



DEFINITION

smart machines

By [Mary K. Pratt](#) | [Francesca Sales](#), Site Editor

A smart machine is a device embedded with machine-to-machine ([M2M](#)) and/or cognitive computing technologies such as [artificial intelligence](#) (AI), machine learning or deep learning, all of which it uses to reason, problem-solve, make decisions and even, ultimately, take action.

Smart machines include [robots](#), [self-driving cars](#) and other cognitive computing systems that are designed to work through tasks without human intervention.

Smart machines are [digital disruptors](#) because of the positive and negative impact they have, and will continue to have, on society. In business, the [competitive advantages](#) these technologies are capable of providing are expected to bring higher profit margins and lead to more efficient manufacturing processes. However, smart machines are also expected to displace workers and dramatically change the nature of work and other societal norms.

How smart machines work

Today's smart machines might seem revolutionary, like something out of science fiction, with capabilities on par with the iconic robots of space-age movies, like C-3PO in *Star Wars*.

However, smart machines are the next step in a long history of incremental advancements in machines and computing. Indeed, smart machines could trace their roots back to early mechanization and the first Industrial Revolution, when, in

the 18th century, rudimentary machines were used to automate some human tasks.

The advent of computers in the 20th century laid the modern groundwork for smart machines. Related technological advancements such as the internet, data storage systems and [sensors](#), gave computer developers the ability to collect and analyze an unprecedented volume of data toward the turn of the century, further speeding the rise of smart machines.

Those capabilities led to business intelligence (BI) and [advanced analytics](#), whereby computers run algorithms to analyze data to identify patterns and then use those patterns to generate insights into past and current events and, later, offer insights on what would happen and what could happen if certain future actions were taken.

This analytics capability, in turn, led to machine learning and [deep learning](#), where computers themselves actually *learn* from additional data sets; more to the point, these smart machines use their new knowledge to adapt and adjust their output.

Smart machines draw heavily on other modern technological advancements, too, such as the development of [neural networks](#), voice recognition and [natural language processing](#).

Examples of smart machine technologies

Many smart machines can replace humans in completing a task; [robotic automation](#) in manufacturing facilities, for instance, can and does replace human workers. But some smart machines, such as those used to diagnose diseases and recommend the best treatments, work for humans (i.e., doctors).

One of the earliest visible examples of smart machines was Deep Blue, a chess-playing computer developed by IBM that gained attention when it defeated world chess champion Garry Kasparov in 1996.

[Watson](#), another IBM invention, also gained attention for its game-playing prowess after winning the TV game show *Jeopardy!* in 2011.

Now, though, IBM Watson is also known for its work in the healthcare field, where it

aids in drug discovery, social program management, patient care management and treatment option selection.

The future of the market

Technology research firm Gartner Inc. predicts that smart machines will enter mainstream adoption by 2021. Furthermore, it expects smart machines to be the most disruptive class of technologies over the coming decade. Gartner puts [cognitive computing](#), AI, intelligent automation, machine learning and deep learning under the smart machines umbrella.

Researchers, analysts and technology leaders agree that smart machines will profoundly change how work is done and how value is created. However, there is disagreement on how, exactly, smart machines will impact our lives, our jobs and society as a whole. Some leading thinkers, including theoretical physicist Stephen Hawking, have voiced concerns about whether artificial intelligence is a threat to humanity. While not expressing the same potential for doom, others also worry about what smart machines mean for people, noting that they will displace so many jobs that society, government, industry and individuals will need to rethink various accepted standards from the length of the average workweek to how value (i.e., money) is distributed.

Smart machines will be digital disruptors because of the effects -- both positive and negative -- they will have on society. In business, the competitive advantages these technologies are capable of providing may bring higher profit margins and lead to more efficient manufacturing processes.

This was last updated in October 2017

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