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## **Artificial Intelligence as Disruption Factor in the Civil Law: Impact of the use of Artificial Intelligence in Liability, Contracting, Competition Law and Consumer Protection with Particular Reference to the German and Indonesian Legal Situation**

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### **Abstract**

The Article describes the impact of artificial intelligence in different areas of the civil law, namely tort law, contract law, antitrust law and consumer protection law. It shows that the use of artificial intelligence already leads to legal constellations, which cannot longer easily subsumed under elementary terms of the civil law and therefore cause a real disruption in the civil law. Terms, which are based on a freedom concept of the subjective rights of the actors, such as private autonomy and contractual will not fit anymore to the activity of artificial intelligence systems the more those systems are able to act independant of human actors. Similar applies to terms which are referring to the freedom of decision like the market behaviour in the competition law. The article discusses several solution approaches, such as personification approaches, agent-principal approaches and the definition of new categories of market and contractual acting. In the consumer protection the special focus in the future legal development will be on the problem how to achieve adequate, though not overflowing, transparency for consumers, especially regarding the combination of big data and algorithms.

**Keywords:** Artificial Intelligence; Electronic Person; Legal Subject; Contractual Freedom; Consumer Protection; Algorithmic Pricing.

### **Introduction**

Artificial Intelligence (AI) is a disruptive technology not only in the sense of the economic term but also for the legal science. More and more AI systems are integrated in various areas of the economy, society and private lifes of the citizens. We find them in autonomous driving systems, in targeting systems of military weapons such as drones, in upload filters of social media to prevent copyright infringements or hate speech, in procurement programs or in stock trading systems.

In this article, which is mainly using references to the German legal discussion it will not be discussed the philosophical question of ethic and/or moral of AI and options of a protectability of AI robots or programs analoge to human rights, nor the constitutional law question, whether citizens may be subject to final decisions of AI, for example in criminal procedures or administrative situations. I already discussed some of these aspects in another article.<sup>1</sup> The theses in this study are based on the view developed in this already published article, especially on its main statement, that intelligent technology in the light of the fundamental principle of human dignity should not replace human freedom and the submission of the individual to human 'imperfection'. A German autor, *Maximilian Becker*, rightly pointed out this aspect related to the discussion about AI upload filters and copyright with the loss of the freedom to unlawful behaviour ("*Von der Freiheit, rechtswidrig handeln zu können*"), talking of the danger, that human behaviour may have to adapt to technical requirements.<sup>2</sup>

### **Exemplary Aspects of Legal Problems Related to the Use of AI**

I would like to start by underlining three specific aspects of the use of AI and then discuss possible solutions for them. Those aspects are (1) liability for damages in tort law, (2) self determined contracting by AI systems and finally (3) competition harming use of AI-programs by companies. Partially these aspects are interconnected with each other. For example the definition of 'technical intent' in the contract law may influence also the definition of 'behavior' in the competition law. The liability for damages in the tort law is relevant also for certain aspects of the antitrust law.

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<sup>1</sup> Stefan Koos, 'Artificial Intelligence – Science Fiction and Legal Reality' (2018) 6 *Malaysian Journal of Syariah and Law*. [23ff].

<sup>2</sup> Maximilian Becker, 'Von Der Freiheit, Rechtswidrig Handeln Zu Können – "Upload-Filter" Und Technische Rechtsdurchsetzung' [2019] *Zeitschrift für Urheber- und Medienrecht*. [636].; H.P. Schwintowski, 'Wird Recht Durch Robotik Und Künstliche Intelligenz Überflüssig?' [2018] *Neue Juristische Online-Zeitschrift*. [1603]. points out a rather optimistic aspect of a deletion of the "dark side of the human" which would lead to a change of legal systems conceptionally based on the purpose to solve human conflicts.

### **Liability for Damages Caused by AI**

AI in autonomous driving systems, autopilots or other comparable systems can cause damages based on autonomous decisions of the program without influence or even influencibility by the user of the system. In the example of the autonomous driving it is obvious, that especially the interaction of machine decisions with flexible behavior of human drivers may lead to situations in which the AI may react logically but not act flexible enough. Art. 1 of the German Road Traffic Regulation (StVO) stipulates: "...Use of the road requires constant care and mutual respect".

Already this provision shows the relevant conflict: recently AI is not able to 'care' and, less, to 'respect'. Accepting full autonomous driving in the traffic with an asymmetric relation between the duties of human traffic participants and automatized traffic participants would mean a misdistribution of risks if there is nor a good reason for it, nor a social compensation for risks due to this asymmetry. Also the 2016 addition to the Vienna Convention on Road Traffic of 1968,<sup>3</sup> which is transferred to national law by Germany,<sup>4</sup> but not by Indonesia<sup>5</sup> (whose specific traffic situation in the cities in fact bears many risks arising from a combination of autonomous driving and individual driving) stipulates, that the driver has at any time to be in full control of the vehicle and is responsible for the behavior of the vehicle in the traffic. Even if it may be discussed, how to interpret the terms of 'control' and 'driver', we can imagine that it may be difficult to sue a user of a car with integrated AI the more independent of the driver the computer systems of the car are and the more complicated their functions are. Moreover, customers of modern cars in the future may not have the choice anymore, whether they want to buy a car including those systems, therefore the risk distribution to the driver may be more and more

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<sup>3</sup> UNECE, 'No Title' (UNECE, 2014) <<https://www.unece.org/fileadmin/DAM/trans/doc/2014/wp1/ECE-TRANS-WP1-145e.pdf>> accessed 16 April 2020.

<sup>4</sup> See the overview in Jenny Gesley, 'Germany', *Regulation of Artificial Intelligence in Selected Jurisdictions, The Law Library of Congress* (2019).

<sup>5</sup> Kelly Buchanan, 'Indonesia', *Regulation of Artificial Intelligence in Selected Jurisdictions, The Law Library of Congress* (2019).

questionable. Specific risks may be minimized once the participation of human drivers in the traffic is deleted in favour of a fully automatized and coordinated traffic system. However, this still lies in far future.

Which options the private law can offer to handle the damage risk? A pragmatic way, which can be already followed in many legal systems is the strict or objective liability which allows to sue the registered user of a car or the driver without personal guilt in the damage situation. This can be the case i.e. with cars,<sup>6</sup> airplanes,<sup>7</sup> industrial facilities,<sup>8</sup> products<sup>9</sup> or animals.<sup>10</sup> AI is a potentially dangerous system or a risk raising part system in potentially dangerous systems for example if it is an integrated part of a car or an aircraft. Here we find now a question of *risk distribution* between user, victim and society. It has to be decided whether the *specific risk of damages arising of the use of the system* should be on the society, which accepts or even supports the integration of AI in vehicles or on the user of the AI or the AI integrating system who has the personal advantage of the use of the system. Given, that the user is able to insure the specific risk of damages by means of special traffic insurances there is recently no reason for imposing the social risk of the use of AI to the society. This may change as soon as the use of AI systems in individual vehicles would stop to be a mere option and as soon it gets obligatory. In this case it should be considered whether the implementation of AI substituting human drivers lies within the scope of the public interest and therefore the risk distribution would have to be reshifted. As in the German Traffic Act exists a legal rule for a strict liability of the registered user of a motor vehicle, damages caused by vehicle integrated AI-systems would already *de lege lata* be covered by this rule. Same happens to aircrafts, nuclear facilities and processing of personal related data by public processors. A liability privilege for the registered user could be only take

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<sup>6</sup> In Germany Section 7 Paragraph 1 of the Road Traffic Act 'StVG'.

<sup>7</sup> In Germany Section 33 of the Air Traffic Act 'LuftVG'.

<sup>8</sup> In Germany Section 1 of the Environmental Liability Act 'UmwHG'.

<sup>9</sup> In Germany Section 1 of the Product Liability Act 'ProdHaftG'.

<sup>10</sup> In Germany Section 833 of the Civil Code 'BGB'.

place if the damage was caused by *force majeure* (“*höhere Gewalt*”).<sup>11</sup> However, the argument of *force majeure* is difficult to set in the civil procedure.

Another concept *de lege ferenda* may be the development of a new category of an individual or a collective liability of the creators of AI, such as producers or programmers. This could be developed analog to product liability rules. However, product liability may not help, if the damage arises from product defects, which were not foreseeable by the producer. In the case of self-developing AI-algorithms it would be very difficult to argue, that the producer could foresee every problematic decision of the evolved autonomous system. A programmer liability therefore would have to be developed also as objective liability. A collective programmers liability furthermore would require a legislative initiative leading to the duty of constituting a collective liability funding system as liability assets by the groups are subject to collective liability.

Can we make the AI system itself liable by developing a personification of the AI as a legal person. At least we could try to develop a legal subjectivity even without a full legal personality. In the German corporation law exists a differentiation between entities which possess legal personality (“*Juristische Personen*”, i.e. Limited Liability Company “*GmbH*”, Stock Company “*AG*” and foundation “*Stiftung*”) and entities which have legal capacity but not full legal personality (“*Rechtssubjekte ohne Rechtspersönlichkeit*”, i.e. commercial partnerships like “*Offene Handelsgesellschaft OHG*” and “*Kommanditgesellschaft KG*” or non-registered associations). The legal rule giving legal capacity to commercial partnerships (*OHG* and *KG*), Sec. 124 para. 1 of the German Commercial Code, was acknowledged by the Federal Court of Justice as legislative expression of a general principle, transferring it to other entities beyond the Commercial Code, such as the partnership under the Civil Code (“*BGB-Gesellschaft*”).<sup>12</sup> Dogmatic

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<sup>11</sup> In Germany Section 7 Paragraph 2 of the Road Traffic Act.

<sup>12</sup> *Bundesgerichtshof Case No. II ZR 331/00 “Weißes Ross”*.

background for this decision was the Group Theory of *Otto von Gierke*.<sup>13</sup> In this case the legal subjectivity is not as far going as the legal personality. In the German legal doctrine this is called “*Teilrechtsfähigkeit*” (partial legal capacity) further developed by *Werner Flume*.<sup>14</sup>

In order to achieve the purpose of a liability subject three aspects must be considered: First it has to be decided whether AI theoretically can be a *legal subject*, able to be liable. Second the problem of the *control* of such an entity must be considered. And third there must be a solution for the *liability assets* of such an entity.

Generally, personification methods in the private law can be used for different reasons: They can be used in order to *protect an entity*. In this sense the personification seems creating rather a programmatic commitment of the state to the protection purpose. Examples for this purpose are approaches to acknowledge autonomous rights to animals, rivers or the nature. As example for this may serve Art. 10, 71-74 of the Constitution of Ecuador which understands the nature as legal person. However, this is a pure positivistic legal fiction as Art. 10 para. 2 says, that the nature is legal subject for the rights which are given to it by the constitution.<sup>15</sup> This purpose is not interesting regarding the topic discussed here, at least as there is recently no ‘strong AI’ which can be somehow set into a legal philosophical analogy to the natural person.<sup>16</sup>

Personification can also be used for making an entity *able to close contracts* and especially for organizing of litigation by creating a *litigation subject*. This last aspect was seen as relevant in a resolution of the European Parliament to create a specific legal status for robots as ‘electronic persons’.<sup>17</sup> A further important aspect connected to this is the purpose of the personification as a *method of separation of*

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<sup>13</sup> Otto von Gierke, *Die Genossenschaftstheorie Und Die Deutsche Rechtsprechung* (Weidmann 1887).; Otto von Gierke, *Deutsches Privatrecht* (Verlag von Duncker & Humblot 1895).[470].

<sup>14</sup> Werner Flume, ‘Gesellschaft Und Gesamthand’ (1972) 136 *Zeitschrift für das gesamte Handelsrecht und Wirtschaftsrecht*. [177ff].

<sup>15</sup> Andreas Fischer-Lescano, ‘Natur Als Rechtsperson – Konstellationen Der Stellvertretung Im Recht’ (2018) 29 *Zeitschrift für Umweltrecht*. [206].

<sup>16</sup> Stefan Koos, ‘Artificial Intelligence – Science Fiction and Legal Reality’ (n 1).[26].

<sup>17</sup> European Parliament, ‘European Parliament Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics, 2015/2103INL’ (*European Parliament*, 2017) <[https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051\\_EN.pdf](https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.pdf)> accessed 11 March 2020.[Paragraph 59 f].

*assets* from a natural or other legal person. Creating a legal person in the form of a foundation or a corporation with transfer of assets to it leads to a perfect separation of asset spheres and gives the liability risk exclusively to the legal person. In the situation of damages arisen by autonomous decisions of AI such an asset separation would be useful as the user of the AI may not have enough influence on the AI so that consequently it may be 'fair' to shift the risks away from the user.

The legal theory basically knows two main theories as explanation, why legal capable subjects can exist beyond the natural persons. Those theories are the *Fiction Theory* by *Friedrich Carl von Savigny*<sup>18</sup> on one hand and several sociological theories, similar to or deduced from the *Group Theory* by *Otto von Gierke*, such as the *Realist Theory* on the other hand. The Fiction Theory states, that something is a legal subject whenever the legislator decides it should be a legal subject. This decision of the legislator leads to a mere fiction of a legal personality.<sup>19</sup> No real or sociological background is needed for this recognition as legal person. Following the Realist or Natural-Entity Theory, certain entities can have real legal personality if they possess an own life and own will. This is for example applicable to partnerships as a group of natural persons acting concerted. If a group of natural persons wishes to act as a group and if it is recognised as a socially acting group then it has to be recognised as a legal subject with partial legal capacity (not full capable legal *person*) by the law.<sup>20</sup> In this case the legal subjectivity is not as far going as the legal personality does ("*Teilrechtsfähigkeit*"). The modern German Corporate Law follows mostly the Realist Theory and the Group Theory, actualised in the mid of the 20th century by *Werner Flume*<sup>21</sup> and the German Federal Court of Justice applied this theory to partnerships and non-registered associations.<sup>22</sup>

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<sup>18</sup> Friedrich Carl von Savigny, *System Des Heutigen Römischen Rechts II* (Bei Veit und Comp 1840).[236].

<sup>19</sup> H. Hassan, 'The Myth of Corporate Personality' - A Comparative Legal Analysis of the Doctrine of Corporate Personality of Malaysian and Islamic Laws' (2012) 6 Australian Journal of Basic and Applied Sciences.[192].

<sup>20</sup> Otto von Gierke, *Die Genossenschaftstheorie Und Die Deutsche Rechtsprechung* (n 14).; Otto von Gierke, *Deutsches Privatrecht* (n 14).[470].

<sup>21</sup> Werner Flume (n 15).[177 ff].

<sup>22</sup> *Bundesgerichtshof Case No. II ZR 331/00 "Weißes Ross"* (n 12).

Under the Fiction Theory an AI-entity can be a legal subject, if a legislator decides so. The European Parliament recently issued a report in 2016, giving a recommendation to the member states of the European Union to regulate AI-legal entities (e-personhood) on the basis of the national civil laws of the member states,<sup>23</sup> which would be the creation of a legal subjectivity by the EU-legislators. Because of the basic freedom of the right of establishment of persons and corporations within the European Union, regulated in Art. 49 TFEU, the legislative regulation of a “AI e-person” would lead to the existence of such a legal person in all member states of the European Union as all member states would have to recognise a legal person effectively founded within the legal conditions of another member state. However, the European Union is not possessing legislative competence to decide on issues of the national corporation law and law of persons and the European Union cannot create legal persons *sui generis*, as an e-person would be.<sup>24</sup> The German Law tends traditionally to be rather careful when it comes to the creation of legal persons due to the thread for the safety and transparence of the legal traffic arising from the existence of legal persons. A legislative development of an e-person would require clear publicity rules and asset preservation rules same as rules for the control of the entity by organs.

Under the Realist Theories AI can only be acknowledged as ‘real’ legal subject, if any real ‘substrate’ can be defined for a recognition as an entity with own life and, most important, own will<sup>25</sup> analogously to natural persons. The natural law concept of the realist theories refers to a certain human substrate of the entity as ‘personification-substrate’. In Corporations, associations and partnerships this is constituted by the members and organs which are agents of the own will of the entity. Foundations, however, have no members but there is at least the perpetuated will of the founder conducting the foundation constituting as

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<sup>23</sup> European Parliament (n 18).[Paragraph 59 f].

<sup>24</sup> Thomas Burri, ‘Free Movement of Algorithms: Artificial Intelligent Persons Conquer the European Union’s Internal Market’ in W. Barfield and U. Pagallo (ed), *Research Handbook on the Law of Artificial Intelligence* (Edward Elgar 2018).[4].

<sup>25</sup> J.-E. Schirmer, ‘Rechtsfähige Roboter?’ (2016) 71 *Juristen Zeitung*. [661].



'personification substrate' the 'personality' of this legal person.<sup>26</sup> In the case of AI there is nor human will of members nor even a somehow 'materialised' will of a creator of the AI. AI is not 'personal' itself. Consequently, there is no real basis for the recognition of it as a legal subject comparable to corporations or foundations. The real basis would have to be reasoned by acknowledging a certain similarity to human will and acting which has to be more than merely some simulation of human behaviour. AI in the forms existing in the present moment does not have this similarity. It would rather be possible to draw an analogy between humans and intelligent animals such as apes or dolphins, which would rather be candidates for a legal personification as they have emotions and will. Only under a less anthropocentric theory, which is not taking free will as necessary condition for the legal subject status, taking the capacity of behavior control as the actually relevant condition,<sup>27</sup> it might be possible to concede AI-entities the status as legal subject on the basis of the realist theories, as a certain kind of control of behaviour is also possible in entities conducted by algorithms.

A different approach for the creation of an artificial intelligent company using the US-company law was proposed by *Bayern*.<sup>28</sup> In this approach in a first step a Limited Liability Company is founded. The statutory purpose of the company is to follow consequently the directions given by an AI without any influence by the will of the founders. Later the founders withdraw from the company leaving the company without any human member. As far it is possible in the legal system, that a corporation exists without any members, this leads to a fully legal capable company constituted only by an AI and conducted exclusively by the decisions of the AI. This approach has to be differentiated from the legislative creation of an 'e-person' or the recognition of a legal subjectivity of an AI-entity in the realist theory. The

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<sup>26</sup> Stefan Koos, *Fiduziarische Person Und Widmung – Das Stiftungsspezifische Rechtsgeschäft Und Die Personifikation Treuhänderisch Geprägter Stiftungen* (CHBeck 2004).[246].

<sup>27</sup> A. Matthias, *Automaten Als Träger von Rechten* (Logos 2018).[48]. See also S. Kirn and K. Müller-Hengstenberg, 'Intelligente (Software-)Agenten: Von Der Automatisierung Zur Autonomie? – Verselbstständigung Technischer Systeme' (2014) 17 *Multimedia und Recht*. [230 ff].

<sup>28</sup> Shawn Bayern, 'The Implications of Modern Business-Entity Law for the Regulation of Autonomous Systems' (2016) 2 *European Journal of Risk Regulation*. [302].

approach is merely the instrumentalisation of a corporation which is already existing as legal person integrating algorithmic decisions with more or less control of natural persons.<sup>29</sup> Such an AI-corporation may be recognized in other states under the rules of the conflict of law. For example, between Germany and the United States of America Art. XXV, para. 5, clause 3 of the Treaty of Friendship, Commerce and Navigation between Germany and the USA of October 20, 1954 stipulates the mutual recognition of the corporations of both states. A recognition of such a corporation, however, seems highly problematic and should be limited (at least from the German point of view) by the conflict of law instrument of Public Policy mainly because such a 'no-mans-company' lacks any clear control and is not controllable.<sup>30</sup> Without further rules of control of such an entity in the national law<sup>31</sup> – discussable are for example solutions using custody or agent solutions – this would be an eclatant contradiction to basic principles of the German corporation law.

Thus, personification methods *de lege lata* without further discussion and legislative activities seem recently not practicable to solve the problem of liability for damages caused by AI activities. Some crucial consequential problems must be solved related to those solutions first, such as the important aspect of control. For the question of autonomous driving it also should be mentioned, that the acceptance of a personification alone is not helping, if there is not a solution for the problem of the liability assets. How should the entity gather assets for a liability? Discussable would be for example a collective funding system taking the producers of AI-systems into responsibility to constitute a liability asset fund. However, recently such a system is not existing yet. Therefore the instrument of the strict liability is – still – practicable to handle damages caused by AI. But, this solution requires also some legislative activities as the strict liability is not

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<sup>29</sup> Thomas Burri (n 25).[4].

<sup>30</sup> Partially disagreeing under certain circumstances: *ibid.* [36].

<sup>31</sup> *ibid.*[7].See also Shawn Bayern [*et.,al.*], 'Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators' (2017) 9 Hastings Science and Technology Law Journal.[132].with an analysis on the options for an implementation of the approach of *Bayern* in several European legal systems.

regulated for all kinds of damages and it must be analysed, which risk distribution between producer, programmer, user and society is adequate depending on the specific integration of AI systems in various situations. Apart of this it seems possible, to interpret intelligent roboters or programs as agents within the process of a contractual performance.<sup>32</sup> In the German law Section 278 Civil Code assigns the personal guilt of an agent within the contract performance process to the obligor. As the AI cannot be culpable an analogy would have to take place taking into consideration the aspect, that the obligor raises the risk for damages within the contractual performance by using AI. In tort law cases Section 831 Civil Code may be analogized: This norm stipulates the liability for vicarious agents, not assigning the guilt of the agent to the principal but stating an own selection- and monitoring culpability with a burden of proof of the principal.

### **Contracting by AI**

If AI-systems are involved in the process of purchasing items, for example in automatized trading systems, it depends on the interpretation of the legal term of the contractual will, whether we have to think about a new category of contracts in the sense of an *'e-contract'* or whether we can just continue using the traditional contractual terms or in the recent or in a certain wider interpretation. It cannot simply be said that AI has the capacity of an own will, even if the AI is *'deciding'* something based on acquired experiences and reacting to situations, which it is confronted with. The term of *'will'* contains several aspects: One aspect is the mental act which gives the impuls to aim for certain goals. This aspect may be fulfilled by AI systems as they can act strategical. However, here already is questionable, whether the impuls for acting of an algorithm is based on mental acts comparable to the human thinking. At least with the other aspects of the will, wish and desire, we find elements which are connected with emotions. It

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<sup>32</sup> O. Keßler, *'Intelligente Roboter – Neue Technologien Im Einsatz – Voraussetzungen Und Rechtsfolgen Des Handelns Informationstechnischer Systeme'* (2017) 20 *Multimedia und Recht*. [592].

can hardly be said, that AI can 'wish' something. Consequently there is no 'will' in the psychological sense.

In the legal sense the contractual will is connected with the concept of the *private autonomy*. It is obvious that already the internet has changed the frame-conditions of the private autonomy for the natural person due to the anonymity of the contractual partners, the speed of the deciding process of the actors in internet contracting situations and the use of filtering technologies like searching machines.<sup>33</sup>

The use of AI before and during the contracting process (prognosis, negotiation and conclusion of the contract itself) will change the conditions for the private autonomy even more drastic. The more independent the AI-System is from the user with improved ability of deep machine learning the less an attribution of its acting will be possible to any natural person. The private autonomy is part of a freedom concept of the legal subject. Thus, it is an instrument of personal freedom, which implies, that if we wish to concede a contractual free will to AI, we do not only need a personification of the AI to a legal subject but also an *agent of free will* which rules the AI-subjects acting. A computer program uncontrolled by a natural person cannot be 'free' even if it is a (partially) legal subject. Therefore it cannot have a 'free will'. The private autonomy as a fundamental principle of the freedom based civil law is influenced not only if an e-person is acknowledged by the law but already - without accepting autonomous AI legal subjects - because the free will is delegated from the natural person to the algorithm if the algorithm is technically able to act independent of its user.<sup>34</sup> Therefore the free will may be displaced by machine determinism, the human would subordinate to the machine.

It is the basic problem of the real (and not only from corporation law deducted) 'e-person' that a legal subject which has full legal capacity needs necessarily free will and therefore emotional capacity (wishing and desire). A personification of AI therefore can necessarily only be a very limited partial legal

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<sup>33</sup> J. Grapentin, 'Die Erosion Der Vertragsgestaltungsmacht Durch Das Internet Und Den Einsatz Künstlicher Intelligenz' (2019) 72 Neue Juristische Wochenschrift.[182f].

<sup>34</sup> *ibid.*[184].

capable subject for mere pragmatic reasons. Its capacity may be limited to the capacity of owning property and, even that, not in order to use property as an instrument of personal freedom but only as liability assets. The problem of the personification of AI can obviously not be discussed without a clear view on legal philosophical questions, especially on the relevance of subjective rights for the personal freedom of the individual. With other words: once we accept fully legal capable e-persons in the civil law, we would separate the subjective right from the individual freedom *and in last consequence from the human dignity as basis of the legal subject status*. This would be a significant and categorial step as it changes the system of the civil law and its legal philosophical grounding. The subjective right or would stay limited to the natural person and to legal persons constituted by their human organs or it would be shifted to a rather *functional term separated from its human rights basis*. Such a shift would be very problematic, as the subjective right has not only an 'egoist' side of personal freedom but on the other hand a corresponding side of 'responsibility'. Freedom corresponds with social responsibility.<sup>35</sup> Transferring the concept of the contractual will to algorithms therefore would also mean to give up the *legal ethic concept of freedom and responsibility*. The subjective right would not longer be a social legal concept but a mere pragmatic concept. This may be acceptable, as an AI subject does not act in order to achieve 'egoistic' goals. AI contracting will be likely always in the interest of a user of the system. The AI then is not acting in its own interest but in the interest of the user and so it could be said, that the declaration of intent is finally serving as an instrument of the contractual freedom of the user and not of the machine. The machine would be a new kind of a '*technical representant*'<sup>36</sup> of the user with 'control' but not 'intent'.

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<sup>35</sup> Karl-Heinz Fezer, *Teilhabe Und Verantwortung – Die Personale Funktionsweise Des Subjektiven Privatrechts* (CHBeck 1986). See also K.-H. Fezer, 'Einleitung UWG' in K.-H. Fezer [et.,al.] (ed), *Lauterkeitsrecht (UWG)* (3rd edn, CHBeck 2016).[Recital 222 and 281] on the understanding of market competition as process of a "responsible market economy".

<sup>36</sup> J. Kersten, 'Menschen Und Maschinen – Rechtliche Konturen Instrumenteller, Symbiotischer Und Autonomer Konstellationen' (2015) 70 *Juristen Zeitung*. [7].

The emotional 'will'-part of the declaration of intent in the machine agent would be seen as deducted from the human 'principal'. The US-Uniform Electronic Transactions Act (UETA) is stipulating in its Section 14: "A contract may be formed by the interaction of electronic agents of the parties, even if no individual was aware of or reviewed the electronic agent's actions or the resulting terms and agreements".

This rule seems to represent an agent-principal approach interpreting electronic acting as contractual declaration in the interest of an individual. But even if the UETA is defining electronic declarations as declarations of intent, this solution in the US-law cannot relieve us from a discussion regarding the declaration of intent and its philosophical and constitutional background: once the law accepts the qualification of machine acting as possible declaration of will following a general – not necessarily specific – emotion-induced intent of an individual using the AI, with in the future more developed AI-systems the step to accept also AI declarations of intent by totally autonomous acting 'technical persons' in the exclusive 'interest' of this AI-entity would be small and the freedom background of the subjective right is not longer clear.

All those discussions about the term of contractual behaviour as aspect of human freedom raise an even more basic legal philosophical problem, which leads back to the question whether we should generally accept e-persons in our law: To acknowledge electronic legal subjects means to make them subjects of the law. However, law is a social instrument to 'socialize' the basically unlimited freedom of the individual by arranging freedom spheres of the individuals in relation to each other and in relation to the society. Accepting entities which are not free – not even through a personal substrate as in the corporations – but entirely determined, would mean a certain misappropriation of the law. This is a methodical-dogmatic aspect which also applies to the personification as result of a legal fiction as described before.

If we continue to refuse to change the concept of the subjective right and based on it the contractual will as a concept of personal freedom then the participation of AI in legal transactions can be handled under two different conditions: First,

decisions of algorithms may be interpreted as deducted – non autonomous - contractual acting originating from a human will. This is similar to the question of copyright law for works created by AI: If a human programmer or user of an AI gives the systems determining impulses for the work, it may be possible to connect the work and with it the copyright for it to this user. The AI would be nothing else than a tool for the creation of the work.<sup>37</sup> This solution transferred to the contract situation implies, that there is at least a rest of determination in the contracting procedure by the human, which surely is the case in most recent automatized purchasing systems, which act following certain determinants given by the user of the system. In these cases we could speak of an anticipated will declaration of the user executed by the instrument of the program. However, with the development of more sophisticated AI-systems it will be more and more difficult to find the connection to a human will of which the AI-acting can be deducted. The mere act of purchasing of an AI-system<sup>38</sup> is surely not enough to assign any concrete machine act to a human principal.

Another possible approach for a solution may be the already mentioned agent-principal solution. In this approach the acting AI is not only a technical transmission instrument for the expression of will of a natural or legal subject but an intermediary of the user or owner of the system. If the AI is seen as mere intermediary which just transfers or receives the contractual declaration of a natural or legal subject, the before explained conflict with the anthropocentric freedom basis of the private autonomy may not arise as the AI does not need own contractual will power. However, as soon as an advanced intelligent program potentially or factually interferes in the contracting process influencing the negotiation we will have to qualify its acting analog to the acting of a representative and therefore to a declaration of intent. In this case the already mentioned problem with the term of the contractual will sooner or later would have to be solved. Therefore also

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<sup>37</sup> S. Ory and C. Sorge, 'Schöpfung Durch Künstliche Intelligenz?' (2019) 72 Neue Juristische Wochenschrift.[711 ff].

<sup>38</sup> J.-E. Schirmer, 'Rechtsfähige Roboter?' (2016) 71 Juristen Zeitung.[663].

under the agent-principal approach a discussion on the term and the function of the contractual will or a separate term of a 'machine will' must be conducted. An analogy to the institute of the civil law representation furthermore would also need the qualification of the AI as a legal subject, which is rejected by the majority of the authors at least in the German legal discussion.<sup>39</sup>

As stated before, the interpretation of machine declarations as based on contractual will cannot take place without a clear decision on the methodical way for an integration of machine declarations into the system of the declarations of intent and the theory of the contract. Based on the opinion presented before the term of the contractual will cannot be interpreted without its connection to the subjective right as instrument of the freedom of the individual and therefore in last consequence to the human dignity. Based on this view machine acting should not be subsumed under the existing term of declaration of intent. As it cannot be denied, that there is a practical need for the integration of machine acting in contractual situations if there is still some connection to an individual interest in the contract, in order to preserve the systematic connection between the legal instruments of personal freedom and the term of the legal intent, systematically rather a *new category of contractual acting with special rules* to protect the legal traffic<sup>40</sup> should be developed than an extension of the term of contractual will or intent. A new category of contractual acting *sui generis* could be designed more dependant or less dependant on the requirement of control of individuals.

This will lead back to the crucial issue of the *role of control* as already mentioned relating to the personification of AI-entities: how intensive and how immediate control of an individual should be existant in legal activities of algorithms. If AI legal acting without any control is accepted how the problems of damages caused by the acting are handled? Contracting by individuals is connected

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<sup>39</sup> J. Grapentin (n 34).[184]. See also K. Cornelius, 'Vertragsabschluss Durch Autonome Elektronische Agenten' (2002) 5 Multimedia und Recht.[354], who already early considered the possibility for a subjectivity of AI with more advanced AI-technology.

<sup>40</sup> O. Keßler (n 33).[592].



with pre-contractual mutual duties for example regarding important information on the item or other circumstances which can be relevant. Who is responsible if an algorithm following its programming interacting with an individual is not disclosing all necessary information? Machines cannot act responsible. Does the use of machines lead to the extinction or diminishing of the role of responsibility in the law? That would mean exactly the mentioned paradigm shift from a socially integrated civil law to a *utilitarian functional law which is separated from its ethic-philosophical basis*. This would make the elaboration of rules for risk and responsibility allocation between the AI-agent and individuals necessary and also new solutions requiring the existence of an individual 'representant' of any AI-subject. Similar questions as already discussed in the part about the liability of AI will arise here. These questions will come up again within the following discussion of the problem of market influencing activities of algorithms.

### **Competition and AI**

An important field of problems is caused by the integration of AI-algorithms within market activities. Problems arise especially through the combination of collection and processing of personal related data including personal related and anonymized data on market behaviour of market participants and consumers. This market related data basis can be used very effectively by intelligent and deep learning computer programs in order to manipulate the competition, for example through algorithmic or personalized pricing or unfair manipulation methods of consumer demand by biasing consumers. Those phenomena are related to the law against unfair competition if it comes to the discriminating of consumers and to the antitrust law, namely regarding algorithmic pricing or the misuse of a dominant market position by enterprises using big amounts of social media mined personal data to manipulate markets. Especially the combination of artificial intelligence and use of personal data may lead to the need of a new adjusting of the parameters of the consumer protection law.

### Algorithmic Pricing and Antitrust Law

After the German Low Cost Air Carrier *Air Berlin* was going into insolvency in 2017 suddenly the prices of domestic flights of the German Airline *Lufthansa* increased significantly. When the German antitrust authority 'Bundeskartellamt' (BkartA) examined the case, *Lufthansa* was defending its pricing activities with the use of an autonomous acting computer based pricing system. Even if the BKartA did not start a process because of unlawful pricing, it pointed out, that an enterprise generally is responsible for pricing activities through algorithms.<sup>41</sup> This shows the recent relevance of AI related to the competition law and the challenge for the competition law in defining and proving unlawful activities if algorithms are involved. It is indeed not yet decided, if and under which circumstances algorithmic pricing can be regarded as an infringement of the antitrust law. Basically the mere reactive adaption of a market behaviour to the market conditions and to the behaviour of competitors, a parallel market behaviour, is not automatically a forbidden behaviour in the antitrust law. However, the mere use of artificial intelligence in the process of the market observation and the market activities of a company may be regarded as a behavior which disturbs the competition,<sup>42</sup> even if this is rather relevant in the area of the unfair competition consumer protection law due to a certain 'disequilibrium of weapons' between the antitrust authorities and the market participants,<sup>43</sup> consumers and sellers. In any case we would have to face the problem with terms of 'behavior' in the competition law.

Art 5 paragraph 1 of the Indonesian Law No. 5/1999 Concerning the Prohibition of Monopoly Practices and Unhealthy Business Competition is stipulating, similar

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<sup>41</sup> Kartellamt rügt Lufthansa, 'Handelsblatt' *Handelsblatt* (28 December 2017) <<https://www.handelsblatt.com/unternehmen/handel-konsumgueter/kartellamt-ruegt-lufthansa-solche-algorithmen-werden-ja-nicht-vom-lieben-gott-geschrieben/20795072.html?ticket=ST-6039232-3ZyTd37QXU3WNZXDqRdk-ap4>>.

<sup>42</sup> J. Ylinen, 'Digital Pricing Und Kartellrecht' (2018) 6 *Neue Zeitschrift für Kartellrecht*. [21].

<sup>43</sup> B. Paal, 'Missbrauchstatbestand Und Algorithmic Pricing – Dynamische Und Individualisierte Preise Im Virtuellen Wettbewerb' (2019) 121 *Gewerblicher Rechtsschutz und Urheberrecht*. [53].; M. Künstler, 'Preissetzung Durch Algorithmen Als Herausforderung Des Kartellrechts – Verhaltenskoordination Über Algorithmen Und Systeme Künstlicher Intelligenz' (2019) 121 *Gewerblicher Rechtsschutz und Urheberrecht*. [42].

to the German and the EU antitrust law, the prohibition to business actors to enter into agreements with competitors to fix the price of goods or services. If we stick to the example of the algorithmic pricing we have two questions to answer:

First, it has to be asked whether it is possible to talk of an 'agreement', in cases of market observing autonomous acting AI-systems reacting to market conditions and, if not, which rules shall be applicable if several market actors use those systems and if market prices are the result of concerted interactions of artificial intelligence systems. Second, it must be considered whether we have to redefine the term of market-'behavior', due to the fact, that artificial intelligence cannot 'behave' lacking the capacity of an 'intent' as we already discussed connected with the contract law.

Regarding the term 'behavior' in the antitrust law it should be stated, that recently it may still be possible to qualify the activity of an algorithm as an action assigned to the user of the system. In the mentioned case of the algorithmic pricing by *Lufthansa* the autonomous acting system can be qualified as an instrument which is still within the full responsibility sphere of the company, especially if the algorithm is only executing an agreement between competitors by partly autonomous actions.<sup>44</sup> Any distortion of the competition caused by the use of this instrument therefore should be within the responsibility of the company.<sup>45</sup> In the German competition law literature consequently are discussed as possible solutions for the case an analogy to the responsibility for employees<sup>46</sup> or a burden of proof assigned to the company using the algorithm<sup>47</sup> regarding the compliance of those systems with the competition law. However, these possible solutions are not liberating from the difficulty, that those systems may just distort the market through

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<sup>44</sup> J. Ylinen (n 43).[21].

<sup>45</sup> K. M. Künstner, 'Preissetzung Durch Algorithmen Als Herausforderung Des Kartellrechts – Verhaltenskoordinierung Über Algorithmen Und Systeme Künstlicher Intelligenz' (2019) 121 Gewerblicher Rechtsschutz und Urheberrecht.[39].

<sup>46</sup> Daniel Dohrn and Linda Huck, 'Der Algorithmus Als "Kartellgehilfe"? - Kartellrechtliche Compliance Im Zeitalter Der Digitalisierung' (2018) 71 Der Betrieb.[176].B. Paal (n 44).[52].

<sup>47</sup> Monopolkommission, 'XXII. Hauptgutachten' (2018) <<https://www.monopolkommission.de/de/gutachten/hauptgutachten/212-xxii-gesamt.html>> accessed 11 March 2020. [Recital 242 ff.].

their mere immanent speed of reaction.<sup>48</sup> We have not yet a clear decision, whether reactionary (not colluding) actions of market monitoring AI-systems should be forbidden by the antitrust law or not.<sup>49</sup> On the other side, a market activity which would be unlawful if conducted by the market actor itself must also be sanctioned if it is achieved by the use of a pricing algorithm. As example may serve the British case CMA, Case 50.223 Online Sales of Posters and Frames and a correspondent case from the United States.<sup>50</sup> It may be necessary to develop new facts of case in the antitrust law in order to sanction the specific unlawful content of machine acting in markets if algorithms will be able to act more autonomous or even independent in the future. This, of course, would require the definition of unlawful facts and the differentiation from acceptable aspects of algorithmic pricing after a legal and economic analysis of the phenomenon and its impacts to the competition process. A mere burden of proof to the market participants without a decision on the unlawful 'essence' of advanced algorithmic market action may lead to the consequence, that the use of those systems is bearing a not acceptable risk for the enterprises as the proof of lawful use is difficult to deliver.<sup>51</sup>

For here it should be enough to point out one important aspect: Purpose of the antitrust law is to avoid and to eliminate market disturbances caused by activities of market actors. The antitrust law is focusing on the effects of market participants behaviour to the competition. Therefore, the subjective aspect of the behaviour is rather secondary behind the primary objective aspect of the market activity. This is quite obvious in the EU-antitrust law conflict of law rule of the effect doctrine, as it is stipulated in Art 6 par 3 lit a of the European Regulation No 864/2007 on the applicable to non-contractual obligations (Rome II-Regulation): "The law applicable to a non-contractual obligation arising out of a restriction of competition shall be the law of the country where the market is, or is likely to be, affected".

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<sup>48</sup> B. Paal (n 44).[44 f].

<sup>49</sup> *ibid.* 45] with a rather positive view.

<sup>50</sup> A. Ezrachi and M. Stucke, 'Artificial Intelligence & Collusion – When Computers Inhibit Competition' (2017) 2017 University of Illinois Law Review.[1777]

<sup>51</sup> Monopolkommission (n 48).[Recital 249].; B. Paal (n 44).[51].

This article of the Rome II-Regulation is applied to non-contractual obligations such as arising from damages caused by competition restrictions. Subjective aspects of the market aspects – i.e. finality to influence a certain national market – are not relevant here. Only the influence of the fact in the national market and the quantitative impact (*de minimis*-clause) is significant. Emphasizing this *objective aspect* of the antitrust law, it seems possible to accept facts of the case which are not referring to the subjective character of behaviour. Different to the contract law, where we pointed out the freedom aspect of the individual, in the competition law the behavioural freedom aspect steps back. A possible legislative measurement may be the codification of a new offence on '*automatized restriction of competition*' within the Unfair Competition Act. This would apply to both solutions, the solution which interprets AI activity as deducted activity of the company and same for the solution which understands AI as legal subject influencing the market. This new defined offence would not be based on the term of an 'agreement' between market actors, which is not fitting to the collusion between algorithms and less to reactive adaptations to the market situation by AI systems. It could cover facts, which are identified as 'collusive' between algorithms, avoiding an extension of the behavioural aspect of the existing antitrust offences. Therefore, it seems systematically less problematic than an extreme extension of the existing offences in the antitrust law system.

### **Consumer Discrimination by AI and Consumer Sovereignty**

The aspect of personalized pricing using AI algorithms is not yet well researched within the German literature. Similar to reactive algorithmic pricing, it is discussed, which exactly the unlawful aspects are in those cases and to what extent the use of AI, especially by the consumers ('algorithmic consumer'), may even be economically effective and therefore favourable or at least minimize the danger of the new technology for the market.<sup>52</sup> Differentiation in offering

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<sup>52</sup> Skeptical B. Paal (n 44).[42]. See also Monopolkommission (n 48).[Recital 169].

conditions, namely in prices, to customers may not generally be unfair market behavior in the sense of the unfair competition law. However, in Indonesia Art 7 lit c Law No 8/1999 on Consumer Protection stipulates the duty of entrepreneurs to not discriminate consumers. Algorithmic pricing against consumers which is horizontally discriminating may be already forbidden conform to this rule, if it can be interpreted in this sense. Generally it should be considered whether the specific unlawful element can be found in the peculiar situation for the other market participants, namely the consumers, caused exactly by the use of AI in the offering process and in the preparation of offers. This is similar to the antitrust law, where the unlawful element may be found in the time factor through the extreme speed of the market reaction of algorithms. In the unfair competition law and here especially in the unfair competition consumer protection law this time factor may have an even bigger significance than in the antitrust law, as it is touching directly the interests of consumers and the 'equality of arms'.

The use of AI-systems in the offering process in combination with the collection and use of big amounts of personal data of consumers leads in two ways to a strong disequality causing strong information deficits of the consumers: First, the consumer may not understand the process of the pricing and the offer. Second, the consumer may not be aware of the knowledge about his personal preferences and life details, which the seller uses by applying AI-based profiling procedures. Furthermore, the consumer himself delivered the elements which may be now used against his own economic interest. Here the unfair competition law needs coordination with the data protection law and the development of data property law as reaction to the developing market of personal data.<sup>53</sup> The mentioned time factor increases the problem, as consumers have to deal with extremely fast and effective actions of the AI, which make it difficult to conduct an informed decision

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<sup>53</sup> Karl-Heinz Fezer, *Repräsentatives Dateneigentum – Ein Zivilgesellschaftliches Bürgerrecht* (Konrad Adenauer Stiftung 2018).; Stefan Koos, 'Protection of Behavioral Generated Personal Data of Consumers', *1st Workshop on Multimedia Education, Learning, Assessment and its Implementation in Game and Gamification* (2019).

without being able to use comparable instruments for regaining price transparency. AI will therefore change the frame conditions for the sovereignty of consumers in the market.

The solution for those problems will most likely have to be developed in relation to the offence of misleading commercial acts and to the concept of an active information of consumers. The consumer protection law of the European Union is based on a restrictive sanctioning system of competition orientated offences against consumers and on an information model which gives competitors active duties to inform consumers. The biggest significance for the problem seems to have the *adaption of an effective consumer information model to the specific situation of consumers as participants in a digitalized market and the compatibilization of the consumer protection law with the data protection law*. The social function of the consumer protection law arises from the integrative function of informed consumer decisions in the market as incentive for the competition.<sup>54</sup> Only reasonably well informed consumers can make informed choices. An effective consumer protection system basically needs two elements: the protection against infringements of the consumer sovereignty and an active consumer information concept by giving information duties to entrepreneurs and active individual claims of consumers to obtain necessary information.

In Indonesia we find a rule on consumer information in Art. 3 lit c and d of Law No. 8/1999 which mentions the programmatic goal to improve the ability of consumers to choose by strengthening transparency and access to information, in Art. 4 lit b Law No. 8/1999 stipulating the right of consumers to obtain appropriate information and in Art.7 lit b Law No. 8/1999. This last provision may not be sufficient to handle the intransparency problem of the use of AI in the offering process as it does not cover the stadium of the preparation of the offer and the offering process itself but literally only the information „with regard to the condition

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<sup>54</sup> Stefan Koos, 'Ethic and Social Responsibility in the Competition Law', *Proceeding International Conference on Developing a Legal System to Promote Social Welfare* (Faculty of Law Trisakti University 2017). Shidarta Shidarta and Stefan Koos, 'Introduction to a Social-Functional Approach in the Indonesian Consumer Protection Law' (2019) 5 *Veritas et Justitia*.

*and warranty of the goods and/or services*“. Compared to this, Art. 3 No 1 of the Directive 2005/29/EC concerning unfair business to consumer practices (‘Unfair Commercial Practices Directive’ UCPD) stipulates:

“This Directive shall apply to unfair business-to-consumer commercial practices, as laid down in Article 5, before, during and after a commercial transaction in relation to a product”.

The scope of the UCPD is wider and would apply to the use of algorithmic price differentiating and even to the preparing processing of consumer personal data before a concrete offer to the consumer. It may be discussed whether the definition of the legislative goal to strengthen transparency in Art. 3 lit c and d Law No. 8/1999 can be used in the sense of an extending interpretation of the duties of entrepreneurs in Art. 7 lit b Law No. 8/1999.

A further question is the detailed design of information duties and the consumer rights concerning the use and the conditions of the AI-action in the offering process. This marks the bridge to the data protection law, which regulates the allowed and illegal use of personal data and the rights of individuals to obtain full information about all personal data stored and about the concrete purpose of the storing and processing process. Further key points of the adaption of the consumer information law to the digitalization will be the amount of information to be given to the consumers in specific situations. Here, the issue of a possible ‘information overflow’ must be carefully considered, which refers to the duty of entrepreneurs to make the use of the AI system in the pricing and offering process comprehensible to the average consumer. Future research will have to focus strongly on the extension of the transparency requirements and duties of entrepreneurs and on the concrete scope of the information duties, namely on the concrete situational amount of information.

## **Conclusion**

The integration of artificial intelligence into the society and the market process brings a real disruption into the private law, which should not be underestimated and which is not comparable to any other technical developments of the last decades.



Legal terms, which were so far relatively easy adaptable to new technological developments, even as revolutionary as for example the dominant use of the internet, will not fit anymore to specific aspects of artificial intelligence conducted activities. The philosophical and constitutional basis of the private law, however, must not be abandoned. Necessary would be an approach which combines conservative legal interpretation, namely the preservation of the humanistic freedom concept of the private law and the concept of the subjective right with a pragmatic development of institutions of the private law to integrate the new technological instruments into the legal system. This leads basically to the need for the development of new categories of legal acting and market influencing.

### **Bibliography**

A. Ezrachi and M. Stucke, 'Artificial Intelligence & Collusion – When Computers Inhibit Competition' (2017) 2017 University of Illinois Law Review.

A. Matthias, *Automaten Als Träger von Rechten* (Logos 2018).

Andreas Fischer-Lescano, 'Natur Als Rechtsperson – Konstellationen Der Stellvertretung Im Recht' (2018) 29 Zeitschrift für Umweltrecht.

B. Paal, 'Missbrauchstatbestand Und Algorithmic Pricing – Dynamische Und Individualisierte Preise Im Virtuellen Wettbewerb' (2019) 121 Gewerblicher Rechtsschutz und Urheberrecht.

*Bundesgerichtshof Case No. II ZR 331/00 "Weißes Ross"*.

Daniel Dohrn and Linda Huck, 'Der Algorithmus Als "Kartellgehilfe"? - Kartellrechtliche Compliance Im Zeitalter Der Digitalisierung' (2018) 71 Der Betrieb.

European Parliament, 'European Parliament Resolution of 16 February 2017 with Recommendations to the Commission on Civil Law Rules on Robotics, 2015/2103INL' (*European Parliament*, 2017) <[https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051\\_EN.pdf](https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.pdf)> accessed 11 March 2020.

Friedrich Carl von Savigny, *System Des Heutigen Römischen Rechts II* (Bei Veit und Comp 1840).

H. Hassan, 'The Myth of Corporate Personality' - A Comparative Legal Analysis of

- the Doctrine of Corporate Personality of Malaysian and Islamic Laws' (2012) 6 Australian Journal of Basic and Applied Sciences.
- H.P. Schwintowski, 'Wird Recht Durch Robotik Und Künstliche Intelligenz Überflüssig?' [2018] Neue Juristische Online-Zeitschrift.
- J.-E. Schirmer, 'Rechtsfähige Roboter?' (2016) 71 Juristen Zeitung.
- , 'Rechtsfähige Roboter?' (2016) 71 Juristen Zeitung.
- J. Grapentin, 'Die Erosion Der Vertragsgestaltungsmacht Durch Das Internet Und Den Einsatz Künstlicher Intelligenz' (2019) 72 Neue Juristische Wochenschrift.
- J. Kersten, 'Menschen Und Maschinen – Rechtliche Konturen Instrumenteller, Symbiotischer Und Autonomer Konstellationen' (2015) 70 Juristen Zeitung.
- J. Ylinen, 'Digital Pricing Und Kartellrecht' (2018) 6 Neue Zeitschrift für Kartellrecht.
- Jenny Gesley, 'Germany', *Regulation of Artificial Intelligence in Selected Jurisdictions, The Law Library of Congress* (2019).
- K.-H. Fezer, 'Einleitung UWG' in K.-H. Fezer [et.,al.] (ed), *Lauterkeitsrecht (UWG)* (3rd edn, CHBeck 2016).
- K. Cornelius, 'Vertragsabschluss Durch Autonome Elektronische Agenten' (2002) 5 Multimedia und Recht.
- K. M. Künstner, 'Preissetzung Durch Algorithmen Als Herausforderung Des Kartellrechts – Verhaltenskoordinierung Über Algorithmen Und Systeme Künstlicher Intelligenz' (2019) 121 Gewerblicher Rechtsschutz und Urheberrecht.
- Karl-Heinz Fezer, *Teilhabe Und Verantwortung – Die Personale Funktionsweise Des Subjektiven Privatrechts* (CHBeck 1986).
- , *Repräsentatives Dateneigentum – Ein Zivilgesellschaftliches Bürgerrecht* (Konrad Adenauer Stiftung 2018).
- Kartellamt rügt Lufthansa, 'Handelsblatt' *Handelsblatt* (28 December 2017) <<https://www.handelsblatt.com/unternehmen/handel-konsumgueter/kartellamt-ruegt-lufthansa-solche-algorithmen-werden-ja-nicht-vom-lieben-gott-geschrieben/20795072.html?ticket=ST-6039232-3ZyTd37QXU3WNZXDqRdk-ap4>>.

- Kelly Buchanan, 'Indonesia', *Regulation of Artificial Intelligence in Selected Jurisdictions, The Law Library of Congress* (2019).
- M. Künstner, 'Preissetzung Durch Algorithmen Als Herausforderung Des Kartellrechts – Verhaltenskoordinierung Über Algorithmen Und Systeme Künstlicher Intelligenz' (2019) 121 *Gewerblicher Rechtsschutz und Urheberrecht*.
- Maximilian Becker, 'Von Der Freiheit, Rechtswidrig Handeln Zu Können – „Upload-Filter“ Und Technische Rechtsdurchsetzung' [2019] *Zeitschrift für Urheber- und Medienrecht*.
- Monopolkommission, 'XXII. Hauptgutachten' (2018) <<https://www.monopolkommission.de/de/gutachten/hauptgutachten/212-xxii-gesamt.html>> accessed 11 March 2020.
- O. Keßler, 'Intelligente Roboter – Neue Technologien Im Einsatz – Voraussetzungen Und Rechtsfolgen Des Handelns Informationstechnischer Systeme' (2017) 20 *Multimedia und Recht*.
- Otto von Gierke, *Die Genossenschaftstheorie Und Die Deutsche Rechtsprechung* (Weidmann 1887).
- , *Deutsches Privatrecht* (Verlag von Duncker & Humblot 1895).
- S. Kirn and K. Müller-Hengstenberg, 'Intelligente (Software-)Agenten: Von Der Automatisierung Zur Autonomie? – Verselbstständigung Technischer Systeme' (2014) 17 *Multimedia und Recht*.
- S. Ory and C. Sorge, 'Schöpfung Durch Künstliche Intelligenz?' (2019) 72 *Neue Juristische Wochenschrift*.
- Shawn Bayern, 'The Implications of Modern Business-Entity Law for the Regulation of Autonomous Systems' (2016) 2 *European Journal of Risk Regulation*.
- Shawn Bayern [*et.,al.*], 'Company Law and Autonomous Systems: A Blueprint for Lawyers, Entrepreneurs, and Regulators' (2017) 9 *Hastings Science and Technology Law Journal*.
- Shidarta Shidarta and Stefan Koos, 'Introduction to a Social-Functional Approach in the Indonesian Consumer Protection Law' (2019) 5 *Veritas et Justitia*.
- Stefan Koos, *Fiduziarische Person Und Widmung – Das Stiftungsspezifische Rechtsgeschäft Und Die Personifikation Treuhänderisch Geprägter Stiftungen* (CHBeck 2004).

——, ‘Ethic and Social Responsibility in the Competition Law’, *Proceeding International Conference on Developing a Legal System to Promote Social Welfare* (Faculty of Law Trisakti University 2017).

——, ‘Artificial Intelligence – Science Fiction and Legal Reality’ (2018) 6 *Malaysian Journal of Syariah and Law*.

——, ‘Protection of Behavioral Generated Personal Data of Consumers’, *1st Workshop on Multimedia Education, Learning, Assessment and its Implementation in Game and Gamification* (2019).

Thomas Burri, ‘Free Movement of Algorithms: Artificial Intelligent Persons Conquer the European Union’s Internal Market’ in W. Barfield and U. Pagallo (ed), *Research Handbook on the Law of Artificial Intelligence* (Edward Elgar 2018).

UNECE, ‘No Title’ (UNECE, 2014) <<https://www.unece.org/fileadmin/DAM/trans/doc/2014/wp1/ECE-TRANS-WP1-145e.pdf>> accessed 16 April 2020.

Werner Flume, ‘Gesellschaft Und Gesamthand’ (1972) 136 *Zeitschrift für das gesamte Handelsrecht und Wirtschaftsrecht*.

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