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Talking point

Allow me to present the employee of the month: our esteemed colleague algorithm (Fintech #5)

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The digital revolution is having a beneficial economic effect: new technologies are appearing at a faster rate. Of course, many of these technologies are still in their infancy and in some cases are still in the visionary stage, but they nevertheless hold unforeseen and lucrative potential. The race for digital technologies and appropriate monetisation strategies has been on for some time, especially among the large internet platforms. In the future, however, digital technologies will also find their way into traditional companies where they will gradually evolve into a comparative competitive advantage. This poses a number of advantages and disadvantages, which we urgently need to discuss.

Artificial intelligence, self-learning algorithms and cognitive systems, these digital technologies are already being experimented with to differing degrees in different sectors. Today, we are frequently seeing the limits to human intelligence and processing capacity. One possible scenario is therefore increased support from cognitive and intelligent machines in all areas of life. Experts remain divided as to the consequences of this development: on the one hand, potential economic growth with increasing productivity and efficiency, on the other, concerns about rising unemployment as a result of digitalisation.

We are already using many general purpose technologies in our day-to-day lives
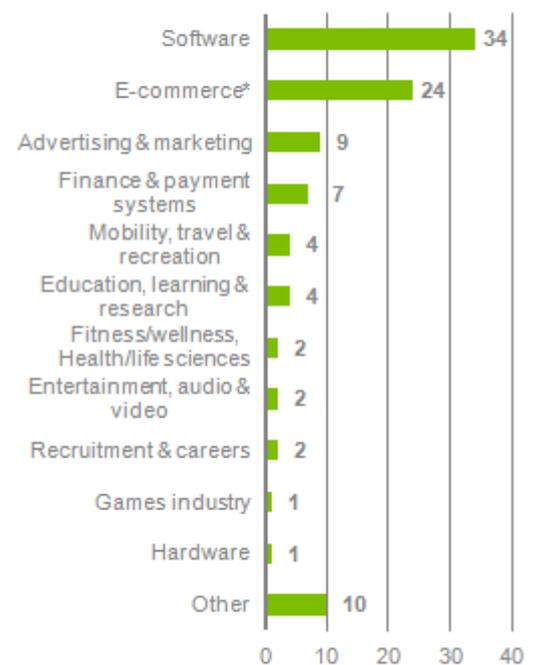
Digital technologies have already reached the mass markets. We now use numerous digital technologies in a multitude of everyday applications, probably without even realising it. For example, when we ask a search engine for advice or use the voice-activated digital assistants from Apple or Google (Siri and Google Now) or activate Amazon's recommendation algorithms to support our purchase choices. The digital revolution is undoubtedly being driven by the ongoing exponential rise in data volumes, the use of microsensors and biometric recognition software, the significant increase in memory capacity and the fact that, true to Moore's Law, processing power is (still) continuing to double at frequent intervals while prices come tumbling down. This is also spurring progress across the Internet of Things (IoT). According to estimates, approximately 50 billion objects will be connected with each other and the internet by 2020. Consequently, billions of dollars of investments and participations are being used to fund the simulation of numerous web technologies worldwide, start-ups are being established and companies are desperately searching for qualified staff.

Artificial intelligence (AI) is driven by self-learning algorithms. The deep learning method represents a milestone here. The intelligent, multi-layer learning algorithm is permanently trained with a vast array of data, ultimately enabling it to filter new findings from combined raw data sources. For example, as more people feed the digital assistant "Siri" with questions, the faster it responds and the better its answers become. Increasingly complex questions also become possible. As a result, personal data, in particular, are now a valuable economic commodity.

Self-learning algorithms: a competitive advantage

Start-ups: Software and e-commerce dominate
%, according to business sector in Germany (n=181)

Sector	%
Software	34
E-commerce*	24
Advertising & marketing	9
Finance & payment systems	7
Mobility, travel & recreation	4
Education, learning & research	4
Fitness/wellness, Health/life sciences	2
Entertainment, audio & video	2
Recruitment & careers	2
Games industry	1
Hardware	1
Other	10

*including recommerce and local commerce

Source: EY (Ernst & Young GmbH)

The professional use of self-learning algorithms will offer a competitive advantage in the future. A better understanding of how to handle real-time data combined with strategic use of the results hold the lure of lucrative profits while, at the same time, increasing customer satisfaction. Furthermore, sources of human error will be reduced, productivity increased and, ultimately, overheads cut. However, it is unlikely that many companies will be fast to implement these technologies. Typical challenges include the machine-readability of data, the associated incompatibility of many IT systems across all business areas and, in general, restructuring away from traditional towards fully automated and digital processes. In addition, new management skills will be needed and the usual silo approach will not work with future innovation processes. The focus will be on the internal integration of human skills and abilities and also IT structures, as well as external networking with partners and technologies via (programming) interfaces. Research-driven start-ups in the information and communications technology sector will increasingly emerge at the interface between academics and business. Not only are the technical requirements right, the financial conditions for such start-ups are also better today. Major investors are making huge sums available for equity funding or are buying entire companies to integrate them into their own value networks. In particular, large internet platforms such as Google, Facebook, Alibaba, Amazon, Apple, but also firms such as IBM and SAP are helping to drive progress in intelligent technologies.

Areas in which artificial intelligence is already being used

Intelligent algorithms can be found in online marketing, the financial sector, logistics, healthcare, sales, and also in the agribusiness and automobile industry and other areas. One classic example in the financial sector is robo-advisors. These may be used to assist financial advisors in their work, or they may operate completely autonomously. Using algorithms, the customer's risk propensity, financial situation and investment needs can be identified with just a few questions so that complex investment strategies with various financial products can then be offered. Another example is the IBM Watson program, which uses an endless number of medical sources and datasets to interpret semantic contexts and provide doctors with diagnostic recommendations. Critics warn, however, that incorrect data records could lead to misdiagnoses. The Internet of Things offers additional progress in development. For example, the interconnected and digital agribusiness promises efficiency gains and declining costs within entire value networks. GPS-controlled farm machinery, field robots, real-time weather information combined with agricultural spatial and soil analyses and even the use of drones are increasingly part of day-to-day life on high-tech farms. What is more, by collecting the data produced along the interconnected elements, continuous optimisation is possible. Although advancing automation is nothing new, its pace is accelerating as a result of the economic forces behind digitisation.

Limits to algorithms

Thus, while technological progress will bring increased demand for qualified personnel, it will also render some existing jobs redundant. If intelligent machines perform the same tasks as people, but do so more efficiently, quickly and cheaply, decision-makers will substitute jobs for capital. Some experts claim that automation and digitisation will result in more jobs being lost than new jobs being created. Others maintain that technological progress will create new, flexible areas of work that hardly anyone can conceive of today. In terms of network effects and economies of scale, intelligent technologies hold enormous development potential. Intelligent machines will certainly not replace humans entirely, rather they will support us in many areas and help us to increase productivity. For instance, our "colleague" the algorithm is not able to question itself or use self-reflection to adapt its own processes where necessary. Human skills and experience will still be needed here and in many other situations. Nor will we be able to simply let the figures to speak for themselves and then derive automated recommendations on the basis of this. In some cases where there is a strong mathematical correlation, we will still have to query the relationships as, ultimately, they may be devoid of meaning.

We now have the opportunity to positively influence technological development by taking deliberate steps to create an adequate framework. Above all, this will be about ensuring that those who may potentially lose out in the competition between man versus technology are prepared for tomorrow's digital working environment. Considerable potential can also be unleashed by promoting Germany's attractiveness as a location for international specialists and executives, but also by integrating the migrant population into the labour market and the high-quality educational system. As digitalisation will create new industries and areas of work, initial, continued and advanced training will play a key role. STEM subjects will also become increasingly relevant and, with them, the need to secure qualified staff and researchers, while simultaneously stepping up cooperation between science and business. In this context, start-ups perform an important economic task. They create jobs and take on entrepreneurial risk, contributing to a country's capacity for innovation and competitiveness.

Simplifying the regulatory framework, offering comprehensive advice for start-ups, providing regional networks and greater access to risk capital are further steps that will undoubtedly promote innovation.

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Fintech #3
Fintech #2
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What is blockchain technologyall about?

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Authors:
Thomas F. Dapp (+49) 69 910-31752
Marius Nagel

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