THE INTERSECTION OF ARTIFICIAL INTELLIGENCE AND INTERNATIONAL TRADE LAWS: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Artificial Intelligence (AI) is reshaping international trade, presenting both challenges and opportunities for existing global legal frameworks. This research explores the intersection of AI and international trade laws, focusing on key areas such as data protection, intellectual property rights (IPR), trade barriers, and regulatory harmonisation. The cross-border flow of data in trade activities raises concerns about privacy and data protection, necessitating the balance between trade liberalisation and regulatory compliance. Moreover, the emergence of AI-generated intellectual property assets poses novel questions regarding ownership, liability, and enforcement mechanisms. Discriminatory practices and trade barriers fueled by AI-driven automation and predictive analytics threaten market access and fair competition. Harmonising regulatory approaches to AI governance is imperative to promote interoperability, innovation, and market integration. Despite these challenges, AI offers significant opportunities to enhance trade facilitation, efficiency, and dispute resolution mechanisms. Embracing AI technologies can streamline supply chains, reduce transaction costs, and expedite customs procedures. Additionally, AI-driven dispute resolution mechanisms offer innovative solutions to resolve trade disputes promptly and efficiently. To address these complexities, policymakers must enhance data governance frameworks, promote IPR harmonisation, and foster regulatory cooperation at both domestic and international levels. By embracing the transformative potential of AI while upholding fundamental principles of fairness and transparency, stakeholders can build a more resilient and inclusive global trading system. The qualitative research methodology has been applied to the following article.

Keywords: Artificial Intelligence, International Trade Laws, Data Protection, Intellectual Property Rights, Trade Barriers, Regulatory Harmonisation.

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TITIK PERTEMUAN KECERDASAN BUATAN DAN UNDANG-UNDANG PERDAGANGAN ANTARABANGSA: CABARAN DAN KESEMPATAN

ABSTRAK

Kecerdasan Buatan (AI) sedang membentuk semula perdagangan antarabangsa, memberikan cabaran dan peluang kepada kerangka undang-undang sedia ada. Kajian ini membincangkan hubungan di antara AI dan undang-undang perdagangan antarabangsa, memberi fokus kepada bidang utama seperti perlindungan data, hak milik harta intelek (IPR), halangan perdagangan, dan harmonisasi undang-undang. Aliran data lintas sempadan dalam aktiviti perdagangan menimbulkan kerisauan mengenai privasi dan perlindungan data, yang memerlukan keseimbangan antara liberalisasi perdagangan dan pematuhan peraturan. Selain itu, kehadiran aset harta intelektual yang dihasilkan oleh AI menimbulkan persoalan baru mengenai pemilikan, liabiliti, dan mekanisme penguatkuasaan. Amalan diskriminatif dan halangan perdagangan yang dipacu oleh automasi berpanduan AI dan ramalan analitik mengancam akses pasaran dan persaingan yang adil. Mengharmonikan pendekatan perundangan untuk pentadbiran AI adalah penting bagi mempromosikan interoperabiliti, inovasi, dan integrasi pasaran. Meskipun terdapat banyak cabaran, AI menawarkan peluang untuk meningkatkan kemudahan perdagangan, kecekapan, dan mekanisme penyelesaian pertikaian. Merangkul teknologi AI boleh menyempurnakan rantaian bekalan, mengurangkan kos transaksi, dan mempercepatkan prosedur percukaian. Selain itu, mekanisme penyelesaian pertikaian yang berpandukan AI dapat menawarkan penyelesaian inovatif untuk menyelesaikan pertikaian perdagangan dengan cepat dan cekap. Dalam menangani kompleksiti ini, pengubal undang-undang harus meningkatkan data rangka kerja tadbir urus kerajaan, mempromosikan harmonisasi IPR, dan mendorong kerjasama penggubal undang-undang di peringkat domestik dan antarabangsa. Dengan merangkul potensi transformasi AI sambil mengekalkan prinsip-prinsip asas keadilan dan ketelusan, pihak berkepentingan boleh membina sistem perdagangan global yang lebih rapi dan inklusif. Metodologi penyelidikan kualitatif telah digunakan untuk artikel ini.

Kata Kunci: Kecerdasan Buatan, Undang-undang Perdagangan Antarabangsa, Perlindungan Data, Hak Milik Intelektual, Halangan Perdagangan, Harmonisasi Peraturan.

INTRODUCTION

The emergence of Artificial Intelligence in international trade is already changing the global market and both challenges and enhances the existing laws. AI is an advanced technology, and various governments and firms throughout the world can apply its potential to trade, and make important changes, not only in traditional trade practices but also in supply chain systems and markets.[1] The following introduction aims at highlighting the areas of AI in international trade law, which require investigation and consideration. To begin with, AI, which is known as machine learning, natural language processing, and robotics, reshapes a myriad of industries, and trade. The technology is being utilised to store and extract data in large amounts, perform any operations quickly without errors, and maintain and realise any actions in particular. In fact, AI is used to buy and sell products from one country to another and support logistics, including shipping and packaging of goods.[2] However, the changes faced by AI in international trade create new legal issues and challenges and should be addressed carefully. For instance, one of these legal challenges is data protection and privacy rights.[3] Thus, data, as one of the key facilitators of trade, are in continuous motion between partners, countries, and various legal systems. At the same time, such universal rights as data privacy and protection against unauthorised access to or use of personal information should be achieved across all jurisdictions and should be properly reconciled with the requirements emerging because of the need for innovation and data-driven trade.[4]

In addition, with the rise of AI-generated intellectual property assets, there are novel issues of ownership, liability, and enforcement mechanisms. Existing intellectual property rights regimes may be

[1]Atkinson, Katie, Trevor Bench-Capon, and Danushka Bollegala. "Explanation in AI and Law: Past, Present and Future." *Artificial Intelligence* Vol. 289, no. 01 (2020): 103–387.

[2]Cui, Yadong. "The High-Level Seminar on AI and Rule of Law Yields Fruitful Theoretical Results, Leading the Direction of Development." *Artificial Intelligence and Judicial Modernization* Vol.15, no. 02 (2019): 193–99.

[3]Richmondet al. "Explainable AI and Law: An Evidential Survey." *Digital Society* Vol.3, no. 1 (2023): 123–80.

[4]Surden, Harry. "Artificial intelligence and law: An overview." *Georgia State University Law Review* Vol. 35, no. 4 (2019): 19-22.

inadequate, as the creation presented by an artificial algorithm cannot limited to individual IP domains.[5] AI-generated works can be created as algorithms, data sets, or software solutions. Legal clarity on the status of AI-generated IP and the associated rules for ownership and liability for infringement are needed to create environments conducive to research and development and business innovation. Another source of domestic tension is the increase in the number of AI-driven automation and predictive analytics.[6] Governments may introduce trade barriers or commission AI-enabled tariff classification algorithms. These could be regarded as violating the WTO[7] principles of non-discrimination and market access.[8] In order to promote regulatory coherence and facilitate innovation, it is relevant to adopt a harmonised approach in regulating AI. However, AI can also be used to promote trade facilitation, efficiency, and dispute resolution mechanisms.[9]

AI technologies can contribute to economic growth and global competitiveness by streamlining supply chains, reducing transaction costs, and accelerating customs procedures. Furthermore, AI-powered mechanisms of dispute settlement can also help solve trade conflicts efficiently and promptly, facilitating a predictable and stable international trading regime.[10] However, the legal and regulatory challenges of AI in international trade should be considered by policymakers, businesses and civil society from a holistic perspective,

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[5]Cyran, Hunter. "New Rules for a New Era: Regulating Artificial Intelligence in the Legal Field." *Journal of Law, Technology, & the Internet* Vol.15, no. 1 (2024): 13-40

[6]Wachteret al. "Why fairness cannot be automated: Bridging the gap between EU non-discrimination law and AI." *Computer Law & Security Review* Vol. 41 (2021): 01-72.

[7]Khan, Asif. "The Emergence of the Fourth Industrial Revolution and its Impact on International Trade." *ASR: CMU Journal of Social Sciences and Humanities* Vol. 11, no. 1 (2024): 01-13.

[8]Khan et al. "Plurilateral negotiation of WTO E-commerce in the context of digital economy: Recent issues and developments." *Journal of Law and Political Sciences* Vol. 11, no. 1 (2021): 20-60.

[9]Bench-Capon, et al. "A history of AI and Law in 50 papers: 25 years of the international conference on AI and Law." *Artificial Intelligence and Law* Vol. 20, no. 2 (2012): 215-319.

[10]Bench-Capon, Trevor. "The need for good old fashioned ai and law." *Jusletter-IT* fses Vol. 30, no. 2 (2021): 23-35.

to ensure that AI applications comply with such fundamental trade principles as fairness, transparency and accountability.[11] By promoting innovative forms of interdisciplinary collaboration, these stakeholders will be better equipped to realise the transformative promise of AI, and as a result, facilitate sustainable economic development and shared prosperity in the era of globalisation.

LITERATURE REVIEW

Research attention on the confluence of AI and international trade laws has escalated in recent years by scholars and practicing experts alike.[12] These papers present a synthesis of findings of existing research, theoretical frameworks, and policy debates with statistics related to the use of AI in international trade.

Data Protection and Privacy: Cross-border data flow has raised privacy concerns and the associated data protection laws. The rapid flow of data and increasing cross-border techniques are raising fears from public and regulatory agencies as to ethical considerations and the privacy implications of international trade. Acquisti and Fong have considered the inherent challenges of the regulatory approach to globalised data privacy but state that cooperation and regulatory harmonisation will be critical. The European Union introduced the General Data Protection Regulation which is one of the contemporary models aimed at safeguarding personal data in cross-border transactions. However, no direct international trade agreement recognises the territorial application of data protection laws. The applicability of GDPR principles, safeguards, and breach determinants to international trade agreements remains questionable.[13]

Intellectual Property Rights (IPR): AI-based intellectual property assets have led to arguments concerning liability, ownership, and enforcement. Girasa, Rosario, and Rosario have researched the

[11]Davis, Joshua P. "Artificial wisdom? A potential limit on AI in law (and elsewhere)." *Okla. L. Rev.* Vol. 72, no. 1 (2019): 51-89.

[12]Khan, Asif, and Muhammad Abid Hussain Shah Jiliani. "Expanding The Boundaries of Jurisprudence In The Era Of Technological Advancements." *IIUMLJ* Vol. 31, no. 2 (2023): 393-426.

[13]Acquisti, Alessandro, Curtis Taylor, and Liad Wagman. "The economics of privacy." *Journal of economic Literature* Vol. 54, no. 2 (2016): 442-492.

impact of AI on intellectual property systems and pointed to the problem that an overwhelming majority of AI-generated works cannot be attributed to their creators.[14] The World Intellectual Property Organisation (WIPO)[15] has initiated discussions on the recognition of patents on AI inventions and the sufficient validity of the patent search and examination processes when assessing AI-generated innovations.[16]

Trade Barriers and Discriminatory Practices: AI technologies, including automation and predictive analytics, have the potential to disrupt traditional trade patterns and market dynamics. Schneider et al.,[17] have analysed the influence of AI on trade flows and economic globalisation, and connected AI with the country's market access and competition nature affected by the regulatory barriers. As such, the problem of expanding the use of AI-based tariff classification features and the violation of the non-discrimination principle between foreign and domestic goods and market access are linked.[18]

Regulatory Harmonisation and Standards: The borderless proliferation of AI technologies warrants discussion on the importance of regulatory harmonisation and interoperability. The online resources of the WTO[19] and International Organisation for Standardisation reveal that both institutions are in the process of developing AI-related

[14]Girasa, Rosario, and Rosario Girasa. "International initiatives in AI." *Artificial Intelligence as a Disruptive Technology: Economic Transformation and Government Regulation* Vol. 54, no. 2 (2020): 255-298.

[15]Khan, Asif, and Ximei Wu. "Bridging the Digital Divide in the Digital Economy with Reference to Intellectual Property." *Journal of Law and Political Sciences* Vol. 28, no. 03 (2021): 256-263.

[16]Citaristi, Ileana. "World Intellectual Property Organization—WIPO." In *The Europa Directory of International Organizations 2022*, pp. 395-398. Routledge, 2022.

[17]Schneider, Johannes, Rene Abraham, Christian Meske, and Jan Vom Brocke. "Artificial intelligence governance for businesses." *Information Systems Management* Vol. 40, no. 3 (2023): 229-249.

[18]Bagwell, K., & Staiger, R. W. Discrimination and competition in international trade: The case of uniform tariffs. *American Economic Journal: Microeconomics*Vol. 12, no. 4 (2020): 97-124.

[19] Khan, Asif. "Rules on Digital Trade in the Light of WTO Agreements." *PhD Law Dissertation, School of Law, Zhengzhou University China*, 2023.

standards and guidelines.[20] However, it would be challenging to reach a consensus regarding regulatory approaches to AI governance, given the range of interests and policy priorities of its member states.[21]

In assumption, the research suggests that there is a broad understanding of the link between AI development and international trade laws. AI can be very beneficial in terms of trade facilitation, efficiency, and dispute settlement, and, in these respects, it can revolutionise the operation of the entire legal and regulatory system.[22] However, at the same time, AI is associated with multiple legal challenges, the most immediate of which are related to data protection, IPRs, regulatory coherence, and transparency, et cetera.[23] Therefore, the key problems should be approached with the involvement of multiple stakeholders and the use of an interdisciplinary method, and relevant governance should be flexible and adaptable in order to secure economic growth and inclusive global trade.[24]

RESEARCH METHODOLOGY

In the given qualitative research project focusing on the role of AI in international trade laws, a multi-faceted approach will be used to explore the complex phenomena. First, the researcher will conduct a literature review that will help establish a theoretical background related to the chosen phenomenon and critically assess the existing scholarly studies.[25] Second, a wide range of qualitative data will be

[20]Cihon, Peter. "Standards for AI governance: international standards to enable global coordination in AI research & development." *Future of Humanity Institute. University of Oxford* Vol. 40, no. 3 (2019): 340-342.

[21]Abbott et al. *International intellectual property in an integrated world economy*. Aspen Publishing, 2024.

[22]Liu, Han-Wei, and Ching-Fu Lin. "Artificial intelligence and global trade governance: a pluralist agenda." *Harv. Int'l LJ* Vol. 61, no. 3 (2020): 407.

[23]Wong, Janis. "Co-creating data protection solutions through a common." PhD diss., The University of St Andrews, 2022.

[24]Carayannis, Elias G., and Joanna Morawska-Jancelewicz. "The futures of Europe: Society 5.0 and Industry 5.0 as driving forces of future universities." *Journal of the Knowledge Economy* Vol. 13, no. 4 (2022): 3445-3471.

[25]Snyder, Hannah. "Literature review as a research methodology: An overview and guidelines." *Journal of business research* Vol.104 (2019): 333-339.

collected, and the first source will be interviews and focus group discussions. This method seeks to gain the insights and opinions of stakeholders which include policymakers, lawyers, businessmen, and scholars. Alternatively, the second source will involve thematic analysis to study patterns, trends, and themes found in this data source.[26] It is believed that the approach involving a combination of document analysis, interviews, and thematic analysis would enable research purpose and goals to be achieved relating to exploring the legal challenges and opportunities related to the reliance on AI technologies in international trade.[27]

IMPLICATIONS OF AI ON INTERNATIONAL TRADE LAWS

Data Protection and Privacy

Data protection and privacy can be defined as activities related to the protection of personal data owned by individuals and the management of their rights to control the data.[28] In terms of AI and international trade, these activities become highly important because of the amount of data exchanged and the level of danger in regard to the data processing and transactions.[29] Data protection addresses a set of measures used to provide that personal data of individuals is processed reliably, legally, and transparently.[30] These measures include the necessity to receive the consent of the individuals to collect their data, the requirement to collect only those data that is necessary for certain purposes and process data only for these purposes, and ensure that data

[26]Bhattacharyya, Dipak Kumar. *Research methodology*. Excel Books India, 2006.

[27]Davidavičienė, Vida. "Research methodology: An introduction." *Modernizing the academic teaching and research environment: Methodologies and cases in business research* (2018): 1-23.

[28]Hoofnagle et al. "The European Union general data protection regulation: what it is and what it means." *Information & Communications Technology Law* Vol. 28, no. 1 (2019): 65-98.

[29]Goldfarb, Avi, and Daniel Trefler. *AI and international trade*. No. w24254. National Bureau of Economic Research, 2018.

[30]Khan, Asif. "E-commerce Regulations in Emerging Era: The Role of WTO for Resolving the Complexities of Electronic Trade." *ASR Chiang Mai University Journal of Social Sciences and Humanities* Vol. 8, no. 2 (2022): 01-13.

is protected against loss, stealing, and disclosure.[31] Privacy reflects the individual right of persons in regards to the data they possess and all the personal information about them. Data privacy implies a number of rights of individuals such as receiving access to the data for verifying its validity, receiving duplicates of their medium, erasure, or not collecting it.[32]

When it comes to international trade, data protection and privacy pose special difficulties since the data involved flies across borders, and the laws and norms in different countries regulating data vary considerably.[33] For example, the European Union's General Data Protection Regulation (GDPR) sets numerous requirements for the personal data transfers. Some of the most important requirements is that the transfer should not take place, unless a given country guarantees the level of protection compatible with the GDPR.[34] As a result, trade can be restricted, and for businesses operating in multiple countries, compliance with the legislation can be more complex and costly.[35] However, the policymakers and the organisations should work together to ensure proper data governance, which would mean that the rights of individuals for their data protection and privacy will be supported and international trade facilitated.[36] To achieve these two goals simultaneously, several steps can be made. First, different countries (for example China, EU, etc) can work on the harmonisation

[31]Achar, Sandesh. "Early Consequences Regarding the Impact of Artificial Intelligence on International Trade." *American Journal of Trade and Policy* Vol. 6, no. 3 (2019): 119-126.

[32]Goldfarb, Avi, and Daniel Trefler. "Artificial intelligence and international trade." *The economics of artificial intelligence: an agenda* (2019): 463-492.

[33]Hallinan, Dara, Michael Friedewald, and Paul McCarthy. "Citizens' perceptions of data protection and privacy in Europe." *Computer law & security review* Vol. 28, no. 3 (2012): 263-272.

[34]Minssen et al. "The EU-US Privacy Shield Regime for Cross-Border Transfers of Personal Data under the GDPR: What are the legal challenges and how might these affect cloud-based technologies, big data, and AI in the medical sector?" *EPLR* Vol. 4, no. 1 (2020): 34-50.

[35]Kahn, Asif, and Ximei Wu. "Impact of digital economy on intellectual property law." *J. Pol. & L.* Vol. 13 no. 1 (2020): 117-125.

[36]Prud'homme, Dan, and Taolue Zhang. China's Intellectual Property Regime for Innovation. Springer International Publishing, 2019.

of their data protection laws.[37] Second, the mechanisms for the international cross-border data transfer which comply with the high standards of the relevant data protection legislation should be developed.[38] Finally, transparency and accountability in data processing practices should be promoted. Such steps would allow for the responsible use of AI technologies and ensure that in the context of international trade, the rights of individuals for the protection of their data are fully observed.[39]

Intellectual Property Rights (IPR)

To begin with, it should be noted that as AI technologies grow more sophisticated, they generate a diversity of intellectual property assets that are critical to further innovation and economic development. An algorithm, a dataset, or a software solution developed with the use of AI constitutes valuable property which should be protected in the absence of IP rights to foster investment in any AI research and development.[40] The reality is, traditional IPR regimes such as patents, copyrights, and trade secrets have so far played an important role in the protection and safeguarding of innovation in a range of industries. For example, in the pharmaceutical industry, patents protect new drug formulations, ensuring that companies can recoup their investment in research and development by granting them exclusive rights to produce and sell the new medication for a certain period.[41] However, the

[37]Põld, Lisette. "Beyond traditional intellectual property: The necessity and possibilities of strengthening the protection of trade secrets through its integration into the modern intellectual property system." *International Comparative Jurisprudence* Vol. 9, no. 1 (2023): 123-138.

[38]Chaudhuri, Abhik. "Internet of things data protection and privacy in the era of the General Data Protection Regulation." *Journal of Data Protection & Privacy* Vol. 1, no. 1 (2016): 64-75.

[39]Lee, Calvin, and Gouher Ahmed. "Improving IoT privacy, data protection and security concerns." *International Journal of Technology, Innovation and Management (IJTIM)* Vol. 1, no. 1 (2021): 18-33.

[40]Brander, James A., Victor Cui, and Ilan Vertinsky. "China and intellectual property rights: A challenge to the rule of law." *Journal of International Business Studies* Vol. 48 (2017): 908-921.

[41]Ike, David. "Preservation of trade secrets pursuant to TRIPS agreement and emerging nations." *Nnamdi Azikiwe University, Awka Journal of Public and Private Law* Vol. 11 (2021); 286-300.

application of these regimes to works generated with the help of AI raises novel and complex legal questions that need to be addressed.[42] For example, one of the most crucial questions is that of authorship and ownership of a work created by AI. In contrast to traditional creative works, in which the identity of the human author is usually quite apparent, AI systems are autonomous, which complicates the attribution of authorship from a legal standpoint.[43] Besides, a range of stakeholders may claim ownership of the AI-generated work – AI developers, data providers, AI users – thus resulting in ownership disputes. In addition, the degree of human input into the creation of such siluriformes varies, which raises the question of the applicability of traditional copyright and patent law.[44]

In addition, liability for infringement in the case of AI-generated work perplexes the legal system. AI algorithms are dynamic, and their results can be unpredictable, which makes it very difficult to draw a line regarding IP protection and breach.[45] Who will be liable in the case in which the AI system learns from copyrighted materials and creates works that are considered derived for the user — the developer of the system, the sources of data, or the user? And who is the liability holder if the AI device that generates new creations in the course of its work infringes existing close patents? The questions are complex and require thorough understanding of AI techniques and systems.[46] Hence, policymakers, attorneys, and market players should join their efforts to create rules that will efficiently meet changes of the time and be

[42]Hong, Jie, Jakob Edler, and Silvia Massini. "Evolution of the Chinese intellectual property rights system: IPR law revisions and enforcement." *Management and Organization Review* Vol. 18, no. 4 (2022): 755-787.

[43]Cimoli, Mario, Giovanni Dosi, Keith E. Maskus, Ruth L. Okediji, Jerome H. Reichman, and Joseph E. Stiglitz, eds. *Intellectual property rights: legal and economic challenges for development*. Oxford University Press, 2014.

[44]Barzel, Yoram, and Douglas W. Allen. *Economic analysis of property rights*. Cambridge university press, 2023.

[45]Papageorgiadis, Nikolaos, and Abhijit Sharma. "Intellectual property rights and innovation: A panel analysis." *Economics Letters* Vol. 141 (2016): 70-72.

[46]Chen, Jianfu. "Intellectual property law." In *Chinese Law: context and transformation*, pp. 762-815. Brill Nijhoff, 2016.

flexible enough.[47] Conclusions regarding AI author ownership and production of patent and copyright law, patents and copyrights must be based on the possibility of the introduction of AI drones.[48] The authorship statement must be maintained, but it must be governed in accordance with the adoption of the automation of creations. Modification of copyright law must be considered to authorise the incorporation of AI innovations.[49] Legislators and courts must increase potential liability for patent piracy-related innovation. They must achieve it effectively.[50] By doing these things, stakeholders will be able to facilitate the process of work with AI and precisely foster AI inventions in the best ways possible[51].

Trade Barriers and Discriminatory Practices

The combination of AI-enabled automation and predictive analytics with global trade can bring both transformative opportunities and significant challenges for the existing trade ecosystem.[52] Some of the main risks associated with the utilisation of AI for driving disruption, and considered by most of policy actors, are the problem of job displacement, economic inequality, and unfair competition.[53] To a

[47]Brown, Ian, and Christopher T. Marsden. *Regulating code: Good governance and better regulation in the information age*. MIT Press, 2023.

[48]Dutfield, Graham, and Uma Suthersanen. *Dutfield and Suthersanen on global intellectual property law*. Edward Elgar Publishing, 2020.

[49]Kur, Annette, and Ulf Maunsbach. "Choice of law and intellectual property rights." *Oslo Law Review* Vol. 6, no. 1 (2019): 43-61.

[50]Zhai, Yixuan. "Safeguarding Innovation: Exploring the Role of Criminal Justice Systems in Protecting Intellectual Property Rights, Combating Piracy, and Promoting Socio-Economic Stability." *International Journal of Criminal Justice Sciences* Vol. 18, no. 1 (2023): 317-347.

[51]Abbott, Frederick M., Thomas Cottier, Francis Gurry, Ryan B. Abbott, Mira Burri, Henning Grosse Ruse-Khan, and Maegan McCann. *International intellectual property in an integrated world economy*. Aspen Publishing, 2024.

[52]Dziurdź, Kasper. "Non-discrimination in Tax Treaty Law and World Trade Law." (2019): 1-672.

[53]Gros, Daniel. "This is not a trade war; it is a struggle for technological and geo-strategic dominance." In *CESifo Forum*, vol. 20, no. 1, pp. 21-26. München: ifo Institut–Leibniz-Institut für Wirtschaftsforschung an der Universität München, 2019.

great extent, the concern is driven by the stable tendency of automation to replace routine labour. However, it is also part of a broader list of socio-economic debates remaining persistent. AI has a large potential to increase efficiency, simplify supply chains, and optimise trade processes.[54] Therefore, these should lead to better productivity and greater economic growth. At the same time, such routine, not requiring highly specific skills, but rather duty-based, labour is the most demanded task at the job market. Workers, mostly represented by the lower- and middle-income classes, lose their jobs and face severe economic inequality.[55]

Also, AI adoption in trade may lead to the deepened inequalities between advanced and developing countries. For example, countries like the United States and Germany, which have significant investments in AI technologies, might use AI-driven logistics to optimise supply chains, reducing costs and delivery times.[56] In contrast, developing countries such as Kenya and Bangladesh, lacking similar technological infrastructure, may struggle to compete, leading to increased economic disparities.[57] Additionally, AI-powered trade platforms could favor businesses in advanced countries with better access to digital tools and skills, further widening the gap between these advanced economies and developing nations.[58] On the one hand, AI offers ample opportunities for efficiency and improvement within

[54]Ray, David, and Gary Goodpaster. "Indonesian Decentralization: local autonomy, trade barriers and discrimination." In *Autonomy and disintegration in Indonesia*, pp. 75-96. Routledge, 2014.

[55]Hasanov, Fakhri J., Zeeshan Khan, Muzzammil Hussain, and Muhammad Tufail. "Theoretical framework for the carbon emissions effects of technological progress and renewable energy consumption." *Sustainable Development* 29, no. 5 (2021): 810-822.

[56]Dauvergne, Peter. "Is artificial intelligence greening global supply chains? Exposing the political economy of environmental costs." *Review of International Political Economy* Vol. 29, no. 3 (2022): 696-718.

[57]Almeshqab, Fatema, and Taha Selim Ustun. "Lessons learned from rural electrification initiatives in developing countries: Insights for technical, social, financial and public policy aspects." *Renewable and Sustainable Energy Reviews* Vol. 102 (2019): 35-53.

[58]Gehl Sampath, Padmashree. "Governing artificial intelligence in an age of inequality." *Global Policy* Vol. 12 (2021): 21-31.

commodity trade transactions.[59] On the other hand, the adoption of AI involves infrastructural investments, skills requirement, and technology.[60] Therefore, for developing countries that are normally characterised by the lack of resources and few technology-related developments, AI adoption is likely to promote technological colonialism and thus exaggerate the gap between the tech-rich and the tech-poor countries.[61] As a result, there is a high likelihood that the governments will resort to protectionist measures or specific barriers to trade.[62] These measures can apply to AI-based automation, whether through tariffs, quotas, or various regulatory barriers.[63] However, their main function is to reduce the flow of AI-implemented goods or services to the domestic markets. Since this can stifle innovation and decrease the flow of goods, such measures can prevent non-discrimination and market access, which are the primary trade principles endorsed both by the relevant trade laws and multilateral institutions.[64] Likewise, AI-generated tariff classification algorithms or biased trade facilitation measures can exacerbate the given inequalities or distort the nature of competition on global markets.[65] For example, if discriminatory values against the importation of specific goods (or reduction of this industry's capacity in one country while being increased in another) are based on an AI product classification system, the international trade regime is likely to face severe challenges.[66] To

[59]Liu, Han-Wei, and Ching-Fu Lin. "Artificial intelligence and global trade governance: a pluralist agenda." *Harv. Int'l LJ* Vol. 61 (2020): 407-450.

[60]Brown, Ian, and Christopher T. Marsden. *Regulating code: Good governance and better regulation in the information age*. MIT Press, 2023.

[61]Dreyer, Iana. *Energising TTIP: Diversification through trade?* European Union Institute for Security Studies (EUISS), 2022

[62]Kinzius et al. "Trade protection and the role of non-tariff barriers." *Review of World Economics* Vol. 155, no. 4 (2019): 603-643.

[63]Ferencz et al. "Artificial Intelligence and international trade: Some preliminary implications." *OECD Trade Policy Papers*, (2022).

[64]Ajibo, Collins C. "African continental free trade area agreement: the euphoria, pitfalls and prospects." *Journal of World Trade* Vol. 53, no. 5 (2019); 871-894

[65]Peterson, John. "The politics of transatlantic trade relations." In *Trade politics*, pp. 36-50. Routledge, 2019.

[66]Sieber-Gasser, Charlotte, Smriti Kalra, and Aditi Vishwas Sheth. "Sustainable Development Goals vs Non-Discrimination in WTO Law:

sum up, though the use of AI in the global trade sphere grants remarkable opportunities for its advancement, a multi-faceted approach for balancing these prospects should be adopted. This approach includes different measures related to the investments in education and skill development, promotion of innovation and technology transfer in the domain of international trade and moves to ensure proper regulation and transparency in the AI development and use in trade.[67] Therefore, the adoption of these strategies by policymakers will guarantee that they benefit from the transforming role of AI for trade, while risks and more widespread and equal involvement of stakeholders are taken into account.[68]

Regulatory Harmonisation and Standards

One of the main factors structuring conditions of international trade development is regulatory harmonisation and standards development. The phenomenon is especially topical these days, taking into consideration the wide use of emerging technologies.[69] The further use of AI, and its inclusion in more and more of the trade activities, raises the need of harmonised regulations, and standards allowing using AI all over the world.[70] Disharmonised regulations present significant challenges across various sectors. For instance, data privacy laws like the GDPR in the EU and the CCPA in California differ in scope and

Does the End Justify the Means?" *Indian J. Int'l Econ. L.* Vol. 13 (2021): 01-25.

[67]Miranzo-Díaz, Javier. "The tension between global public procurement law and nationalist/populist tendencies: proposals for reform." *Revista de investigacoes Constitucionais* Vol. 7, no. 2 (2020): 355-400.

[68]Evenett, Simon J. "Protectionism, state discrimination, and international business since the onset of the Global Financial Crisis." *Journal of International Business Policy* Vol. 2 (2019): 9-36.

[69]Mariani, Marcello, Samuel Fosso Wamba, Sandro Castaldo, and Gabriele Santoro. "The rise and consolidation of digital platforms and technologies for remote working: Opportunities, challenges, drivers, processes, and consequences." *Journal of Business Research* Vol. 160 (2023): 113617.

[70]Winter, Jenifer Sunrise, and Elizabeth J. Davidson. "Harmonizing regulatory spheres to overcome challenges for governance of patient-generated health data in the age of artificial intelligence and big data." In *TPRC48: The 48th research conference on communication, information and internet Policy*. 2020.

enforcement, complicating compliance for multinational firms.[71] Food safety regulations vary globally, affecting exporters and importers, while financial regulations differ between countries, hindering global financial operations. Environmental standards and telecommunications regulations also lack consistency, impacting sustainability efforts and telecom projects, respectively. These examples underscore the complexities and barriers that arise when regulations diverge, hampering international trade and cooperation.[72] Harmonisation of regulations presupposes the process of aligning different laws, regulations, and administrative measures, with an assumption that they will become more similar and there will be no different regulations or reduced number of regulations in regard to products.[73] In the context of AI, regulatory harmonisation aims at addressing a wide range of issues, including different policies that exist in the area of AI regulation, safety standards, ethical norms, and liability systems.[74] The development of standard-compatible harmonised regulations creates an equal playing field for all businesses that want to participate in global markets, reduces their profits losses, and improves consumer trust in AI products and services.[75]

[71]Kusworo et al. "Establishment of a National Regulatory Body to Overcome Disharmonization of Natural Resources and Environmental Policies." *International Journal of Multicultural and Multireligious Understanding* Vol. 9, no. 11 (2022): 225-235.

[72]Nasir, Citra, Nasrah Hasmiati Attas, Tri Eka Saputra, and Cristofer Susanto. "Efforts To Overcome-Dis-Harmonization Of Regional Regulations To Realize Harmonious Regional Regulation." *International Journal of Business, Law, and Education* Vol. 3, no. 2 (2022): 203-211.

[73]Díaz-Rodríguez et al. "Connecting the dots in trustworthy Artificial Intelligence: From AI principles, ethics, and key requirements to responsible AI systems and regulation." *Information Fusion* Vol. 99 (2023): 101896.

[74]Marble et al. "A regulatory science initiative to harmonize and standardize digital pathology and machine learning processes to speed up clinical innovation to patients." *Journal of Pathology Informatics* Vol. 11, no. 1 (2020): 22.

[75]Stuurman, Kees, and Eric Lachaud. "Regulating AI. A label to complete the proposed Act on Artificial Intelligence." *Computer Law & Security Review* Vol. 44 (2022): 105657.

The first aspect is standards enable a way of ensuring there is interoperability, compatibility, as well as quality assurance of AI technologies. Standards are a formulation of technical specifications, minimum criteria for performance and best practices in development, operationalisation, and use of artificial intelligence systems.[76] Standards give a framework for innovation by providing a common language and reference for the industry, researchers, and policy makers. They enable market access by demonstrating compliance of AI systems.[77] International institutions such as International Organisation for Standardisation,[78] International Telecommunication Union[79], and the Organisation for Economic Co-operation and Development[80] have a significant role in the development of AI-related standards and guidelines.[81] These international bodies coordinate the formulation of these standards by enabling dialogue among stakeholders in member states and industry, knowledge sharing, and fostering consensus.[82]

Furthermore, it is clear that with adequate regulatory harmonisation and standards alignment, trade agreements, and other mechanisms for international trade can promote the alignment of

[76]Laux, Johann, Sandra Wachter, and Brent Mittelstadt. "Three pathways for standardisation and ethical disclosure by default under the European Union Artificial Intelligence Act." *Computer Law & Security Review* Vol. 53 (2024): 105957.

[77]González-Gonzalo et al. "Trustworthy AI: closing the gap between development and integration of AI systems in ophthalmic practice." *Progress in retinal and eye research* Vol. 90 (2022): 101034.

[78]Rittberger, Volker, Bernhard Zangl, Andreas Kruck, and Hylke Dijkstra. *International organization*. Bloomsbury Publishing, 2019.

[79]Savage, James G. *The politics of international telecommunications regulation*. Routledge, 2019.

[80]Abbott, Kenneth W., Philipp Genschel, Duncan Snidal, and Bernhard Zangl. "Orchestration: Global governance through intermediaries." In *The Spectrum of International Institutions*, pp. 140-170. Routledge, 2021.

[81]Winter, Jenifer Sunrise, and Elizabeth Davidson. "Harmonizing regulatory regimes for the governance of patient-generated health data." *Telecommunications Policy* Vol. 46, no. 5 (2022): 102285.

[82]Kim, Kyungmo, and George A. Barnett. "The structure of the international telecommunications regime in transition: A network analysis of international organizations." *International Interactions* Vol. 26, no. 1 (2000): 91-127.

regulations and standards and reduce trade barriers.[83] It is believed to aid the promotion of regulatory cooperation, mutual recognition of standards and conformity assessment procedures.[84] However, existing challenges include the need to provide both regulatory harmonisation and standards alignment in scenarios that include the application of AI, which can be difficult because of the differences (China, EU, etc) in legal systems, cultural norms, policy priorities, and the challenges of dealing with a rapidly moving technology and an evolving nature of AI, among others.[85] Overall, such approaches as regulatory harmonisation and standards alignment require a coordinated international action undertaken by governments and international organisations, industry, and civil society.[86] Importantly, the elimination of regulatory barriers and the promotion of trust in innovations can be achieved through a combination of different approaches, which includes public-private partnerships, multi- stakeholder dialogues, and capacity-building programmes, all of which provide an opportunity for a rules-based approach to AI-enabled globalisation.[87] This is essential to create a conducive environment for the application of AI and to realise technology's full potential through advances in innovation and expansion of competition while ensuring sustainable development.[88]

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[83]Klotz, Sebastian. *International Standardization and Trade Regulation: Exploring Linkages Between International Standardization Organizations and International Trade Agreements*. Brill, 2024.

[84]Woodward, Richard. *The organisation for economic co-operation and development (OECD)*. Routledge, 2009.

[85]Druetta, Corrado. "AI in the Making: Is EU Artificial Intelligence Regulatory Framework a Good Move for European Manufacturing?" *Int'l. In-House Counsel J.* Vol. 14 (2021): 7367.

[86]McFadden, Mark, Kate Jones, Emily Taylor, and Georgia Osborn. *Harmonising Artificial Intelligence*. Working paper 2021.5, 2021.

[87]Ebers, Martin, Veronica RS Hoch, Frank Rosenkranz, Hannah Ruschemeier, and Björn Steinrötter. "The European Commission's proposal for an Artificial Intelligence Act—a critical assessment by members of the Robotics and AI Law Society (RAILS)." Vol. 4, no. 4 (2021): 589-603.

[88]Winter, Jenifer Sunrise, and Elizabeth Davidson. "Harmonizing regulatory regimes for the governance of patient-generated health data." *Telecommunications Policy* Vol. 46, no. 5 (2022): 102285.

OPPORTUNITIES FOR AI IN INTERNATIONAL TRADE

Trade Facilitation and Efficiency

Blockchain, smart contracts, and predictive analysis are AI-powered tools that are expected to revolutionise international trade by driving increased efficiency, reduced costs, and optimal resource allocation for the vast majority of supply chains.[89] As AI algorithms and processes of data analysis are particularly valuable in the context of automating routine processes and reducing the operational risks, their implementation in the sphere of international trade may be particularly beneficial for accelerating customs clearance procedures and improving cross-border trade smoothness.[90] Blockchain technology, in particular, may be used for ensuring transparent and unchangeable record-keeping of the trade transactions, allowing the use of decentralised ledgers to record all of the information.[91] A shared, unchanged record increases the level of trust and transparency between the trading partners, helps meet the increased tracking level for the goods, and allows real-time verification of the goods' stages at all parts of the supply chain.[92] As a result, the representatives will be able to completely eliminate the dangers of counterfeiting, theft, and illicit trade, reducing the risks of administrative delays that continue to occur due to paperwork processes.[93]

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[89]Jaloliddin, Rahmonov. "Digitalization in global trade: opportunities and challenges for investment." *Global Trade and Customs Journal* Vol. 18, no. 10 (2023).

[90]Garg, Seema, Navita Mahajan, and Jayanta Ghosh. "Artificial Intelligence as an emerging technology in Global Trade: the challenges and Possibilities." In *Handbook of Research on Innovative Management Using AI in Industry 5.0*, pp. 98-117. IGI Global, 2022.

[91]Fornes, Gaston, and Maria Altamira. "Artificial intelligence and international business." In *Digitalization, technology and global business: How technology is shaping value creation across borders*, pp. 71-90. Cham: Springer International Publishing, 2023.

[92]Shrivastava, Pranjal, and Vandana Sharma. "Debunking the 5G Covid 19 Myth-A Comprehensive Review of 5G and its Implications in IoT." In *2023 4th International Conference on Intelligent Engineering and Management (ICIEM)*, pp. 1-6. IEEE, 2023.

[93]Mayo, Shaker Mahmood. "Restrictions, Challenges and Opportunities for AI and ML." *International Journal of Innovations in Science & Technology* Vol. 5, no. 2 (2023): 121-132.

A smart contract is an AI-driven programme that automates and executes the terms of a trade agreement without the need for intermediation.[94] Such self-executing contracts conduct specific actions as soon as all predetermined conditions are met and the action calls for payment. As this process does not involve human interference, trade destination management is streamlined.[95] These transactions no longer need to pass through multiple intermediation stages that help avoid disputes and delays. The predictability and certainty delivered by smart contracts are seen as advantageous as the speed of trade is accelerated, transaction costs are decreased, and performance is improved.[96] Predictive analytics is another broadly used AI solution that allows historical information and data to be analysed to foresee future events, market developments, and patterns by employing AI and machine learning.[97] Large volumes of data that include market trends, buyer purchases vice are processed during the prediction, and steps and supply chain performance are taken to anticipate demand and prevent any uneconomical quantities of goods from being stored.[98] Furthermore, thanks to predictive analytics, issues that could create bottlenecks along the way are considered width. As these risks are anticipated, their impact mitigated by the companies, and the proximity of supplies will be optimised for the manufacturer.[99]

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[94]Krichen, Moez. "Strengthening the security of smart contracts through the power of artificial intelligence." *Computers* Vol. 12, no. 5 (2023): 107.

[95]Strielkowski et al. "post-soviet economics in the context of international trade: opportunities and threats from mutual cooperation." *Economic research-Ekonomska istraživanja* Vol. 36, no. 1 (2023): 2021-2044.

[96]Lamers, Patrick, Thuy Mai-Moulin, and Martin Junginger. "Challenges and opportunities for international trade in forest biomass." *Mobilisation of Forest Bioenergy in the Boreal and Temperate Biomes* Vol. 20 (2016): 127-164.

[97]Budhwar, Pawan, Ashish Malik, MT Thedushika De Silva, and Praveena Thevisuthan. "Artificial intelligence–challenges and opportunities for international HRM: a review and research agenda." *The International Journal of human resource management* Vol. 33, no. 6 (2022): 1065-1097.

[98]Hammoud, Hawraa. "Trade Secrets and Artificial Intelligence: Opportunities & Challenges." *Available at SSRN 3759349* (2020).

[99]Dwivedi, Yogesh K., Laurie Hughes, Elvira Ismagilova, Gert Aarts, Crispin Coombs, Tom Crick, Yanqing Duan et al. "Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and

It is imperative that businesses understand the complexities of international trade and make the necessary investments in technology to successfully navigate sophisticated regulations and minimise transaction risks and costs. Moreover, businesses need to balance transaction costs against other costs and benefits, such as the considerations of supply chain efficiency, access to suppliers, and reliance on foreign inputs to make informed decisions.[100] The application of AI-driven technologies can accelerate the process of customs clearance since the verification of documents, assessment of risks, and checking the compliance can be automated. For example, AI-driven tools can track the invoice details, bill of lading, and certificate of origin by scanning the documents to find any inconsistencies, mistakes, or fraud.[101] AI technologies reduce the time and costs of the verification implemented by the officials of customs and contribute to improving the accuracy and speed of customs clearance equally. As a result, cross-border trade becomes faster and more predictable for expected time frames. AI-driven tools can help improve facilitation of trade, reduce transaction costs, and improve the efficiency of supply chains in international trade. Therefore, businesses and governments can improve the pace of transactions and decrease risks related to international transactions and reduce the costs by utilising these tools.[102]

agenda for research, practice and policy." *International Journal of Information Management* Vol. 57 (2021): 101994.

[100]Sanders, Nada R., Tonya Boone, Ram Ganeshan, and John D. Wood. "Sustainable supply chains in the age of AI and digitization: research challenges and opportunities." *Journal of Business logistics* Vol. 40, no. 3 (2019): 229-240.

[101]Yufriadi, Ferdi, Fadilla Syahriani, and Abdullah A. Afifi. "Trade Transformation in The Digital Era: Agency Role, Opportunities And Challenges." *AL-IMAM: Journal on Islamic Studies, Civilization and Learning Societies* Vol. 5 (2024): 13-23.

[102]Smith, Matthew J., Hesiquio Benítez-Díaz, Margarita África Clemente-Muñoz, John Donaldson, Jon M. Hutton, H. Noel McGough, Rodrigo A. Medellin et al. "Assessing the impacts of international trade on CITES-listed species: Current practices and opportunities for scientific research." *Biological Conservation* Vol. 144, no. 1 (2011): 82-91.

Dispute Resolution Mechanisms

Disputes in the sphere of international trade are regular. Because different parties have various interpretations of trade agreements and are driven by diverse interests, the uncontrolled occurrence of conflicts negatively affects the development of international trade. Uncontrolled occurrences in international trade, such as disputes over tariffs, trade agreement interpretations, and intellectual property rights violations, present significant challenges to the development of global commerce. Tariff disputes, exemplified by the U.S.-China trade war, can escalate tensions and disrupt established trade flows.[103] Additionally, differing interpretations of trade agreements, as seen in NAFTA renegotiations, often lead to prolonged negotiations and uncertainty. Intellectual property rights violations, including patent infringement and theft of trade secrets, further exacerbate tensions between trading partners, particularly in technology-intensive industries. Moreover, unilateral sanctions and embargoes, such as those imposed by the U.S. on Iran, can result in retaliatory measures and trade conflicts. Furthermore, disputes over subsidies and state aid, as evidenced by the Airbus-Boeing rivalry, highlight concerns regarding fair competition and market distortions. These uncontrolled occurrences underscore the complexity and volatility inherent in international trade, hindering efforts to foster sustainable economic growth and cooperation.[104] However, the integration of AI into dispute resolution mechanisms is a novel opportunity to solve disputes faster and cheaper.[105]

Online Arbitration Platforms: Online International Arbitration Platforms are designed to help process all data about a certain dispute through machine learning algorithm, determine what cases are close to this one, and offer a personalised solutions method.[106] By summarising

[103]Cohen et al. "Conflict analytics: when data science meets dispute resolution." *Manag Business Rev* Vol. 2, no. 2 (2022): 86-93.

[104]Rule, Colin. "Online dispute resolution and the future of justice." *Annual Review of Law and Social Science* Vol. 16 (2020): 277-292.

[105]Rooney, Kim M. "Turning the rivalrous relations between arbitration and mediation into cooperative or convergent modes of a dispute settlement mechanism for commercial disputes in East Asia." *Contemp. Asia Arb. J.* Vol. 12 (2019): 107.

[106]Gao, Yuanfei, and Yuan Liu. "Construction and Application of International Commercial Dispute Resolution Mechanism Model." *Security and Communication Networks* Vol. 2022 (2022); 01-12

all data about disputes and all arbitration cases in general, the system allows one to submit the complaint, evidence, and claim online, which saves the party the paperwork and simplifies and the job of the arbitrator. In general, these platforms facilitate the arbitration procedure and can be seen as a way of mitigating the administrative work of the arbitrators.[107] While merely offering a safe and transparent online environment helps sustain the effectiveness, fairness and accessibility of the international trade dispute settlement system, the important advantage of the online medium is its big databases about all previously resolved disputes at one's disposal.[108]

Algorithmic Mediation Systems: Algorithmic mediation systems are based on AI algorithms, which are used to negotiate between parties and resolve issues. These systems draw on data about the two parties' mediation strategies, commonalities, and historical resolutions to propose objectively optimal settlements.[109] They allow the parties to resolve issues while focusing on their common interests, which implementation is said to improve trust level between them. Further, AI allows to optimise the negotiation process, reducing conflicts by proposing only the objectively best solutions only. Finally, reducing the time and utilisation of resource in the process also decreases the expense of mediation, making it more accessible for other parties.[110]

Predictive Analytics for Legal Decision-Making: Predictive analytics are core AI applications that allow lawyers and adjudicators to evaluate trade disputes' chances of success, predict the outcome, and develop the most effective strategy.[111] The system works by analysing

[107]Carneiro et al."Online dispute resolution: an artificial intelligence perspective." *Artificial Intelligence Review* Vol. 41 (2014): 211-240.

[108]Alessa, Hibah. "The role of Artificial Intelligence in Online Dispute Resolution: A brief and critical overview." *Information & Communications Technology Law* Vol. 31, no. 3 (2022): 319-342.

[109]Hirblinger, Andreas T. "When mediators need machines (and vice versa): Towards a research agenda on hybrid peacemaking intelligence." *International Negotiation* Vol. 28, no. 1 (2022): 94-125.

[110]Zeleznikow, John. "Using artificial intelligence to provide intelligent dispute resolution support." *Group Decision and Negotiation* Vol. 30, no. 4 (2021): 789-812.

[111]Frolova, Evgenia E., and Elena P. Ermakova. "Utilizing artificial intelligence in legal practice." In *Smart Technologies for the Digitisation*

past cases, legal norms, and key principles to distinguish patterns and trends as well as risky segments of trade disputes. It provides a comprehensive data analysis and detailed recommendations that can be based on. In this way, parties can assess the chances of success and allocate resources on the most effective strategy. The key advantage of the AI application is that it can reveal the benefits, costs, and risks of litigations to motivate parties to consider apricot methods of disputes' resolution.[112]

The implementation of AI into the existing dispute resolution mechanisms provides impressive opportunities for their transformation, allowing stakeholders to facilitate the efficiency, accessibility, and fairness of international trade dispute resolution. The use of online arbitration platforms, algorithmic mediation systems, and predictive analytics could help address trade disputes faster, reduce the costs of litigation, and ensure the stability and predictability of the global trade regime,[113] Nevertheless, it is vital that AI-implemented dispute resolution mechanisms adhere to the fundamental principles of fair and transparent proceedings, as well as due process.[114] They must also consider whether the adoption of AI on a large scale in the legal sphere will result in unintended consequences and whether they can bring up some novel ethical and regulatory challenges.[115]

of industry: Entrepreneurial environment, pp. 17-27. Singapore: Springer Singapore, 2021.

[112]Alsamhan, Eyad. "AI And Online Dispute Resolution: Mediation." *Journal of Scientific Development for Studies and Research (JSD)* Vol. 4, no. 13 (2023): 283-300.

[113] Sourdin, Tania, Bin Li, and Tony Burke. "Just, quick and cheap? Civil dispute resolution and technology." *Macquarie Law Journal* Vol. 19 (2019): 17-38.

[114]Putera, Nurus Sakinatul Fikriah Mohd Shith, Hartini Saripan, Rafizah Abu, and Sarah Munirah Abdullah Hassan. "Artificial Intelligence for Construction Dispute Resolution: Justice of the Future." (2021).

[115]Łągiewska, Magdalena. "New technologies in international arbitration: a game-changer in dispute resolution?" *International Journal for the Semiotics of Law-Revue internationale de Sémiotique juridique* (2023): 1-14.

POLICY RECOMMENDATIONS

Enhancing Data Governance Frameworks

During the age of AI-driven globalization, effective and comprehensive data governance frameworks that simultaneously protect such data, privacy, and facilitate trade are vital. The assertion that current data governance frameworks lack comprehensiveness arises from challenges in keeping pace with rapidly evolving technology and addressing global data flows effectively. While some regions have robust regulations like the GDPR, others lack comprehensive frameworks, leading to inconsistencies and loopholes. Novel privacy concerns, such as facial recognition, further stress the need for adaptable governance. A case study could involve a multinational tech company navigating varying regulations, hindering cross-border operations. Thus, while existing frameworks provide foundational principles, their ability to facilitate global trade hinges on adapting to technological advancements and harmonizing regulations across borders comprehensively.[116] Governments and international organisations working together should develop such frameworks that correspond to the recent advances via AI implementation to the global trade process. Being transparent, these frameworks would stipulate the rules, guidelines, and regulations on how data is collected, processed, and shared throughout the international trade process.[117] This level of transparency would ensure that stakeholders' trust is maintained in good shape, as well as that people are aware of their role in the given process and the right to use data as planned.[118] In turn, the principle of accountability is bound to be considered a crucial element of the data governance frameworks in question. Specifically, the governments are expected to assign punishments to any organisation that has carried out

[116]Li, Mengyang. "Adapting legal education for the changing landscape of regional emerging economies: A dynamic framework for law majors." *Journal of the Knowledge Economy* (2023): 1-30.

[117]Mishra, Neha. "International Trade Law and Data Ethics: Possibilities and Challenges." *Artificial Intelligence and International Economic Law: Disruption, Regulation, and Reconfiguration (CUP, 2021, Forthcoming).*, *ANU College of Law Research Paper* 21.43 (2020).

[118]Felzmann, Heike, Eduard Fosch-Villaronga, Christoph Lutz, and Aurelia Tamò-Larrieux. "Towards transparency by design for artificial intelligence." *Science and engineering ethics* Vol. 26, no. 6 (2020): 3333-3361.

an international trade operation and, at the same time, has failed to observe the prescribed data protection rules.[119] Additionally, the fourth principle of data governance frameworks is that the authority to develop the system will be vested in the government. This applies to organisations partaking in international trade, which will only proceed with their data collection activities after providing information to the relevant government organisation within two weeks.[120] The collection and sharing of such data should cease if the concerned government agency states that the organisation did provide the relevant information.[121] Lastly, organisations partaking in international trade may not be able to collect or share data with the people without special pardon or unless a proper screening process takes place.[122]

It is crucial that data governance frameworks help to promote trade facilitation in the field of data security and privacy. In particular, they should contribute allowing transborder data flows while protecting the data. Therefore, data governance frameworks should help to get data protection laws harmonised and reach mutual recognition agreements in regards to data protection. Moreover, by taking into account the fact that different standards within one field should be compatible, data governance frameworks should incorporate principles such as transparency, accountability, and user consent.[123] Therefore, it is necessary to take serious steps at the international level to promote international cooperation and get data protection laws harmonised in regard to cross-border data flows. In particular, governments need to participate in multilateral initiatives and sit at the

[119]Rustad, Michael L., and Thomas H. Koenig. "Towards a global data privacy standard." *Fla. L. Rev.* Vol. 71 (2019): 365.

[120]Ruijer, Erna, and Albert Meijer. "Open government data as an innovation process: Lessons from a living lab experiment." *Public Performance & Management Review* Vol. 43, no. 3 (2020): 613-635.

[121]Keshta, Ismail, and Ammar Odeh. "Security and privacy of electronic health records: Concerns and challenges." *Egyptian Informatics Journal* Vol. 22, no. 2 (2021): 177-183.

[122]Ferencz, Janos, Javier López González, and Irene Oliván García. "Artificial Intelligence and international trade: Some preliminary implications." (2022).

[123]Delacroix, Sylvie, and Neil D. Lawrence. "Bottom-up data trusts: Disturbing the 'one size fits all'approach to data governance." *International data privacy law* Vol. 9, no. 4 (2019): 236-252.

negotiation table with other parties to align data protection laws and share experience in an attempt to solve both new and existing problems.[124] It is vital to integrate these principles into comprehensive data governance frameworks that may apply to different regions of the world. In this way, these frameworks will ensure responsible data governance powered by AI-era globalisation.[125]

Promoting IPR Harmonisation

Policymakers need to act to unify IP laws and rules sooner rather than later to effectively address the distinctive obstacles presented by AI-created works.[126] The growing complexities of copyright and ownership rights underscore the urgency for policymakers to unify IP laws and rules in response to the unique challenges posed by AI-created works. Take, for instance, projects like "The Next Rembrandt," where AI algorithms replicate artistic styles or AI systems generate music compositions. In these cases, questions arise regarding who holds copyright—the developers, dataset creators, or the AI itself. Such ambiguity in existing IP laws can lead to legal disputes and hinder innovation. Without clear guidelines, stakeholders face uncertainties regarding ownership, attribution, and liability. Policymakers must swiftly address these challenges to provide clarity and establish frameworks that encourage innovation while safeguarding creators' rights and promoting fair use. By unifying IP laws and rules for AI-created works, policymakers can foster a conducive environment for creativity and technological advancement while mitigating legal uncertainties and promoting fair and equitable outcomes for all involved parties. With greater and greater regularity, AI technology encourages innovation in a wide range of industries. As a result, the urgent need to ensure the coherence and comprehensibility of the IP

[124]Zhou, Jingyuan. "A new multilateralism? A case study of the Belt and Road Initiative." *The Chinese Journal of Comparative Law* 8, no. 2 (2020): 384-413.

[125]Mishra, Neha. "International trade law meets data ethics: a brave new world." *NYUJ Int'l L. & Pol.* Vol. 53 (2020): 303.

[126]Sovhyra, Tetiana. "Artificial Intelligence and Issue of Authorship and Uniqueness for Works of Art (Technological Research of the Next Rembrandt)." Kult. i mystetstvo u suchasnomu sviti Vol. 22 (2021): 156-163.

uptake framework is increasing.[127] The assertion that the current IP uptake framework lacks coherence finds support in various studies and reports, highlighting inconsistencies and disparities across jurisdictions. For instance, research conducted by the ICC and the WIPO has revealed significant variations in patent laws and procedures among different countries, posing challenges for businesses seeking international patent protection. These discrepancies lead to increased costs and complexities in navigating the patent application process, ultimately hindering innovation and technology transfer on a global scale.

Moreover, the advent of new technologies like AI and blockchain has introduced novel legal complexities, which the existing IP framework struggles to address effectively. Reports from the European Union Intellectual Property Office (EUIPO) underscore the need for updated IP laws and regulations to tackle issues such as data ownership, algorithmic inventions, and digital rights management arising from these technologies.

Similarly, inconsistencies in copyright laws and enforcement mechanisms across jurisdictions have long been a concern for creators and rights holders. Studies conducted by the International Confederation of Societies of Authors and Composers (CISAC) have highlighted the challenges in enforcing copyright protection internationally, particularly in the digital environment where content can be easily distributed and reproduced across borders.

In summary, the basis for arguing that the current IP uptake framework lacks coherence lies in the evidence provided by studies and reports from reputable organizations such as the ICC, WIPO, EUIPO, and CISAC. Addressing these disparities and inconsistencies requires concerted efforts from policymakers to harmonize and update IP laws, ensuring coherence and comprehensibility in an increasingly complex global economy. An essential part connected to this unification effort

[127]Gupta, Rohit, Bhawana Rathore, Baidyanath Biswas, Mahadeo Jaiswal, and Raunak Kumar Singh. "Are we ready for metaverse adoption in the service industry? Theoretically exploring the barriers to successful adoption." *Journal of Retailing and Consumer Services* Vol 79 (2024): 103882.

is the clear definition of the requirements for AI invention.[128] Generally, being visually human-created, standard inventions are easily validated for IP insurance measures, but AI-generated devices increase questions about who should be seen as the inventor. Policymakers should define explicit standards by which AI inventorship can be ascertained, with the roles of AI programmes, human developers, and their respective data sources considered, against these criteria.[129] In addition, clear policies governing the ownership of AI-generated IP have to be established to provide a sense of security regarding investment in AI R&D.[130] The present uncertainty and inadequate classification of IP rights for AI-created works contribute to low levels of investment in AI R&D and legal instability among businesses and creators.[131] Eventually, policymakers should support structuring them accordingly through new legal measures or modifications in conventional IP ownership law to determine to whom different AI technology stakeholders should be aided in applying or deploying AI systems or who claims these inventions to provide objective security in possession.[132]

In the same manner, amending patent examination procedures to evaluate AI created inventions is important to ensure that the patent system is adequate and worthwhile for the AI era.[133] Amending patent

[128]Díaz-Rodríguez et al. "Connecting the dots in trustworthy Artificial Intelligence: From AI principles, ethics, and key requirements to responsible AI systems and regulation." *Information Fusion* 99 (2023): 101896.

[129]Campi, Mercedes, and Marco Dueñas. "Intellectual property rights, trade agreements, and international trade." *Research Policy* Vol. 48, no. 3 (2019): 531-545.

[130]Adolfsson, Sofia. "AI as a Creator: How do AI-generated creations challenge EU intellectual property law and how should the EU react?" (2021).

[131]Nardin, Alessio. "Artificial Intelligence as a General-Purpose Technology: an exploratory analysis of PCT patents." (2021).

[132]Abbott, Frederick M., Thomas Cottier, Francis Gurry, Ryan B. Abbott, Mira Burri, Henning Grosse Ruse-Khan, and Maegan McCann. *International intellectual property in an integrated world economy*. Aspen Publishing, 2024.

[133]Lopez, Monica, and Irene Gonzalez. "Artificial Intelligence Is Not Human: The Legal Determination of Inventorship and Co-Inventorship, the Intellectual Property of AI Inventions, and the Development of Risk

examination procedures is crucial to address AI-created inventions, as current procedures are designed for human inventors. Presently, patents require a human inventor, assess novelty and non-obviousness from a human perspective, and have disclosure requirements tailored for traditional inventions. However, AI can autonomously generate inventions, raising issues with the human inventorship requirement. Assessing novelty and non-obviousness for AI-generated innovations is also challenging since AI solutions may not be obvious to humans but routine for AI. Moreover, disclosing complex AI processes adequately in patents is difficult. Therefore, updating these procedures is necessary to ensure the patent system remains effective and inclusive in the AI era.[134] Given the inherent difficulty of creating traditional patent examination processes that can accurately identify the novelty, non-obviousness, and utility of an AI generated invention policy makers should work with patent offices and industry stakeholders to develop innovative approaches and evaluation criteria.[135] This could, for example, include the use of AI technologies to assist with the patent examination process, for example by letting a machine learning algorhythm to quickly review all prior art to determine whether it is applicable to the current application being evaluated.[136] By harmonising intellectual property laws and regulations that affect AI businesses policymakers will be able to create a legal and regulatory environment that is highly conducive to innovation, entrepreneurship and economic development.[137] The current legal and regulatory environment concerning IP laws affecting AI businesses is fragmented

Management Guidelines." *J. Pat. & Trademark Off. Soc'y* Vol. 104 (2024): 135.

[134]Chun, Matthew. "Artificial Intelligence for Drug Discovery: A New Frontier for Patent Law." *J. Pat. & Trademark Off. Soc'y* Vol. 104 (2024): 5.

[135]Bal, Ravtosh, and Indermit S. Gill. "Policy approaches to artificial intelligence-based technologies in China, European Union and the United States." (2020).

[136]Meier-Ewert, Wolf R., and Jorge Gutierrez. *Intellectual property and digital trade: Mapping international regulatory responses to emerging issues*. No. ERSD-2021-4. WTO Staff Working Paper, 2021.

[137]Sulehri, Fiaz Ahmad, Amjad Ali, and Mehboob Alam. "Assessing the Pathways of Sustainable Development: A Structural Equation Modeling Investigation of Regulatory Framework, Innovation and Economic Indicators." *Journal of Asian Development Studies* Vol. 13, no. 1 (2024): 970-984.

globally, leading to uncertainty and compliance burdens. This fragmentation, coupled with the rapid pace of AI development, poses challenges in areas such as patent eligibility, copyright protection, and liability for AI-generated outcomes. Harmonizing IP laws and regulations across jurisdictions holds promise for creating a more conducive environment for innovation, entrepreneurship, and economic development. However, achieving harmonization requires addressing emerging legal challenges, promoting international cooperation, and ensuring that regulatory frameworks remain agile and responsive to technological advancements in AI.[138] The clarity surrounding inventorship, ownership rules, and patent examination procedures means that inventors will be confident in their ability to seek a patent for an invention created with the help of AI, and investors and businesses will feel secure in their right to monetise and invest in these inventions.[139] It is expected that clear and facilitating laws on IP will greatly increase the use of AI technologies for the benefit of all of society.[140]

Fostering Regulatory Cooperation

Smooth and constructive regulatory cooperation, as well as information exchange on AI-based standardisation, certification, and conformity assessment schemes are fundamentally facilitated and promoted by governments. Regulatory cooperation in AI is challenging due to diverse approaches, rapid technological changes, and geopolitical tensions. Different countries prioritize various aspects; for example, the EU emphasizes data privacy, while the US focuses on innovation. The lack of universal standards complicates alignment, and geopolitical tensions, particularly between the US and China, hinder cooperation.[141] The EU's AI Act, with its stringent regulations, can

[138]Cheng, Manli, Junbo Wang, Shanlin Yang, and Qiang Li. "The driving effect of technological innovation on green development: From the perspective of efficiency." *Energy Policy* Vol. 188 (2024): 114089.

[139]Chauhan, Aditi, and Kashmir Singh. "Intellectual Property Rights and Artificial Intelligence: A Path to the Future."

[140]Azmeh, Shamel, Christopher Foster, and Jaime Echavarri. "The international trade regime and the quest for free digital trade." *International Studies Review* Vol. 22, no. 3 (2020): 671-692.

[141]Padmanaban, Harish. "Revolutionizing Regulatory Reporting through AI/ML: Approaches for Enhanced Compliance and Efficiency." *Journal*

stifle innovation, especially for smaller companies. The US's laissez-faire approach encourages rapid innovation but may lead to inconsistent standards. China's centralized strategies raise privacy concerns, complicating international alignment. Improving cooperation requires involvement from international standards bodies, bilateral and multilateral agreements, public-private partnerships, and a harmonized global risk assessment framework. Achieving smooth cooperation will involve developing common standards, fostering international dialogue, and balancing innovation with ethical considerations.[142] As such, AI remains one of the major drivers of changes in the global economy and innovations in trade.[143] Through concerted efforts, governments are able to exchange information, share experiences, and coordinate activities to provide effective measures to minimise the impact of trade with one another.[144] Governments can achieve such cooperation by engaging in mutual dialogue and collaborative exchange to ensure that their regulatory measures are coherent, aligned with one another, and adherent to international standards. As a result, governments should engage in the design and establishment of permanent mechanisms and programs to ensure regular interaction and information exchange between themselves, as well as with the private sector and relevant international standard setting, certification, and conformity assessment bodies. Such cooperation mechanisms may also include bilateral and multilateral agreements, joint study and research programs, working groups, focused research on selected critical technical subjects and other, similar activities to provide for regular dialogue and cooperation between the governments.

of Artificial Intelligence General science (JAIGS) ISSN: 3006-4023 2, no. 1 (2024): 71-90.

[142]Rasool, Saad, Mohammad Ali, Hafiz Muhammad Shahroz, Hafiz Khawar Hussain, and Ahmad Yousaf Gill. "Innovations in AI-Powered Healthcare: Transforming Cancer Treatment with Innovative Methods." *BULLET: Jurnal Multidisiplin Ilmu* Vol. 3, no. 1 (2024): 118-128.

[143]Kop, Mauritz. "AI & intellectual property: towards an articulated public domain." *Tex. Intell. Prop. LJ* Vol. 28 (2019): 297.

[144]Edunjobi, Tolulope Esther. "Sustainable supply chain financing models: Integrating banking for enhanced sustainability." *International Journal for Multidisciplinary Research Updates 2024* 7, no. 02 (2024): 001-011.

International organisations can become intermediaries between various stakeholders to establish and promote best practices in the field of AI. The Government, industry associations, and civil society can use the WTO[145] or International Organisation for Standardisation to exchange their views and experiences and develop shared norms and guidelines for implementing AI solutions. By using the expertise of their member states and the global reach of their activities, international organisations can facilitate the process of bridging regulatory, financial, cultural and other gaps between different stakeholders.[146] In addition, governments can help promote the adoption of international standards for AI technologies by participating in processes of standard setting organised by international organisations and seeking subsequent application of these standards at the national level.[147] Most importantly, it consists in the harmonisation of national norms with international requirements and the encouragement of developers and users of AI technologies to use universally recognised patterns for developing and implementing the new product.[148] The most effective initiative that could be taken in this field is promoting the use of AI technologies by means of supporting the generally accepted standards and certificates.[149] This can help to establish trust, confidence, and international trade growth.[150] Besides, it would help to facilitate innovations spread in the world market. The common set of AI-related

[145]Khan, Asif, and Ximei Wu. "Reforms for culmination of the deadlock in appellate body of WTO: An agenda of saving the multilateral trading system." *Journal of Humanities, Social and Management Sciences (JHSMS)* (2021).

[146]Abbott, Kenneth W., Philipp Genschel, Duncan Snidal, and Bernhard Zangl. "Orchestration: Global governance through intermediaries." In *The Spectrum of International Institutions*, pp. 140-170. Routledge, 2021.

[147]Herz, Benedikt, and Malwina Mejer. "Effects of the European Union trademark: Lessons for the harmonization of intellectual property systems." *Research Policy* Vol. 48, no. 7 (2019): 1841-1854.

[148]Weber-Lewerenz, Bianca. "Corporate digital responsibility (CDR) in construction engineering—ethical guidelines for the application of digital transformation and artificial intelligence (AI) in user practice." *SN Applied Sciences* Vol. 3 (2021): 1-25.

[149]George, Alexandra. "Transcending territoriality: International cooperation and harmonization in intellectual property enforcement and dispute resolution." *Tsinghua China L. Rev.* Vol. 10 (2017): 225.

[150]Kop, Mauritz. "AI & intellectual property: towards an articulated public domain." *Tex. Intell. Prop. LJ* Vol. 28 (2019): 297.

standards, certificates, and procedures of compliance assessment can be promoted by the initiative of information exchange and regulatory cooperation.[151] Therefore, while working in cooperation with international organisation and both governmental and non-governmental stakeholders, states benefit from shared experience and knowledge, and develop interoperable set of regulatory and technical requirements, which help to promote innovation, ensure consumers' protection, and facilitate market access for AI technologies.[152]

CONCLUSION

To conclude, the effects of AI implementation into international trade create an array of unprecedented opportunities as well as complex challenges for policy-makers, businesses, and the general public. At the heart of these advancements are technologies such as machine learning, predictive analytics, and automation, which can make trade processes more seamless, cut transaction costs, and promote the efficiency of supply chains. However, concerns over privacy and data protection, job displacement, and unfair competition necessitate a nuanced regulator framework and collaborative governance mechanisms. Therefore, one of the key priorities for governments should be regulatory harmonisation, standards alignment, and information exchange to ensure the integrity and interoperability of AI governance. By means of governments' actions, such principles, as transparency, accountability, and user consent may be preserved with an emphasis on responsible data handling at the age of AI-driven globalisation.

Additionally, policymakers should take the necessary steps to ensure that IP laws are congruent and that the rules regarding AI works are clearly defined. For example, states should. They should also reform patent examination to spur innovation while preserving IP rights. Recommendations about these changes and reforms are available in detail at the organisation's official website. The role of international organisations affiliated with AI's development, such as

[151]Guha et al. "Ai regulation has its own alignment problem: The technical and institutional feasibility of disclosure, registration, licensing, and auditing." *George Washington Law Review, Forthcoming* (2023).

[152]Campi, Mercedes, and Marco Dueñas. "Intellectual property rights and international trade of agricultural products." *World Development* Vol. 80 (2016): 1-18.

International Organisation for Standardisation and WTO, will be to support discussions among all interested parties and advance the dialog for more inclusive and interoperable governance principles. To be more precise, international organisations, governments, and industry stakeholders can benefit from sharing their knowledge about differing databases, trying to find common ground and develop compatible regulatory frameworks. As such, technology can be used in a way that allows high competitiveness, innovation, and the protection of consumer rights. Such a collaborative approach is essential for inclusive and resilient trade. It can help all states involved in AI development prosper by utilising the technology to improve their manufacturing and economic stance. They can implement the necessary balance to preserve at least some of the privacy concerns, innovations principles and trade facilitation.

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