# Talan
## The future is a playfield



# A brief history of Digital Transformation
## A path from *Data Driven* to *Data Inspired*

*A Talan white paper on data intelligence*

# PART #1

## 4th Industrial Revolution and Digital Transformation

Don't believe everything you see, don't believe everything you hear, especially when it comes to interpret Data.

To potentially evolve from a Data Driven strategy to Data Inspired journey, it requires to get in mind that technology is a path but not a destination.
Even, more, it's indispensable to understand that data is a raw source that requires to be refine but not the expression of truth.

### "Become" Digital Native

At the heart of the 4th industrial revolution that is the cradle of the Digital Transformation, companies see the technology fundamentally provides new perspectives for their human, operational and commercial models. This new ecosystem, which is constantly reinventing itself, opens up new the same time, to strive for ever greater growth and performances.

The challenge is for them to become digital native, ie to think and act digital at all organizational levels. In passing, one can note that paradox of "becoming naive".

### Industry 4.0 challenges humans

By 2020, actually this is tomorrow, 50% of business activity will depend on their ability to produce new services, new products and new models.

This fourth industrial revolution, also known as Industry 4.0, is fundamentally different from he previous three. Remember.
The first revolution relied on the mehanization of manufacturing and production, with the use of coal, and the introduction of steam industrial usage.
The second is the use of electrical energy in mass production assembly lines.
The third revolution saw the borth of automated production using electronics, computer science and robotics.

Today, the industry 4.0 is the one of the Smart Factory, Smart Cities, Autonomous decision-making, Big Data Analytics, IoT, Cloud computing etc...
This fourth industrial revolution is illustrated by a range of new technologies, methods and models that combine the physical, digital and biological worlds, impacting all disciplines, all the economies of all industries.

It's even going ultimately to challenge the role that humans must play in the era of artificial intelligence systems and robots.

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# Digital Transformation NewEra

The first period began in 1945. This is the era of computer Hardware. This revolution continues today. See the development of Quantum Computing. In this respect, Bill Gates declares disarmingly that he believes in it a lot, even if he admits he does not understand the mathematical theory on which he relies.

The second one, which started in 1985, is Software. It continues to flourish today as well. Since mobile devices such as smartphones and tablets have appeared, we are now talking about applications (or apps). Coding, is no longer exclusively reserved for IT specialists and goes beyond purely IT teams since Data Scientists and Data Engineers, take ownership of new technologies.

Finally, in 2005, the data era started. If you never heard about Big Data, Data Analytics, Data Visualization, you are the weak link.

All innovative technologies, including Edge Computing, Mobility, Internet of Things, Augmented Reality and now Artificial Intelligence,  are based on data.  Digital Transformation era is starting from here.



By way of anecdote, it is interesting to note that historic players of this adventure, even the renowned visionaries who were actively involved in this story, may not have always been aware of the magnitude of this revolution.

For example, Ken Olson, the CEO of Digital Equipment, who was one of the pioneers of American industrial computing, said in 1977: "There is no reason for anyone to want a computer in his home". As we all know, he was not on the right side of history. There are billions of PCs in homes today.  There will be an estimated 6.1 billion smartphone users by 2020. Smart devices are actually the number one mean to access the Internet today.

"Digital Transformation", what are we exactly talking about?

We are far beyond the idea that it's just about developing applications, hiring a data steward or a CDO (are we?). According to IDC 2019 Predictions, through 2022, 75% of successful digital strategies will be built by a transformed IT organization, with modernized and rationalized infrastructure, applications and data architectures.

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*"Companies should not have a digital transformation strategy, they must have a strategy, which relies on digital transformation"*

*Bill Schmarzo - University of San Francisco School of Management.*

Digital Transformation is led by drivers, such as technology, which impact the Business and even the society. Data is becoming an economic capital.
Digital Transformation means assuming a revolution of commercial and industrial processes.
In line with the challenges of their partners, competitors, customers and prospects ecosystem, companies must set up a strategy that will allow them to beat or fight their competitors, to better satisfy their customers, to recruit, train and retain the best talents on the market and finally, to innovate quickly and easily.

Thus, all companies must define how

they want to use hardware or software technologies, the methodologies that implement them and the infrastructure that will support them. They must define how they will align this their activity in order to support their business strategy.

The question they must ask themselves is: How to make the most of this for their customers and how will it change the experience of their employees in keeping with their strategy?

## PART #2
## Data is the new oil... or may be not.

### Neural Networks success and failure

Once upon a time, the US Army wanted to use neural networks to automatically detect camouflaged enemy tanks. The researchers trained a neural net on 50 photos of camouflaged tanks in trees, and 50 photos of trees without tanks. Using standard techniques for supervised learning, the researchers trained the neural network.
Wisely, the researchers had originally taken 200 photos, 100 photos of tanks and 100 photos of trees. The researchers ran the neural network on the remaining 100 photo. Without further training the neural network classified all remaining photos correctly. Success confirmed!

The researchers handed the finished work to the Pentagon, which soon handed it back, complaining that in their own tests, the neural network was failing.

It turned out that in the researchers' dataset, photos of camouflaged tanks had been taken on cloudy days, while photos of plain forest had been taken on sunny days. The neural network had learned to distinguish cloudy days from sunny days, instead of distinguishing camouflaged tanks from empty forest.

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## Successful Data Centric Companies

We all remember the time were oil companies were the masters of the world. Well, they might still want to demand that title. There is no question that oil has truly been at the center of any economy. Putting any business in movement one way or another. But today, these are the GAFA from USA (Google, Apple, Facebook, Amazon) and the BATX (Baidu, Alibaba, Tencent & Xiaomi) from China that are ruling the world. Not mentioning Microsoft, Netflix, Airbnb, Tesla and Uber...

According to Forbes ranking, the 5 world's most valuable brands are, Apple, Google, Microsoft, Facebook and Amazon. Their success relies on their ability to turn data into monetizable merchandise. To give you an example, Amazon recommendation engine is responsible for 35% of its revenue, using information from each individual customer data, including purchases, behavior and history put together. Thanks to all this, Amazon is able to establish a list of items that we don't even know we want to buy.

### Data have never been so easy to reach.

According to a University of Southern California study, a decade ago overall digital information located on storage devices, for the entire world, reached 300 Exabyte. To figure out what it's like, just imagine that it would require over 400 billion CD-ROMs. If you were to build a stack with it, you would go over the distance from the erth to the moon.

There are up to 5 billion searches on Google per day. Data have never been so easy to reach. The unstoppable advances of technologies makes it easy to process them and to produce Data Driven decisions.

Deep Learning and technologies are part of the AI family. AI also includes Voice Recognition, Text to Speech, Computer Vision, Neural Networks, Advanced Analytics, Natural Language Processing to mention just a few. They are revolutionary technologies, but for it to work at best, it requires data.
It's even more obvious for areas including Big Data, Data Visualization, Data Analytics... maybe because the name contains "Data".

## By the way, what does the "Big" of Big Data mean?

Whether to build manufacturing platforms based on Internet of Things, business solutions based on Mobility, retail applications to enhance customer experience relying on Big Data or any industrial innovations aiming to digitize or automate processes, Data are the definitive cornerstone. Data stands at the very heart of the digital era. It is in this way that collecting, storing, cleansing, standardizing, enriching, modeling and analyzing data is nothing less that essential.

By the way, what does the "Big" of Big Data mean?
At its early beginning Big Data was just about a huge amount of Data. There were this big "V", for "Volume" from Gartner definition. Since that time, there is a constant and regular reassessment of what "Big" means, scaling from Terabytes first, to Petabytes nowadays, to Zetabytes tomorrow and maybe one day, Brontobytes.

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# Dat[AI]nspired Strategy

Even though one may be tempted to compare Data to Oil, the comparison is not so useful beyond the image of all the value added that this represents. The real value of data lies in the insights generated through analytics, combinations of different data sets, the application of advanced models all of this put in perspective of business strategy.

Then the biggest challenge is to rise above the simplistic approach of a data driven strategy, to resist the temptation to follow technical information blindly but to leverage it with human critical sense, empathy, creativity, inventiveness and to overcome technology biais in a DataInspired strategy.
Just for fun, let's try to understand what a Brontobyte of data means.
OK, take a second to figure out that, with 5 Exabytes, we could store all the words spoken by mankind.
 Now, see that 1 Brontobyte is 1 Billion Exabytes... See? There is a quotation we found on the Internet which says: "The only thing there is to say about a Brontobyte is that it is a 1 followed by 27 zeros!"

# PART #3

## Don't let data dive you, rather be datAInspired

**Massive data driven failure**

20 years ago, NASA lost a $125 millions set of high tech robotic and software components when their spacecraft on its way to Mars burned after a 10 months journey. The reason for this massive failure is data driven. One engineering team used metric units while another used English units for a key spacecraft operation. Both of the teams were confident in their capacity to compute complex calculations quickly and accurately. Actually, they made it perfectly. Just one thing, at a global project perspective, the Data were wrong.

*"Technology alone is not a silver bullet for digital transformation. While investing in the right technology is crucial, placing too much importance on the role and performance of technology in digital transformation is a barrier to success"* Collins said, President at Telstra an Australian Telecom company.

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# Now, what's being DatAInspired?

Let' start with a really first simple explanation.
Imagine you plan to go and watch a movie tonight and you want to follow a data driven decision making process.
You then refer to AlloCine -this is a french app, you can use any other else- and then check the show that got the best combined evaluation of public audience and professional movie review in terms of scorings.
Here, you have a data driven choice, by selecting any 5 stars rated movie. But what about if you now want to make a Data Inspired Decision?
You'll still pick up a set movies that are 5 stars rated and also the 4 stars, and for each of them, read the storyline and select the one that fit the best with you mood.
This way, data let you make a first selection, stating that you recognize the value a scores produced by the application and then you add the human thinking to enhance the decision making process.

## From "What happened" to "What will happen?"

Let's see what we can do when searching for illumination which is exactly the inspiration we are referring.

The evolution of data analysis since the 80s is quite amazing. In this early age of data intelligence, we were mainly asking, "What happened?" To answer this question, IT teams were building statistics and interactive reporting.
Then, in the 90s, we started to talk about analysis based on MS Excel. OLAP (online analytical processing) appeared at the same time. The analysis era aimed to answer the question, "Why did this happen?".
In the 2000s, companies began to specifically focus on, "What's happening now?". The advent of dashboards and scorecards built the monitoring generation, which later gave rise to a new question: "What will happen?".

To answer this, data analysts first used data mining and then advanced data analytics. Artificial Intelligence technologies including machine learning, neural networks and deep learning now help companies' leaders to face the challenges raised by the need for prediction.
Industry 4.0 is the land where Data Intelligence meets Human capabilities in the sense that intelligent applications can do the job whenever complex processes or routine tasks can be automated and let humans process the part that need judgement, common sense and emotional intelligence. Because automated doesn't necessarily means smart.

## Combining Human and Technology

In California, GE is working with ShotSpotter, which is designed for detecting and locating gunfire in real time. GE is combining cameras, microphones, and sensors into its intelligent LED streetlights. The solution is using smart devices, complex real-time algorithms and the work of a team of human specialists to launch alerts.

In Australia, the University of Technology Sydney is harnessing Deep Learning and Artificial Intelligence algorithms to detect sharks from drone footage. First, they preprocess public videos of sharks. This is the learning part. Then, a Neural Network runs detection and recognition algorithms. Empowering the action of drones, this provides a real-time search and rescue service.
The input data, the video, are rated by humans. This is where the most sensitive intelligence is brought the system. Then, models and algorithms are "just" learning from this.

Data and applications make sense only if they are actionable. Making technology actionable is about connecting intelligences. That means combining human judgment and intuition to smart machines and software. Because technology cannot be free from business specialists.

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# Technology achieves no purpose by itself

Applying any technology should serve a predefined dual purpose: on the one hand improve the human condition, whether they are customers, employees or people in general and on the second hand make organizations or the society progress.

Then, adopting and mastering the best tools isn't enough to drive the digital transformation in order to achieve those objectives. You can have the most advanced technologies and the biggest amount of data, the key to success always lies in the definition of business objectives, in the draw up of the progress you want to achieve. It can be to make life easier for employees, increase customer satisfaction, grow the revenues, shorten the time to market, optimize internal processes, create new services products, diversify activities or found new monetization opportunities.

Technology alone is not a Silver Bullet, be Data Inspired

To switch a company in a data inspired mind, leaders must think differently. They must be creative and innovative. They must figure out the new value they want to bring to their activity.
That includes rethinking entirely business models and patterns of communication, identifying new sources of revenue and reconsider channels to leverage.
It is only once this reflection phase is completed that they can imagine which technologies to implement in order to power their vision and their strategy.
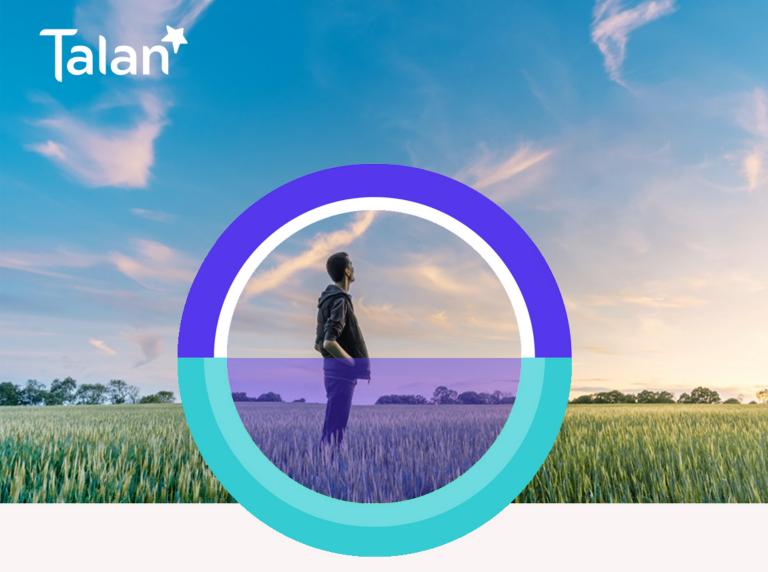
## Digital Transformation 2.0

Behind the Data Inspired concept, there is nothing but the structuring of new business models leaning on tactical or strategic priorities together with human, providing judgment, sense of analysis, common sense, intuition, sensitivity all of this empowered by technology.
All of this will take you to Digital Transformation 2.0 era, and beyond.

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**OUR CONVICTION**

To meet the challenges of an increasingly complex world, we help our clients embrace short transformation cycles, from design to implementation. We rely on both the technological lever and the strength of our DNA based on collective intelligence, agility and entrepreneurial spirit.

Collective intelligence consists of combining the diverse expertise of the group's workforce with that of our customers and partners. Agility allows us to capitalize on our experiences and rein-vent ourselves on each project with pragmatism and humility. At Talan, we are entrepreneurial, daring, bold and experimental when need be.

#TheFutureIsAplayField #BeDataInspired

CONTACTS
frederic.jacquet@talan.com
jean-christophe.dohollo@talan.com