

ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN GLOBAL TRADE

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Abstract

Artificial Intelligence (AI) is reshaping global trade at every level from manufacturing and logistics to finance and geopolitics. We can analyse the interrelation of Global Trade and Artificial Intelligence (AI) with the help of following points.

1. AI in Supply Chains
2. AI and Manufacturing Patterns
3. Trade Finance & Risk Management
4. Digital Trade & AI Services
5. Geopolitics and AI Competition

With the help of AI how Global Trade improve? For this following points are essential to consider

1. Supply Chain Optimization
2. Trade Finance & Risk Management
3. Customs, Compliance & Regulation
4. Manufacturing & Comparative Advantage
5. Digital Trade & Services
6. Geopolitics & AI Competition
7. Economic Implications Positive Effects....

But there are some Problems of Global Trade in Artificial Intelligence (AI). Because AI is transforming global commerce, but it also creates serious structural, economic, and geopolitical challenges. Below are the major problems shaping AI-driven global trade.

1. Digital Divide between Nations
2. Semiconductor Dependency & Supply Risk
3. Geopolitical Tensions & Trade Wars
4. Job Displacement & Social Instability
5. Data Governance Conflicts
6. Ethical and Bias Issues in Cross-Border AI

As per the problems in Global Trade through AI, we have to face some of the Challenges. For India, it presents strategic opportunities as well as serious structural challenges, such as Job Displacement in Labour-Intensive Exports, Global Regulatory & Trade Barriers, Digital Infrastructure Gaps, Semiconductor & Hardware Dependency and Competition from AI Superpowers, Skill Gap & Talent Migration, Cyber security & Trade Barriers etc. These challenges may limits competition and may reduce innovation in the long run. It results in widening global inequality, increasing geopolitical conflict, Fragmenting international trade systems, concentrating power in a few countries and corporations. In this paper challenges of AI in Global Trade and remedies to solve it are given.

Keywords: Artificial Intelligence, Global Trade.

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Introduction:

Artificial Intelligence (AI) is reshaping global trade at every level — from manufacturing and logistics to finance and geopolitics. Instead of trade being driven mainly by cheap labour and natural resources, it is increasingly shaped by data, algorithms, and technological capability. There is an interrelation of Global Trade and Artificial Intelligence (AI). Artificial Intelligence (AI) is transforming global trade by reshaping how goods are produced, transported, marketed, and regulated across borders. In this paper structured influencing of AI on international commerce is given.

AI is transforming global commerce, but it also creates **serious structural, economic, and geopolitical challenges**. Even if AI-driven trade promises efficiency and growth, but it also creates risks. So it's become necessary to see the challenges of AI in Global Trade Process. The central challenge of AI is balancing **innovation, fairness, security, and openness** in a rapidly evolving technological trade system. Developing nations risk becoming dependent consumers rather than competitive producers in AI-driven trade. Artificial Intelligence is reshaping global trade, but it also creates deep economic, political, and structural challenges. These challenges may limit competition and may reduce innovation in the long run. It results in Widening global inequality, increasing geopolitical conflict, Fragmenting international trade systems, concentrating power in a few countries and corporations

Artificial Intelligence (AI) is transforming global trade, but for **India**, it presents both strategic opportunities and serious structural challenges. As India expands digital trade, protecting infrastructure becomes crucial. As the challenges faces by India in AI and Global Trade, India should apply the Strategic process. India must decide how to move from being primarily a **service-export nation** to becoming a **technology-creating nation** in AI-driven global trade.

Research Problem:

There is an interrelation of Global Trade and Artificial Intelligence (AI). Artificial Intelligence (AI) is transforming global trade by reshaping it and influence on international commerce. AI is transforming global commerce, but it also creates serious structural, economic, and geopolitical challenges. Even if AI-driven trade promises efficiency and growth, but it also creates risks. So it's become necessary to see the challenges of AI in Global Trade Process. These challenges may limit competition and may reduce innovation in the long run.

Artificial Intelligence (AI) is transforming global trade, but for **India**, it presents both strategic opportunities and serious structural challenges. This Research would like to find out the Importance of AI for International Trade activity, its challenges and find out the solution for it.

Objectives of Study:

- 1) To know about the Artificial Intelligence (AI) and global trade
- 2) To understand role of AI in International business.
- 3) To find out challenges of AI in Global Trade.
- 4) To find out finding and solution (Remedial actions) to maintain interrelation between Artificial Intelligence (AI) and global trade.

Research Methodology:

Research type – This is Descriptive type research. It is based on Secondary Data from different books, Journals, websites, articles etc. to satisfy the objectives of research paper.

Data Collection and Analysis:

For this study researcher used the secondary data such as different books, Journals, websites, articles etc. This study is conceptual in nature through the review of valuable literature, journals, magazines, and web sources and referring to publications, qualitative results have been drawn out in the form of findings & Suggestions.

Description:

Artificial Intelligence (AI) is reshaping global trade at every level from manufacturing and logistics to finance and geopolitics. Instead of trade being driven mainly by cheap labour and natural resources, it is increasingly shaped by data, algorithms, and technological capability. We can analyse the interrelation of Global Trade and Artificial Intelligence (AI) with the help of following points:

1. AI in Supply Chains: AI improves how goods move across borders with the help of following points:

- Predictive demand forecasting
- Smart inventory management
- Route optimization for shipping
- Real-time risk monitoring (weather, port congestion, political instability)

Global firms like Amazon and Maersk use AI to reduce delays and cut costs. Its **Result is that it** Faster the process, cheaper the commodity and it more resilient trade flows.

2. AI and Manufacturing Patterns: AI-powered robotics and automation are changing comparative advantage:

- Less dependence on low-wage labour
- Greater importance of skilled talent and tech infrastructure
- Growth of re shoring and near shoring

Countries investing heavily in AI—such as the United States, China, and Germany—are strengthening their positions in high-value exports. That countries **shift** from labour-cost advantage to technology advantage.

3. Trade Finance & Risk Management: AI enhances global trade finance by:

- Detecting fraud in cross-border payments
- Assessing credit risk more accurately
- Automating compliance checks (AML, KYC)

Institutions like HSBC use AI tools to streamline international transactions. Its **impact is that it suffers with** Lower risk and quicker financing for exporters and importers is available.

4. Digital business, Trade & AI:

- AI is expanding trade in services:
- AI-as-a-Service (cloud platforms)
- Cross-border software exports
- Data analytics consulting
- Digital marketing

Companies such as Microsoft and NVIDIA power much of the global AI infrastructure. Its **trend is that** Services trade is growing faster than physical goods trade.

5. Geopolitics and AI Competition: AI has become strategic infrastructure. Trade tensions increasingly involve:

- Semiconductor export controls
- AI chip restrictions
- Data localization policies

For example, tensions between the United States and China include restrictions on advanced AI chips. AI is transforming global trade from a system based primarily on **physical capital and labour** into one driven by **data, algorithms, and innovation ecosystems**. In the coming decade, competitive advantage will depend on Talent, Data access, Semiconductor capability, Cloud infrastructure, Regulatory frameworks, Economic Implications, Increased productivity, Lower transaction costs, Faster cross-border commerce, Better market prediction

Artificial Intelligence (AI) is transforming global trade by reshaping how goods are produced, transported, marketed, and regulated across borders. In this paper structured influencing of AI on international commerce is given with the help of following points. With the help of AI how Global Trade improve? For this consider following points.

1. Supply Chain Optimization: AI enhances efficiency across global supply chains by:

- **Demand forecasting** using predictive analytics
- **Inventory optimization** to reduce overstock and shortages
- **Route optimization** for shipping and logistics
- Real-time risk monitoring (weather, geopolitical instability, port congestion)

Major companies like Amazon and Maersk use AI to improve global distribution networks. **Impact of is that it can maintain** Lower costs, improve Faster delivery, Reduced waste and Greater resilience

2. Trade Financial activity & Risk Management: AI improves financial systems that support global trade can able to:

- Fraud detection in cross-border payments
- Credit risk assessment for exporters/importers
- Automated compliance checks (KYC, AML)

Financial institutions like HSBC use AI-driven tools to streamline trade finance operations. Its **Impact is for** faster approvals, reduced fraud and Improved trust in international transactions

3. Customs, Compliance & Regulation: Governments use AI to:

- Detect smuggling and tariff evasion
- Analyse cargo scanning images
- Automate customs documentation

Organizations such as the World Customs Organization promote digital transformation in border management. It reduced clearance times, increased revenue collection, stronger enforcement.

4. Comparative Advantage: AI-driven automation is reshaping traditional trade theories:

- Reduced reliance on low-cost labour
- Increased importance of skilled talent and data infrastructure
- Rise of “reshoring” and “nearshoring”

Countries investing heavily in AI—like the United States, China, and Germany—are gaining technological trade advantages.

5. Digital Trade & Services: AI improves trade in services such as

- Software exports
- AI-as-a-Service platforms
- Cross-border digital consulting

- Data-driven marketing

Companies like Microsoft and NVIDIA power global AI ecosystems through cloud and hardware infrastructure.

6. AI Competition and Geopolitics: AI is now strategic infrastructure. Trade tensions increasingly involve:

- Semiconductor export controls
- AI chip restrictions
- Data localization laws

For example, tensions between the United States and China include restrictions on advanced chip exports.

7. Economic Implications Positive Effects

- Higher productivity
- Lower transaction costs
- Increased global integration
- Expanded digital trade

Problems of Global Trade in Artificial Intelligence (AI)

AI is transforming global commerce, but it also creates **serious structural, economic, and geopolitical challenges**. Below are the major problems shaping AI-driven global trade

1. Digital Divide between Nations: AI development requires:

- Advanced semiconductors
- Massive datasets
- Cloud infrastructure
- Skilled talent

A few countries—such as the United States and China—dominate AI infrastructure. Many developing nations lack computing power and data ecosystems. **So Problem is** AI could widen global inequality rather than reduce it.

2. Semiconductor Dependency & Supply Risk

AI systems depend on advanced chips produced by a small number of firms like NVIDIA and manufacturers such as TSMC. Issues include Geographic concentration of chip production, Export controls, and Political tensions. It increases **Risk like** supply disruption it could impact the entire global trade system.

3. Trade Wars as per geographical area: AI is now strategic infrastructure. Countries impose Export restrictions, Technology bans, Sanctions, Data localization rules. Tensions between the United States and China include restrictions on AI chip exports and advanced semiconductor equipment. It creates a **Problem** Trade fragmentation and technological blocs.

4. Job Displacement & Social Instability : AI automation reduces demand for:

- Routine manufacturing labour
- Clerical and processing jobs
- Basic logistics roles

Countries relying on low-cost labour exports may face:

- Unemployment
- Reduced comparative advantage
- Income inequality

It may Result in Social unrest and political backlash against globalization.

5. Data Governance Conflicts

AI depends on data—but global data flows face:

- Privacy laws (e.g., regional regulations)
- Data sovereignty requirements
- Cyber security threats

Different regulatory systems make cross-border AI trade complex and expensive. **There is a Challenge of** No universal global framework for AI governance.

6. Ethical and Bias Issues in Cross-Border AI

AI systems trained in one country may:

- Reflect cultural bias
- Produce unfair outcomes in other markets
- Misalign with local laws or values

This creates legal and reputational risks for multinational firms.

7. Concentration of Market Power

AI markets tend to be dominated by large tech companies with:

- Massive datasets
- Strong network effects
- Huge capital resources

This can reduce competition and make smaller economies dependent on foreign platforms.

So, even if AI-driven trade promises efficiency and growth, but it also creates risks as follows:

- Increasing inequality
- Fuelling geopolitical rivalry
- Fragmenting global markets

So it's become necessary to see the challenges of AI in Global Trade Process

AI and Global Trade: Key Challenges

The most important challenge of AI is balancing **innovation, fairness, security, and openness** in a rapidly evolving technological trade system. Developing nations risk becoming dependent consumers rather than competitive producers in AI-driven trade. Artificial Intelligence is reshaping global trade—but it also creates deep economic, political, and structural challenges. Below is a type of the major challenges:

1. Technology Concentration & Inequality

AI development requires:

- Advanced semiconductors
- High-performance computing
- Large datasets
- Skilled engineers

2. Semiconductor Supply Chain Risks

Problems include:

- Geographic concentration of chip production
- Political tensions in key regions
- Export restrictions on advanced technology

So risk of manufacturing could slow global manufacturing and digital trade.

3. Trade Fragmentation & Geopolitics

AI is now strategic infrastructure. Governments impose:

- Export controls

- Sanctions
- Investment screening
- Technology bans

Its result in Emergence separate technological blocs instead of a unified global market.

4. Job Displacement & Shifting Comparative Advantage

AI-driven automation reduces demand for:

- Low-cost manufacturing labour
- Routine clerical work
- Basic logistics roles

Countries that built export strength on cheap labour may lose competitiveness. So nation can face the **challenge of** Rising unemployment and income inequality in some regions.

5. Data Governance & Regulatory Conflicts

AI depends on cross-border activities, but countries have different:

- Privacy laws
- Data localization requirements
- Cyber security standards

Its necessary to have global AI regulatory framework , otherwise company can face high compliance costs.

6. Cyber security & Systemic Risk

AI-powered trade systems increase vulnerability to:

- Cyber attacks
- Data breaches
- Infrastructure disruption

A major cyber incident could paralyze supply chains or financial networks.

7. Market Concentration & Monopoly Power

AI markets often favour large tech firms due to Network effects, Massive data ownership, High entry barriers, Job displacement in manufacturing and in routine sectors, Digital divide between developed & developing countries, Data governance conflicts, Cyber security risks , Digital divide between nations.

These challenges may limits competition and may reduce innovation in the long run.

AI and the Challenges of Global Trade in India

Artificial Intelligence (AI) is converting global trade. But **India** has strategic opportunities as well as serious structural challenges. As per India's economic context following are the challenges of AI and Global Trade in India.

1 Digital Infrastructure Gaps: Even if India has strong digital public infrastructure (UPI, Aadhaar, ONDC), but it faces challenges also:

- Uneven AI adoption across MSMEs
- Limited high-performance computing access
- Dependence on imported semiconductor chips

India still relies heavily on foreign chip manufacturers like TSMC. It creates a **challenge of** technological dependency.

2. Semiconductor & Hardware Dependency: AI development depends on advanced chips designed by firms such as NVIDIA.

India is expanding semiconductor manufacturing through policy initiatives, but:

- Fabrication capacity is still limited

- High capital requirements slow progress

3. Job Displacement in Labour-Intensive Exports

India's trade strength traditionally lies in:

- Textiles
- Garments
- IT services
- Business process outsourcing

AI-driven automation may reduce demand for routine BPO and back-office services. 4. Global Regulatory & Trade Barriers

4. AI-related global trade faces

- Data localization requirements
- Cross-border data flow restrictions
- Diverging AI regulations

India must balance:

- Protecting data sovereignty
- Remaining competitive in digital trade

Policy frameworks influenced by institutions like the World Trade Organization affect how India negotiates AI-related trade rules.

5. Competition from AI Superpowers

- AI research
- Advanced chip design
- Large language models
- AI cloud infrastructure

6. Skill Gap & Talent Migration

India has strong engineering talent, but faces:

- Brain drain to foreign tech hubs
- Skill is different between regular education and AI base industry needs
- Need for advanced AI research investment

Without large-scale up skilling, inequality may increase between high-skill and low-skill workers.

7. Cyber security & Data Risks

AI-driven trade systems increase vulnerability to:

- Cyber attacks
- Financial fraud
- Data breaches

The challenges faces by India in AI and Global Trade, India should apply the Strategic process. Must decide how to move from a **service-export nation** to **technology-creating nation** in AI-driven global trade. Because the opportunity exists — but success depends on:

- Semiconductor ecosystem development
- AI research funding
- Skill transformation
- Smart trade diplomacy
- Ethical AI governance

Conclusion

Global Trade and Artificial Intelligence (AI) are the interdependent activity for progress of the nation. AI improves how goods move across borders. AI-powered robotics and automation are

changing comparative advantage. In the coming decade, competitive advantage will depend on Talent, Data access, Semiconductor capability, Cloud infrastructure, Regulatory frameworks, Economic Implications, Increased productivity, Lower transaction costs, Faster cross-border commerce, Better market prediction. Artificial Intelligence (AI) is transforming global trade by reshaping how goods are produced, transported, marketed, and regulated across borders. AI is moving through global trade and commerce, it also creates **some structural, economic, and geopolitical challenges**. So, even if AI-driven trade promises efficiency and growth, but it also creates risks. The main challenge of AI is balancing **innovation, fairness, security, and openness** in changing technological trade system. Developing nations risk becoming dependent consumers rather than competitive producers in AI-driven trade. These challenges may limit competition and may reduce innovation in the long run. It results in Widening global inequality, increasing geopolitical conflict, Fragmenting international trade systems, concentrating power in a few countries and corporations

Findings:

- 1) AI improves how goods move across borders
- 2) AI-powered robotics and automation are changing comparative advantage
- 3) AI enhances global trade finance
- 4) AI is converting global trade from a system based primarily on physical capital and labour into one driven by data, algorithms, and innovation ecosystems.
- 5) Artificial Intelligence (AI) is transforming global trade by reshaping how goods are produced, transported, marketed, and regulated across borders.
- 6) AI-driven automation may reduce demand for routine BPO and back-office services.

Suggestions:

In Global Trade while using AI as various challenges faces by India, India should apply the Strategic idea and processes. And must decide how to move primarily as a **service-export nation** to become a **technology-creating and techno base nation** in AI-driven global trade.

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