



Artificial Intelligence and Law

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If you book a flight via a travel portal, you will quickly find that prices change - depending on when you book. Simple variable pricing, depending on how far in advance you book, is certainly common. But fluctuations within hours and minutes are a new development. This dynamic pricing is based on comprehensive observation and evaluation of competitors' market prices. Is it worthwhile for the provider to enter into particularly low prices or does he prefer to sell fewer trips but at better margins? The result is based on many individual decisions made by algorithms. Until now, people defined the decision criteria for the algorithms, but now increasingly the machines themselves - with artificial intelligence.

So what is artificial intelligence?

Artificial intelligence is a highly developed electronic systematics, which is no longer defined and programmed by human beings, but which gains and develops its own knowledge from collected information and patterns (Deep Learning). It uses extensive electronic networking structures for this purpose. An AI system is self-learning and makes independent decisions based on self-developed algorithms.

From a technical point of view, artificial intelligence (AI) is a branch of computer science. It deals with the automation of intelligent behaviour and so-called machine learning. As is often the case with new developments, the concept and content of the definition cannot be clearly defined. It is already unclear what exactly is to be understood by "intelligence". In any

case, artificial intelligence is regarded as one of the decisive driving forces of the digital revolution. The term is not new; research on artificial intelligence began in the 1980s. However, computer performance was far too weak at the time to achieve any significant results. Today, on the other hand, processors and computers are exorbitantly more powerful: a supercomputer performs more computing operations than all PCs in Germany, and components for the application of AI are already installed in smartphones. This means that practical and affordable results can already be achieved today. Technically, an AI process involves billions comparisons of existing data with new data in grouped circuits, the results of which are again compared in many test steps. Thus the system with AI recognizes a cat picture as cat and not as dog - or in the picture of a skin part a certain skin disease.

Today, experts differentiate between two dimensions of artificial intelligence: the weak artificial intelligence is an advanced tool of man, the strong AI develops a not really predictable life of its own with a neuronal functionality similar to the human brain, but presumably with a different cognitive structure - and without consciousness, essence and feelings. All this is only simulated, like in chatbots.

Applications and Markets

In the meantime, there are numerous application areas for AI in almost all industries. It starts with Data Mining and the analytical evaluation of large amounts



of data, Big Data. This is the basis for target group-oriented marketing, especially in social media and e-commerce. It is not without reason that the internet companies Google, Amazon, Facebook, but also Uber, are the largest investors in the development of AI.

KI understands and masters languages, no longer just as a translation database, but with semantic understanding. It therefore delivers machine translations into foreign languages and reacts and communicates as voice-controlled assistants (Alexa, Siri) and communicates with users as social bots.

Intelligent systems can also be found in stock trading and in electronic investment consulting, the Robo Advisory for securities investments.

Machines also automatically design and generate contracts in the mass business, Smart Contracts, and could document these without a notary with the Blockchain technology counterfeit-proof. Systems such as eBay are already replacing state court proceedings in eCommerce by carrying out an electronic conciliation procedure for defect claims - as so-called softlaw.

In medicine, AI enables the evaluation of complex laboratory data. Diagnostic software with AI now often recognizes clinical pictures more accurately than a doctor, for example from the image of the iris or appearances on the skin. The same applies to animal diseases and plant diseases, also as disease control.

In the Smart Home, systems with AI take over the intelligent building control: energy, climate, ventilation, lighting and sun protection, supply with media, survey and access control.

On a larger scale, AI also supports energy supply and consumption in the Smart City, but also mobility and traffic control in the private sector and public transport, waste disposal, emergency systems, e-government and more.

Last but not least, AI enables autonomous driving through intelligent and interconnected vehicles that are not only able to find their way, but also to react appropriately to traffic situations in order to avoid accidents, damage and injuries.

On a large scale, AI applications can of course also be found in manufacturing: in the networked production under Industry 4.0, the machines and systems not only work through predefined tasks, but also communicate and react continuously to changes in their digital community - across operations, companies and national borders. The monitoring and optimization of processes is the goal, right up to early detection and automatic supply of requirements, for example through predictive maintenance or distance production with additive manufacturing.

And last but not least, military warfare in cyberwar scenarios and in autonomous wafer systems is also being upgraded with AI: moving and flying weapon systems are developing into autonomous units that can act in battle without human intervention.

All in all, it becomes clear to what extent AI, as a cross-sectional technology, can bring about technological, operational, economic and social changes. This is why the race for AI developments is in full swing not only in the economy, but also between states in order to achieve strategic and geopolitical advantages. The USA and China are the most important players, while Europe and Germany are far behind - albeit with special competence in industrial applications.

AI in state and society

Developments in artificial intelligence are not only about technical or economic goals, but also about ethical, social and legal aspects. What rank do we want to give to AI-controlled systems, and how do we secure our social order and our legal system in interaction with non-human actors? In recent years, a number of activities have emerged in Germany and Europe to this end, including robotics and autonomous driving. The Ethics Commission has submitted guidelines for autonomous driving and conflict cases to the Federal Government. Associations such as Bitkom are intensively involved in the discussion on issues of economic significance, social challenges and human responsibility. The Federal Government is currently pursuing the goal of massively promoting this area with its AI initiative. And the work of the Europeans Commission's High-Level Expert Group on



Artificial Intelligence on its "Ethic Guidelines for a trustworthy AI" is currently underway.

Artificial intelligence in the legal framework

The use of artificial intelligence poses new challenges to the legal system. This is not just because systems are faster and more powerful than previously known systems and technically seen by the individual - but because they are able to make decisions instead of humans and without immediate predictability and human control.

Contracts

First of all, the question of legally secure contracts comes to the fore. If machines or systems are to trigger rights and obligations between the parties involved through their data transmission, it must also be possible to create a binding legal basis without a human declaration of intent. In addition, jurisprudence now attributes such "machine declarations" to the owners of the machines and systems as an offer and acceptance, because they move within the decision-making channels set by their owners. However, they are not referred to as representatives, but as machine agents. It is questionable whether this view can also be applied when machines no longer make their decisions only functionally but also intellectually autonomously.

After all, in conventional systems the algorithms are laid out and the criteria for decision-making are determined - in the AI, however, the system develops its own decision criteria, without any preliminary planning by the owner. Strictly speaking, the action of the system is no longer covered by its will, perhaps not even by its general idea of acting and the results of the system. Nevertheless, his business partner should probably be able to rely on the binding nature of the system's behaviour, for example according to the principle of toleration power of attorney or prima facie power of attorney, in which the represented person has to allow himself to be attributed the declarations of his representative, who is unauthorized in individual cases.

Liability

If damage or injury occurs, the question of liability arises. In contractual liability for the provision of a defect-free service, hardly any new aspects arise: The contractual partner is the owner for whom the system has established the contract, and the latter is liable for performance and freedom from defects. He will hardly be able to invoke the fact that his system did not work properly or in its sense in the event of service disruptions such as delay, non-fulfilment, defects or violation of non-obligations. System errors can probably not be regarded as a case of force majeure any more than a failure of the IT system today. Also the use of AI in quality control and in the execution of commercial inspection and complaint obligations should not differ in principle from conventional systems.

Another consideration applies to cases in which AI-controlled machines and systems, but also vehicles, cause damage or loss of rights during autonomous driving, to third parties or to contractual partners, which are not covered by a contractual liability. To this end, our legal system distinguishes between fault-based liability (due to intent or negligence) and strict liability (e.g. product liability of the manufacturer, liability of the vehicle owner and liability of the property owner). In this area, jurisprudence discusses who exactly is to be seen as responsible: Whose decision and behaviour is relevant for the assessment of fault? Who should be the liable party for the machines and systems used, for example the owner, the holder, the operator or the supplier of the system? As a result, a liability principle would probably make sense in which the person who actually controls the use of the system is liable, recourse against internal responsibilities not excluded. The extent to which the responsible party can cover risks by means of business and product liability insurance depends on the individual case. It is also under discussion whether AI systems should not be liable for themselves.

Data protection

In principle, data protection raises the same questions as before: personal data may not be processed without further ado, whereas anonymised or pseudonymised data without allocation to persons may. However, a new situation may arise if AI-supported sys-



tems from the aggregation of anonymous data can then assign data to individuals with sufficient certainty. Then machine data becomes personal data again and they are subject to data protection.

Intellectual property

The protection of intellectual property can also play an important role in the use of AI:

The AI itself is an intelligent system that suggests copyright protection. However, in most cases it does not have the quality of a work creation as it does with software. As a rule, AI systems do not constitute a database under copyright protection. Like software, AI as such is not patentable as a technical invention unless it is embodied in a technical product. Whether the AI is protected as a trade secret with its original and then self-developed processes and specifications depends again on its concrete use and, recently, according to European law on trade secrets, on whether it is the subject of concrete protective measures.

A second question is whether the results obtained by AI constitute protectable intellectual property. These can be analysis results, but also other "creative" works such as music, texts, images or software. Machine analyses with AI do not fall under copyright protection. And in the case of creative works it is already recognised today that the creator (composer, author, photographer, software developer) may also use sophisticated instruments - as long as he contributes an important part and has the decision-making power over the design of his work, the result can be protected by copyright. If, however, a system generates a result without human input alone, the work cannot be protected under the existing copyright law.

Whether an intellectual property right should also exist in the future for creations by machines will certainly be the subject of fundamental legal policy discussion. Just like the AI system itself, however, the results achieved by AI can also be protected as trade secrets, a protection that does not apply if the results are published. Possibly the accessible results can then be used in reverse engineering with AIs to develop the structures of other AIs.

Competition law

With its powerful potential, artificial intelligence is capable of fundamentally changing markets and competition. In the interest of a functioning competition system, current competition law therefore concentrates on the control of processes in which market power does not arise through performance but through mergers of companies. Whether or not new market power arises is first assessed by merger control on the basis of the size of the small businesses. It aims at processes in which already powerful companies strategically buy up new start-ups with potential, such as Google did with Deep Mind (developer of the AI for the game GO). This would enable the Cartel Office to limit the concentration of AIs in the hands of powerful and financially strong players and thus their strengthening of market power.

If market power already exists, the company must not abuse it and, for example, discriminate against other market participants or bind them unjustifiably. AI can, however, help to create highly intelligent mechanisms which, due to their massive information advantage (information asymmetry), result in competitors, customers or suppliers making less favourable arrangements than with a balanced information situation.

Ultimately, AI is also used in systems for market observation and pricing. Already today, algorithms without AI control pricing on the basis of information on demand, interests (e.g. on search engines), social data (place of residence, mobile phone model, buying behaviour), times of day and others (dynamic pricing). With KI, the systems are even more powerful. Therefore, the control of the abuse of market power also applies here. However, as soon as the systems follow and react to the prices of competitors, they can constitute an inadmissible exchange of information in the sense of a price cartel. The legal problem now lies in the allocation of the action to persons - the actual reaction to the exchange of information is not a human being, but an autonomous system that has even given itself its own rules for reacting to price changes when using AIs. Therefore, the Monopolies Commission rightly proposes to treat the implementation of an algorithm based price system in advance as a restrictive and inadmissible exchange of information. This idea



should also take effect if systems with AI are strengthened.

Management liability

In corporate management, the question of management liability arises as to whether and to what extent management and the Executive Board are responsible for the behavior of the systems they use, including those with artificial intelligence. In principle, it is their duty to use only those instruments that are technologically secure and do not cause any legal infringements. If these systems operate autonomously and their decision-making mechanisms cannot be reconstructed, the responsibility of the company's executive bodies in the event of infringements and damages remains the same. Conversely, the question arises as to the extent to which the management and executive board can rely on AI in their decision-making in corporate matters and, above all, can rely on it (business judgement rule). AI is certainly advantageous as an auxiliary instrument, but management must not transfer decision-making to technology alone and thus cannot shift its responsibility for the company onto it.

Structural classification

In addition, there are many legal discussions on the structural classification of AIs: Does a Generator for contract texts provide a legal service? Are Robo Advisory Platforms subject to financial supervision? May soft law, supported by AI, take the place of state courts? May the public administration have its discretionary decisions made by AIs?

Legal personality

In view of the far-reaching functional autonomy of AI systems, a discussion has arisen on the question of a legal personality of robots and AI systems and thus whether they should be given legal capacity as legal persons. Currently robots are treated as objects, there is no legal classification for immaterial systems, even for simple machine data our law knows no classification, for example in the sense of data ownership. With regard to the decision-making autonomy of AI systems in terms of content, there are voices in favour of

an "electronic person" (ePerson). Such a figure is not inconceivable, for example in analogy to foundations as an ownerless and holder-less legal person. The responsibility would then lie solely with the robot or the system. Misconduct can then be sanctioned by switching off the system and imposing financial fines. As an intelligent system, AI should even avoid misconduct if it learns from sanctions. The demand for an AI system liability fund for damages quickly leads to the question of the appropriate and necessary amount of funds. Compulsory insurances and other security systems with solid guarantees are more suitable for this purpose. Legally an encapsulation of the liability is not necessary, the liability for an AI system can be isolated also over corporations such as GmbH, AG and foundation. However, a far-reaching decoupling of damage and liability does not seem desirable from the point of view of prevention.

AI and ethics

Many of the legal issues raised by AI on new issues can only be considered from an ethical perspective: May there be an identification of people in mass proceedings, e.g. by facial recognition, without their consent? Does the human being have to be able to recognize them in dialogue with AI? Do unknown social bots violate fundamental rights and human dignity in dialogue with humans? How must the system decide in the dilemma between alternative impending damages? May autonomous systems, in particular medical diagnoses, autonomous vehicles and autonomous weapons systems, decide the lives of humans? Ultimately, it is a question of whether machines may only use their functionally similar or even superior capabilities in the service of human beings, or whether they may be given a status legally comparable to that of human beings. This discussion will accompany us in the coming years.



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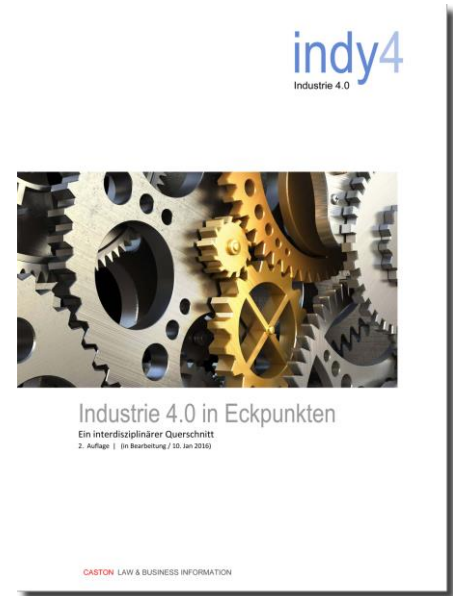
Industrie 4.0 in Eckpunkten

Ein interdisziplinärer Querschnitt

Jedes Unternehmen muss sich mit den Herausforderungen von Industrie 4.0 auseinandersetzen.

Mit der aufkommenden Bedeutung von Industrie 4.0 hat sich in Niedersachsen die **Expertengruppe Indy4** aus verschiedenen Fachbereichen und mit unterschiedlichem Hintergrund gebildet: Forschungsinstitute, Hochschulen und Berater, die Industrie 4.0 interdisziplinär im Querschnitt beleuchten. Die Erkenntnisse sollen zum einen Arbeiten in Forschung und Entwicklung anregen, zum anderen aber ganz praktische Fragestellungen in den Unternehmen identifizieren und dazu Lösungen erarbeiten.

Aus der interdisziplinären Betrachtung zeigt sich, dass Industrie 4.0 nicht nur ein technologisches Phänomen ist, sondern um den technischen Kern herum in einer mehrdimensionalen Umgebung aus Management, Finanzen, Personalentwicklung, Marketing und Kundenbeziehungen und Recht stattfindet. Der Grundsatz von den Chancen und Risiken einer neuen Technologie gilt also auch und besonders für Industrie 4.0. Die Entwicklungen spielen sich dabei auf der operativen und auf der strategischen Ebene ab.



Industrie 4.0 im Rechtsrahmen

Recht für die digitale Unternehmenspraxis

Industrie 4.0 ist für die meisten Unternehmen nicht mehr nur ein Schlagwort, sondern als Weg in die Digitalisierung von Produktion und Geschäftsprozessen bereits Realität.

Bei der Umsetzung der technologischen Entwicklungen entstehen allerdings zahlreiche neue rechtliche Fragen, die ein Unternehmen geklärt haben muss, um seine Ziele störungsfrei und sicher verfolgen zu können. Im Vordergrund steht die Sicherheit von Prozessen und Produkten - von größter Bedeutung ist aber auch der Umgang mit eigenen und fremden Daten und die Rechte daran. Je mehr sich ein Unternehmen digitalisiert, umso stärker verlagern sich seine Werte in diesem Bereich.

Der neue Report „Industrie 4.0 im Rechtsrahmen“ beschreibt in den verschiedenen Feldern, welche rechtlichen Rahmenbedingungen die Unternehmensprozesse steuern:

