

Data Insights

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Artificial Intelligence

What does it mean for your business?

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What does it mean for your business?

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Introduction

In April 2018, Google surprised the whole tech community by disclosing a new AI software that could imitate a human conversation perfectly. This programme was able to make use of its 'voice' to book a seat at a hair salon. The person at the other end of the line didn't know that she was speaking with a machine. It was one of the first real application of the Turing definition of "intelligent software"; the ability to mislead the interlocutor about its real nature. This kind of demonstration opens up a whole new field for AI, showing that AI can act as a virtual person, replacing humans without user's knowledge.

This Turing test is not a new concept. By creating a device capable of reading encrypted German messages developed by the famous Enigma machine, Alan Turing created the genesis of AI during World War II.

AI today is not only a buzz word but a reality: we are all making use of AI every day when we carry out online searches or talk to a home box assistant, etc. Little by little, AI will be used far more frequently with regard to everyday services.

According to Hugues Bersini, professor of Artificial Intelligence at ULB and co-director of IRIDIA Laboratory, the Interdisciplinary Research and Development Institute of Artificial Intelligence: "Intelligent informatics is nestling everywhere, invading all nooks of our existence; all objects can be endowed with this intelligence. And these objects are not only intelligent, everywhere, ubiquitous but they can also connect to each other, coordinate their actions. Today, AI has become a big tool-box

filled with tools able to replace human behaviours and performances in many situations, even the one we feel are reflex or instinctive process."

But this leaves us with many questions: What about businesses? What will be next? How will AI disrupt businesses over the next decades? What are the main AI applications for businesses? Are all companies concerned by AI, and should they re-invent their services and their ways of working based on new AI technologies?

Should managers and CEOs of all sectors be concerned about AI and what are the sectors or companies where AI will make the most impact?

Stakes

AI today is bringing new solutions to a large range of sectors;

from face recognition to connected cars and from cancer detection to intelligent home devices. Some people fear that AI will eventually replace humans at work, creating a threat for employment, and for the future of mankind as a whole. Besides these 'negative' prophets, other experts are fostering a positive vision of AI, being used as tools and assistants that can increase human productivity and create completely new kinds of jobs, such as AI experts, AI specialists, and experts who will teach machines how to perform certain tasks.

In general, all experts consider that we are only in the early stage of this technology: What we know currently with regard to AI is purely "narrow AI",

that is to say AI programmes or scripts which are able to perform only one specific task. So we can only imagine what the "general AI" will be able to do and how greatly it will outperform even the best human/employee in any cognitive or operational task.

However, can AI really be useful for your business? Which businesses need AI, and how will they use it?

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Hugues Bersini



Professor of Artificial Intelligence at ULB and co-director of IRIDIA Laboratory (Interdisciplinary Research and Development Institute of Artificial Intelligence).

“Two different types of AI exist: one which thinks (the conscious AI) and one which understands and learns (the unconscious AI). Let's take the example of autonomous translation. The conscious AI used to do syntactic analysis, extracting verbs, nouns and trying to understand the sentence meaning. Now with the unconscious AI, the philosophy is different. To be visual: you take all the books translations in all languages, create a huge translation library, give it to a complex neural network, and this network will simply learn how to

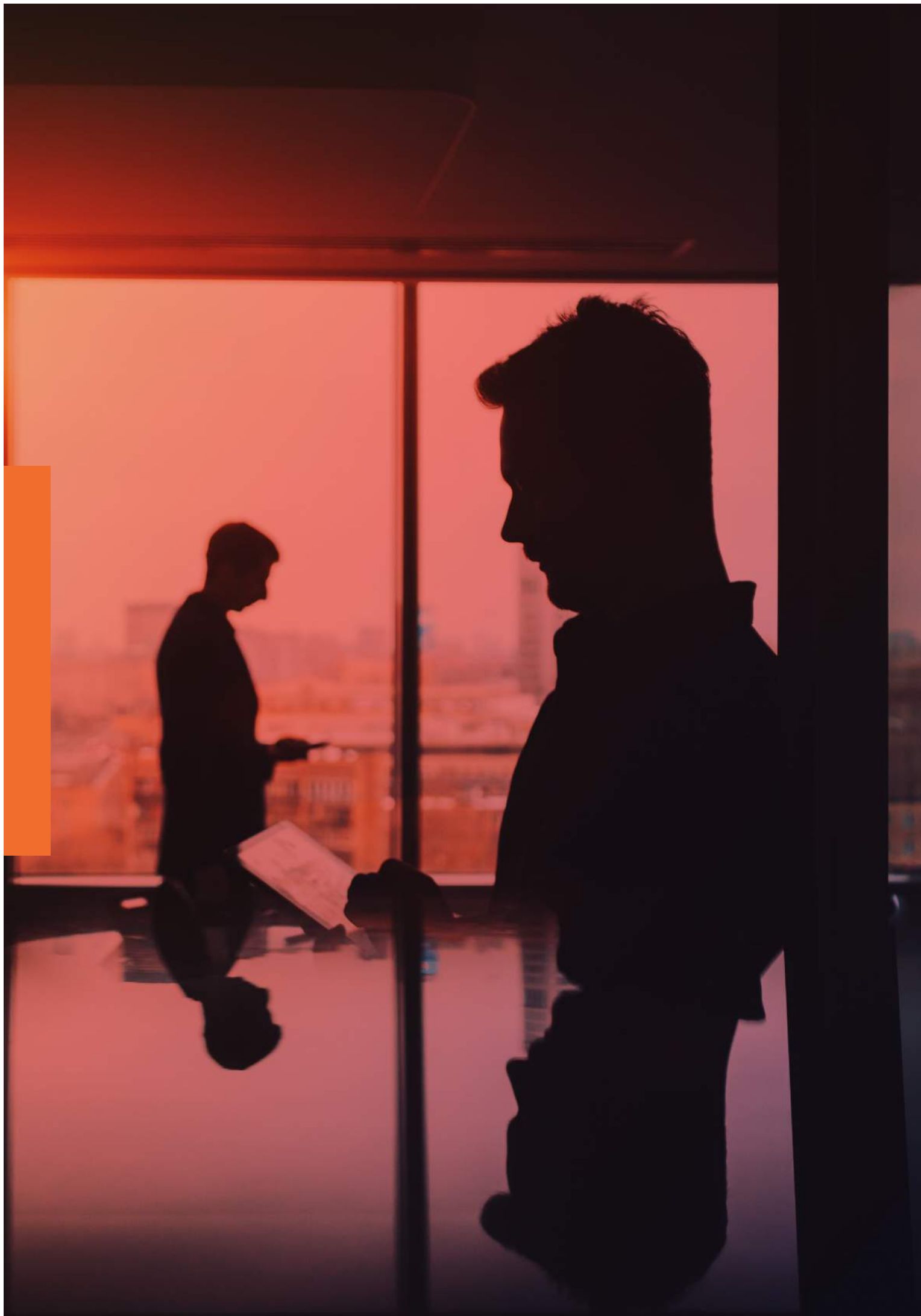
translate and make decisions. Thus, it is not able to explain its decision.

We human being try to rely as much as possible on unconsciousness intelligence, because we are pretty good at it. When we are driving or biking, we don't think about driving or biking. But once we meet a situation we didn't expect, then we have to become conscious. With the AI machine, it's the other way around. We are using conscious AI machine when a problem is easy, but now that problems become more complicated we are trying to rely as much as possible on unconscious machine. Facing complexity, machines need a lot of data and a lot of unconsciousness. Depending on the situation and the decision the AI must take, can we accept to give decision-making power to a machine that can't self-explain what it is?”

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Success stories and industry applications

AI has been around us for a long time now. The most famous AI, used and known by most of us is Google Translate (which uses a multitude of data from translations found in millions of books and websites etc.). But AI or predictive modelling has also been widely used by businesses to offer better services to their customers. Here are a few examples:



- Online accounting software is currently testing AI to correct human mistakes and to allocate expenses automatically to the right account.

- Smart HR services can analyse CVs automatically and rank candidates based upon different criteria. AI can also automatically assess candidate criteria such as personality, education, skills and motivation.

- Thanks to a large database of 300 million companies, the European Commission is using predictive modelling from Vadis Technologies to detect fraud amongst projects that receive public funding; the model can calculate more than 120 indicators, reflecting a broad range of risks from those in connection with company managers to risks of fraud and bankruptcy. In this case, it is more about predictive modelling than AI.

- AI and predictive modelling are used by CRM to run automated online chats, allowing employees to focus on complex problems and not having to waste time on easy and common questions.

AI is growing and more applications of its intelligence are being discovered every day. However, many companies, even if very motivated, don't know how to implement it. They may ask themselves: What AI can do for my business?

Here are some applications, spread across five different sectors. AI should not be seen as scary but something that can positively revolutionize your company.

Retail & Fast-Moving Consumer Goods:



In this industry, AI mostly tallies with enhanced customer experience.

By monitoring, gathering and analysing lots of different data (geolocation, behaviour, age etc.), retail companies and AI can offer a personalized customer experience including online and offline promotions, meaningful services, tailored recommendations, chatbots, speech recognition etc. This data can also be used by AI to write insightful reports and predictions, allowing marketers to make more customer oriented decisions.

For example, thanks to facial recognition software, Walmart can identify if a customer is satisfied or not when they arrive at the check-out counter. If a customer seems frustrated, an employee from customer service will meet them in order to get them back on-board, solve their problem and ensure that they have a good experience in the store.

Finance, banking & insurance:



The finance industry is strongly impacted and influenced by Fintech and AI. Offering its service online is now mandatory for banks. With all of this data available online, almost all banks have invested in data scientists in order to be more efficient, saving time and money. Their objectives are to better serve customers and analyse behaviours to propose personalized offerings online, eliminating time consuming and repetitive tasks for employees.

JP Morgan Chase have created a platform which uses image recognition software to examine legal documents and extract useful data points in just a few seconds. It allows the company to get thousands of hours of work carried out in a short period of time,

Utility & energy:



Thanks to smart electricity meters, energy companies received tons of useful consumption data. It allows companies to predict electricity consumptions forecasts whilst also assessing renewable energy.

The French oil company, Total, decided to invest in AI and develop new usage for geoscience as well as predictive maintenance. Total announced a partnership with Google Cloud to increase its efficiency in finding oil and gas fields for exploration and production. AI will gather, interpret subsurface images and sort data in order to create a usable base, allowing geoscientific operators to have more time to focus on added value tasks.

Total is also focusing its attention on gathering more and more data around electricity usage and photovoltaic. After acquiring Lampiris and Direct Energie (Belgium and French electricity companies), Total is gaining access to a whole new set of data that needs to be analysed to better predict energy demand and renewables production, thus stabilizing the electricity networks in real-time.

are able to manage a huge quantity of personal data, including sensitive individual information. AI can be leveraged by governments to increase public services' quality. It allows the possibility of enhancing national security by identifying potentially dangerous individuals and predicting accidents, risk and potentials crimes.

Belgian police announced recently that it will leverage AI to better predict crime and intervene at the right moment. Cross checking individual data from social networks can also potentially help anticipate terrorist attacks.

Life science:



Often the precursor of new technology, the medical field is also investing a lot in AI and the results are already impressive. AI can not only detect types of cancer but will also analyse DNA and the effectiveness of drugs; all of this much faster and efficiently than when carried out by clinicians.

As computer calculation capacities are growing stronger and the quantity of training data delivered to feed AI algorithms grows, AI is becoming more powerful than the best human experts. Recently, a study showed that AI cancer detectors are faster and better than clinicians.

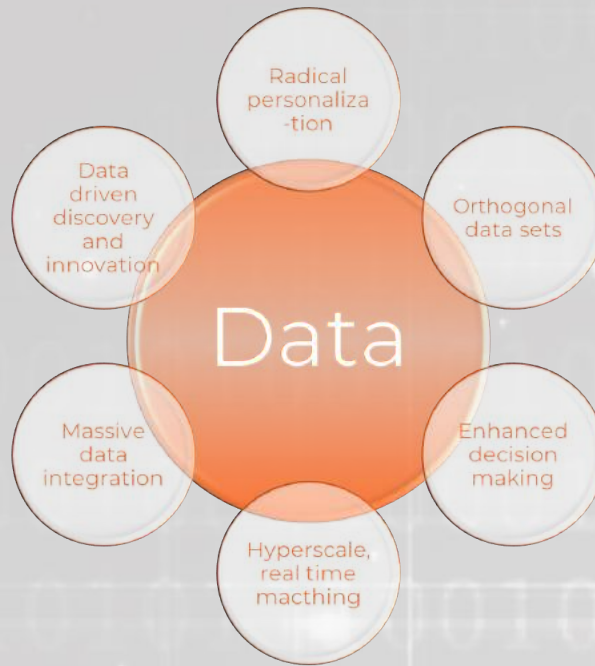
Apart from analysing and detecting what cancerous cells are present, AI technology can also predict a patient's future needs (unexpected re-admissions, long hospital stays, etc.), helping doctors to provide the best treatment possible.

Public services:



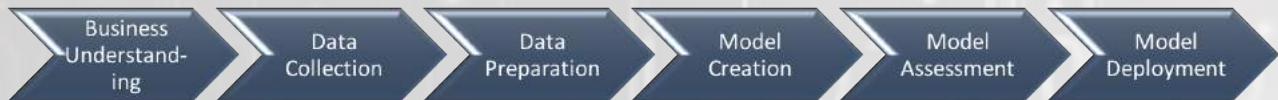
Now that it is possible to upload legal documents online, declare taxes or manage medical files, public services

Disruptive models fueled by Data

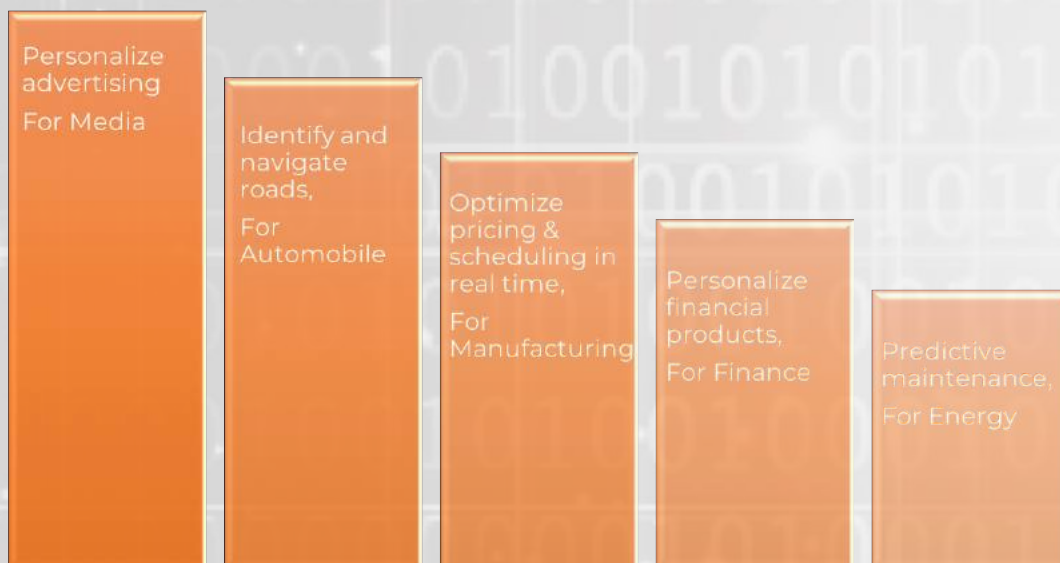


Source : McKinsey Global Institute analysis

AI Solution workflow



TOP 5 Higher potential actions and industry



Source : McKinsey Global Institute analysis

Theo Vanneuville



Our Data Scientist Consultant,
in mission for Total Group. Engineer
graduated from CentraleSupelec.

"My mission is to analyze data from renewable energy production facilities, storage batteries or smart meters.

What is commonly called artificial intelligence is actually a collection of tools and statistical methodologies made to learn from errors in order to predict something. And AI goes faster than the human; capitalizing on the capabilities of machines, such as GPUs, that can increase the speed of calculation and execute extremely complex operations in a relatively short amount of time. We ask the machine to digest a large amount of training data, which it will learn (meaning integrate into their model) to get as close as possible to human decisions. Learning is now mainly supervised (human have to teach AI how to do it), but in the future, there will be more and more unsupervised learning"

Challenges

Implementing AI applications in companies can cause a number of problems.

- The "black box" effect: People don't easily understand what is happening inside complex AI models such as neural networks with a large number of layers, called deep learning. The model parameters are much more difficult to interpret than simpler models. They may be more precise, but they require more trust from company managers. AI can be considered as a kind of predictive modelling (but broader) when the quantity of model parameters grows enormously and becomes difficult for a human to understand.

- The term "AI" can be misleading as it may refer to a conscious intelligent being, while most of AI today is based on statistical calculations applied to a large quantity of data; what we call the 'narrow AI'. Sometimes, instead of using terms such as 'AI', one should inform business managers that these programs rely on maths and statistics, and there's nothing magical about it.

- To be efficient, both AI and predictive modelling need to obtain the right quality and quantity of data. This step usually takes up most of the time. AI makes sense only when the quantity of training data explodes, and cannot be handled with simpler models. This is obviously true with unstructured data, such as image and speech. It also becomes true for digital marketing data where there is a huge quantity of web data collected from users: AI can show its strength in analysing and predicting users' behaviour but should not be an option when smaller datasets are involved.

Best practices

If your company is considering using AI to develop new services and grow its business, it is worth taking note of experiences:

Before launching an AI implementation, make sure that your company has gone through different maturity steps

to better manage its data. It is illusory to create AI or data science services if the company has insufficient data, or if this data is not managed properly. Good data management practices, and automation tasks known as RPA, should be deployed before AI, per se. Businesses can collect useful historical data through the Internet of Things for example, or through cloud services to help their employees better collaborate and share information.

Make sure your company decision-makers understand the differences between predictive modelling and AI, or between machine learning and deep learning, and choose the appropriate models according to your business needs and your project specificities. In many business projects, predictive modelling with simpler models can be more appropriate and easier to implement than deep learning models, replacing humans only when it comes to easy but time consuming tasks.

Leverage AI as a tool to support, assist and simplify human work.

AI is in many cases a way to facilitate burdensome human tasks. It can also

be used to replace dangerous tasks or reduce the risks of errors. AI should not be considered a 'magical' technology that will replace humans, but rather as a tool to serve humans and help them focus on more added-value tasks.

Tools to implement AI

Once your company has decided to leverage AI, you must find the right tools to implement it. Fortunately, data science and AI have become more accessible, thanks to many new services:

- Open source libraries such as Tensorflow and Keras, based on Python and proposed by a growing community of developers, offer a quick way to develop AI-based proof of concept. More and more companies are moving towards these open sources technologies, which are now backed by strong communities, reducing the cost of licences of proprietary tools and software.



- Cloud platforms such as Microsoft Azure or Amazon Web Services offer ready-to-go AI modules, designed to fit models very quickly. For example, Microsoft Azure proposes a visual interface to drag-and-drop data

tables and quickly try out different machine learning algorithms.

- Training for AI is easily accessible through MOOCs, such as Stanford Professor Andrew Ng's Deep Learning course on Coursera. This explains (for those with a good math background), how to implement facial recognition, speech recognition and more AI-based services.

It is essential to make sure that your company has the right internal resources, e.g. data scientists that have received AI training, in order to properly implement AI for your business.

Conclusion

AI brings power to many businesses by enabling them to do more and at a faster pace than humans can. Thanks to its autonomy and ability to learn, it will soon be able to replace human intervention when it comes to making decisions, creating strategy and solving problems.

AI and deep learning are particularly successful for face recognition, speech recognition, autonomous driving and other kinds of treatments where a huge amount of training data is needed.

AI is a fancy word that has created a lot of hype, but that doesn't necessarily fit all the needs for all businesses. In some cases, simpler techniques like RPA and predictive modelling are sufficient to match the actual business requirements. Not all businesses are ready for AI and, even if AI has become democratized by open source libraries and cloud platforms, most companies need to go through a maturity funnel and make sure their

data management and automatization processes are set up properly before tackling AI.

As simpler predictive modelling is "easier" to apply in business, it is currently much more useful to companies. But AI has the power to create a lot of real business value both now and in the future. Companies facing hard competition and choosing to invest in AI will gain a strong competitive advantage. For every field and industry, AI can provide an application that will always improve performances. But a good businessman needs to be sure that AI will be the best option for his business beforehand as AI will not provide the most efficient answer to every problem.

AI has a lot of potential and new uses will be created exponentially in the next years. It will not cease to surprise us and improve our way of working and doing business.

Intys Data

Intys Data is a company dedicated to guiding customers leverage their digital transformation. We support our clients to reinvent or grow their business by combining data-driven technologies with a lean driven approach.

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<http://www.vadis.com>

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