

ARTIFICIAL INTELLIGENCE:
PERSPECTIVES FOR THE FINANCIAL INDUSTRY

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Artificial Intelligence (AI) will be one of the key technologies driving the future competitiveness of numerous industries. However, the term “AI” is defined in a variety of ways. AI could be understood as an umbrella term for technologies and systems that carry out tasks otherwise only executable with human intelligence. This requires specific skills that fall into the broad categories of “Sense”, “Comprehend”, “Act” and “Learn”. Through machine learning, modern AI systems can be trained to adapt to changes in their environment, self-optimize and hence achieve better results than earlier versions of AI systems that were based on clearly defined, pre-programmed rules. Based on AI methods, rational and autonomous agents can be developed that collect and analyse relevant information from their environments, come to optimal conclusions based on certain performance parameters and eventually perform physical actions (e.g. robotics) or virtual actions (e.g. chat bots). Machine learning algorithms ensure that the information base of the system is continuously updated so that performance of the system is optimized in an iterative process.

A broad range of applications

AI methods and technologies are already being used in a wide variety of products and digital services, such as navigation systems, digital cameras, drones, and robots. Industrial robotic systems have already been used for many years, especially in the automotive, process and service industries. Highly automated, yet relatively inflexible manufacturing systems are increasingly being replaced with intelligent, decentralised, self-optimising manufacturing systems. The “Smart Factory” is a substantial element of Industry 4.0. Service robots are taking on assistive functions in the household (vacuum cleaner, lawn mower) or in medical care. AI can be applied in home appliances with internet connectivity (“Smart Home”), intelligent traffic control (“Smart Mobility”), or in energy supply (“Smart Grid”). Further areas of application for AI include search engines, speech recognition systems, digital assistants or cyber security. Humanoid robots that emulate the human structure of head, torso and limbs are particularly fascinating examples of AI. The humanoid robot ASIMO (Advanced Step in Innovative Mobility), developed by Honda, is currently one of the most advanced humanoid robots in the world.

Artificial Intelligence in the financial sector

The financial sector will also be significantly affected by advances in AI as financial products and business processes are increasingly digitised. A look at the banking sector reveals that potentially all parts of the value chain could be substantially optimised, if not revolutionised, by introducing AI. This is valid for Customer Relationship Management (CRM), for example, where “predictive analytics” can lead to a deeper understanding about a bank’s customer base, thereby gaining valuable insights for marketing strategies, product development or pricing. In central functions such as risk management and compliance, AI can be deployed to fight money laundering, fraud and regulatory breaches. Furthermore, asset management can benefit from the use of AI by developing smart trading strategies. However, the use of AI in the financial sector is still in its infancy, not only for banks and the asset-management industry, but also for the insurance sector and stock exchanges. Besides, there is still a lack of young financial technology firms (“FinTechs”) in the German startup ecosystems that are developing or using AI technologies.

From a macroprudential perspective, AI technologies may contribute to global financial stability by improving early warning systems for detecting potential systemic risk. A further aspect that will become increasingly important in coming years consists of the potential interdependencies between AI and the Blockchain technology, e.g. the combination of both technologies makes innovative, real-time payment and settlement systems possible. Hence, usage-dependent pricing models could be implemented along the supply chain. However, the introduction of AI in the financial sector will create new challenges in areas of data and investor protection.

Policy implications

The German federal government has decided to invest three billion Euros by 2025 to support research and development in AI, as a leading position in AI technologies is decisive for the future competitiveness of the German economy. Although research on AI at German universities and research institutions belongs to the best in the world, e.g. in the field of cyber security, robotics or connected cars, there is a substantial need to accelerate the time-to-market for AI-based products and services. The transformation of fundamental research on AI into commercial enterprises is a field where economic

policy can be an important catalyst by providing regulatory framework, IT infrastructure and financial support. The lack of venture capital in Germany is still a limiting factor for innovative technology startups in our country. AI has not only the potential to disrupt economic structures such as the labour market, but may also trigger far reaching consequences for our society. Therefore, an interdisciplinary approach integrating multiple disciplines and perspectives is needed to deal with chances and risks of AI in a broader context.