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EXPANDING THE BOUNDARIES OF JURISPRUDENCE IN THE ERA OF TECHNOLOGICAL ADVANCEMENTS

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ABSTRACT

In the current era of advanced technology, the convergence of artificial intelligence (AI) and big data presents intricate challenges in the technical and doctrinal aspects of law and the fundamental principles of jurisprudence. Addressing this challenge entails three potential approaches: reevaluating the independent status of specific foundational categories, reconfiguring the interpretation of such categories, or steadfastly defending and enhancing our understanding of specific classifications. The reconstruction of the essential concept of "law" remains uncertain and necessitates further deliberation. Although the new technological era has not introduced entirely novel jurisprudential dilemmas, it has reconsidered existing perspectives. Swiftly and effectively responding to these challenges becomes paramount in seizing fresh opportunities for the independent advancement of Chinese jurisprudence. The purpose of the study is to push the boundaries of jurisprudence by exploring and addressing legal issues arising in the era of technological advancements. The qualitative research methodology has been applied in this article.

Keywords: New Technology Era, Artificial Intelligence, Big Data Basic, Scope of Jurisprudence, Jurisprudence Response.

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MEMPERLUAS SEMPADAN PERUNDANGAN DALAM ERA KEMAJUAN TEKNOLOGI

ABSTRAK

Dalam era teknologi canggih masa kini, penumpuan terhadap kecerdasan buatan (AI) dan data raya meghadirkan cabaran rumit dalam aspek teknikal dan doktrin undang-undang serta prinsip asas perundangan. Tiga pendekatan yang berpotensi diperlukan untuk menangani cabaran ini: menilai semula status bebas kategori asas tertentu, mengkonfigurasi semula tafsiran kategori tersebut, atau dengan tegas mempertahankan dan meningkatkan pemahaman kita mengenai klasifikasi tertentu. Pembinaan semula konsep penting "undang-undang" masih belum diyakini dan memerlukan perbincangan yang lebih lanjut. Walaupun era teknologi baharu ini belum memperkenalkan sepenuhnya dilemma perundangan, ia telah mempertimbangkan perspektif-perspektif yang sedia ada. Bertindakbalas secara cepat dan efektif terhadap cabaran-cabaran adalah penting dalam merebut peluang-peluang baharu demi kemajuan bebas perundangan negara Cina. Tujuan kajian ini adalah untuk menolak batasan- batasan perundangan dengan meneroka dan menangani isu-isu undang-undang yang timbul dalam era kemajuan teknologi. Metodologi penyelidikan kualitatif telah digunakan dalam artikel ini.

Kata kunci: Era teknologi baru, Kecerdasan Buatan, Asas Data Raya, Skop Perundangan, Tindak balas Perundangan.

INTRODUCTION

The impact of the new technology era, marked by intelligence, significantly differs from the traditional era characterised by mechanisation, electrification, and information technology.[1] While traditional technology serves as an "auxiliary" power to enhance human abilities, the new technology era represents "alternative" and "superpower" capabilities that bring forth the "algorithmic society," where "machine" logic supersedes "human" logic.[2] This shift implies

[1] Growiec, Jakub. "The digital era, viewed from a perspective of Millennia of economic growth." (2018).

[2] Girutskiy, O. I., & Kirillov, K. A. (2020, April). Regulatory legal and technical confirmation with the risk analysis while mounting ITS (intelligent transport systems) auxiliary equipment or replacing power

the dominance of data and algorithm-driven technological power, which challenges normative meaning and value practices in human social activities, including law.[3]

So far, AI research and its applications can be divided into three phases: the first phase is marked by the application of expert systems in the legal field.[4] The second stage is the autonomous machine learning (neural network and deep learning) stage. It links the learning of expert systems with system control, mimicking the structure of the human brain for information acquisition, storage, connection, and replication.[5] The third stage replaces the system's functional/technical problem solution from predetermined parameters inherent and independently generated by the AI, i.e., creating independent, self-flowing, entity-free, abstract decision paths that no longer resemble the human brain.[6] On the contrary, what makes sense is weak AI and strong AI. It must be admitted that the so-called "strong AI" is only a specialised AI that can beat humans in application scenarios that meet closed conditions (e.g., Alpha Dog) and is far from being a general AI, so it is too early to talk about the full-scale comparison of AI with humans or even the overtaking of the latter.[7] However, while scientists are primarily concerned with current realities, philosophers must think more about the future. The study of philosophy, including jurisprudence, requires a certain degree of foresight.[8] The "new technological era" in this paper refers to the era of moving from weak artificial intelligence to strong artificial intelligence. The main feature

units. In *IOP Conference Series: Materials Science and Engineering* (Vol. 819, No. 1, p. 012038). IOP Publishing.

[3] David S Han, "Constitutional Rights and Technological Change," *UC Davis L. Rev.* 54 (2020): 71.

[4] Krishnamoorthy, C. S., and S. Rajeev. *Artificial intelligence and expert systems for engineers*. CRC press, 2018.

[5] Xiang, Weiming, Patrick Musau, Ayana A. Wild, Diego Manzanas Lopez, Nathaniel Hamilton, Xiaodong Yang, Joel Rosenfeld, and Taylor T. Johnson. "Verification for machine learning, autonomy, and neural networks survey." *arXiv preprint arXiv:1810.01989* (2018).

[6] Green, Alex, Mitchell Travis, and Kieran Tranter. "Jurisprudence of the Future." *Law, Technology and Humans* 4, no. 2 (2022): 1-4.

[7] Hoffmann, Christian Hugo. "A philosophical view on singularity and strong AI." *AI & SOCIETY* (2022): 1-18.

[8] Scott Veitch, Emilios Christodoulidis, and Marco Goldoni, *Jurisprudence: Themes and Concepts* (Taylor & Francis, 2023). (page No.?)

of this era is "synthetic intelligence" based on the combination of algorithms and big data, i.e., the integrated application of machine learning, neural networks, big data, cognitive systems, evolutionary algorithms, and other elements.[9]

RESEARCH METHODOLOGY

For the purpose of conducting qualitative research for the article *"Expanding the Boundaries of Jurisprudence in the Era of Technological Advancements,"* a thorough methodology will be used to examine pertinent books, websites, research articles, and other legal data. A thorough analysis and synthesis of the body of literature will be done as part of the research, with the emphasis on recent releases, important legal sources, and seminal works. The study employs content analysis to ascertain significant themes, conceptual structures, and developing patterns in legal jurisprudence in relation to technological progress. To give readers a more complex understanding of the topic, the analysis will also look at opposing viewpoints, inconsistencies, and gaps in the literature. To guarantee a comprehensive analysis of the changing environment, careful examination of official documents, legal databases, and reliable internet resources will be conducted. The qualitative research methodology will give priority to richness and depth of understanding, facilitating a comprehensive investigation of the complex intersections between legal precedent and technological advancement.

JURISPRUDENTIAL ISSUES IN THE NEW TECHNOLOGICAL ERA

The new technological era has brought technical and theoretical problems to the legal field. The technical problems refer to the application of big data and artificial intelligence in the legal field, such as information retrieval of laws and cases, big data modeling of law-related litigation, and code framework design in cyberspace.[10] The discipline that deals with these issues is "legal informatics". Legal

[9]Zhang, Byoung-Tak. "Hypernetworks: A molecular evolutionary architecture for cognitive learning and memory." *IEEE computational intelligence magazine* 3, no. 3 (2008): 49-63.

[10]Zhang, Wenxian. "Human Rights Jurisprudence in the New Era." *J. Hum. Rts.* 18 (2019): 265.

informatics is the application of new technologies in the field of legal practice, while legal experts, such as natural scientists and knowledge engineers, are responsible for solving technical problems.[11] However, jurists focus on the legal theoretical problems arising from big data and artificial intelligence, which can be divided into two levels: legal doctrine and jurisprudence. Legal doctrine involves how the existing legal system deals with the problems posed by new technologies, such as the legal protection of personal information, property rights of artificial intelligence workers, and the legal liability of driverless cars.[12] In contrast, jurisprudential research addresses the challenges new technologies pose to law's basic concepts, methods, and values from a legal philosophy and theory perspective.[13] While legal doctrine involves instrumental problem-solving, jurisprudence presents fundamental challenges.

The current jurisprudential discourse regarding artificial intelligence and big data concentrates on both jurisprudential methodology and value theory, with the former examining the impact of new technologies on legal reasoning and judicial thinking models. The latter scrutinises the potential threats of new technologies to fundamental legal concepts like freedom, equality, security, and their defense of values. In contrast, there is less focus on conceptualism, the fundamental categories of jurisprudence. Although the challenge of new technologies to the basic categories of jurisprudence may appear less apparent and intuitive than the challenge to methodology and value theory, the significance of this challenge could be even more momentous.[14] If this challenge proves successful, it will radically transform the underlying logic of jurisprudence. Conversely, if

[11] Crootof, Rebecca. "Jurisprudential space junk: treaties and new technologies." In *Resolving conflicts in the law*, pp. 106-129. Brill Nijhoff, 2018.

[12] Neacsu, Dana. "Technology-Revealing or Framing the Truth? A Jurisprudential Debate." *Duq. L. Rev.* 60 (2022): 246.

[13] Paliwala, Abdul. "Rediscovering artificial intelligence and law: an inadequate jurisprudence?." *International Review of Law, Computers & Technology* 30, no. 3 (2016): 107-114.

[14] Susskind, Richard E. "Expert systems in law: A jurisprudential approach to artificial intelligence and legal reasoning." *The modern law review* 49, no. 2 (1986): 168-194.

unsuccessful, this underlying logic would be more robust in the new context. [15]

This article takes a macroscopic yet limited approach by selecting representative categories to exemplify the possible impact of basic categories of jurisprudence in the new technological era and their different responses. Rather than focusing on individual categories and their developmental changes in response to new technological conditions, it aims to provide a starting point or guide for subsequent research by drawing a "general picture" of the situation of basic categories of jurisprudence in the new technological era. The challenges to these categories can be broadly divided into three categories described below.

Addressing the Challenge: Rethinking the Independent Categorisation in Response to Technological Advancements

New technologies have fundamentally questioned the theoretical necessity and practical usefulness of certain basic categories of jurisprudence, raising doubts about their continued existence. [16] Although questioning and rethinking of these categories have existed in jurisprudence, the advent of new technologies has amplified them, accelerating the likelihood of their abandonment.[17] Two of the more representative categories in this regard are "objects of legal relations" and "branches of law."

The demise of the object of the legal relationship

The object of legal relations is the object to which the rights and obligations between the subjects of legal relations are directed. Legal relations always carry certain legally recognised and protected interests (legal benefits); the object is the externalisation and carrier of such

[15] Rehna Gul and Abdallah Mohamed Othman El Nofely, "The Future Of Law From The Jurisprudence Perspective For Example: The Influence Of Science & Technology To Law, AI Law," *Sociological Jurisprudence Journal* 4, no. 2 (2021): 99–104.

[16] Laurillard, Diana. *Rethinking university teaching: A conversational framework for the effective use of learning technologies*. Routledge, 2013.

[17] Raju, Vignesh. "A New India and Its Need for a Technologically Driven Jurisprudential Renaissance." *Part 1 Indian J. Integrated Rsch. L.* 2 (2022): 1.

legal benefits. From the 1990s to the present, the mainstream opinion in jurisprudence has formed a quadrilateral approach to objects: things, persons, mental goods, and acts (or the results of acts).[18]

The fundamental elements of artificial intelligence are data and algorithms. Data is the "oil" and "nutrients" of artificial intelligence, and its content is information. Data and information have a high degree of symbiosis and commonality.[19] However, because of the focus on the interests of the parties, the nature of the specific claims, and the possible ways of relief, the two also have the significance of the legal distinction. From the viewpoint of legal attributes, data has only property attributes but no personality attributes; personal information should be mainly classified as a legal personality interest, but at the same time contains specific property attributes and thus has both personality and property values.[20] In the new technological era, the question arises about what constitutes the object of a legal relationship concerning personal information or data. Although categorising data as a property is precise, it raises concerns when considering its relationship to information. As data carries information, its characterisation may limit the nature of the information. Thus, asserting the private property attribute of personal data in the civil sphere can lead to the conclusion emphasising the exclusive dominance of the information right holder over their personal information.[21] However, this view conflicts with the public nature of personal information in the new technological era.[22]

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[18] Mervan Selcuk and Suleyman Kaya, "A Critical Analysis of Cryptocurrencies from an Islamic Jurisprudence Perspective," 2021.page No?

[19] Safadi, Hani, and Richard T. Watson. "Digital Symbiosis, Data Obligations, and Data Rights: A New Perspective on Digital Ecosystems for Understanding their Societal Influence." *Data Obligations, and Data Rights: A New Perspective on Digital Ecosystems for Understanding their Societal Influence (June 2, 2021)* (2021).

[20] Solaiman, Sheikh M. "Legal personality of robots, corporations, idols and chimpanzees: a quest for legitimacy." *Artificial intelligence and law* 25 (2017): 155-179.

[21] Papacharissi, Zizi. *A private sphere: Democracy in a digital age*. Polity, 2010.

[22] Maria Koromina, Maria-Theodora Pandi, and George P Patrinos, "Rethinking Drug Repositioning and Development with Artificial

In contrast to data, information is more challenging to categorise objectively. Two ideas have been established based on the difference between information and data. One idea considers information as a carrier of personal personality interests. For example, some scholars[23] argue that the so-called right to personal information is not directed towards personal information, but the personality interests related to personal information. This view is reflected by the fact that Chinese Civil Code protects personal information under the "personality rights" title.[24] "Personality" is a fundamental attribute of a person and is an essential element of a person who is the subject of legal relations.[25] Although we can talk about "personality interests," personality or personality interests cannot be objectified. Personality is not the same as the person; a person is a physiological whole composed of various physiological organs, which belong to the category of objects of legal relations. The person is also a thing in physical form. However, because it is the material carrier of the person (the person with personality), it is subject to stricter legal restrictions as an object of legal relations than ordinary things to protect personality and human dignity.[26] Defining information as "personality interest" or as a part of personality would be equivalent to denying the object property of information to some extent. [27] However, since the information has the dual value of personality and property, and the property has the object's orientation,

Intelligence, Machine Learning, and Omics," *Omics: A Journal of Integrative Biology* 23, no. 11 (2019): 539–48.

[23] Lal, Deepali. "Criminal Procedure—Technology in the Modern Era: The Implications of Carpenter v. United States and the Limits of the Third-Party Doctrine as to Cell Phone Data Gathered Through Real-Time Tracking, Stingrays, and Cell Tower Dumps." *University of Arkansas at Little Rock Law Review* 43, no. 4 (2022): 519.

[24] Wang, Liming, and Bingwan Xiong. "Personality rights in China's new civil code: a response to increasing awareness of rights in an era of evolving technology." *Modern China* 47, no. 6 (2021): 703-739.

[25] Cui, Shujie, and Peng Qi. "The legal construction of personal information protection and privacy under the Chinese Civil Code." *Computer Law & Security Review* 41 (2021): 105560.

[26] Liang, Na. "The Boundary and Protection Path of Personal Information and Privacy Right from the Perspective of Civil Code." *Science of Law Journal* 2, no. 4 (2023): 1-7.

[27] Zlătescu, Irina MOROIANU, and Monna-Lisa MAGDO BELU. "PERSONALITY RIGHTS IN THE ROMAN CIVIL CODE." *Fiat Iustitia* 1 (2014).

a paradox arises: information is both an inseparable element of the subject of legal relations and a type of object of legal relations.[28] Another way of thinking is to consider information as a new object type independent of the established types. But this approach is undesirable not only because the information has both subject-object properties and cannot be classified as an "object" alone but also for a theoretical classification reason: if each new legal relationship is born with a new type of object independently, the list of objects will be endless.[29]

The debate over the object of data and information highlights a more profound issue at the jurisprudential level: the necessity of retaining the category of the object of legal relations.[30] This is not to say that the concept of "object" cannot logically exist as long as the subject and object, along with the content and conditions, together constitute the complete orientation of the general category of "legal relations."[31] However, the theoretical value of the object of legal relations as an independent essential category of jurisprudence is being questioned.[32] The existing theory of object cannot adequately explain the current state of civil legal relations, nor can it be applied to other areas of legal relations.[33] The concept of the object of legal relations, or object of rights, originates from civil jurisprudence and presupposes a model of dominance based on "ownership."[34] Based on the paradigm of subject-object dichotomy, this model emphasises the exclusive domination of the subject of the right over the object and implies a

[28] Chelaru, Eugen. "Personality Rights in the Regulation of the New Civil Code; The Right to Private Life." *Acta Universitatis Lucian Blaga* (2012): 25.

[29] Koromina, Pandi, and Patrinos. 55.

[30] Li, Jingwei. "Positioning and Protection of Personal Information in the Civil Code's Personality Rights Section in the Era of Big Data." In *2023 4th International Conference on Big Data and Informatization Education (ICBDIE 2023)*, pp. 236-244. Atlantis Press, 2023.

[31] Popovici, Adrian. "Personality Rights-A Civil Law Concept." *Loy. L. Rev.* 50 (2004): 349.

[32] Gao, Raymond Yang. "Personal Information Protection Under Chinese Civil Code: A Newly Established Private Right in The Digital Era." *Tsinghua China L. Rev.* 13 (2020): 165.

[33] Pang, Xinzhao. "Civil law protection of personal information in the era of big data." *Open Access Library Journal* 8, no. 10 (2021): 1-12.

[34] Graziadei, Michele. "The structure of property ownership and the common law/civil law divide." *Comparative property law* (2017): 71-99.

transparent object external to the subject of the right.[35] However, this model is not descriptive enough for legal relations with the content of claims, formation rights, and defenses. For example, if the "act (result of the act)" is the object of the claim, what is the object of the right of formation and the right of defense? Civil law scholars have long broken away from the quadrilateral approach and enumerated many types of objects.[36]

Furthermore, applying the concept of the object of legal relations, which originated in civil law, to other areas of law has created confusion.[37] For instance, there has been a debate about the object of criminal legal relations, with different views on applying the act, object, mental content, achieving penalties, criminal acts, criminal composition, and criminal responsibility. [38] Some commentators suggest that the object of criminal legal relations is the "carrier of the offender's interests" in general, extending to life, freedom, qualification, and property.[39] As a result, if we were to list the objects of legal relations across civil law and other branches of law, the list would be extensive and tend to expand as new legal relations are created.[40] Thus, the object theory would become purely descriptive, mapping the reality of various relations, and lose its function of standardising and formatting reality, ultimately undermining its value as a "theory.[41]"

Is it still necessary to treat the object of legal relations as an independent category in jurisprudence and maintain the subject-object dichotomy paradigm for understanding legal relationships? With the

[35] Hodgson, Geoffrey M. "Much of the 'economics of property rights' devalues property and legal rights." *Journal of Institutional Economics* 11, no. 4 (2015): 683-709.

[36] Burin, Achas Kathleen. "Property in criminal law and private law." PhD diss., University of Oxford, 2021.

[37] Lundmark, Thomas. *Charting the divide between common and civil law*. Oxford University Press, USA, 2012.

[38] Ashworth, Andrew, and Jeremy Horder. *Principles of criminal law*. Oxford University Press, USA, 2013.

[39] Hart, Herbert Lionel Adolphus. *Punishment and responsibility: Essays in the philosophy of law*. Oxford University Press, 2008.

[40] MacCormick, Neil. *Institutions of law: an essay in legal theory*. OUP Oxford, 2007.

[41] Shanks, Michael, and Christopher Y. Tilley. *Social theory and archaeology*. Cambridge: Polity Press, 1987.

emergence of data/information legal relationships, scholars are questioning the relevance of these traditional concepts.[42] They argue that data community rights should not be limited to property ownership but instead should focus on regulating the interaction of interests among social subjects around the exploitation of data values.[43] This calls for a new way of thinking about legal relationships, one that lifts the veil of the "object" and directly confronts the interests behind it.[44] The new technological era has provided social conditions that make this understanding more convincing, suggesting that the "object of legal relations" may not be necessary as an independent category in the jurisprudential knowledge system.[45]

The disintegration of the "legal sector"

In traditional jurisprudence, a legal department refers to a group of legal norms that are similar in nature, formed by dividing all the legal norms in force in a country based on specific criteria or principles.[46] These legal departments and other interconnected legal sectors make up the legal system. The legal norms are the basic units of the legal departments, which are the constituent units of the legal system.[47] This three-order structure can be described as "legal norms - legal departments - legal system." While the legal system encompasses all the legal norms of a country, the division of legal departments is a necessary component. The academic community typically uses primary and secondary criteria to classify legal sectors.[48] The primary criterion is the object of legal regulation, which refers to the social

[42] Kerr, Gayle, Don E. Schultz, Philip J. Kitchen, Frank J. Mulhern, and Park Beede. "Does traditional advertising theory apply to the digital world?: a replication analysis questions the relevance of the elaboration likelihood model." *Journal of Advertising Research* 55, no. 4 (2015): 390-400.

[43] Mittelstadt, Brent Daniel, and Luciano Floridi. "The ethics of big data: current and foreseeable issues in biomedical contexts." *The ethics of biomedical big data* (2016): 445-480.

[44] Thomas, Christopher A. "The uses and abuses of legitimacy in international law." *Oxford Journal of Legal Studies* 34, no. 4 (2014): 729-758.

[45] Koromina, Pandi, and Patrinos. 50

[46] Twining, William. *General jurisprudence: understanding law from a global perspective*. Cambridge University Press, 2009.

[47] Twining, William. "Normative and legal pluralism: a global perspective." *Duke J. Comp. & Int'l L.* 20 (2009): 473.

[48] Tamanaha, Brian Z. *A general jurisprudence of law and society*. Oxford Socio-Legal Studies, 2001.

relations that are regulated by law. The secondary criterion is the method of legal regulation, which pertains to the mechanism or specific way in which the law regulates or protects social relations. In line with these criteria, the current Chinese legal system comprises constitutional law, civil law, commercial law, administrative law, economic law, social law, criminal law, litigation and non-litigation procedural law, and other legal departments.[49]

China has implemented numerous laws and regulations on information protection, network security, data security, and other related areas to keep up with rapid technological advancements. One example of China's efforts to regulate information protection and network security is the Cybersecurity Law implemented in 2017.[50] This law aims to safeguard cyberspace sovereignty, security, and development, emphasising the protection of personal information and important data. The law mandates that network operators take measures to protect personal information and data, requiring consent from users before collecting their data. Additionally, it specifies that critical information infrastructure operators must store important data within the country's borders and undergo security assessments.

China has also introduced other regulations such as the Data Security Law, passed in 2021,[51] which further enhances protection measures for data security and management. This law focuses on data classification, cross-border data transfer, and establishes rules for data processing activities by companies operating in China. These regulations showcase China's proactive approach to addressing the challenges posed by rapid technological advancements and the need to ensure information protection, network security, and data privacy.[52] These legal documents are carriers of legal norms and must be categorised appropriately. Two general ideas for categorisation are cutting and classifying. The cutting approach involves dividing the legal norms contained in law into separate legal departments such as

[49] Brown, Ronald C. "Understanding Chinese courts and legal process: Law with Chinese characteristics." *Understanding Chinese Courts and Legal Process* (1997): 1-430.

[50] Kosseff, Jeff. "Defining cybersecurity law." *Iowa L. Rev.* 103 (2017): 985.

[51] Chen, Jihong, and Jiabin Sun. "Understanding the chinese data security law." *International Cybersecurity Law Review* 2, no. 2 (2021): 209-221.

[52] Greenleaf, Graham. "Now 157 Countries: Twelve Data Privacy Laws in 2021/22." (2022).

civil, administrative, and criminal law.[53] For example, the Personal Information Protection Law includes legal norms regulating property and personal relations between equal subjects, administrative relations between the state and individuals, and legal norms regulating relations between the state and the individual. The classifying approach involves grouping the relevant laws into a new legal sector, such as a science and technology law sector, without cutting the legal norms. This method allows legal norms to adapt and adjust to the development of social relations and promotes communication and coordination with the external environment.[54]

Both approaches have their pros and cons. The cutting approach maintains the established division of legal departments. However, it may fragment a legal document, which is not conducive to grasping the purpose and spirit of the whole law.[55] The classifying approach avoids this drawback but may impact the established legal sector division standards and lead to a less scientific and rigorous legal system structure design. The categorisation of legal norms needs to strike a balance between maintaining legal departments' stability and adapting to social relations' development.[56] The category of the legal sector also faces a similar dilemma, as creating new legal sectors in response to reality may eventually render the theory of the legal sector insignificant.[57]

The relevance of dividing the legal system into different branches is a topic that prompts reflection. This division originates

[53] Cheh, Mary M. "Constitutional limits on using civil remedies to achieve criminal law objectives: Understanding and transcending the criminal-civil law distinction." *Hastings LJ* 42 (1990): 1325.

[54] Amaru, Stephanie, and Netra B. Chhetri. "Climate adaptation: Institutional response to environmental constraints, and the need for increased flexibility, participation, and integration of approaches." *Applied Geography* 39 (2013): 128-139.

[55] Koskenniemi, Martti. "International law: constitutionalism, managerialism and the ethos of legal education." *Eur. J. Legal Stud.* 1 (2007): 8.

[56] Moore, Sally Falk. *Law as process: an anthropological approach*. LIT Verlag Münster, 2000.

[57] Ashish Dwivedi et al., "Addressing the Challenges to Sustainable Initiatives in Value Chain Flexibility: Implications for Sustainable Development Goals," *Global Journal of Flexible Systems Management* 22 (2021): 179–97.

from the ancient Roman separation of public and private law.[58] Private law was the foundation of Roman law and the subject of scholarly study, while public law was often considered secondary due to its connection with politics.[59] This dichotomy also influenced legal education and research. However, the relevance of this division has diminished over time as social law has emerged and public and private law has become increasingly interconnected.[60] Therefore, scholars suggest abandoning the sectoral law approach and adopting a problem-oriented, unified field law approach.[61] Rigid definitions should not limit legal research and education, as the legal system is based on subject matter rather than social relations or institutional adjustment methods.

It may be time to dismantle the sectoral structure of law and restructure the legal system. This includes abandoning the "legal department" and establishing a second-order structure of "legal norms - legal system."[62] In this new perspective, legal research focuses on the problem at hand, and the legal system serves as the scope for searching for relevant legal norms without necessarily considering their nature. This approach allows legal norms to be categorised differently based on the problem, giving the legal system a dynamic character. The challenge to the sectoral model of law is not new but has been amplified in the new technological era. As a result, the concept of "branches of law" is becoming increasingly unnecessary[63].

[58] Gabor, Hamza. "Roman law traditions and classification into 'branches' of contemporary legal systems." (2016).

[59] McKeon, Michael. *The secret history of domesticity: Public, private, and the division of knowledge*. JHU Press, 2006.

[60] Greenidge, Abel Hendy Jones. *Infamia: its place in Roman public and private law*. Clarendon Press, 1894.

[61] Liu, Shouying, and Xuefeng Xiong. "Problem-oriented approach to political economy." *China Economic Review* 69 (2021): 101674.

[62] Van Loo, Rory. "The New Gatekeepers." *Virginia Law Review* 106, no. 2 (2020): 467-522.

[63] Vladimirovna, Boshno Svetlana. "Law system and legislation system." *Law and modern states* 5 (2013): 13-25.

Navigating Challenges and Responses: Reconfiguring Established Understandings in the Face of Technological Advancements

More fundamental categories of jurisprudence need to be reconstructed in the new technological era than those that have been abandoned.[64] Depending on the degree of reconstruction, there are two scenarios: some basic categories need to be wholly reconstructed. In contrast, others must only be partially reconstructed or reconstructed at some levels.[65] The former is typical of "legal acts," while the latter is typical of "legal rights".[66]

Radical Reconstruction: (Narrowly) Legal Acts

A legal act is a factual event performed by a legal subject that is capable of producing legal effects, such as the creation, modification, or termination of a legal relationship.[67] Legal acts can be categorised into symbolic acts, including meaningful and quasi-meaningful acts, and non-representational acts, including factual ones.[68] Symbolic acts, or legal acts in the narrow sense, are the acts of the parties involved to obtain the corresponding legal effect as expressed.[69] In some countries, particularly China, such narrow legal acts are called "civil legal acts," emphasising the importance of private law autonomy. According to civil law scholars (narrow), legal action is the fundamental tool of self-determination in private law.[70] It serves as a marker of the distinction

[64] Morrison, Wayne. *Jurisprudence: From The Greeks To Post-Modernity*. Routledge, 2016.

[65] Baer, Judith A. *Our lives before the law: Constructing a feminist jurisprudence*. Princeton University Press, 1999.

[66] El-Gamal, Mahmoud A. "Incoherence of contract-based Islamic financial jurisprudence in the age of financial engineering." *Wis. Int'l LJ* 25 (2007): 605.

[67] Harris, Angela P. "The jurisprudence of reconstruction." *Cal L. Rev.* 82 (1994): 741.

[68] Lawrence III, Charles R. "The fire this time: Black lives matter, abolitionist pedagogy and the law." *Journal of Legal Education* 65, no. 2 (2015): 381-404.

[69] Viberg, Åke. *Symbols of law: a contextual analysis of legal symbolic acts in the Old Testament*. Vol. 1. BoD-Books on Demand, 2021.

[70] Lixin, Yang. "From the General Provisions of Civil Law to the General Rules of Civil Law: A Historic Leap." *Social Sciences in China* 41, no. 2 (2020): 5-25.

between public and private law.[71] The (narrow) legal action concept is closely tied to the maintenance of private law autonomy and thus serves as a central thread in developing this concept.[72]

The demarcation between private and public law marks a distinction between relations that are equal and autonomously shaped by private individuals and relations that are unequal and governed by power.[73] The difference in norm creation is that the subject obligated in a private law relationship creates the norm and imposes the obligation.[74] In contrast, the subject obligated in a public law relationship does not participate. For example, in a contractual relationship, the party entering the contract is legally obligated to perform a particular mutual act. In contrast, in an administrative law relationship, the administrative body establishes the administrative order unilaterally.[75] However, from the perspective of general law theory, the commonality between private and public law is greater than the differences.[76] Both civil legal acts and administrative orders are individualisations of general legal norms. They are constituent elements of legal creation that can be attributed to the unity of the legal order.[77]

Additionally, the validity of civil legal acts derives from the authorisation of the legal order, just as administrative orders do. Both are "political" in nature, as they create subordinate individual norms based on higher general law and are part of the legal order.[78] Both private and administrative bodies are "organs" of legal creation. In the process of individualisation, general legal norms leave room for the

[71] Weinrib, Ernest J. The idea of private law. Oxford University Press, 2012.

[72] Phil Macnaghten, Sarah R Davies, and Matthew Kearnes, "Understanding Public Responses to Emerging Technologies: A Narrative Approach," *Journal of Environmental Policy & Planning* 21, no. 5 (2019): 504–18.

[73] Nedelsky, Jennifer. *Law's relations: A relational theory of self, autonomy, and law*. OUP USA, 2011.

[74] Scott, Elizabeth S. "Social norms and the legal regulation of marriage." *Virginia law review* (2000): 1901-1970.

[75] Freeman, Jody. "Extending public law norms through privatization." *Harvard Law Review* 116, no. 5 (2003): 1285-1352.

[76] Aviram, Amitai. "A paradox of spontaneous formation: The evolution of private legal systems." *Yale L. & Pol'y Rev.* 22 (2004): 1.

[77] Romano, Santi. *The legal order*. Taylor & Francis, 2017.

[78] Summers, Robert S. *Form and function in a legal system: a general study*. Cambridge University Press, 2005.

exercise of the will of private persons or administrative bodies, regardless of whether the law is in the public or private sphere.[79]

If we consider the distinction between (narrow) legal acts and de facto acts, the former is notable because it is contingent on de facto acts.[80] (Narrow) legal acts create individual norms within limits authorised and permitted by general legal norms, while de facto acts merely trigger the effects of legal norms without creating individual norms themselves. In other words, the effect of a legal act results directly from the authorised act of will and indirectly from the general legal norm. In contrast, the effect of a factual act is given directly by the general legal norm. According to the philosophy of language, a (narrowly defined) legal action is a type of declarative speech act, the content of which is transformed into an institutional fact through the guarantee of the authorising norm.[81] These types of acts are not uncommon in both private and public law.[82] Therefore, civil legal acts are simply variations of such speech acts in private law and do not possess unique structural characteristics.[83] The dichotomy between public and private law, where the (narrow) legal act is used as the criterion for differentiation, is heavily influenced by values and ideology, and the autonomy of meaning in private law exists more at the level of legal policy theory than at the level of non-legal theory.[84]

The advent of new technology challenges the traditional understanding of legal behaviour. In addition to big data, algorithms are a critical component of artificial intelligence. Machine learning algorithms automatically analyse data to identify patterns and use them

[79] Stephen A Woods et al., "Personnel Selection in the Digital Age: A Review of Validity and Applicant Reactions, and Future Research Challenges," *European Journal of Work and Organizational Psychology* 29, no. 1 (2020): 64–77.

[80] Yablo, Stephen. "De facto dependence." *The Journal of philosophy* 99, no. 3 (2002): 130-148.

[81] Marmor, Andrei, and Scott Soames, eds. *Philosophical foundations of language in the law*. Oxford University Press, USA, 2011.

[82] Goldberg, Sanford. *Assertion: On the philosophical significance of assertoric speech*. Oxford University Press, USA, 2015.

[83] Briggs, Richard. *Words in action: Speech act theory and biblical* interpretation. A&C Black, 2004.

[84] Mikhail, John. "The Constitution and the Philosophy of Language: Entailment, Implicature, and Implied Powers." *Virginia Law Review* (2015): 1063-1103.

to make predictions about unknown data. One notable application of machine learning algorithms is algorithmic trading, where a computer-controlled algorithm decides whether to buy or sell securities based on exchange prices.[85] In traditional legal theory, buying and selling securities is a legal act that involves the intention of the buyer and seller, which algorithms lack. However, algorithmic trading is as efficient and accurate as human trading.[86]

Another example is the Google Assistant system, which can book appointments and reservations through a phone call without revealing that it is artificial intelligence. While there is an ethical question about whether AI should identify itself as such, achieving the legal result is the primary concern.[87] As AI lacks a material human mind, it does not have meaning or a point of view. Therefore, in specific situations involving AI, the traditional concept of "meaning" as the core legal act will face significant challenges.[88]

Ably non-human entities can perform social functions that were once reserved for humans, and the traditional concept of legal acts may become obsolete. AI can make programmed representations through predetermined algorithms and even self-learning algorithms, despite not having a mind or meaning. The fact that these "hollow" representations do not seem to affect social interactions is alarming, as it suggests that the intelligence part of AI is focused on social functions rather than the mind.[89] This means that AI can replace human interaction and communication and many social actions or relationships that have already been socially functionalised. These social relations may exist not only in private law but also in public law,

[85] Alzubi, Jafar, Anand Nayyar, and Akshi Kumar. "Machine learning from theory to algorithms: an overview." In *Journal of physics: conference series*, vol. 1142, p. 012012. IOP Publishing, 2018.

[86] Das, Kajaree, and Rabi Narayan Behera. "A survey on machine learning: concept, algorithms and applications." *International Journal of Innovative Research in Computer and Communication Engineering* 5, no. 2 (2017): 1301-1309.

[87] Noda, Kenichiro. "Google Home: smart speaker as environmental control unit." *Disability and rehabilitation: assistive technology* 13, no. 7 (2018): 674-675.

[88]Jonathan Grudin and Richard Jacques, "Chatbots, Humbots, and the Quest for Artificial General Intelligence," in *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 2019, 1–11.

[89] Boden, Margaret A. *AI: Its nature and future*. Oxford University Press, 2016.

where AI systems could automatically issue tickets to drivers who run red lights. In such cases, the logical chain from "meaning" to "representation" is broken, and the external "representation" of an automated decision is sufficient to complete a valid legal interaction. As AI becomes increasingly capable of performing social functions that were once performed exclusively by humans, the existing concept of legal acts may be in danger of disintegration. The traditional concept of legal acts may be wholly reconstructed as non-human entities can perform social functions through purely symbolic acts.[90]

Partial Reconstruction: Legal Rights

Legal relations are fundamentally based on legal rights and legal obligations. The concept, nature, structure, and types of rights have been the subject of extensive study in jurisprudence. Traditionally, rights are viewed from an individualistic perspective, as they are considered inseparable from the subjectivity of the subject of rights.[91] In German, rights are called "subjective law" (subjective Recht). [92]Protecting or promoting one's interests against infringement by others or society is considered the primary significance of rights.[93] Therefore, in traditional jurisprudence, individual rights have a personal character, distinct from the public interest, which is public and safeguarded by power. The classical dualistic framework is based on the differentiation between private rights and public powers.[94]

Protecting personal information has become a significant issue in the new technological era. Scholars debate whether personal information should be protected through a rights model (right to

[90] Murdoch, Jonathan. "Ecologising sociology: Actor-network theory, co-construction and the problem of human exemptionalism." *Sociology* 35, no. 1 (2001): 111-133.

[91] Scolnicov, Anat. *The right to religious freedom in international law: between group rights and individual rights*. Routledge, 2010.

[92] Pattaro, Enrico, Hubert Rottleuthner, Roger A. Shiner, Aleksander Peczenik, and Giovanni Sartor. "The Law and What is Right. Hans Kelsen Under Suspicion." *A Treatise of Legal Philosophy and General Jurisprudence* (2005): 333-353.

[93] Yu, Peter K. "Reconceptualizing intellectual property interests in a human rights framework." *UC Davis L. Rev.* 40 (2006): 1039.

[94] Leung, Kwok, Pamela Tremain Koch, and Lin Lu. "A dualistic model of harmony and its implications for conflict management in Asia." *Asia Pacific Journal of Management* 19 (2002): 201-220.

personal information) or an interest model (right to personal information). However, this challenge is not limited to sectoral law doctrine but extends to understanding the "rights" category in jurisprudence.[95] Unlike traditional rights, personal information has a public aspect and requires institutional arrangements to effectively protect public interests, as opposed to just private interests. [96] Individuals do not solely own personal information, and it serves as a public resource for social governance, corporate management, and innovation in science, culture, and the arts.[97] Individuals' exclusive control of personal data contradicts the institutional basis of social progress.[98]

Moreover, personal information has a public function in the digital market and society, and its use is not exclusive.[99] Therefore, to ensure effective market functioning and societal benefit, it is necessary to transform personal information into public information. [100] The interest model supporters oppose treating personal information as a right, but the question is whether rights and public interests are genuinely incompatible.[101]

Two different dimensions of the concept and rights substantiation are involved here. Although originating in the particular context of German tort law doctrine, the distinction between rights and interests in civil law scholarship touches on the root of the concept of

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[95] Langford, Malcolm, ed. "Social rights jurisprudence: emerging trends in international and comparative law." (2008).

[96] Bagenstos, Samuel R. "The unrelenting libertarian challenge to public accommodations law." *Stanford Law Review* (2014): 1205-1240.

[97] Langford, Malcolm. "The justiciability of social rights: From practice to theory." *Social rights jurisprudence: emerging trends in international and comparative law* 3 (2008): 43-45.

[98] Deborah N Archer, " White Men's Roads through Black Men's Homes': Advancing Racial Equity through Highway Reconstruction," *Vand. L. Rev.* 73 (2020): 1259.

[99] Gandy, Oscar H. *The panoptic sort: A political economy of personal information*. Oxford University Press, 2021.

[100] Bélanger, France, and Robert E. Crossler. "Privacy in the digital age: a review of information privacy research in information systems." *MIS quarterly* (2011): 1017-1041.

[101] Nissenbaum, Helen. "Protecting privacy in an information age: The problem of privacy in public." In *The ethics of information technologies*, pp. 141-178. Routledge, 2020.

rights.[102] That is, rights are only one of the tools to protect interests, and the legislator is perfectly capable of protecting the interests of others by simply creating obligations.[103] What is unique about the concept of rights is that it is an important concept and institutional setting for the protection of the intrinsic independence of the individual and autonomy.[104] Rights imply the ability of the individual to make claims, which forms the basis of human dignity. Thus, rights have to claim as a central element. This means that the individual is autonomous within the domain defined by the content of the right and that the rights holder can be the manipulator of the obligations directed.[105]

If obligation implies restriction, then the right holder, who corresponds to the relational obligation, acquires something more than those subjects who benefit from the non-relational obligation, namely "control" over the relational obligation.[106] The content of "control" is the freedom or choice of the right holder concerning the relational obligation. It is this autonomy and personal control that distinguishes rights from other interests. In essence, while rights reflect interests, interests do not always rise to the level of rights. Rights arise only when the legal system places the freedom of choice to protect a particular interest in the hands of a particular person (the right holder).[107] Two points should be made about this personal control: first, such control is not absolute because even in the realm of traditional rights, rights are subject to the interests of others and the public interest, so rights need not present themselves as a form of exclusive control.[108] Second, such control does not imply the "privatisation" of a specific interest (e.g.,

[102] Rigamonti, Cyrill P. "The conceptual transformation of moral rights." *The American journal of comparative law* 55, no. 1 (2007): 67-122.

[103] Donaldson, Sue, and Will Kymlicka. *Zoopolis: A political theory of animal rights*. Oxford University Press, USA, 2011.

[104] Christman, John. "Autonomy in moral and political philosophy." (2003).

[105] Buss, Sarah. "Valuing autonomy and respecting persons: Manipulation, seduction, and the basis of moral constraints." *Ethics* 115, no. 2 (2005): 195-235.

[106] Mégret, Frédéric. "The Nature of International Human Rights Obligations." *International human rights law* (2010).

[107] Sen, Amartya. "Elements of a theory of human rights." In *Justice and the capabilities approach*, pp. 221-262. Routledge, 2017.

[108] Stone, Christopher D. "Should trees have standing?Toward legal rights for natural objects." In *Environmental rights*, pp. 283-334. Routledge, 2017.

personal information), i.e., a specific interest does not have the property of the private interest of the right holder only, or such an interest can be protected only through a right.[109] It only gives priority to the right holder to trigger relational obligations. Therefore, the public nature of the function and the non-exclusivity of using personal information is not enough to prove that it cannot be a right.[110] Because x is a right of y, which is fully compatible with x being both a public interest, this does not challenge the concept of the right itself.

Although interests do not equate to rights, the evidential foundation of rights lies in interests, as only a legitimate interest can be safeguarded as a right. Nevertheless, the public nature of personal information challenges the conventional approach to establishing rights.[111] In the modern technological era, personal information serves public interests, making the basis of individual rights reliant not only on individual interests but also on protecting public interests.[112] Therefore, the right holder's interest is not equivalent to the right itself, and the significance of the right outweighs that of the right holder's interest. The right, not the interest of the right holder, directly evidences the obligations of others, indicating that the right is a more substantial reason than the interest of the right holder.[113]

Furthermore, the right reflects the right holder's interest and adds an independent reason to it, which is the interest of others or the common good.[114] The common good becomes a factor in assessing the weight or significance of the right, increasing its value, and making it more important than the right holder's interest. The existence of the right contributes significantly to the common good. Some experts argue

[109] Teubner, Gunther. "After privatisation?: The many autonomies of private law." In *Critical theory and legal autopoiesis*, pp. 128-153. Manchester University Press, 2019.

[110] Dusollier, Séverine. "The commons as a reverse intellectual porperty: from exclusivity to inclusivity." In *Concepts of property in intellectual property law*, pp. 258-281. Cambridge University Press, 2013.

[111] Graham, John, Timothy Wynne Plumptre, and Bruce Amos. *Principles for good governance in the 21st century*. Vol. 15. Ottawa: Institute on governance, 2003.

[112] Warnick, Barbara. *Critical literacy in a digital era: Technology, rhetoric, and the public interest*. Routledge, 2001.

[113] Archer. 1545

[114] Bozeman, Barry. *Public values and public interest: Counterbalancing economic individualism*. Georgetown University Press, 2007.

that the public good can be divided into the consuming and participatory public good, and rights are primarily concerned with the consuming public good, which encompasses domestic and foreign security, social peace and order, ecological environment, and various public services.[115] This suggests a new direction of rights evidence. This common good rights view asserts that the public good can be a sufficient reason to impose obligations on others alongside the individual interests of the right holder. For instance, the right to freedom of expression can impose obligations on others due to the right holder's interest to express themselves freely and the public interest of a social environment where information can be exchanged freely.[116]

Similarly, the "rights-based theory" in China suggested that rights-based law could also be socially based. [117] In the new technological era, legal rights can be preserved, but their evidentiary basis should be reevaluated. The traditional bias of "private" versus "public" should be abandoned, and the legitimacy of rights should be placed on the side of "private."[118] While this bias is not new, it has become more apparent in the age of new technology.[119]

Challenges and Responses: Firm Defense and Better Defense

New technologies have affected some of the fundamental categories of jurisprudence to some extent, but they have not substantially disrupted them.[120] These fundamental categories are generally linked to widely

[115] Nabatchi, Tina, Alessandro Sancino, and Mariafrancesca Sicilia. "Varieties of participation in public services: The who, when, and what of coproduction." *Public administration review* 77, no. 5 (2017): 766-776.

[116] Balkin, Jack M. "Digital speech and democratic culture: A theory of freedom of expression for the information society." In *Law and Society approaches to cyberspace*, pp. 325-382. Routledge, 2017.

[117] Maurushat, Alana. "The benevolent health worm: comparing Western human rights-based ethics and Confucian duty-based moral philosophy." *Ethics and information technology* 10 (2008): 11-25.

[118] Jizeng, Fan. "The Evolution of Fundamental Rights Legislation in PRC: From Soviet Model of Human Right Theory to Influence of the UN Universal Standard of Human Rights." *Taiwan Journal of Human Rights* 2 (2015): 39-82.

[119] Archer. 1560

[120] Liu, Hin-Yan, Matthijs Maas, John Danaher, Luisa Scarcella, Michaela Lexer, and Leonard Van Rompaey. "Artificial intelligence and legal

acknowledged and unwavering fundamental concepts and values. For instance, "legal responsibility" and "legal subject" are distinct categories grounded in the value of human autonomy or dignity, which serve as the cornerstone of contemporary legal systems and jurisprudential understanding.[121]

Defense of "legal responsibility"

In the field of law, liability can be categorised into responsibility and strict liability. However, with the advent of the new technological era, the traditional concept of fault-based liability has been challenged.[122] According to this concept, one of the primary conditions for assigning responsibility is the condition of control, which is rooted in the notion of free will. The challenge posed by new technologies can be divided into three areas.[123]

Firstly, using big data and algorithms creates an "information cocoon" that narrows people's free choice space, influencing and potentially determining their behaviour. [124] This personalised recommendation may create an illusion of free will, challenging the practical conditions for exercising free will. While the information cocoon does not necessarily challenge free will, it raises questions about whether freedom of will exists.[125]

Secondly, comprehensive medical methods like cochlear implants, brain-computer interfaces, and biochips can alter human biological attributes and impact human autonomy and decision-

disruption: a new model for analysis." *Law, Innovation and Technology* 12, no. 2 (2020): 205-258.

[121] Eidelson, Roy J., and Judy I. Eidelson. "Dangerous ideas: Five beliefs that propel groups toward conflict." *American psychologist* 58, no. 3 (2003): 182.

[122] Jansen, Nils. "The idea of legal responsibility." *Oxford Journal of Legal Studies* 34, no. 2 (2014): 221-252.

[123]Feng Liu, "The Recalibration of Chinese Assertiveness: China's Responses to the Indo-Pacific Challenge," *International Affairs* 96, no. 1 (2020): 9–27.

[124] Wright, Richard W. "The Grounds and Extent of Legal Responsibility." (2003).

[125] Morse, Stephen J. "Moral and legal responsibility and the new neuroscience." *Neuroethics: Defining the issues in theory, practice, and policy* (2006): 33-50.

making.[126] While this challenge can be mitigated by recognising the concept of responsibility centered around free will, using artificial intelligence devices can still lead to exemptions in the case of external impacts on autonomous judgment.[127]

Thirdly, the emergence of artificial solid intelligence may create non-human subjects and their free will, which is not based on biological traits. The core of fault liability is free will, so whether potent artificial intelligence agents have free will poses a fundamental challenge to fault liability.[128] The new technological era poses several challenges to the traditional concept of fault-based liability, and the notion of free will is at the core of these challenges. However, recognising responsibility centered around free will can help mitigate some of these challenges.[129]

Defending the 'legal subject'

The legal subject, or the subject of legal relations, refers to a person with a legal personality who can participate in legal relationships, exercise certain rights, fulfill obligations, and assume responsibilities.[130] To become a legal entity, a person must belong to one of two categories: natural person or legal person. A natural person is a biological human, while a legal person is a product of legal fiction.[131] Both natural and legal persons must satisfy two conditions to qualify as legal entities: capacity for rights and capacity for conduct. Capacity for rights means the legal ability to enjoy certain rights and

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[126] Svider, Peter F., Qasim Husain, Olga Kovalerchik, Andrew C. Mauro, Michael Setzen, Soly Baredes, and Jean Anderson Eloy. "Determining legal responsibility in otolaryngology: a review of 44 trials since 2008." *American journal of otolaryngology* 34, no. 6 (2013): 699-705.

[127] Paul G Nestor, "In Defense of Free Will: Neuroscience and Criminal Responsibility," *International Journal of Law and Psychiatry* 65 (2019): 101344. (Is this the page No?)

[128] Rabin, Dana Y. *Identity, crime, and legal responsibility in eighteenth-century England*. Basingstoke: Palgrave Macmillan, 2004.

[129] Asif Khan et al., "Aggression and Individual Criminal Responsibility in the Perspective of Islamic Law," *Competitive Social Science Research Journal* 3, no. 1 (2022): 35–48.

[130] Bartlett, Katharine T. "Feminist Legal Methods [1990]." In *Feminist legal theory*, pp. 370-403. Routledge, 2018.

[131] Tesón, Fernando R. "The Kantian theory of international law." In *The Nature of International Law*, pp. 557-606. Routledge, 2017.

obligations according to the law, which is granted and recognised by the law. Capacity for conduct, on the other hand, refers to the ability of legal subjects to acquire rights, fulfill obligations, and assume responsibilities through their actions.[132] Nonetheless, the capacity for responsibility is a vital requirement for the qualification of legal subjects.

The previous passage illustrates that artificial intelligence agents cannot be held responsible for faults like rational humans because they lack free will.[133] Only humans are recognised as possessing self-determination and taking responsibility for their actions and foreseeable consequences. While human behaviour and consequences are not unrelated phenomena, they arise from within the individual and their ability to choose different actions.[134] Therefore, humans can be held accountable for their actions.

Granting artificial intelligence the status of a subject undermines human dignity and weakens autonomous decision-making.[135] The only way for artificial intelligence agents to become legal entities is to abandon fault liability and limit their legal entity to those with strict liability.[136] According to pure law theory, the law aims to regulate behaviour, and the concept of a "person" in law is a simplified and auxiliary concept that personifies rights, obligations, and responsibilities.[137] Ultimately, whomever the law attributes responsibility to is the subject of responsibility, regardless of whether they possess free will or fault.[138] This approach has two attribution

[132] O'donnell, Guillermo. "Why the rule of law matters." *J. Democracy* 15 (2004): 32.

[133] Nielsen, Laura Beth. "Situating legal consciousness: Experiences and attitudes of ordinary citizens about law and street harassment." In *Consciousness and Ideology*, pp. 289-324. Routledge, 2017.

[134] Allan, Trevor RS. *Constitutional justice: a liberal theory of the rule of law*. Oxford University Press, USA, 2003.

[135] Lowe, Alan Vaughan. *International law*. Oxford University Press, 2007.

[136] Tribet, Laurence H. "The puzzling persistence of process-based constitutional theories." In *Constitutionalism and Democracy*, pp. 221-238. Routledge, 2017.

[137] Murphy, Tim. "Hans Kelsen's Pure Theory of Law." *Western Jurisprudence (Dublin, Thomson Round Hall, 2004)* (2004): 251-268.

[138] Kelsen, Hans. *General theory of law and state*. Routledge, 2017.

models, one of which is the behaviourist attribution model found in criminal law.[139]

The argument is that if AI can make decisions that lead to criminal behaviour, it should bear criminal responsibility and have a legal personality.[140] However, holding AI responsible for its actions is not practical, and it is unclear whether AI can bear specific forms of punishment or compensate the injured party.[141] Some suggest that AI can be treated as a legal entity with incomplete capacity, similar to underage children and that its "guardians" (designers, manufacturers, or users) should bear the responsibility.[142] However, this approach is flawed as AI does not possess the conscious ability or the possibility of responsibility reversal. Instead, the natural or legal person behind AI should be treated as the legal entity.[143]

Another viewpoint compares AI with legal entities and argues that AI could have a legal personality like legal entities.[144] However, legal entities refer to a collection of natural persons, and the legal effects of their actions are attributed to the legal entity, which ultimately assumes responsibility. In contrast, AI is not a collection of natural people; its behaviour is self-implemented rather than represented by natural people.[145] Therefore, AI cannot be granted the

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[139] Elizabeth Macpherson, Julia Torres Ventura, and Felipe Clavijo Ospina, "Constitutional Law, Ecosystems, and Indigenous Peoples in Colombia: Biocultural Rights and Legal Subjects," *Transnational Environmental Law* 9, no. 3 (2020): 521–40.

[140] Balkin, Jack M. "Deconstructive practice and legal theory." In *Derrida and Law*, pp. 309-352. Routledge, 2017.

[141] MacCormick, Neil. *Institutions of law: an essay in legal theory*. OUP Oxford, 2007.

[142] Sampaio, Jorge Silva. "An almost pure theory of legal interpretation within legal science." *Legal Interpretation and Scientific Knowledge* (2019): 81-139.

[143] Sheppard, Jennifer. "Once Upon a Time, Happily Ever After, and in a Galaxy Far, Far Away: Using Narrative to Fill the Cognitive Gap Left by Overreliance on Pure Logic in Appellate Briefs and Motion Memoranda." *Willamette L. Rev.* 46 (2009): 255.

[144] Solum, L. B. (2020). Legal personhood for artificial intelligences. In *Machine ethics and robot ethics* (pp. 415-471). Routledge.

[145] Prakken, Henry. *Logical tools for modelling legal argument: a study of defeasible reasoning in law*. Vol. 32. Springer Science & Business Media, 2013.

qualification of legal subjects, at least for now.[146] Humans should always be responsible for their activities within the legal boundaries, and existing standards of "people" should be defended.[147] While AI may not be granted the qualification of legal subjects, the legal responsibility for AI's actions should be attributed to the natural or legal person behind AI.[148]

ULTIMATE CHALLENGE: PARADIGM SHIFT IN THE CATEGORY OF "LAW"?

The advent of new technology presents challenges across various subjective and objective legal categories and the very definition of "law" itself. In traditional legal studies, positive law is characterised as a collection of social norms with distinct attributes. However, the new technological era challenges at least three established characteristics of law.[149] Despite this, there is insufficient justification to conclude whether these features should be discarded.[150]

The law traditionally refers to national law, a social norm enforced by the state's coercive power. However, with the emergence of new technology, numerous norms have surfaced that were not created by state agencies, and some norms created by state agencies only have guiding significance.[151] These types of norms are commonly known as "soft laws." While soft laws do not rely on national coercive power and do not have absolute binding force, they may still be considered part of the national legal order if authorised by national law.[152] Non-independent legal norms, which do not necessarily

[146] Vladeck, David C. "Machines without principals: liability rules and artificial intelligence." *Wash. L. Rev.* 89 (2014): 117.

[147] Scherer, Matthew U. "Regulating artificial intelligence systems: Risks, challenges, competencies, and strategies." *Harv. JL & Tech.* 29 (2015): 353.

[148] Macpherson, Ventura, and Ospina. 60

[149] Surden, Harry. "Machine learning and law." *Wash. L. Rev.* 89 (2014): 87.

[150] Bostrom, Nick, and Eliezer Yudkowsky. "The ethics of artificial intelligence." In *Artificial intelligence safety and security*, pp. 57-69. Chapman and Hall/CRC, 2018.

[151] Goldsmith, Jack L., and Eric A. Posner. *The limits of international law*. Oxford University Press, 2005.

[152] Gavron, Jessica. "Amnesties in the light of developments in international law and the establishment of the International Criminal

stipulate mandatory actions, must be linked to sanctions through other norms to be effective. However, soft laws created without authorisation are not directly or indirectly related to state coercive power, so they may not be considered part of the law unless explicitly authorised.[153] The enforcement of such soft laws would then be abandoned, and the characteristic of state coercion would not apply.[154]

The universality of law is the second distinguishing feature. According to traditional jurisprudence, the law is a set of rules, and the essence of rules is "stable generalisation" or generalisation.[155] This feature distinguishes law from individual norms such as administrative decisions, judgments, and rulings.[156] Some theorists argue that, in the past, society had to rely on general rules to handle events with high probability due to the constraints of information costs.[157] However, in the era of artificial intelligence and big data, collecting and analysing individual data is no longer a problem.[158] As people obtain predictions about legal operations from platforms, their previous cognition and feedback become accumulated data, and the results obtained are the outcome of artificial intelligence learning this data.[159] These results are not universal but linked to specific personal data, and individual rules formed around each individual come into play.[160] However, it is essential to note that the so-called individual rules are the product of

Court." *International & Comparative Law Quarterly* 51, no. 1 (2002): 91-117.

[153] Koh, Harold Hongju. "Transnational legal process." In *The Nature of International Law*, pp. 311-338. Routledge, 2017.

[154] Matthew Barrett et al., "Artificial Intelligence Supported Patient Self-Care in Chronic Heart Failure: A Paradigm Shift from Reactive to Predictive, Preventive and Personalised Care," *Epma Journal* 10 (2019): 445–64.

[155] Kelsen, Hans. *General theory of law and state*. Routledge, 2017.

[156] Abbott, Kenneth W., Robert O. Keohane, Andrew Moravcsik, Anne-Marie Slaughter, and Duncan Snidal. "The concept of legalization." *International organization* 54, no. 3 (2000): 401-419.

[157] Reyna, Valerie F., and Frank Farley. "Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy." *Psychological science in the public interest* 7, no. 1 (2006): 1-44.

[158] Stiglitz, Joseph E. "Information and the Change in the Paradigm in Economics." American economic review 92, no. 3 (2002): 460-501.

[159] Cohen, Julie E. "Law for the platform economy." *UCDL Rev.* 51 (2017): 133.

[160] Litman, Todd. "Autonomous vehicle implementation predictions." (2017).

applying algorithms to personal data and that algorithms are essentially a set of universal or procedural rules.[161] There are two possible understandings here: one is that only universal rules belong to the law.

In contrast, individual rules generated by applying universal rules to specific facts (personal data) do not belong to the law.[162] Thus, the universality of law still holds. The other possibility is that universal rules and some individual rules belong to the law. This view represents the pure legal theory and challenges the universal characteristics of the law.[163] According to this position, normative legal documents such as constitutions and laws and non-normative legal documents such as judicial judgments, administrative decisions, and even civil legal acts (such as contracts) belong to the law.[164] However, there is currently no consensus on this issue.[165] The legality of algorithms also needs to be addressed.

The third point concerns the standardisation of law. While it is true that social life is becoming increasingly computerised and algorithms are being integrated into the legal system, this alone does not mean that algorithms can be considered law.[166] On the one hand, in the era of artificial intelligence, algorithms function like laws by regulating and guiding people's behaviour.[167] When algorithms predict and induce behaviour, people are constrained by a legal framework and have limited choices, making their behaviour less arbitrary.[168]

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[161] Xiong, Guoli, Zhenxing Wu, Jiacai Yi, Li Fu, Zhijiang Yang, Changyu Hsieh, Mingzhu Yin et al. "ADMETlab 2.0: an integrated online platform for accurate and comprehensive predictions of ADMET properties." *Nucleic Acids Research* 49, no. W1 (2021): W5-W14.

[162] Moore, Sally Falk. *Law as process: an anthropological approach*. LIT Verlag Münster, 2000.

[163] Luhmann, Niklas. *A sociological theory of law*. Routledge, 2013.

[164] MacCormick, Neil. *Institutions of law: an essay in legal theory*. OUP Oxford, 2007.

[165] Tamanaha, Brian Z. *A general jurisprudence of law and society*. Oxford Socio-Legal Studies, 2001.

[166] Raz, Joseph. *Between authority and interpretation: On the theory of law and practical reason*. OUP Oxford, 2009.

[167] Finnis, John. *Natural law and natural rights*. Oxford University Press, 2011.

[168] Twining, William. *Globalisation and legal theory*. Cambridge University Press, 2000.

However, the computerisation of law poses a fundamental challenge to its unique functionality at the experiential level.[169]

On the other hand, algorithms, and law still have significant differences. According to traditional jurisprudence, law guides and constrains behaviour, making it obligatory rather than arbitrary.[170] Unlike artificial intelligence, which can adapt to changes in external information and parameters through deep learning, the law has a "deep non-learning" nature.[171] It cannot adjust its norms, principles, and values flexibly. This characteristic, however, makes law a guarantee of normative expectations and obligates actors in social interaction to take legal actions or respond to the law.[172]

In contrast, algorithms only force actors to behave in a certain way through technological means, and the behaviour of the actors is forced rather than obligated.[173] Actors only need to be aware of the algorithms, not respond to them. If algorithms are considered equivalent to or even replacing laws, cognition will replace normativity.[174]

Furthermore, the difference between algorithms and law can also affect judicial decisions. In traditional jurisprudence, judicial adjudication is a legal reasoning process that requires participants to understand normative reasons.[175] Big data technology, on the other

[169] Dickson, Julie. *Evaluation and legal theory*. Bloomsbury Publishing, 2001.

[170] Lancichinetti, Andrea, and Santo Fortunato. "Community detection algorithms: a comparative analysis." *Physical review E* 80, no. 5 (2009): 056117.

[171] Uricchio, William. "The algorithmic turn: Photosynth, augmented reality and the changing implications of the image." In *Cultural Technologies*, pp. 19-35. Routledge, 2012.

[172] Narcisa Roxana Mosteanu and Alessio Faccia, "Fintech Frontiers in Quantum Computing, Fractals, and Blockchain Distributed Ledger: Paradigm Shifts and Open Innovation," *Journal of Open Innovation: Technology, Market, and Complexity* 7, no. 1 (2021): 19.

[173] Macy, Michael W., and Robert Willer. "From factors to actors: Computational sociology and agent-based modeling." *Annual review of sociology* 28, no. 1 (2002): 143-166.

[174] Kaptelinin, Victor, and Bonnie A. Nardi. *Acting with technology: Activity theory and interaction design*. MIT press, 2006.

[175] Sourdin, Tania. "Judge v Robot?: Artificial intelligence and judicial decision-making." *University of New South Wales Law Journal, The* 41, no. 4 (2018): 1114-1133.

hand, predicts future judgments through calculations based on historical data of judicial behaviour.[176] This approach believes in digital solutions and replaces argumentation with data computation. This could completely change the existing judicial thinking and practice.[177]

In light of these functional similarities and differences, whether we should retain the name "law" as a normative thing or extend it to include cognitive functional analogies.[178] If we adopt the former approach, the normative features of law will be preserved, and the uniqueness of legal concepts will also be maintained. If we adopt the latter approach, normativity will no longer be considered a characteristic of law.[179]

At the heart of the issues mentioned above lies a fundamental conflict between two approaches to understanding the category of law: conceptual analysis and functionalism.[180] The traditional approach to jurisprudence asserts that the nature of law is reflected in its defining characteristics. Anything that does not conform to these characteristics, even if it serves the same social function, is not considered law.[181] On the other hand, the functionalism approach suggests abandoning the insistence on the concept and characteristics of law and instead emphasises the perspective of social function or functional

[176] Xu, Zichun. "Human Judges in the era of artificial intelligence: challenges and opportunities." *Applied Artificial Intelligence* 36, no. 1 (2022): 2013652.

[177] Contini, Francesco. "Artificial intelligence and the transformation of humans, law and technology interactions in judicial proceedings." *Law, Technology and Humans* 2, no. 1 (2020): 4-18.

[178] Binns, Reuben. "Human Judgment in algorithmic loops: Individual justice and automated decision-making." *Regulation & Governance* 16, no. 1 (2022): 197-211.

[179] Scherer, Maxi. "Artificial Intelligence and Legal Decision-Making: The Wide Open?." *Journal of international arbitration* 36, no. 5 (2019).

[180] Morison, John, and Adam Harkens. "Re-engineering justice? Robot judges, computerised courts and (semi) automated legal decision-making." Legal Studies 39, no. 4 (2019): 618-635.

[181] Zalnieriute, Monika, and Felicity Bell. "Technology and the judicial role." *The Judge, the Judiciary and the Court: Individual, Collegial and Institutional Judicial Dynamics in Australia (Cambridge University Press, 2021)* (2020).

substitutes.[182] In this approach, code is considered law, as algorithms can create order without the need for traditional legal frameworks.[183]

Functionalism is a specific version of pragmatism, which argues that we can choose what we consider law.[184] Some theorists argue that algorithms cannot achieve the status of law, despite their importance in the era of artificial intelligence.[185] However, this perspective relies on conceptual analysis, while functionalism challenges the approach.[186] Ultimately, whether algorithms should be classified as a law depends on whether we value the unique value of law as a normative practice.[187] This issue requires a comprehensive debate within the jurisprudential community in the future.

CONCLUSION

This article does not cover all the fundamental categories of law, and the response provided by a limited representative category is only a preliminary step. In-depth discussions on each category require further research. However, the previous discussion highlights that modern legal knowledge and the legal system are built on integrated concepts and categories that have developed over centuries. These concepts and categories cannot be abandoned or subverted as a whole. Despite the new technology era, it is not bringing about new legal issues. The issues faced

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[182] Sales, Philip. "Algorithms, Artificial Intelligence, and the Law." *Judicature* 105 (2021): 22.

[183] Mingyu Kim et al., "Autonomous Shipping and Its Impact on Regulations, Technologies, and Industries," *Journal of International Maritime Safety, Environmental Affairs, and Shipping* 4, no. 2 (2020): 17–25.

[184] Sourdin, Tania, and Richard Cornes. "Do judges need to be human? The implications of technology for responsive judging." *The Responsive Judge: International Perspectives* (2018): 87-119.

[185] Re, Richard M., and Alicia Solow-Niederman. "Developing artificially intelligent justice." *Stan. Tech. L. Rev.* 22 (2019): 242.

[186] Chakrabarti, Deepayan, and Christos Faloutsos. "Graph mining: Laws, generators, and algorithms." *ACM computing surveys (CSUR)* 38, no. 1 (2006): 2-es.

[187] McGregor, Lorna, Daragh Murray, and Vivian Ng. "International human rights law as a framework for algorithmic accountability." *International & Comparative Law Quarterly* 68, no. 2 (2019): 309-343.

by some fundamental categories of law have existed for a long time, and new technology only presents them in a new form or amplifies them.

Therefore, when we talk about the "new challenges" of new technology, we refer only to the novelty of the "context," not the "problem." New technology only disturbs the existing legal knowledge system and prompts us to reflect on our inherent understanding of the law. This reflection is based on jurisprudence's theoretical logic and language and requires responding with words and methods. The disturbance caused by new technology does not require updating the basic categories of law. Instead, it prompts us to better defend and reflect on our current paradigms and underlying values.

The long-standing issue behind this "disturbance response" is the relationship between law and technology and between people and technology. This issue is within the field of jurisprudence. With China's implementation of the new technology curve overtaking strategy, the legal community should provide institutional suggestions and academic knowledge to address instrumental challenges while also proposing effective legal solutions to address fundamental challenges. By doing so, we can seize new opportunities for the independent development of Chinese legal science.