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Policy recommendations for integrating artificial intelligence into global trade agreements

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Abstract

The integration of artificial intelligence (AI) into global trade agreements presents a transformative opportunity to enhance efficiency, competitiveness, and innovation in international commerce. This review outlines policy recommendations aimed at facilitating the seamless incorporation of AI technologies into the framework of global trade agreements. As AI technologies continue to proliferate across various sectors, including manufacturing, logistics, and services, understanding the implications and challenges of their integration into trade agreements becomes paramount. This review provides insights into the current landscape of AI in global trade, highlighting both the existing challenges and opportunities for leveraging AI to drive economic growth and sustainable development. Key policy considerations include the harmonization of AI standards, addressing intellectual property rights and data ownership, facilitating cross-border data flows, ensuring transparency and accountability in AI decision-making, mitigating potential job displacement and inequality, and promoting ethical AI practices. Drawing on case studies and best practices from regional trade agreements and industry-specific implementations, this review offers actionable recommendations for policymakers, businesses, and international organizations. These recommendations emphasize the importance of collaborative efforts, capacity building, and monitoring mechanisms to effectively harness the benefits of AI while mitigating potential risks. By embracing AI as a driver of innovation and efficiency in global trade, stakeholders can foster a more inclusive and resilient trading environment that maximizes the benefits of technological advancements for all participants.

Keywords: International Business Law; Policy; Recommendations; Integrating Artificial Intelligence; Global Trade Agreements

1 Introduction

Artificial intelligence (AI) has emerged as a transformative force in various aspects of international trade, revolutionizing traditional business models, supply chains, and consumer experiences (Soni et al., 2019). AI encompasses a wide range of technologies that enable machines to mimic human cognitive functions, such as learning, reasoning, problem-solving, and decision-making. In the context of international trade, AI applications are diverse and encompass areas such as logistics optimization, predictive analytics, risk management, market intelligence, and customer service automation (Uwaoma et al., 2023). One of the most significant contributions of AI to international trade is its ability to enhance operational efficiency and reduce costs throughout the supply chain. For example, AI-powered predictive analytics can optimize inventory management by forecasting demand and adjusting production schedules accordingly, thereby minimizing excess inventory and stockouts. Similarly, AI-driven logistics optimization algorithms can streamline transportation routes, reduce fuel consumption, and improve delivery times, leading to cost savings for businesses engaged in cross-border trade (Oguejiofor et al., 2023). Moreover, AI enables businesses to gain

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deeper insights into market trends, consumer preferences, and competitive landscapes, thereby facilitating more informed decision-making and strategic planning (Allioui and Mourdi, 2023). By analyzing vast amounts of data from diverse sources, AI algorithms can identify emerging market opportunities, anticipate shifts in consumer behavior, and optimize pricing strategies to maximize profitability in global markets. Furthermore, AI-powered tools such as natural language processing (NLP) and machine translation facilitate communication and collaboration across linguistic and cultural barriers, thereby enabling smoother interactions between international partners, suppliers, and customers (Ahmad et al., 2024). This capability is particularly valuable in the context of cross-border negotiations, contract management, and customer support, where effective communication is essential for building trust and fostering mutually beneficial relationships. AI holds immense potential to transform the landscape of international trade by enhancing efficiency, agility, and competitiveness across various stages of the value chain. As businesses increasingly embrace AI technologies to navigate the complexities of global markets, policymakers and stakeholders must recognize the importance of integrating AI considerations into the framework of global trade agreements to ensure that the benefits of AI are realized in a manner that is inclusive, transparent, and sustainable (Egieya et al., 2023).

The integration of AI into global trade agreements is essential for several reasons. First and foremost, AI technologies have the potential to drive significant economic growth and job creation by fostering innovation, productivity gains, and new business opportunities in the global marketplace (Liu and Lin, 2020). By incorporating AI-related provisions into trade agreements, policymakers can create a conducive environment for investment in AI research, development, and deployment, thereby stimulating economic activity and creating a level playing field for businesses to compete and thrive. Second, integrating AI into trade agreements can help address regulatory gaps and uncertainties surrounding AI technologies, particularly in areas such as data protection, intellectual property rights, and cross-border data flows. As AI applications become increasingly pervasive in international trade, it is imperative to establish clear and consistent rules and standards that govern the use, sharing, and protection of data generated by AI systems. By harmonizing regulatory frameworks and promoting interoperability between different legal systems, trade agreements can facilitate the seamless exchange of data and technology across borders, thereby fostering innovation and collaboration on a global scale (Udeh et al., 2024). Furthermore, integrating AI considerations into trade agreements can promote transparency, fairness, and accountability in the deployment and use of AI technologies, thereby mitigating potential risks and challenges associated with AI-driven decision-making, such as algorithmic bias, privacy violations, and job displacement. By establishing guidelines and principles for the responsible use of AI, trade agreements can help build trust and confidence among stakeholders, while also ensuring that AI benefits are equitably distributed and accessible to all segments of society (Hu et al., 2019). Integrating AI into global trade agreements is essential for unlocking the full potential of AI to drive economic growth, innovation, and prosperity in the digital age. By embracing AI as a catalyst for positive change and incorporating AI-related provisions into trade agreements, policymakers can create an enabling environment for businesses to harness the power of AI to navigate the complexities of global markets, while also safeguarding against potential risks and challenges (Akindote et al., 2023).

2 Current landscape of ai in global trade

The current landscape of artificial intelligence (AI) in global trade is marked by both significant challenges and vast opportunities (Dwivedi et al., 2021). Understanding these dynamics is crucial for policymakers, businesses, and stakeholders to navigate the complexities of AI integration into international trade effectively. One of the primary challenges facing AI in global trade is the protection of sensitive data. AI algorithms rely on vast amounts of data to train and improve their performance, raising concerns about data privacy, security, and the potential misuse of personal or proprietary information. Ensuring robust data protection measures and regulatory compliance is essential to address these concerns and build trust among stakeholders. AI algorithms are susceptible to bias, which can perpetuate or exacerbate inequalities in global trade. Biased algorithms may lead to unfair treatment of certain individuals or groups, hinder market access for marginalized communities, or perpetuate discriminatory practices in decision-making processes (Ahmad et al., 2024). Addressing algorithmic bias requires careful scrutiny of training data, algorithmic transparency, and diversity in AI development teams to ensure fairness and inclusivity (Chi et al., 2021). The rapid advancement of AI technology has outpaced the development of regulatory frameworks and standards governing its use in global trade. Regulatory fragmentation and inconsistencies across jurisdictions create legal uncertainty and compliance challenges for businesses operating in multiple markets. Harmonizing regulatory frameworks and establishing clear guidelines for AI deployment are essential to promote interoperability, reduce compliance costs, and facilitate cross-border trade.

AI technologies have the potential to streamline trade processes, reduce transaction costs, and enhance operational efficiency throughout the supply chain (Dash et al., 2019). Automation of repetitive tasks, predictive analytics, and optimization algorithms can help businesses make data-driven decisions, optimize resource allocation, and respond quickly to changing market conditions, thereby improving competitiveness and profitability. AI enables businesses to

develop new products, services, and business models that cater to evolving consumer demands and market trends (Akindote et al., 2023). By leveraging AI-driven insights and predictive analytics, businesses can identify untapped market opportunities, customize offerings to meet specific customer needs, and expand their market reach beyond traditional boundaries. This innovation-driven approach to global trade can stimulate economic growth, create new job opportunities, and foster entrepreneurial activity in emerging industries. AI-powered risk management tools can help businesses identify, assess, and mitigate risks associated with international trade, such as supply chain disruptions, regulatory changes, and geopolitical uncertainties. By analyzing vast amounts of data in real-time, AI algorithms can detect patterns, anomalies, and emerging threats, enabling businesses to proactively manage risks and ensure compliance with regulatory requirements across different markets. The current landscape of AI in global trade presents both challenges and opportunities for businesses, policymakers, and stakeholders. Addressing challenges related to data privacy, algorithmic bias, and regulatory compliance is essential to harnessing the full potential of AI to drive efficiency, innovation, and competitiveness in international trade. At the same time, embracing opportunities for enhanced efficiency, innovation, and risk management can pave the way for a more resilient and inclusive global trading system in the digital age (Alahira et al., 2024).

The regulatory landscape surrounding AI in global trade is characterized by a patchwork of laws, regulations, and standards that vary across jurisdictions and industries (Soprana, 2022). While some countries have enacted comprehensive AI strategies and frameworks to promote innovation and competitiveness, others lag behind in regulatory development, creating regulatory gaps and inconsistencies that hinder cross-border trade and collaboration. Regulatory frameworks governing AI in global trade typically address key areas such as data protection, intellectual property rights, algorithmic transparency, and ethical considerations. However, the rapid pace of technological innovation and the complexity of AI applications pose challenges for policymakers in keeping pace with emerging trends and addressing evolving risks and concerns (Uwaoma et al., 2023). Many countries have enacted data protection laws and regulations to safeguard the privacy and security of personal data (Newman, 2008). However, the cross-border nature of AI-driven data flows raises challenges for data protection enforcement and compliance, particularly in the absence of harmonized international standards and mechanisms for data sharing and interoperability. AI technologies raise complex issues related to intellectual property rights, including patentability, ownership of AI-generated outputs, and the use of proprietary algorithms and datasets. Existing intellectual property regimes may not adequately address these issues, leading to legal uncertainty and disputes over ownership and infringement rights in AI-generated inventions and creations (Anyanwu et al., 2023). The opacity of AI algorithms and decision-making processes raises concerns about accountability, fairness, and trustworthiness in AI-driven systems. Regulatory frameworks often lack specific requirements for algorithmic transparency, auditability, and explainability, making it challenging for stakeholders to assess the reliability and accuracy of AI outputs and outcomes. AI technologies raise profound ethical and societal implications, including concerns about job displacement, inequality, bias, and discrimination. While some countries have developed ethical guidelines and principles for AI development and deployment, regulatory frameworks may lack enforceable mechanisms for ensuring compliance with ethical standards and addressing ethical dilemmas in practice (Okoye et al., 2024). Addressing these regulatory gaps requires coordinated action and collaboration among governments, international organizations, businesses, and civil society stakeholders. Efforts to develop harmonized standards, guidelines, and best practices for AI in global trade can help promote interoperability, facilitate cross-border data flows, and foster trust and confidence in AI-driven systems (Ferencz et al., 2022). Moreover, capacity-building initiatives and knowledge-sharing platforms can support policymakers and stakeholders in understanding and addressing the complex regulatory challenges and opportunities associated with AI integration into international trade.

3 Policy considerations for integrating ai into global trade agreements

Harmonizing AI standards across borders is essential to promote interoperability, reduce regulatory barriers, and facilitate the seamless exchange of AI technologies and data in global trade. Standardization can enhance predictability, consistency, and transparency in AI development and deployment, thereby fostering trust and confidence among stakeholders (Atadoga et al., 2024). Standardization efforts should encompass various aspects of AI, including technical specifications, interoperability protocols, ethical guidelines, and certification mechanisms. Harmonized standards can cover areas such as data quality, algorithmic transparency, cybersecurity, privacy protection, and fairness in AI decision-making, ensuring that AI systems meet minimum requirements for reliability, safety, and accountability. Achieving harmonization requires international cooperation and collaboration among governments, standards organizations, industry consortia, and other stakeholders (Baron et al., 2014). Multilateral initiatives, such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), play a crucial role in developing consensus-based standards that reflect diverse stakeholder perspectives and address global challenges. Capacity-building initiatives can support developing countries and emerging economies in adopting and implementing AI standards effectively. Technical assistance, training programs, and knowledge-sharing platforms can help build

institutional capacity, raise awareness of best practices, and foster a culture of standardization among policymakers, regulators, and industry stakeholders.

Intellectual property rights (IPR) play a critical role in incentivizing innovation and investment in AI technologies. Global trade agreements should provide robust protection for AI-related inventions, patents, copyrights, and trade secrets, while also striking a balance between incentivizing innovation and promoting access to AI technologies for public benefit (Coker et al., 2023). Clarifying data ownership rights and access mechanisms is essential to facilitate data sharing and collaboration in AI-driven innovation ecosystems. Trade agreements should recognize the value of data as a strategic asset and establish clear rules and principles governing data ownership, usage rights, and cross-border data flows, while also respecting privacy and confidentiality concerns. Data sovereignty principles may conflict with the free flow of data across borders, raising challenges for global trade and data-driven innovation. Trade agreements should seek to reconcile competing interests by promoting data localization policies that balance national security, privacy, and economic considerations, while also fostering international cooperation and data exchange for mutual benefit.

Cross-border data flows are essential for enabling AI-driven innovation, trade, and economic growth in the digital economy. Trade agreements should promote open and secure data ecosystems that facilitate the free flow of data across borders, while also respecting privacy, security, and regulatory requirements (Burri, 2017). Trade agreements should discourage unjustified data localization requirements that restrict the movement of data across borders and impede digital trade. Provisions prohibiting forced data localization measures can help create a level playing field for businesses and promote efficiency, competition, and consumer choice in global markets. Ensuring data privacy and security is essential to building trust and confidence in cross-border data flows. Trade agreements should include provisions that require parties to adopt and enforce robust data protection measures, such as encryption, access controls, and data breach notification requirements, to safeguard personal and sensitive data from unauthorized access, disclosure, or misuse (Eboigbe et al., 2023).

Trade agreements should promote transparency and explainability in AI decision-making processes to enhance trust, accountability, and user acceptance. Provisions requiring transparency reports, audit trails, and impact assessments can help stakeholders understand how AI systems work, identify biases or errors, and address concerns about fairness, accountability, and discrimination. Embedding ethical principles and values into AI governance frameworks is essential to ensuring responsible and ethical AI deployment in global trade (Walz and Firth-Butterfield, 2019). Trade agreements should encourage parties to adhere to internationally recognized ethical guidelines, such as the OECD Principles on Artificial Intelligence, and promote the adoption of ethical AI standards and certification schemes that align with societal values and expectations. Establishing accountability mechanisms is crucial to address liability and accountability issues arising from AI-driven decision-making. Trade agreements should encourage parties to implement accountability frameworks that assign responsibility for AI outcomes, provide recourse mechanisms for individuals affected by AI errors or biases, and establish liability rules that hold AI developers, users, and providers accountable for harm caused by AI systems (Uwaoma et al., 2023).

AI-driven automation and technological advancements have the potential to disrupt traditional labor markets, leading to job displacement, skills mismatches, and income inequality. Trade agreements should address these challenges by promoting policies and programs that support workers' transition to new job opportunities, enhance skills development and lifelong learning, and promote inclusive growth and social cohesion. Ensuring fair and equitable labor standards is essential to protect workers' rights and promote decent work in the digital economy. Trade agreements should include provisions that uphold core labor standards, such as freedom of association, collective bargaining, non-discrimination, and fair wages, to safeguard workers' rights and promote social justice in the face of technological change. Strengthening social protection systems is essential to mitigate the adverse effects of job displacement and income inequality resulting from AI-driven automation (Oluwaseyi and Cena, 2024). Trade agreements should encourage parties to adopt social safety nets, unemployment insurance schemes, and lifelong learning programs that provide workers with the support and resources they need to adapt to changing labor market dynamics and technological advancements.

Embedding ethical principles and values into AI development and deployment is essential to ensure that AI technologies serve the public interest and contribute to human well-being (Ejairu et al., 2024). Trade agreements should promote the adoption of ethical AI frameworks, guidelines, and principles that emphasize transparency, fairness, accountability, privacy, and non-discrimination in AI decision-making processes. Engaging stakeholders in the development and implementation of ethical AI practices is crucial to building consensus, fostering trust, and addressing societal concerns about AI technologies (Ihemereze et al., 2023). Trade agreements should encourage parties to establish multi-stakeholder forums, advisory bodies, and consultation mechanisms that facilitate dialogue, collaboration, and knowledge-sharing among governments, industry, civil society, academia, and other stakeholders. Promoting international cooperation and collaboration on ethical AI practices is essential to address global challenges and ensure

consistent and harmonized approaches to AI governance. Trade agreements should support initiatives that promote cross-border collaboration, capacity-building, and knowledge exchange on ethical AI standards, best practices, and certification schemes, while also fostering cultural diversity, inclusivity, and respect for human rights and fundamental freedoms (Sempere, A. M., & León, 2023).

4 Case studies and best practices

European Union (EU), the EU has been at the forefront of integrating AI considerations into its regional trade agreements. For example, the EU's Digital Single Market Strategy emphasizes the importance of promoting digital innovation, including AI, to drive economic growth and competitiveness. Regional trade agreements, such as the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada, include provisions on digital trade, data protection, and intellectual property rights that are relevant to AI integration.

Asia-Pacific Economic Cooperation (APEC) member economies have recognized the potential of AI to enhance regional trade and economic cooperation. APEC's work on digital trade and innovation aims to promote cross-border data flows, harmonize regulatory frameworks, and foster collaboration on emerging technologies, including AI. Regional initiatives, such as the APEC Cross-Border Privacy Rules (CBPR) system, provide a framework for businesses to demonstrate compliance with data protection requirements and facilitate data flows in the Asia-Pacific region (Ikwue et al., 2023).

The Association of Southeast Asian Nations (ASEAN) is increasingly focusing on digital transformation and innovation as drivers of regional economic integration and competitiveness. ASEAN's Digital Integration Framework includes initiatives to promote digital trade, e-commerce, and technology adoption among member states. Regional trade agreements, such as the ASEAN Trade in Services Agreement (ATISA), recognize the importance of digital trade and include provisions on data localization, cybersecurity, and electronic transactions that are relevant to AI integration.

Successful implementations of AI in trade facilitation, AI technologies, such as machine learning algorithms and computer vision systems, are being deployed to enhance customs and border control processes, streamline cargo inspections, and detect illicit goods more effectively (Anyanwu et al., 2024). For example, the United States Customs and Border Protection (CBP) uses AI-powered systems to analyze data from sensors, cameras, and other sources to identify high-risk shipments and prioritize inspections, thereby improving trade facilitation and border security. AI-enabled supply chain management systems help businesses optimize inventory levels, reduce lead times, and improve delivery reliability through predictive analytics, demand forecasting, and route optimization algorithms. Companies like Amazon and Walmart leverage AI to manage complex supply chains spanning multiple countries and suppliers, enabling them to respond quickly to changing market conditions and customer demands while minimizing costs and risks. AI technologies are transforming trade finance and risk management practices by automating credit assessments, fraud detection, and compliance checks. Banks and financial institutions use AI-powered algorithms to analyze trade finance transactions, assess creditworthiness, and detect suspicious activities, thereby improving efficiency, accuracy, and transparency in trade finance operations.

Lessons learned from AI adoption in specific industries, AI technologies have revolutionized manufacturing processes by enabling predictive maintenance, quality control, and production optimization. Companies like Siemens and General Electric leverage AI to monitor equipment performance, identify potential issues before they occur, and optimize production schedules to minimize downtime and maximize efficiency (Nwankwo et al., 2024). AI-driven personalization and recommendation systems have transformed the retail and e-commerce industry by tailoring product offerings and marketing messages to individual customer preferences. Companies like Amazon and Alibaba use AI algorithms to analyze customer data, predict purchasing behavior, and deliver personalized shopping experiences that drive sales and customer loyalty (Oguejiofor et al., 2023). AI applications in healthcare, such as medical imaging analysis, drug discovery, and patient care management, hold promise for improving diagnosis accuracy, treatment effectiveness, and healthcare delivery efficiency (Nwankwo et al., 2024). Healthcare providers and pharmaceutical companies are investing in AI-driven technologies to accelerate medical research, develop innovative therapies, and improve patient outcomes in diverse areas, including oncology, cardiology, and neurology (Ogunjobi,et al., 2023). Case studies and best practices from regional trade agreements, trade facilitation initiatives, and industry-specific applications demonstrate the transformative potential of AI to enhance efficiency, competitiveness, and innovation in global trade. By leveraging AI technologies effectively and learning from successful implementations in various sectors, policymakers, businesses, and stakeholders can unlock new opportunities for sustainable growth and prosperity in the digital age.

5 Recommendations for policy implementation

Foster a collaborative approach to AI policy development through multi-stakeholder dialogue involving governments, businesses, academia, civil society, and international organizations (Okorie et al., 2024). Engage stakeholders in consultations, working groups, and public-private partnerships to co-create policies and standards that reflect diverse perspectives, address common challenges, and promote consensus-based solutions (Ojeyinka et al., 2024). Establish mechanisms for coordination and information sharing among governments, businesses, and international organizations to exchange best practices, lessons learned, and emerging trends in AI governance. Facilitate collaboration on capacity-building initiatives, technical assistance programs, and knowledge-sharing platforms to support policy implementation and foster innovation in global trade. Promote public-private collaboration on AI research, development, and deployment by incentivizing industry engagement, funding collaborative projects, and facilitating technology transfer and knowledge diffusion (Okorie et al., 2024). Encourage businesses to adhere to ethical AI principles, participate in voluntary certification schemes, and share data for research and development purposes, while also respecting intellectual property rights and commercial interests (Nembe et al., 2024).

Create pilot programs and testing grounds to experiment with AI integration in specific sectors or trade facilitation processes. Collaborate with businesses, research institutions, and international organizations to design and implement pilot projects that demonstrate the feasibility, scalability, and benefits of AI technologies in real-world settings (Oriekhoe et al., 2023). Learn from the experiences and outcomes of pilot projects to identify best practices, lessons learned, and areas for improvement in AI integration. Evaluate the effectiveness, efficiency, and impact of AI technologies on trade facilitation, supply chain management, customs procedures, and other aspects of international trade, and use this knowledge to inform policy decisions and resource allocation (Oriekhoe et al., 2024). Scale up successful pilot projects and replicate them in other contexts or regions to maximize their benefits and impact. Identify barriers to scalability, such as regulatory constraints, resource limitations, or technological challenges, and develop strategies to overcome them through policy reforms, investment incentives, or capacity-building initiatives (Uwaoma et al., 2023).

Invest in capacity-building initiatives and education programs to enhance stakeholders' knowledge and skills in AI technologies, data analytics, and digital trade. Provide training courses, workshops, and online resources on AI fundamentals, applications, and governance for policymakers, regulators, business leaders, and other stakeholders involved in global trade. Raise awareness of the opportunities and challenges of AI integration in global trade through awareness campaigns, stakeholder consultations, and public engagement initiatives (Reis et al., 2024). Disseminate information about AI best practices, case studies, and success stories to inspire innovation, foster collaboration, and build trust among stakeholders. Forge partnerships with academic institutions, research centers, and professional associations to develop curricula, certification programs, and research projects that address the evolving needs and demands of AI in global trade (Usman et al., 2024). Collaborate with academia to conduct research, pilot projects, and policy analysis on emerging issues and trends in AI governance, ethics, and regulation.

Develop monitoring frameworks and evaluation mechanisms to assess the impact of AI integration on trade agreements, economic performance, and societal outcomes. Define key performance indicators (KPIs), benchmarks, and targets to measure progress, track trends, and identify areas of improvement in AI governance, implementation, and impact assessment. Implement regular reporting and review processes to monitor AI-related developments, trends, and challenges in global trade and provide feedback on policy effectiveness and implementation (Obi et al., 2024). Organize periodic reviews, consultations, and stakeholder meetings to discuss findings, exchange insights, and solicit input for policy adjustments and reforms. Collect and analyze data on AI adoption, investment, and outcomes in global trade using standardized methodologies and metrics. Collaborate with national statistical agencies, international organizations, and research institutions to gather data, conduct surveys, and publish reports on AI-related trends, patterns, and implications for trade agreements and economic development (Uwaoma et al., 2023). Effective policy implementation requires collaborative efforts, pilot programs, capacity-building initiatives, and monitoring mechanisms to harness the benefits of AI integration in global trade while mitigating potential risks and challenges (Eboigbe et al., 2023). By adopting a multi-stakeholder approach, learning from pilot projects, investing in education and training, and establishing robust monitoring frameworks, policymakers, businesses, and stakeholders can navigate the complexities of AI governance and ensure that AI technologies contribute to inclusive, sustainable, and resilient global trade systems (Okogwu et al., 2023).

6 Conclusion

The integration of artificial intelligence (AI) into global trade agreements presents both challenges and opportunities for policymakers, businesses, and stakeholders. There is a need for harmonized AI standards to promote interoperability, reduce regulatory barriers, and facilitate cross-border data flows. Collaborative efforts between governments, businesses, and international organizations are essential to develop consensus-based standards that reflect diverse stakeholder perspectives and address global challenges. Clear rules and principles governing intellectual property rights and data ownership are critical to foster innovation, protect investments, and promote data-driven collaboration in global trade. Trade agreements should provide robust protection for AI-related inventions, copyrights, and trade secrets, while also establishing mechanisms for data sharing, access, and interoperability. Cross-border data flows are essential for enabling AI-driven innovation, trade, and economic growth in the digital economy. Trade agreements should promote open and secure data ecosystems that facilitate the free flow of data across borders while also respecting privacy, security, and regulatory requirements. Transparency, fairness, and accountability in AI decision-making processes are crucial to building trust, fostering accountability, and addressing concerns about algorithmic bias, discrimination, and privacy violations. Mechanisms for algorithmic transparency, ethical AI practices, and accountability frameworks should be integrated into global trade agreements to promote responsible AI deployment and governance. AI-driven automation and technological advancements have the potential to disrupt traditional labor markets, leading to job displacement, skills mismatches, and income inequality. Trade agreements should promote policies and programs that support workers' transition to new job opportunities, enhance skills development, and promote inclusive growth and social cohesion in the face of technological change.

Looking ahead, the future outlook for AI integration in global trade agreements is promising yet complex. As AI technologies continue to advance and proliferate across sectors, policymakers, businesses, and stakeholders must remain vigilant and proactive in addressing emerging challenges and opportunities. Continued advancements in AI technology, including machine learning, natural language processing, and robotics, will drive innovation, productivity gains, and new business models in global trade. Policymakers must stay abreast of technological developments and adapt regulatory frameworks accordingly to harness the benefits of AI while mitigating potential risks. Strengthening international cooperation and collaboration on AI governance is essential to address global challenges, foster trust, and promote responsible AI deployment in global trade. Multilateral initiatives, such as the OECD AI Principles and the G20 AI Ethics Guidelines, provide a foundation for dialogue, consensus-building, and knowledge-sharing on AI governance and regulation. Ethical and societal considerations will play an increasingly important role in shaping AI governance and regulation in global trade. Policymakers, businesses, and stakeholders must prioritize ethical AI practices, human rights, and social values in AI development and deployment to ensure that AI technologies serve the common good and contribute to inclusive, sustainable, and equitable development. AI integration has the potential to transform the landscape of global trade, driving efficiency, innovation, and competitiveness in the digital age. By embracing collaborative approaches, ethical principles, and forward-thinking policies, policymakers, businesses, and stakeholders can harness the full potential of AI to build a more inclusive, resilient, and prosperous global trading system for the benefit of all.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Ahmad, I. A. I., Akagha, O. V., Dawodu, S. O., Obi, O. C., Anyanwu, A. C., & Onwusinkwue, S. (2024). Innovation management in tech start-ups: A review of strategies for growth and sustainability. *International Journal of Science and Research Archive*, *11*(1), 807-816.

[2] Ahmad, I. A. I., Anyanwu, A. C., Onwusinkwue, S., Dawodu, S. O., Akagha, O. V., & Ejairu, E. (2024). CYBERSECURITY CHALLENGES IN SMART CITIES: A CASE REVIEW OF AFRICAN METROPOLISES. *Computer Science & IT Research Journal*, *5*(2), 254-269.

[3] Akindote, O. J., Adegbite, A. O., Dawodu, S. O., Omotosho, A., & Anyanwu, A. (2023). Innovation in data storage technologies: from cloud computing to edge computing. *Computer Science & IT Research Journal*, *4*(3), 273-299.

[4] Akindote, O. J., Adegbite, A. O., Dawodu, S. O., Omotosho, A., & Anyanwu, A. (2023). Innovation in data storage technologies: from cloud computing to edge computing. *Computer Science & IT Research Journal*, *4*(3), 273-299.

[5] Alahira, J., Mhlongo, N. Z., Ajayi-Nifise, A. O., Olubusola, O., Daraojimba, A. I., & Oguejiofor, B. B. CROSS-BORDER TAX CHALLENGES AND SOLUTIONS IN GLOBAL FINANCE.

[6] Allioui, H., & Mourdi, Y. (2023). Unleashing the potential of AI: Investigating cutting-edge technologies that are transforming businesses. *International Journal of Computer Engineering and Data Science (IJCEDS)*, *3*(2), 1-12.

[7] Anyanwu, A., Dawodu, S. O., Omotosho, A., Akindote, O. J., & Ewuga, S. K. (2023). Review of blockchain technology in government systems: Applications and impacts in the USA.

[8] Anyanwu, A., Olorunsogo, T., Abrahams, T. O., Akindote, O. J., & Reis, O. (2024). DATA CONFIDENTIALITY AND INTEGRITY: A REVIEW OF ACCOUNTING AND CYBERSECURITY CONTROLS IN SUPERANNUATION ORGANIZATIONS. *Computer Science & IT Research Journal*, *5*(1), 237-253.

[9] Atadoga, J. O., Nembe, J. K., Mhlongo, N. Z., Ajayi-Nifise, A. O., Olubusola, O., Daraojimba, A. I., & Oguejiofor, B. B. (2024). CROSS-BORDER TAX CHALLENGES AND SOLUTIONS IN GLOBAL FINANCE. *Finance & Accounting Research Journal*, *6*(2), 252-261.

[10] Baron, J., Ménière, Y., & Pohlmann, T. (2014). Standards, consortia, and innovation. *International Journal of Industrial Organization*, *36*, 22-35.

[11] Burri, M. (2017). The governance of data and data flows in trade agreements: the pitfalls of legal adaptation. *UCDL Rev.*, *51*, 65.

[12] Chi, N., Lurie, E., & Mulligan, D. K. (2021). Reconfiguring diversity and inclusion for AI ethics. In *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society* (pp. 447-457).

[13] Coker, J. O., Uzougbo, N. S., Oguejiofor, B. B., & Akagha, O. V. (2023). The Role Of Legal Practitioners In Mitigating Corporate Risks In Nigeria: A Comprehensive Review Of Existing Literature On The Strategies And Approaches Adopted By Legal Practitioners In NIGERIA TO MITIGATE CORPORATE RISKS. *Finance & Accounting Research Journal*, *5*(10), 309-332.

[14] Dash, R., McMurtrey, M., Rebman, C., & Kar, U. K. (2019). Application of artificial intelligence in automation of supply chain management. *Journal of Strategic Innovation and Sustainability*, *14*(3).

[15] Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*, 101994.

[16] Eboigbe, E. O., Farayola, O. A., Olatoye, F. O., Nnabugwu, O. C., & Daraojimba, C. (2023). Business intelligence transformation through AI and data analytics. *Engineering Science & Technology Journal*, *4*(5), 285-307.

[17] Eboigbe, E. O., Farayola, O. A., Olatoye, F. O., Nnabugwu, O. C., & Daraojimba, C. (2023). Business intelligence transformation through AI and data analytics. *Engineering Science & Technology Journal*, *4*(5), 285-307.

[18] Egieya, Z. E., Ewuga, S. K., Omotosho, A., Adegbite, A. O., & Oriekhoe, O. I. (2023). A review of sustainable entrepreneurship practices and their impact on long-term business viability. *World Journal of Advanced Research and Reviews*, *20*(3), 1283-1292.

[19] Ejairu, E., Mhlongo, N. Z., Odeyemi, O., Nwankwo, E. E., & Odunaiya, O. G. (2024). Blockchain in global supply chains: A comparative review of USA and African practices. *International Journal of Science and Research Archive*, *11*(1), 2093-2100.

[20] Ferencz, J., González, J. L., & García, I. O. (2022). Artificial Intelligence and international trade: Some preliminary implications.

[21] Hu, X., Neupane, B., Echaiz, L. F., Sibal, P., & Rivera Lam, M. (2019). *Steering AI and advanced ICTs for knowledge societies: A Rights, Openness, Access, and Multi-stakeholder Perspective*. UNESCO Publishing.

[22] Ihemereze, K. C., Eyo-Udo, N. L., Egbokhaebho, B. A., Daraojimba, C., Ikwue, U., & Nwankwo, E. E. (2023). IMPACT OF MONETARY INCENTIVES ON EMPLOYEE PERFORMANCE IN THE NIGERIAN AUTOMOTIVE SECTOR: A CASE STUDY. *International Journal of Advanced Economics*, *5*(7), 162-186.

[23] Ikwue, U., Ekwezia, A. V., Oguejiofor, B. B., Agho, M. O., & Daraojimba, C. (2023). Sustainable Investment Strategies In Pension Fund Management: A Comparative Review Of Esg Principles Adoption In The US AND NIGERIA. *International Journal of Management & Entrepreneurship Research*, *5*(9), 652-673.

[24] Liu, H. W., & Lin, C. F. (2020). Artificial intelligence and global trade governance: a pluralist agenda. *Harv. Int'l LJ*, *61*, 407.

[25] Nembe, J. K., Atadoga, J. O., Mhlongo, N. Z., Falaiye, T., Olubusola, O., Daraojimba, A. I., & Oguejiofor, B. B. (2024). THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING TAX COMPLIANCE AND FINANCIAL REGULATION. *Finance & Accounting Research Journal*, *6*(2), 241-251.

[26] Newman, A. (2008). *Protectors of privacy: Regulating personal data in the global economy*. Cornell University Press.

[27] Nwankwo, T. C., Ejairu, E., Awonuga, K. F., Usman, F. O., & Nwankwo, E. E. (2024). Conceptualizing sustainable supply chain resilience: Critical materials manufacturing in Africa as a catalyst for change. *International Journal of Science and Research Archive*, *11*(1), 2427-2437.

[28] Nwankwo, T. C., Ejairu, E., Awonuga, K. F., Usman, F. O., & Nwankwo, E. E. (2024). Conceptualizing sustainable supply chain resilience: Critical materials manufacturing in Africa as a catalyst for change. *International Journal of Science and Research Archive*, *11*(1), 2427-2437.

[29] Obi, O. C., Akagha, O. V., Dawodu, S. O., Anyanwu, A. C., Onwusinkwue, S., & Ahmad, I. A. I. (2024). COMPREHENSIVE REVIEW ON CYBERSECURITY: MODERN THREATS AND ADVANCED DEFENSE STRATEGIES. *Computer Science & IT Research Journal*, *5*(2), 293-310.

[30] Oguejiofor, B. B., Omotosho, A., Abioye, K. M., Alabi, A. M., Oguntoyinbo, F. N., Daraojimba, A. I., & Daraojimba, C. (2023). A review on data-driven regulatory compliance in Nigeria. *International Journal of applied research in social sciences*, *5*(8), 231-243.

[31] Oguejiofor, B. B., Uzougbo, N. S., Kolade, A. O., Raji, A., & Daraojimba, C. (2023). Review of Successful Global Public-Private Partnerships: Extracting key Strategies for Effective US Financial Collaborations. *International Journal of Research and Scientific Innovation*, *10*(8), 312-331.

[32] Ogunjobi, O. A., Eyo-Udo, N. L., Egbokhaebho, B. A., Daraojimba, C., Ikwue, U., & Banso, A. A. (2023). Analyzing historical trade dynamics and contemporary impacts of emerging materials technologies on international exchange and us strategy. *Engineering Science & Technology Journal*, *4*(3), 101-119.

[33] Ojeyinka, O. T., & Omaghomi, T. T. (2024). Climate change and zoonotic diseases: a conceptual framework for predicting and managing health risks in the USA. *GSC Biological and Pharmaceutical Sciences*, *26*(3), 027-036.

[34] Okogwu, C., Agho, M. O., Adeyinka, M. A., Odulaja, B. A., Eyo-Udo, N. L., Daraojimba, C., & Banso, A. A. (2023). Exploring the integration of sustainable materials in supply chain management for environmental impact. *Engineering Science & Technology Journal*, *4*(3), 49-65.

[35] Okorie, G. N., Udeh, C. A., Adaga, E. M., DaraOjimba, O. D., & Oriekhoe, O. I. (2024). DIGITAL MARKETING IN THE AGE OF IOT: A REVIEW OF TRENDS AND IMPACTS. *International Journal of Management & Entrepreneurship Research*, *6*(1), 104-131.

[36] Okorie, G. N., Udeh, C. A., Adaga, E. M., DaraOjimba, O. D., & Oriekhoe, O. I. (2024). ETHICAL CONSIDERATIONS IN DATA COLLECTION AND ANALYSIS: A REVIEW: INVESTIGATING ETHICAL PRACTICES AND CHALLENGES IN MODERN DATA COLLECTION AND ANALYSIS. *International Journal of Applied Research in Social Sciences*, *6*(1), 1-22.

[37] Okoye, C. C., Ofodile, O. C., Tula, S. T., Nifise, A. O. A., Falaiye, T., Ejairu, E., & Addy, W. A. (2024). Risk management in international supply chains: A review with USA and African Cases. *Magna Scientia Advanced Research and Reviews*, *10*(1), 256-264.

[38] Oluwaseyi, J., & Cena, J. (2024). Analyzing the Impact of Artificial Intelligence on Job. *STATISTICS*, *14*(1), 150-155.

[39] Oriekhoe, O. I., Ashiwaju, B. I., Ihemereze, K. C., Ikwue, U., & Udeh, C. A. (2023). Review of technological advancement in food supply chain management: comparison between USA and Africa. *World Journal of Advanced Research and Reviews*, *20*(3), 1681-1693.

[40] Oriekhoe, O. I., Omotoye, G. B., Oyeyemi, O. P., Tula, S. T., Daraojimba, A. I., & Adefemi, A. (2024). BLOCKCHAIN IN SUPPLY CHAIN MANAGEMENT: A SYSTEMATIC REVIEW: EVALUATING THE IMPLEMENTATION, CHALLENGES, AND FUTURE PROSPECTS OF BLOCKCHAIN TECHNOLOGY IN SUPPLY CHAINS. *Engineering Science & Technology Journal*, *5*(1), 128-151.

[41] Reis, O., Eneh, N. E., Ehimuan, B., Anyanwu, A., Olorunsogo, T., & Abrahams, T. O. (2024). PRIVACY LAW CHALLENGES IN THE DIGITAL AGE: A GLOBAL REVIEW OF LEGISLATION AND ENFORCEMENT. *International Journal of Applied Research in Social Sciences*, *6*(1), 73-88.

[42] Sempere, A. M., & León, J. F. (2023). Cultural Cooperation between European, Latin American and Caribbean countries: Concepts, Strategies and Good Practices.

[43] Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2019). Impact of artificial intelligence on businesses: from research, innovation, market deployment to future shifts in business models. *arXiv preprint arXiv:1905.02092*.

[44] Soprana, M. (2022). Governing Artificial Intelligence: The Role of International Trade Law.

[45] Udeh, C. A., Orieno, O. H., Daraojimba, O. D., Ndubuisi, N. L., & Oriekhoe, O. I. (2024). BIG DATA ANALYTICS: A REVIEW OF ITS TRANSFORMATIVE ROLE IN MODERN BUSINESS INTELLIGENCE. *Computer Science & IT Research Journal*, *5*(1), 219-236.

[46] Usman, F. O., Eyo-Udo, N. L., Etukudoh, E. A., Odonkor, B., Ibeh, C. V., & Adegbola, A. (2024). A CRITICAL REVIEW OF AI-DRIVEN STRATEGIES FOR ENTREPRENEURIAL SUCCESS. *International Journal of Management & Entrepreneurship Research*, *6*(1), 200-215.

[47] Uwaoma, P. U., Eboigbe, E. O., Eyo-Udo, N. L., Daraojimba, D. O., & Kaggwa, S. (2023). Space commerce and its economic implications for the US: A review: Delving into the commercialization of space, its prospects, challenges, and potential impact on the US economy. *World Journal of Advanced Research and Reviews*, *20*(3), 952-965.

[48] Uwaoma, P. U., Eboigbe, E. O., Eyo-Udo, N. L., Ijiga, A. C., Kaggwa, S., & Daraojimba, A. I. (2023). Mixed reality in US retail: A review: Analyzing the immersive shopping experiences, customer engagement, and potential economic implications. *World Journal of Advanced Research and Reviews*, *20*(3), 966-981.

[49] Uwaoma, P. U., Eboigbe, E. O., Eyo-Udo, N. L., Ijiga, A. C., Kaggwa, S., & Daraojimba, A. I. (2023). Mixed reality in US retail: A review: Analyzing the immersive shopping experiences, customer engagement, and potential economic implications. *World Journal of Advanced Research and Reviews*, *20*(3), 966-981.

[50] Uwaoma, P. U., Eboigbe, E. O., Eyo-Udo, N. L., Ijiga, A. C., Kaggwa, S., & Daraojimba, D. O. (2023). THE FOURTH INDUSTRIAL REVOLUTION AND ITS IMPACT ON AGRICULTURAL ECONOMICS: PREPARING FOR THE FUTURE IN DEVELOPING COUNTRIES. *International Journal of Advanced Economics*, *5*(9), 258-270.

[51] Uwaoma, P. U., Eboigbe, E. O., Kaggwa, S., Akinwolemiwa, D. I., & Eloghosa, S. O. (2023). ECOLOGICAL ECONOMICS IN THE AGE OF 4IR: SPOTLIGHT ON SUSTAINABILITY INITIATIVES IN THE GLOBAL SOUTH. *International Journal of Advanced Economics*, *5*(9), 271-284.

[52] Walz, A., & Firth-Butterfield, K. (2019). Implementing ethics into artificial intelligence: A contribution, from a legal perspective, to the development of an AI governance regime. *Duke L. & Tech. Rev.*, *18*, 176.