future tech

Fourth Industrial Revolution
Artificial Intelligence (AI)

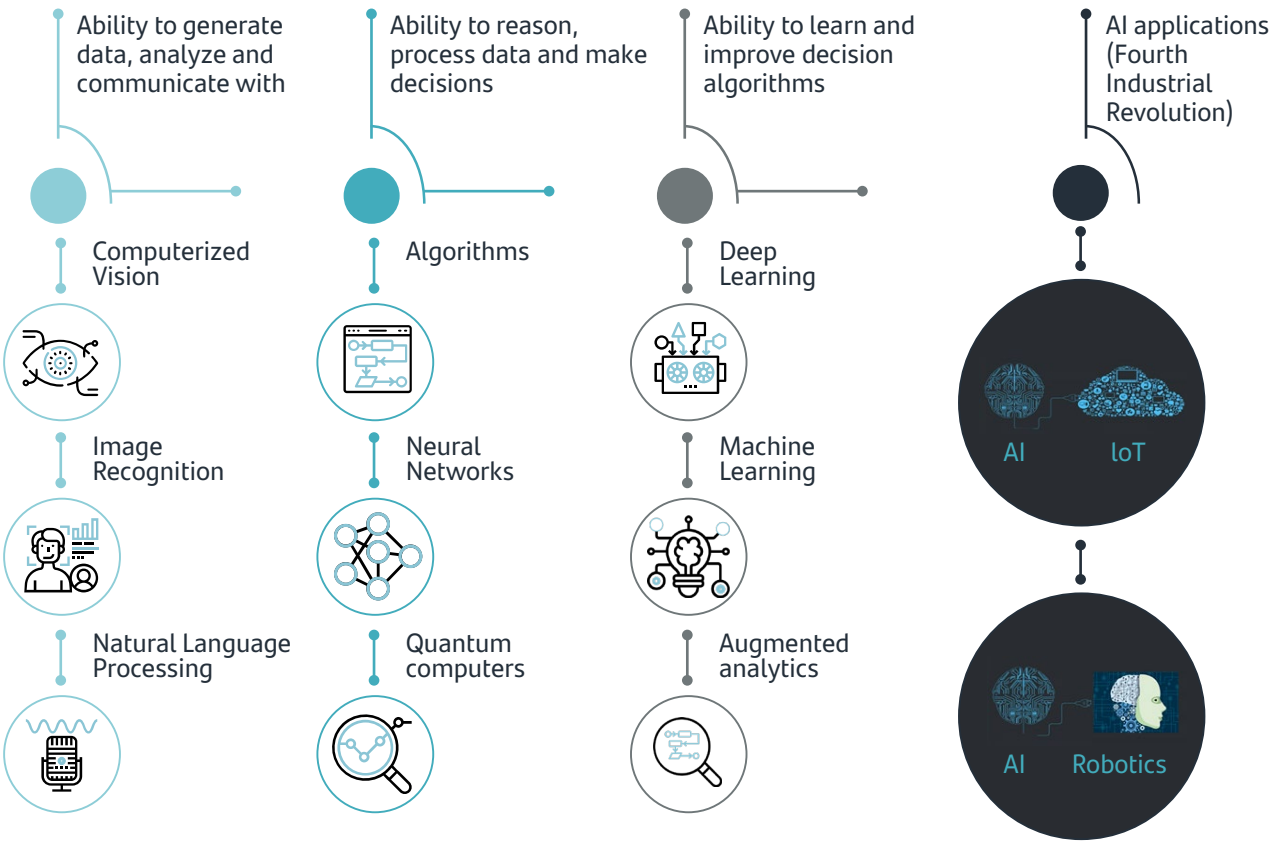
Artificial intelligence is the combination of algorithms that enable computers to imitate the perception, learning, problem-solving and decision-making capabilities of human minds to perform functions that a human being could perform. Some progress has already been made in this area, namely that machines are being trained to see, hear, navigate and even interact in real time. These disruptive technologies cover a wide range of disciplines such as **Machine Learning, Deep Learning, Big Data** and **3D vision**. Progress in all these areas is making artificial intelligence a reality. Companies that can adapt and implement these innovations will capture much of the growth and revenue opportunities in their respective industries.

AI is currently at an early stage known as "**weak AI**," where it is only able to perform a specific task without precise instructions (e.g. Face ID). In the future, more advanced AI will be able to perform intellectual tasks, including broad cognitive reasoning. PWC estimates that AI could contribute up to 15.7 billion dollars to the global economy in 2030 as a result of increased productivity, customization and quality enhancements*.

The opportunities to benefit from AI technologies are in **AI-enabled industries** (the adoption of AI in key vertical business processes), **AI applications** (helping to drive higher levels of automation, faster decision-making, and significant cost savings), and **AI infrastructure** (includes companies in the semiconductor, electronic components, and infrastructure software sectors).

Artificial Intelligence Ecosystem

Source: PwC's Global Artificial Intelligence Study: Exploiting the AI Revolution

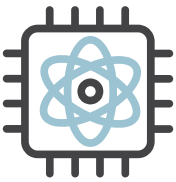


Key Innovations Driving Growth in AI

Deep Learning

Deep learning —a form of **artificial intelligence inspired by the human brain** —is sweeping across every industry around the world. Deep learning is a subset of machine learning in artificial intelligence that has networks capable of unsupervised learning from data that is unstructured or unlabeled. Also known as deep neural learning or deep neural networks. It provides the ability to learn without supervision from unstructured data ("Raw Data") using deep neural networks (individual or multiple layers of algorithms).

Deep learning **is one of the most important software breakthroughs of our time**. Now that software is enabling most industries, deep learning will have a profound impact on cars, robotics, drones, biotech, finance, agriculture, and many others.



Quantum Computing

While standard computers use classical bits, quantum computers us **qubits** or quantum bits. Thus, unlike a conventional computer, where information is stored as binary 0 or 1 using bits, a quantum computer harnesses the unique ability of subatomic participles in the form of a qubit. As a result, **quantum computers can handle very complex operations at speeds exponentially greater** than conventional computers while consuming much less energy.

Quantum computing will have a huge impact in areas such as logistics, medicine design, financial modelling, and digital manufacturing. **The market for quantum computing is projected to reach $65 billion by 2030** from just $507.1 million in 2019, growing at a CAGR of 56.0%**.

Big Data

The digital era **has created an overwhelming amount of information**, with the total amount of data projected to rise to 175 zettabytes by 2025***. This massive amount of data has proven to be immensely valuable to companies. For the first time, businesses are able to integrate disparate data into meaningful sources for AI algorithms to understand behaviors.

Data plays a huge role in **gaining valuable insights about target demographics and customer preferences**. From every interaction with technology, whether active or passive, we are creating new data that can describe us. With data being captured through products, video cameras, credit cards, cell phones, and other touchpoints, our data profile is growing exponentially. **Companies can leverage these insights for product improvements, business strategy, and marketing campaigns to cater to their target customers**.

** Source: Quantum Computing Market Research Report
*** Source: Data Age 2025, by Seagate Technology

Innovators in Artificial Intelligence

NVIDIA Corporation designs, develops, and markets three dimensional (3D) graphics processors and related software. The Company offers products **that provides interactive 3D graphics to the mainstream personal computer market.**

Nvidia´s technology plays a central role in many young, high-growth areas of tech. Central to Nvidia's leadership is the **company's graphics processing unit (GPU),** which powers autonomous vehicles, high-performance gaming, cloud computing and many other areas requiring deep learning.

Microsoft Corporation develops, manufactures, licenses, sells and supports software products.

Microsoft's cloud computing service, **Azure, is home to AI-driven tools for medicine, language, robotics, medical imaging and many other areas.** A 2019 $1 billion investment in Elon Musk-founded **OpenAI** aims to produce the Holy Grail of AI, **artificial general intelligence (AGI) – the technology that can do anything human intelligence can.** If successful, Microsoft will be OpenAI's preferred partner for commercialization.

Google's parent, Alphabet, has a practically existential interest in investing heavily in artificial intelligence. **Google uses AI and deep learning to automate many vital parts of its sprawling software business**: relevant search results, speech recognition, self-driving technology, ad pricing, personal assistant software and much more. In late 2019, Google announced it had achieved "**quantum supremacy**" with its **Sycamore processor**, solving in 200 seconds a computation that would take the world's fastest supercomputer 10,000 years.

Salesforce regularly acquires hot tech startups to improve its software-as-a-service (SaaS) offerings. In 2019, it acquired **Bonobo AI**, a firm using automated analysis of customer phone calls, texts and chats to deliver actionable insights. This fits perfectly with Salesforce **Einstein**, the company's AI-powered software that uses data to identify previously invisible business patterns.

ServiceNow, Inc. provides enterprise information technology (IT) management software.

ServiceNow®Agent Intelligence is a platform function that provides a layer of artificial intelligence (AI) that empowers features and capabilities across ServiceNow applications to provide better work experiences.

According to IDC, the worldwide AI market grew 35.6% to $28.1 billion last year as a result of announcements, initiatives and acquisitions. **IBM** took the lead with a 9.2% share of the overall market****. A world leader in AI for business, **Watson solutions have been implemented across 20 industries** and 80 countries. Additionally, IBM Research is a world leader in the science of AI. In 2018, IBM secured over 1600 AI-related patents.

**** Source: IDC Report: Worlwide Artificial Intelligence Market Shares, 2018

Did you know that?

61
Trllion $

Venture capital for financing AI companies increased by USD 61 billion between 2010 and 2020. Most of this capital has been invested in companies based in the United States or China.

(1) Source: Forbes

5.1
Petaflops

DeepL (the leading AI-based language translation company) operates on a supercomputer in Iceland; it's capable of carrying out 5.1 petaflops (5 100 000 000 000 000 operations per second), meaning it is capable of translating a million words in less than one second

(2) Source: DeepL

1
Trillion

Number of interactions/conversations of Apple users with SIRI per week. The number of iPhone users worldwide already exceeds 1 billion

(3) Source: TechRepublic

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