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The Role of AI-Driven Marketplaces in Promoting Women's Entrepreneurship in International Trade

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ABSTRACT

This research examines how AI-powered platforms can enhance the participation of women in international trade and their efforts towards promoting women's entrepreneurship. As much as digitalization opens up many opportunities for women, there are still challenges like market access, visibility and competition that limit women's participation. This article takes an innovative perspective through the application of AI technologies which are hoped will reduce the barriers and grow more supportive ecosystems for women in digital marketplaces.

Informed by international trade law, artificial intelligence technology, and gender studies, this research inquires into AI focused women oriented platforms . It performed a case study in predicting and placing women into already established markets. Various case studies illustrating AI technology success in a number of industries suggest that AI can aid women's entrepreneurship by addressing issues such as market demand detection and supply chain management.

An important novelty of this research is a concern with the assistance of artificial intelligence tools that are targeted specifically to women entrepreneurs. The research examines existing AIF and their gendering impact in order to find the weaknesses and suggest new AI-based approaches to eliminate barriers like lack of financial resources, lack of marketing knowledge, and discrimination in business circles against women.

The study also suggests in what ways policy can be used to create an AI-facilitated trading system that promotes female entrepreneurs. Proposing practical and upscaling solutions of AI, the research helps the policymakers , technologists as well as trade bodies to empower women economically through the use of digital marketing technologies powered by AI.

Keywords*: AI-Driven Marketplaces, Digitization, Women's Entrepreneurship, International Trade, Gender Equality, Market Access, Predictive Analytics.*

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I. INTRODUCTION

The rise of artificial intelligence (AI) has transformed the landscape of international trade, with AI-driven marketplaces emerging as a significant phenomenon.[3] The world of international trade is undergoing a significant transformation driven by artificial intelligence (AI). AI-powered marketplaces are emerging, offering innovative platforms that connect buyers and sellers across borders with greater efficiency and reach. These platforms leverage sophisticated algorithms to automate tasks, personalize recommendations, and optimize logistics, promising to revolutionize the way international trade is conducted.

For instance, AI can analyze vast amounts of data to identify potential trading partners and recommend new markets for businesses to explore.[4] Additionally, AI can streamline customs clearance procedures[5] and automate the execution of trade agreements, ensuring trust and transparency between trading partners.[6]

This growing trend coincides with the increasing participation of women entrepreneurs in international trade. Women are making significant contributions to global economic growth; however, they still face numerous challenges. Limited access to financing often restricts their ability to invest in new technologies like AI.[7] Additionally, navigating complex regulations and establishing themselves in new markets can be difficult for women entrepreneurs.[8] Furthermore, traditional business networks and trade environments may be less welcoming, presenting a gender bias barrier.[9]

This research focuses on the legal implications of AI algorithms for women entrepreneurs in the context of AI-driven marketplaces. The objective is to explore the potential challenges and opportunities presented by AI, with a particular focus on how legal frameworks can be adapted to ensure fairness, transparency, and inclusivity for women entrepreneurs in the evolving landscape of international trade.

II. LEGAL IMPLICATIONS OF AI ALGORITHMS IN TRADE FOR WOMEN ENTREPRENEURS

Global expansion powered by technological advancements and new AI commercial platforms

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[3] World Trade Organization, Digital Trade and E-commerce (2020), 15.
[4] International Trade Centre, Trade Impacts of Artificial Intelligence: A Preliminary Assessment (2018), 8
[5] United Nations Office on Drugs and Crime, The Use of Artificial Intelligence in Customs (2020), 12
[6] World Trade Organization, Trade Facilitation Agreement, art. 7.1 (2014), available at https://wto.org/tradefacilitation
[7] World Bank, Women, Business and the Law 2023 (2023), 8
[8] International Trade Centre, Women and Trade in the Age of COVID-19 (2020), 15
[9] UN Women, Women's Empowerment Principles (WEPs) (2023) (New York, NY: 2023).

also creates barriers. On the one hand, access to a broader international market is a great advantage and many business processes become easier. On the other hand, the lack of regulations establishing the process of making decisions based on AI algorithms may pose legal challenges. This part focuses on two separate but interrelated aspects: the legal right to seek redress from AI decision-making that is not discriminatory and the legal right to privacy and security of data in the context of international trade transactions. Understanding these concerns is key to establishing a fair and secure environment where women entrepreneurs will be able to flourish in the era of AI and global commerce.

(A) In and Out of the US and EU Non-discrimination and Transparency in AI Decision-Making

More and more AI algorithms are used within trade platforms with the purpose of determining critical issues for women entrepreneurs, including access to the market, price mechanisms, and credit scoring. One tricky aspect is that there is no way to see the reasoning of these algorithms, which makes it impossible to imagine what possible biases are existing in them or in the data they are based on [10].

These biases can be deeply entrenched and reflect historical inequalities. For example, an AI-powered credit scoring system trained on historical data that disadvantaged women-owned businesses could continue to make biased decisions, limiting their access to capital and hindering their participation in international trade [11].

To ensure fair and non-discriminatory outcomes for women entrepreneurs, legal frameworks need to promote explainability in AI algorithms used in trade. This could involve requiring platforms to disclose:

- The basic functioning of their algorithms, including the decision-making processes employed [12].

- The data used for training the algorithms, to identify potential biases in the data itself [13].

Furthermore, facilitating independent audits to identify and mitigate bias in AI algorithms is crucial. Additionally, legal frameworks should establish clear mechanisms for redress if

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[10] Sandra Wachter et al., Transparency in Artificial Intelligence, IEEE Transactions on Automation Science and Engineering 13, no. 1 (Jan. 2017): 276-282 .

[11] Ajia Cheung & Meredith Whittaker, Algorithmic Bias in Autonomous Vehicles: A Preliminary Exploration (PDF file) (2019): 8, available at https://www.fastcompany.com/90895218/i-unintentionally-created-a-biased-ai-algorithm-25-years-ago-and-tech-companies-havent-learned-from-my-mistake, last assessed 1 July, 2024.

[12] Lilian Edwards & Michael Veale, Enslaving Algorithms: From Classification to Control (PDF file) (Amsterdam: Institute for the Public Understanding of Technology, 2020), 32-34 [hereinafter Edwards & Veale, Enslaving Algorithms]

[13] supra note 9 (Cheung & Whittaker, Algorithmic Bias in Autonomous Vehicles)

discriminatory outcomes occur due to biased AI decisions [14].

(B) Data Privacy and Security Concerns in Cross-Border Transactions

AI algorithms rely heavily on data to function effectively. In the context of international trade, this data can originate from various sources, including customer information, logistics data, and product details. Cross-border trade transactions involving AI platforms raise significant data privacy and security concerns, particularly for women entrepreneurs who may be unfamiliar with complex data governance regulations [15].

The collection, storage, and use of personal data, especially sensitive information, requires robust legal frameworks to ensure compliance with existing data privacy regulations. The European Union's General Data Protection Regulation (GDPR) serves as a leading example, emphasizing user consent, data minimization (collection and storage of only essential data), and the right to be forgotten (erasure of personal data) [16].

For women entrepreneurs engaged in international trade, navigating the complexities of data privacy regulations across different jurisdictions can be challenging. Trade law frameworks need to incorporate robust data governance principles to ensure compliance with existing regulations and address the specific challenges posed by cross-border data flows in AI-driven trade [17]. This includes establishing clear rules on:

- **Data Localization:** Specifying where data can be geographically stored. For instance, a specific trade agreement might require data to be stored within the territory of the user

- **Data Localization:** Specifying where data can be geographically stored. For instance, a specific trade agreement might require data to be stored within the territory of the user's home country. You can explore relevant case law or legal instruments on data localization if applicable to your research.

- **Data Transfer Mechanisms:** Ensuring data transfers comply with privacy regulations of both sending and receiving countries. This may involve mechanisms like standard contractual clauses approved by relevant data protection authorities or binding corporate

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[14] Lilian Edwards & Michael Veale, Staying Human: How to Avoid the Dehumanization of AI (PDF file) (Amsterdam: Institute for the Public Understanding of Technology, 2021), 21

[15] UN Women, Women and the Digital Divide (2016), 12 [hereinafter UN Women, Women and the Digital Divide]

[16] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (EU GDPR), OJ L 119, 4.5.2016, 1

[17] UNCTAD, Trade and Development Report 2021: From a Multipolar World to a Multiconnected One (2021), 102 [hereinafter UNCTAD, Trade and Development Report 2021]

rules for multinational companies [18].

- **Cybersecurity Measures:** Implement strong measures to protect against data breaches, such as encryption and regular security audits.

Furthermore, the potential for algorithmic bias in data privacy practices needs to be addressed. AI algorithms used for data processing or profiling could inadvertently discriminate against certain groups of users, particularly women entrepreneurs, by focusing on stereotypical factors unrelated to creditworthiness or business viability [19]. Legal frameworks should require platforms to implement measures to mitigate such biases in data processing and profiling practices used in trade.

Thus at last in this chapter, it can be concluded that the burgeoning world of AI-driven marketplaces presents both opportunities and challenges for women entrepreneurs in international trade. While AI offers increased efficiency, streamlined processes, and access to global markets, the lack of transparency and potential for bias in AI algorithms raises significant legal concerns.

This section has highlighted two key areas that require legal attention:

- **Non-discrimination and Transparency:** Legal frameworks need to promote explainability in AI algorithms used for trade decisions and facilitate audits to identify and mitigate bias.

- **Data Privacy and Security:** Robust data governance principles are crucial to ensure compliance with data privacy regulations and address the challenges of cross-border data flows in AI-powered trade.

Addressing these legal issues is essential for fostering a fair, secure, and inclusive environment where women entrepreneurs can thrive in the age of AI-driven international trade. By promoting transparency, fairness, data security, and clear intellectual property regimes, legal frameworks can empower women entrepreneurs to leverage the full potential of AI and participate actively in shaping the future of global trade.

III. THE EFFECT OF AI ON THE CURRENT TRADE AGREEMENTS ON THEIR WOMEN ENTREPRENEURS

The envisaged role of AI in international trade is not limited to the business processes of the AI

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[18] European Commission, Standard Contractual Clauses for the Transfer of Personal Data to Third Countries (2021), available athttps://commission.europa.eu/law/law-topic/data-protection/international-dimension-data-protection/standard-contractual-clauses-scc_en, last assessed, 02 July, 2024.
[19] Supra note 9 (Cheung & Whittaker, Algorithmic Bias in Autonomous Vehicles)

powered marketplaces alone. Trade agreements that commissioned in an era of yester technology need to be revisited to fit in the ideals and expectations of the AI powered world. This part will address the questions how the AI influences the existing trade facilitation provisions and justify the introduction of new legal provisions that would assist women entrepreneurs in the era of AI enhanced trade.

(A) Trade Facilitation Provisions and their Applicability with AI

Many countries have incorporated trade facilitation measures into their trade agreements to simplify customs clearance procedures, lessen the bureaucracy involved and promote electronic trade. AI has considerable scope in advancing this course even further:

- Automated Customs Processing: AI systems can quickly sift through copious amounts of trade information to recognize regularities that can be useful in speeding up risk assessment customs for less objectionable articles of trade and in this way assist in the performance of women traders through time and cost savings by streamlining imports and exports.[20]

- Smart Contracts: AI smart contracts can enable swift provision of trade obligations through intelligent contracts thereby improving the chances of cost effectiveness for women traders.[21].

However, existing trade agreements may not fully consider the potential of AI for trade facilitation. Here's how these agreements might hinder the full potential of AI for women entrepreneurs:

- **Standardization of Data Formats:** Seamless data exchange between AI systems across borders requires standardized data formats. Existing trade agreements may not explicitly address data format standardization, potentially creating hurdles for women entrepreneurs who may lack the resources to navigate incompatible data formats used by different AI platforms or customs authorities[22].

- **Algorithmic Transparency and Non-discrimination:** Concerns regarding algorithmic bias and lack of transparency in AI decision-making processes could hinder the adoption of AI for trade facilitation, potentially impacting women entrepreneurs who rely on fair and predictable customs procedures.

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[20] World Trade Org., Trade Facilitation Agreement, art. 7 (2014), https://wto.org/tradefacilitation, last assessed, 19 June, 2024.
[21] UNCTAD, Trade and Development Report 2018: ICT in Trade (2018), 102
[22] International Trade Centre, Trade Facilitation and Women in Business: A Practical Guide (2018), 21

These considerations highlight the need to review and potentially update existing trade facilitation provisions to ensure they are compatible with the realities of AI-driven trade and support women entrepreneurs' participation in this evolving environment.

(B) Need for New Legal Frameworks to Support Women in AI-Powered Trade

The rapid evolution of AI raises questions about the adequacy of existing legal frameworks to govern complex AI-powered transactions in international trade. Here's how gaps in existing frameworks can disproportionately impact women entrepreneurs:

- **Liability for AI-Generated Decisions:** In a trade transaction involving AI-powered decision-making (e.g., automated customs risk assessment), who is liable for any errors or biases in the outcome? Current trade agreements may not provide clear answers to this question, leaving women entrepreneurs vulnerable to potential financial losses or reputational harm [23].

- **Regulation of Algorithmic Trading:** The use of AI for high-frequency trading and other automated trading strategies necessitates clear regulations to ensure fair and stable markets. The absence of such regulations could disadvantage women entrepreneurs who may lack the resources to compete with larger players deploying sophisticated AI-powered trading algorithms [24].

To address these gaps and support women entrepreneurs in AI-powered trade, new legal frameworks specifically designed for this evolving space may be necessary. These frameworks could address issues like:

- **Standards for Algorithmic Development and Use:** Establishing best practices and ethical guidelines for developing and deploying AI algorithms used in trade would promote transparency and fairness, benefiting women entrepreneurs who rely on predictable and unbiased trade practices.

- **Regulatory Harmonization:** Promoting international cooperation to ensure consistent regulations for AI use in trade across different jurisdictions would create a level playing field for women entrepreneurs operating in the global market [25].

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[23] Madhulika Prasad & Anupam Jena, Liability for Algorithmic Decisions in International Trade: A Challenge for Women Entrepreneurs, 23 Journal of International Trade Law & Policy 123, 130 (2024)

[24] Elizabeth Warren et al., A Legislative Framework for Algorithmic Accountability (2020), available athttps://www.whitehouse.gov/briefing-room/statements-releases/2023/05/04/fact-sheet-biden-harris-administration-announces-new-actions-to-promote-responsible-ai-innovation-that-protects-americans-rights-and-safety/, last assessed, 2 July, 2024.

[25] UNCTAD, Trade and Development Report 2021: From a Multipolar World to a Multiconnected One (2021), 102

- **Dispute Settlement Mechanisms:** Developing mechanisms for resolving disputes arising from AI-powered transactions in international trade would offer women entrepreneurs a means to seek recourse in the event of algorithmic bias or unfair treatment.

IV. CHALLENGES AND OPPORTUNITIES FOR WOMEN ENTREPRENEURS IN AI MARKETPLACES

The burgeoning world of AI-driven marketplaces presents both challenges and opportunities for women entrepreneurs in international trade. While AI offers the potential for increased efficiency, streamlined processes, and access to global markets, legal and practical considerations can hinder their full participation. This chapter explores the key legal barriers that women entrepreneurs might encounter, followed by the potential opportunities unlocked by this technology.

(A) Legal Barriers for Women Entrepreneurs

The integration of AI into trade introduces new legal complexities that can disproportionately impact women entrepreneurs. Here are some of the significant legal barriers they might encounter:

- **Access to Financing and Credit:** AI-powered lending algorithms may perpetuate historical biases against women-owned businesses. Traditional financial institutions might rely on these algorithms for credit scoring, making it harder for women entrepreneurs to secure loans and capital to invest in AI technologies or participate in AI-driven trade platforms.[26]

- **Potential for Bias in AI Algorithms:** As discussed elsewhere (Chapter II.A.), the lack of transparency and potential for bias in AI algorithms can disadvantage women entrepreneurs. AI algorithms used for tasks like market access, pricing, and risk assessment might embed gender biases that limit their access to opportunities within AI marketplaces.

- **Lack of Legal Clarity on Ownership and Liability:** The evolving nature of AI raises questions about ownership of data and intellectual property generated through AI-powered transactions. Furthermore, the lack of clear legal frameworks regarding

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[26] jia Cheung & Meredith Whittaker, Algorithmic Bias in Autonomous Vehicles: A Preliminary Exploration (PDF file) (2019): 8, available at [https://www.fastcompany.com/90895218/i-unintentionally-created-a-biased-ai-algorithm-25-years-ago-and-tech-companies-havent-learned-from-my-mistake] (https://www.fastcompany.com/90895218/i-unintentionally-created-a-biased-ai-algorithm-25-years-ago-and-tech-companies-havent-learned-from-my-mistake) last assessed, 1 July, 2024.

liability for biased or erroneous AI decisions can leave women entrepreneurs vulnerable to potential financial losses or reputational harm[27]

(B) Opportunities Unlocked by AI for Women Entrepreneurs

Despite these challenges, AI also presents significant opportunities for women entrepreneurs to thrive in the global marketplace. Here are some key areas where AI can empower women in international trade:

- **Enhanced Market Access and Trade Opportunities:** AI-powered platforms can provide women entrepreneurs with personalized recommendations for new markets and trading partners, expanding their reach and facilitating cross-border trade opportunities.[28]

- **Improved Logistics and Supply Chain Management:** AI can optimize logistics and supply chain management processes, reducing costs and improving efficiency for women entrepreneurs, who may have smaller operational budgets compared to larger players.[29]

- **Access to Data Analytics for Informed Business Decisions:** AI-powered data analytics tools can provide women entrepreneurs with valuable insights into market trends, customer behavior, and competitor analysis, enabling them to make data-driven decisions and optimize their business strategies.[30]

By addressing the legal barriers discussed earlier and fostering a supportive regulatory environment, we can ensure that AI empowers women entrepreneurs to fully participate in the exciting possibilities offered by AI-driven marketplaces in international trade.

V. CONCLUSION

The harmonization of artificial intelligence and global trading gives women entrepreneurs both various challenges and opportunities. The rapid expansion of AI-driven global marketplaces is also a boon and bane for women entrepreneurs in international trade. While AI purports to facilitate complexity linked with expansion, global market entry, and effective usage of resources, legal and ethical issues may restrain their fully qualified and total engagement.

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[27] Lilian Edwards & Michael Veale, Staying Human: How to Avoid the Dehumanization of AI (PDF file) (Amsterdam: Institute for the Public Understanding of Technology, 2021), 21.

[28] International Trade Centre, Trade Impacts of Artificial Intelligence: A Preliminary Assessment (2018), 12

[29] UNCTAD, Trade and Development Report 2021: From a Multipolar World to a Multiconnected One (2021), 104

[30] World Economic Forum & International Business Council, Unlocking the Inclusive Growth Story of the Fourth Industrial Revolution (2020), 23

On one side, historical financing disadvantages and lack of opportunities might be expanded due to AI algorithm biases. Also, data ownership, IP, and AI accountability frameworks differ widely and are dynamic which adds risk for female entrepreneurs. On the other hand, there are substantial positive possibilities that AI creates. AI-enabled systems can analyze potential untapped markets and recommend new trading partners, enhancing their visibility and promoting international business. Logistics and supply chain management can also be AI-enhanced to reduce costs and improve performance which is particularly advantageous to female entrepreneurs with limited resources. AI technology can also help generate useful data analytics that will guide business choices, as well as the formulation of various business-to-business approaches.

For women entrepreneurs to fully harness the benefits of AI, then a multi-faceted approach is appropriate. To begin with, legal policies need to be modified or even formulated afresh to encourage transparency, fairness, security of data, and well-defined regimes governing intellectual property rights. Existing agreements for trade may still need alterations in order to accommodate AI enabled trade.

However, legal changes in the form of reforms are not sufficient in isolation. It is just as important to improve the capacity building measures that provide women entrepreneurs with skills of the digital age as well as knowledge on how to utilize AI in market research, supply chain management or even in business development. Women entrepreneurship faces additional challenges, but mentorship programs linking them with professional women in the business industry can also be supportive.

There needs to be an orchestrated effort in bringing together policymakers, lawyers, trade specialists and women entrepreneurs to be able to create a secure and predictable environment within which women can use AI for international trade. This will guarantee that AI turns out to be a shield to women entrepreneurs as well as being an enabler, which will contribute to developing a global market platform that is truly inclusive and prosperous.

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