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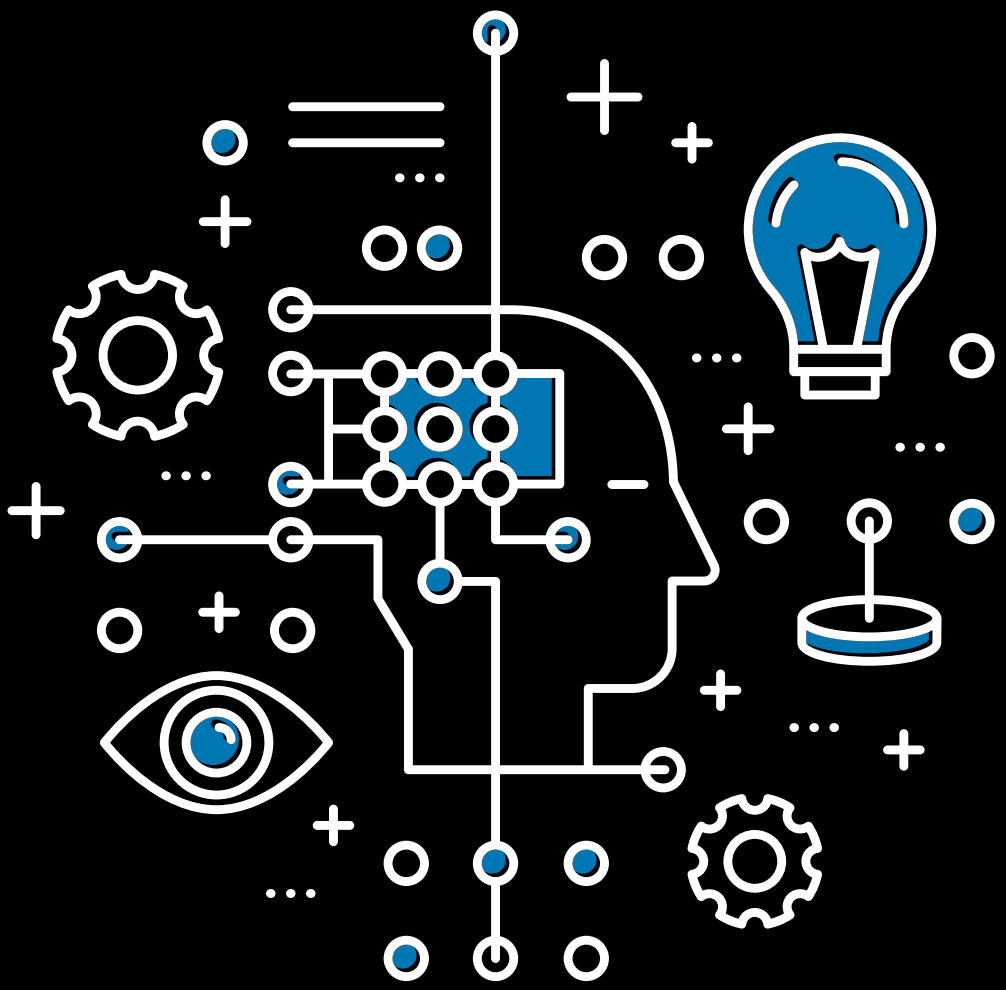
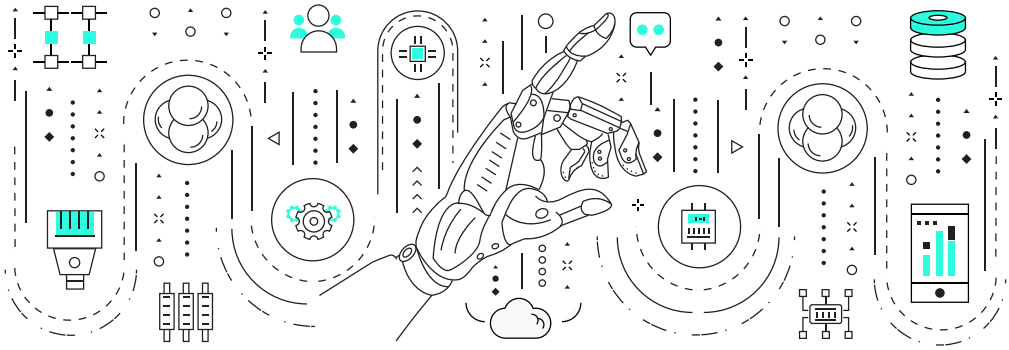


Artificial Intelligence:
Why businesses need to pay attention to artificial intelligence?

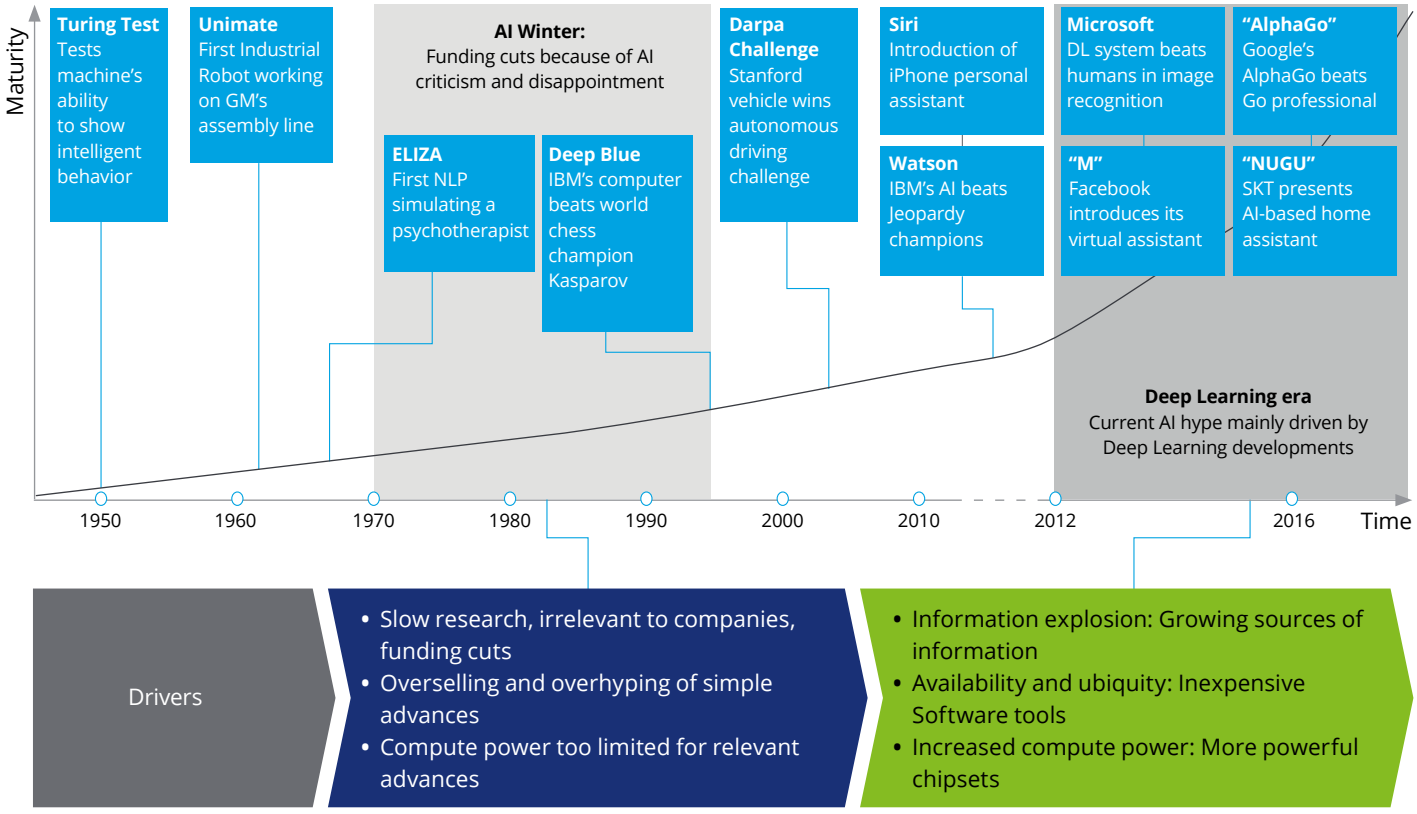
November 2017

Artificial Intelligence: Next "bold play"

Artificial intelligence is defined as "the theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages."



Evolution of Artificial Intelligence



Source: Deloitte Analysis; Secondary sources

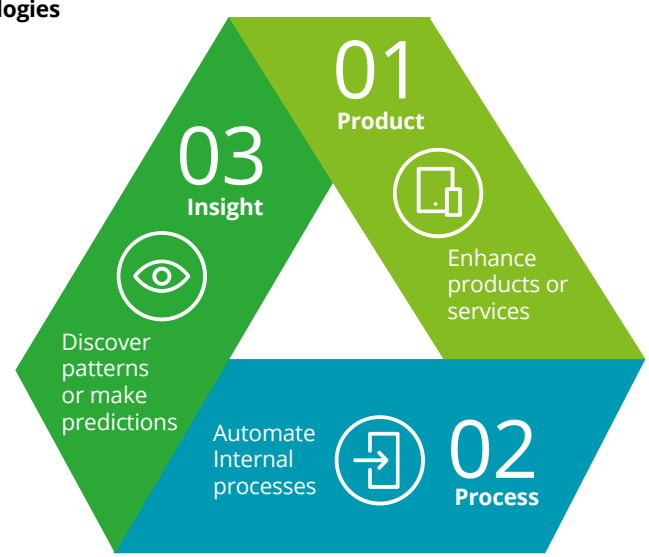
Creating business value with Artificial Intelligence and cognitive technologies

Three main applications are: product, process and insight

Artificial intelligence is the theory and development of computer systems able to perform tasks that normally require human intelligence.

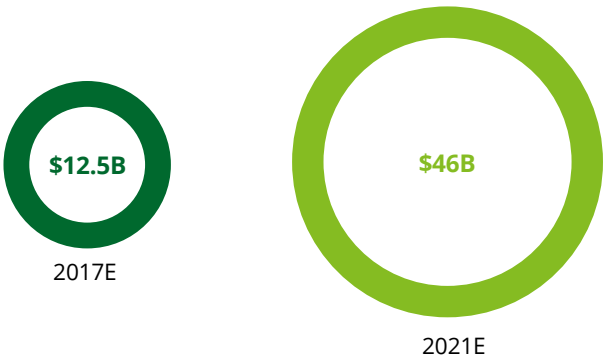
Cognitive technologies are products of the field of artificial intelligence. They are able to perform tasks that only humans used to be able to do (e.g. computer vision, machine learning, natural language processing, and speech Recognition).

Organizations need to thoroughly evaluate costs / benefits of these technologies to clearly articulate the expectations and the impact on the business.



Strong growth projected for "AI systems" spending

A new update to the Worldwide Semiannual Cognitive Artificial Intelligence Systems Spending Guide from International Data Corporation (IDC) forecasts worldwide revenues for cognitive and artificial intelligence (AI) systems will reach $12.5 billion in 2017, an increase of 59.3% over 2016. Global spending on cognitive and AI solutions will continue to see significant corporate investment over the next several years, achieving a compound annual growth rate (CAGR) of 54.4% through 2020 when revenues will be more than $46 billion.



Source: Worldwide Semiannual Cognitive Artificial Intelligence Systems Spending Guide, IDC`

Key Technologies and Methodologies

Below are some of the most important cognitive technologies—those that are seeing wide adoption, making rapid progress, or receiving significant investment

Machine learning refers to ability of computer systems to improve their performance by exposure to data without the need to follow explicitly programmed instructions. At its core, machine learning is the process of automatically discovering patterns in data. Once discovered, the pattern can be used to make predictions.

Natural language processing refers to the ability of computers to work with text the way humans do, for instance, extracting meaning from text or even generating text that is readable, stylistically natural, and grammatically correct.

Speech recognition focuses on automatically and accurately transcribing human speech. The technology has to contend with some of the same challenges as natural language processing, in addition to the difficulties of coping with diverse accents, background noise, distinguishing between homophones, and the need to work at the speed of natural speech.

Computer vision refers to the ability of computers to identify objects, scenes, and activities in images. Machine vision, a related discipline, usually refers to vision applications in industrial automation, where computers recognize objects such as manufactured parts in a highly constrained factory environment.

Robotics Integrating cognitive technologies such as computer vision and automated planning with tiny, high performance sensors, actuators, and cleverly designed hardware, has given rise to a new generation of robots that can work alongside people and flexibly perform many different tasks in unpredictable environments

Organizations across industries of the economy are already using cognitive technologies in diverse business functions. A few use cases are illustrated below, where we try to portray both by technology and sector-wise implications.

Applications of **machine learning** are very broad, with the potential to improve performance in nearly any activity that generates large amounts of data which needs to be analysed and used for predictive models. While a significant effort is being spent in financial services around Fraud, Risk and areas such as KYC and AML, we are also seeing applications in sales forecasting, inventory management, oil and gas exploration, and public health.

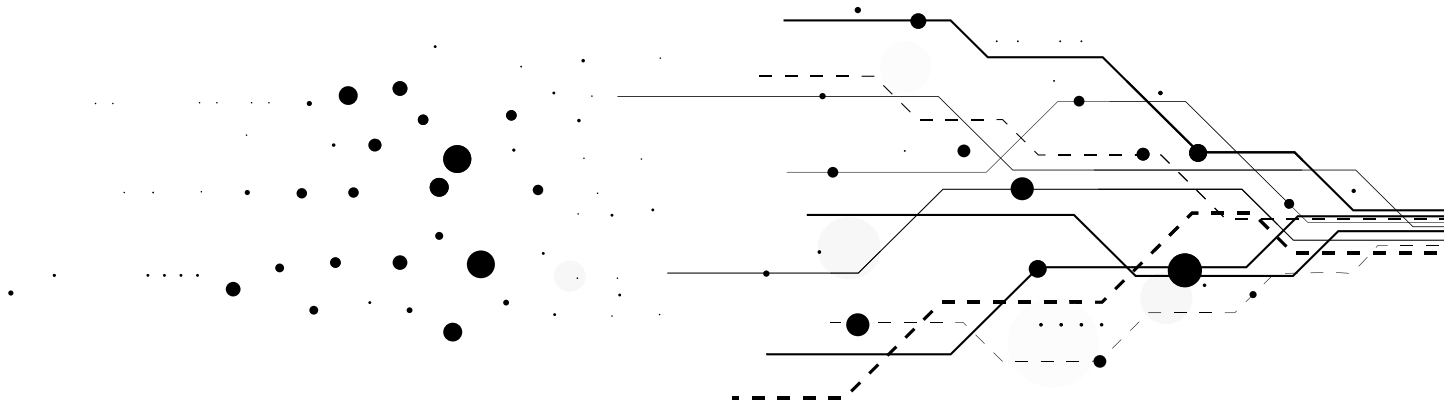
Applications of **natural language processing** often address relative narrow domains such as analysing customer feedback about a particular product or service, automating discovery in civil litigation or government investigations (e-discovery), and automating writing of formulaic stories on topics such as corporate earnings or sports.

Computer vision has diverse applications, including analysing medical images to improve diagnosis, and treatment of diseases; face recognition, used by Facebook to automatically identify people in photographs; in security and surveillance to spot suspects; and in shopping - consumers can now use smartphones to photograph products and be presented with options for purchasing them.

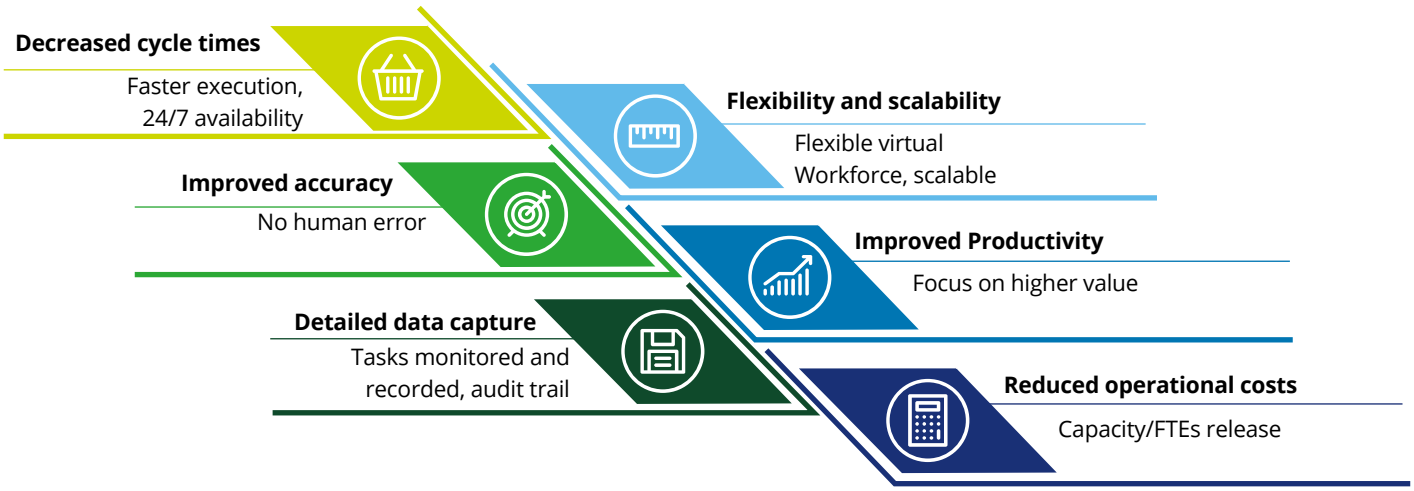
Brief snapshot of some of these cognitive use cases across industries

	Machine Learning	Speech / Voice Recognition	Natural Language Processing	Computer Vision
Financial Services	Automated fraud detection systems - Reduce AML false positives and thereby reduce cost to fast track regulatory processes	To automate customer service telephone interactions	Generating portfolio commentaries using natural language generation	Erie Insurance uses drone fitted cameras and machine vision to assess property damage.
Life Sciences Healthcare	To predict cause-and effect relationships from biological data and the activities of compounds, helping pharmaceuticals companies identify promising drugs	For transcribing notes dictated by physicians is used in around many US hospitals	To enhance the completeness and accuracy of electronic health records by translating free text into standardized data, clinical decision support (CDS) for precision medicine and cancer care e.g. IBM Watson	To automate the analysis of mammograms and other medical images
Telecom Media Technology	To enhance products or create entirely new product categories, such as the Roomba robotic vacuum cleaner or the Nest intelligent thermostat	To automate customer service telephone interactions	Companies are using data analytics and natural language generation technology to automatically draft articles about data focused topics such as corporate earnings or sports game summaries	Facial detection and analytics technology for "emotional analytics" as part of content testing and media planning
Oil & Gas / Natural Resources	Wide range of applications, from locating mineral deposits to diagnosing mechanical problems with drilling equipment	Could use ambient analytics (information gathering in the background via tone of voice) to pick up on stress levels or fatigue of its workforce and respond with interventions to prevent costly mistakes.	Recent advances in search, machine learning, and natural language processing have made it possible to extract structured information from free text, providing a new and largely untapped source of insights for well and reservoir planning	Autonomous fleets deployed in mines /deep sea drilling using robots with image recognition capabilities
Retail	To automatically discover attractive cross-sell offers and effective promotions	To enhance productivity in-store or through business operations, voice recognition technology can drive sales and make a big impact on a retailer's bottom line.	Contextual intelligence from unstructured text and image understanding technologies can analyse huge amounts of crawled data cycles from fashion blogs, articles, and images, and provide tools to detect, track, and forecast fashion fads and also give insights into how the industry is moving	

Source: DU Press; Secondary sources



Key Benefits of Artificial Intelligence



Source: Deloitte Analysis; Secondary sources

Conclusive Remarks

Understanding how to obtain the maximum benefit from Artificial Intelligence and cognitive technologies requires careful analysis of an organization's processes, its data, its talent model, and its market. Use of cognitive technologies is not viable everywhere, nor is it valuable everywhere. In some areas, it will become vital. We think the greatest advantage of cognitive technologies is its potential to create value, going beyond cost optimization. And we believe that for most organizations and most applications, cognitive technologies will restructure work and make it more efficient, perhaps restraining the growth of jobs in certain areas, but creating jobs in newer areas.

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