR HOME

The “Smart Home” and home automation market is thriving. The firm MarketsandMarkets estimates that it will represent **137 billion dollars in the world by 2023**. The CTA estimates that in 2019, the market for “Smart Home” objects will experience a 17% growth in the American market.

Voice assistants (Google Home, Alexa ...) are also progressively breaking into the market, and positioning themselves as aggregators. They contribute greatly to growth in this market. By relying on artificial intelligence, these connected speakers can control other objects in the house. Deloitte predicts that the “smart speaker” market will represent **7 billion dollars in sales in the world in 2019**, or a 63% increase compared to 2018, making the category the fastest growing in mainstream electronics.

The topic of **interoperability** is becoming crucial to ensure that all objects in the house are compatible, and can be used in harmony.



Voice assistants are setting up shop in homes

164 million

units will be sold in the world in 2019, as opposed to 98 million in 2018.

250 million

connected speakers will be installed by the end of 2019.

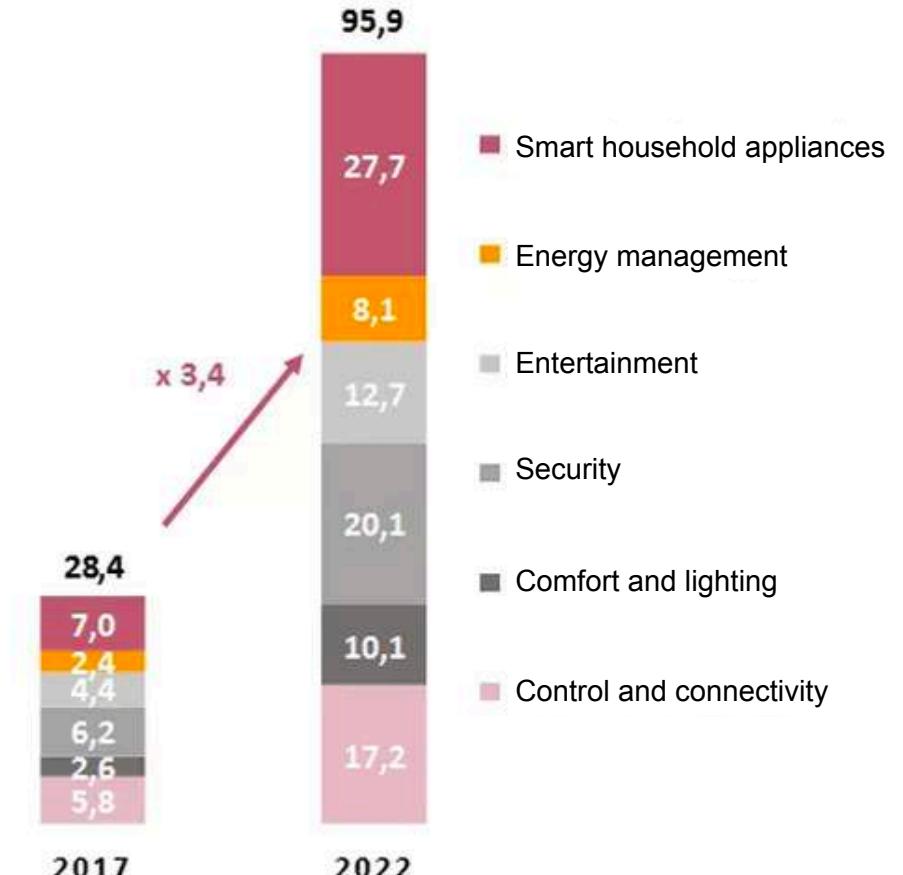
Source :Smart speakers : Growth at a discount, Deloitte, 2018



SMART HOME: MULTIPLE OPPORTUNITIES, ESPECIALLY FOR VOICE!

- Apart from smart household appliances, the main fields of applications in the “Smart Home” are **home security, energy management, and entertainment**.
- Today, the most commonly bought connected items are:
 - **LED lightbulbs**
 - **Connected surveillance cameras**
 - **Connected household appliances**
- Connectivity of several objects used in daily life reinforces the legitimacy of voice assistance, whose advanced level of AI and connectivity make them able to **control everything at the same time**.
- Market growth for these objects is especially due to diversification of NLP technology applications: though sales were concentrated in Anglophone countries up to **90% in 2017, at the start of 2019, more than 100 million hubs** were in use outside of the United States and Great Britain.

Predictions of how the Smart Home market will evolve between 2017 and 2022 (in billions of €)



Source : Tendances IT smart home 2018 et Club IOT , Smart Home 2018

THERE AREN'T ONLY VOICE ASSISTANTS: THE SMART VOICE-ACTIVATED FAUCET



KOHLER



- **WHAT?**
Voice command can control the faucet and choose the water flow. A sensor on the faucet monitors consumption and sends an alert in the event of a leak via the KOHLER Konnect application.

- **WHAT'S THE POINT?**
This smart faucet both improves hygiene in the kitchen (avoiding physical contact by using voice command), and makes it easier to maintain and manage the water network by using sensors.



THERE AREN'T ONLY VOICE ASSISTANTS: THE SMART SPACE HEATER

 LANCEY ENERGY STORAGE



- **WHAT?**
It's the 1st smart electric space heater with an integrated battery. It can configure itself using machine learning and artificial intelligence, which allows it to optimize the home's energy consumption. The space heater doesn't use WiFi - it communicates using low-frequency waves.
- **WHAT'S THE POINT?**
The connected space heater can cut an electricity bill in half, and save energy up to 30%, in particular because the batteries are charged during off-peak hours, and because they produce renewable energy. The batteries are also recyclable. The return on investment is 4 to 5 years in the most favorable conditions.





LANCEY

SMART CONNECTED SPACE
HEATER



Jérémie Renard
CFO - LANCEY ENERGY STORAGE





3

ETHICS AND AI

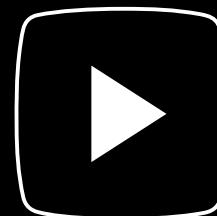
“SCIENCE WITHOUT CONSCIENCE IS BUT THE RUIN OF THE SOUL” RABELAIS



HUB
Arnold Zephir
DATASCIENTIST, AUTEUR "INTELLIGENCES ARTIFICIELLES"

AI REBALANCING MYTH AND REALITY

IN A GRAPHIC NOVEL, ARNOLD
EXPLAINS THE REAL POTENTIAL OF AI
TODAY



AI TODAY, TOMORROW, AND AFTER

*“We will need to build the relationship between man and machine (...)
Machines are not perceived as a threat in the West since everything is
considered having a soul.” Alec Ross*



Sources : Hub Institute



Singularity Net

WITH SINGULARITY, INDEPENDENT AI DOESN'T SEEM SO FAR OFF

SINGULARITY NET

WHAT?

> Singularity Net presents itself as an open source AIAS “AI as a service” platform that wants to become a real network of connected, coordinated, and autonomous AI technologies based on Blockchain. Each bit of AI fuels the others to generate a collective intelligence and a more powerful AI.

The AI would interact by using APIs to communicate, exchange information, and outsource different tasks related to an action. They would therefore become independent.

It utilizes a token called “Artificial General Intelligence,” or AGI, which allows developers to monetize their service within the network.

WHAT'S THE POINT?

> Singularity connects developers with their clients in order to incite and make implementing AI solutions easier in small and medium-sized structures.

Moreover, their ambition to create a decentralized system would lead to more security, reliability, and power.



FRENCH LEGISLATION, “THE PRIVACY PARADOX”

The GAFA tax, the controversial French bill that is causing us to dust off our philosophy books.

What it is:

A 3% tax levied on revenue for international digital corporations.

Additional discussions that it has sparked:

If the idea is to tax GAFA, since they use our personal data for free, why not establish a right to intellectual property on our digital data? Such is the question posed by Gaspard Koenig, a French essayist. It's a capitalist approach criticized by the National Commission for Data Protection.

The primary response:

Today, the answer to this question of respecting people's private lives and data is the GDPR. But it still has its limits, which will soon be reached by the boom in AI development.

The consequences:

Respecting ethics and citizens' private lives is essential, but this contradicts the technological development of AI, as well as the advantages of the services and offers that consumers appreciate so much. **In fact, the more we regulate and restrict access to data, the less AI advances.** It's still difficult for Westerners to find a **balanced model between technological advances, competitive advantages, and ethical respect.** When it comes to data, can AI still develop outside of the all-or-nothing mentality?



THE GDPR IN 8 POINTS

1 DEFINITION

The General Data Protection Regulation is a European law supervising those who process data from physical people (and their subcontractors).

3 COLLECTION RESTRICTIONS

Companies are only authorized to gather data that they truly need.

5 DELETING DATA

Users can demand that the entirety of their data be deleted.

7 CLASS ACTION LAWSUIT

Users can file a class action lawsuit if their rights are violated.

2 NOTION OF CONSENT

Users must give companies their consent before they can collect and use their data.

4 DATA TRANSFER

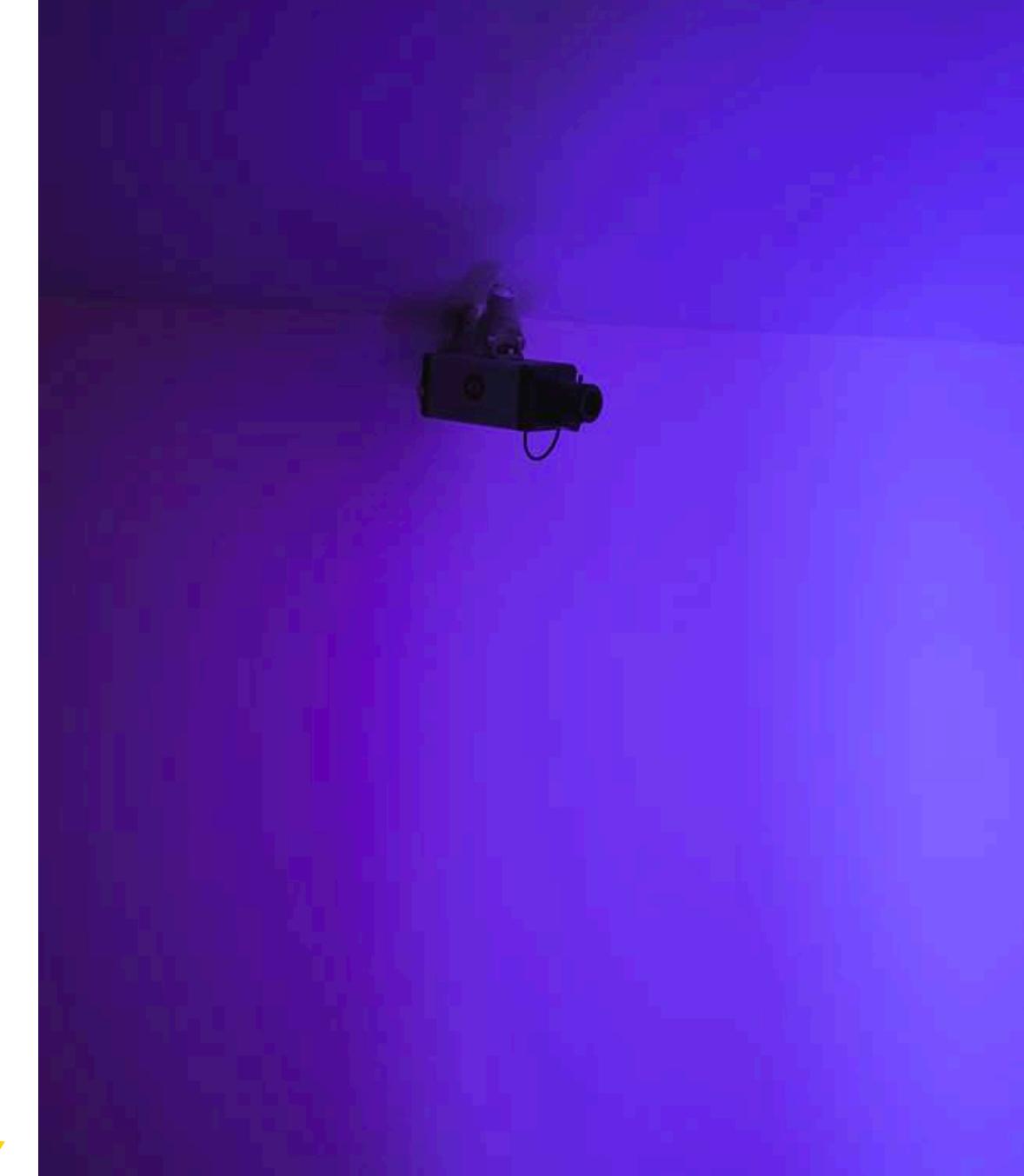
Users can demand that the entirety of their data go with them (and not be saved) when changing providers.

6 ACCESS TO SOCIAL NETWORKS

Without parental authorization, users can't have a social network account before the age of 15.

8 SANCTIONS

Companies that don't respect GDPR regulations may have to pay a fine of up to 20 million € or 4% of their annual global revenue.



CHINA IS MORE ‘ALL’ THAN ‘NOTHING’...

The Chinese government has announced its **program for a social credit system**, which will be implemented by 2020.

The project is based on their surveillance of the population via cameras that are installed throughout the city. In fact, there are 176 million cameras currently in use, many of which are able to perform **facial recognition**. China plans to raise this number to **400 million cameras by 2021**.

These installations allow the police to **identify individuals** and link their face **directly to an ID**. Thus, any infraction results in them losing a social point, and authorizes public services like trains or planes to refuse access to certain individuals.

While Europe and the United States are looking into complex regulations of AI and the protection of private date, China is going full steam ahead without fretting about ethical concerns. Between its major investments and data sources, China is taking a significant lead in developing AI technologies. As it happens, they are learning more quickly, and without restrictions.

This difference in ethical apprehension between countries will be a problem in the future when AI is established everywhere. **The problems will first come in terms of competition between regions and companies, and then in the movement of goods and individuals and data.**

It remains to be seen how these cultural differences will be understood on a global scale.



i

CHINA IN A FEW FIGURES

GOVERNANCE OF DATA AND SURVEILLANCE

MORE THAN DATA

X2

Number of purchases made online as compared to the US

600 M

Foreign transactions made by Tencent

889 M

Number of WeChat users

SOFT LAWS

400 M

Number of cameras in the country, most of which have facial recognition capacities

2020

Year of the social credit system will be implemented

\$3.5 B

Amount of the Chinese AI market

500,000

Number of researchers

Development of O2Os (online to offline startups) creating new layers of information

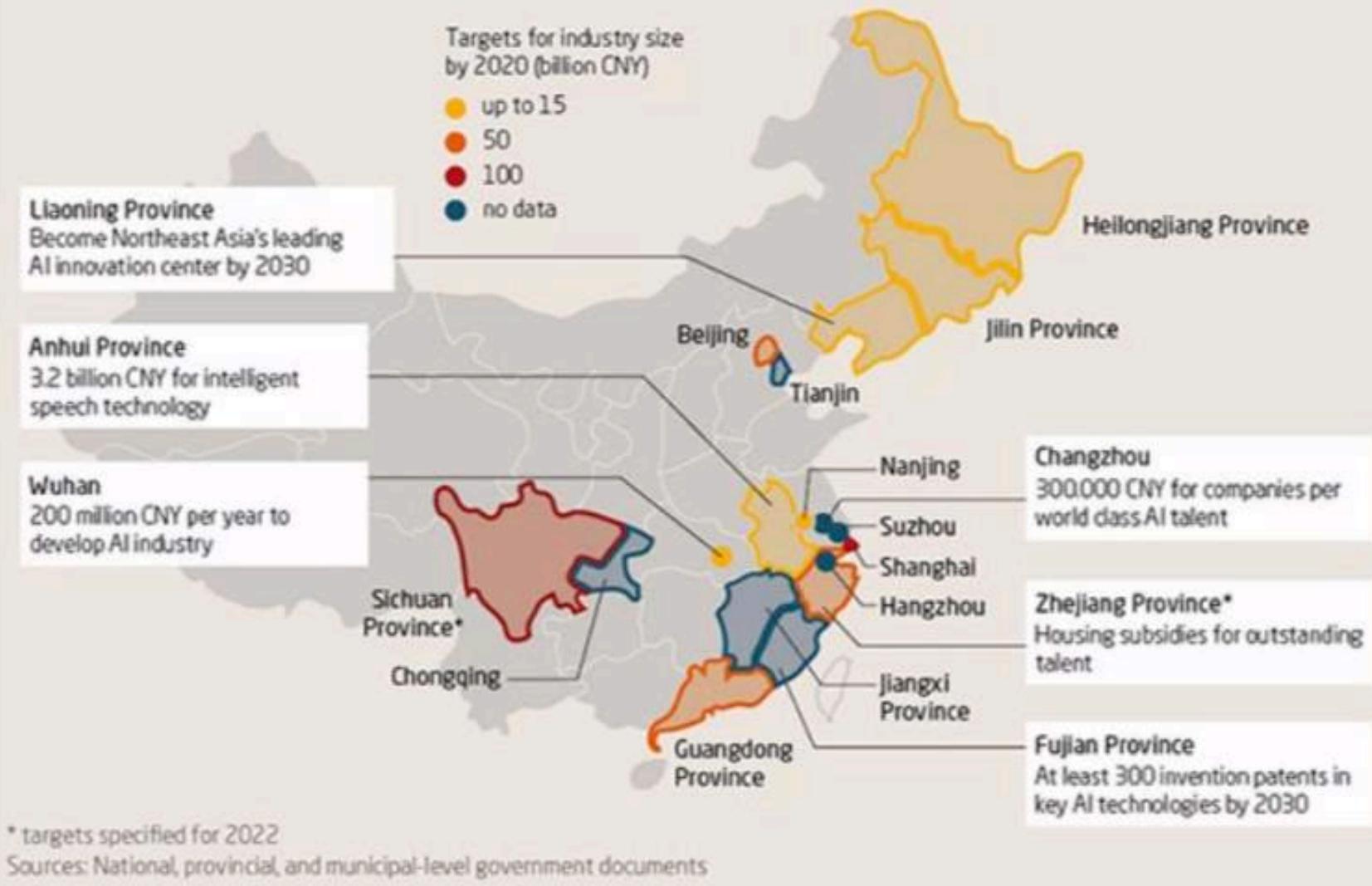


Sources : Deciphering China's AI Dream - Future of humanity institute - Oxford University - March 2018



FOCUS ON CHINESE INVESTMENTS

Local governments charge ahead with AI development
Provincial and municipal plans set ambitious measures and goals



PROTECTING HUMAN DATA: GDPR, YES, BUT AFTER THAT...

GDPR, the first step that might not be enough for autonomous AI. In fact, there still aren't enough rights that can include drones, autonomous vehicles, and other future, more independent robots.

The question lies in **issues regarding civic responsibility**, more especially in the event of an accident.

A second issue arises regarding algorithms, which for the moment are subject to copyright, but AI algorithms are evolving independently based on the data provided to them.

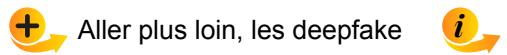
This same data is considered by French law to be the property of the creator, therefore inextricable or reusable without agreement, financial or material compensation.

Concrete things to be considered:

GAFA tax

Creating sui generis right protections that include AI in France

Creating a legal body specific to robots, which would hold autonomous robots responsible for their actions



Aller plus loin, les deepfake



AND AFTER...

When AI creates something, who does it belong to? To the AI, which created it without human intervention? To the AI's creator, without whom the AI wouldn't exist? To the AI's owner? When humans create something, should our creations belong to our parents, and our parents' parents, and so on, to the very origins of life? That way, every creation actually belongs to all of humanity...

These are the questions of ethics and philosophy that have future high school graduates shaking in their boots.

As long as our **AI doesn't have any intention**, and all it does is repeat and source its data in order to create, these questions remain fairly simple, and reside essentially in the domain of **intellectual property** between the origin of the data and the final generated product.

Beyond creation, a far-off future with new, still unknown technologies could give way to robots that have emotions.

After all, even today when Sophia (the robot by Hanson Robotics) is insulted, she's programed to understand the insult and know that it involves something negative.

So what's the right legal framework for these possible future augmented beings?

Concrete things to be considered:

- Creating the status of electronic personality
- Providing a legal personality



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