

# Exploring the Challenges and Opportunities for Globalisation of Logistics and Supply Chains

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*Abstract:* - The problem statement outlines the complex challenges that organizations trying to optimize their international supply chain and logistics operations must overcome. Companies functioning in a globally networked environment face a complex terrain of opportunities and difficulties because of the globalization of supply chain management and logistics. The difficulties brought on by the globalization of supply chain management and logistics span several areas, such as cultural variety, regulatory inequalities, infrastructure constraints, and geopolitical unpredictability. Globalization in logistics offers many opportunities like market access, development of supply chain management, and technological advancements. On the other hand, it also causes challenges like supply chain complexities, and cross-broader regulations in logistics. The study used the process of secondary data collection and qualitative analysis through axial coding based on grounded theory. The main conclusions cover a synthesis of issues, from technological advances and legislative discrepancies to route optimization for transport and the function of technology in addressing these issues. The benefits of globalization also include expanded access to markets, economies of scale, and knowledge transfer. The conclusion emphasized the need for logistics and supply chain management to strike a balance between centralized control and localized response. Organizations must aggressively alter their approaches to take advantage of the advantages while navigating the obstacles in a constantly changing international marketplace as globalization continues to change the business landscape.

*Key-Words:* - Globalisation, Supply Chain Management, Engineering Supply Chains, Logistics, Digitalisation, Technology Management, Engineering Management, Organisations.

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## 1 Introduction

The environment of supply chain management and logistics has changed because of internationalization, giving rise to a complex web of interconnected networks that make it easier to transfer individuals, data, and resources throughout the globe. Companies looking to optimize their supply chains now face both possibilities and challenges because of these phenomena. This chapter will evaluate the background information and will provide a general knowledge about modern-day supply chain management. The study will evaluate the issues and opportunities of supply chain management based on interconnected networks around the world. As per the views of [1], considering the challenges or the risks globalization puts on supply chain management, companies around the world focus on implementing sustainable approaches as possible. Stakeholders from various countries and areas are frequently included in worldwide supply chains, including suppliers, manufacturers, distributors, and retailers.

Communication, quality control, and regulatory compliance can all face difficulties when managing and coordinating these many entities. According to [2], businesses are vulnerable to different categories of risks because of the globalization of supply chains, including those caused by instability in the geopolitical aspects, unexpected environmental events, and unanticipated disruptions like various epidemics. For example, if there is a disturbance in one area of the world, it may have devastating indirect consequences and affect the entire global chain. For companies, globalization develops fresh markets and clientele. By interacting with a broader demographic, businesses may take advantage of the different tastes of customers and economies of scale [3]. Cost savings may result from outsourcing manufacturing or purchasing resources from countries with low costs. Furthermore, improvements in technology and transportation have increased the effectiveness of the supply chain, lowered lead times, and enhanced management of inventory, [2]. As per Figure 1, it is noticed that due

to globalization and the movement of trade from one country to another, there is an increase in supply chain revenues. In 2020 the supply chain revenue was \$15.58B and is forecasted to increase to \$27.58 billion within 2026, [4].

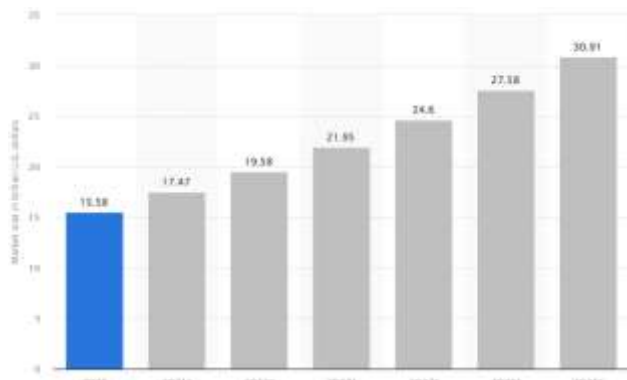


Fig. 1: Global SCM Development with Globalisation, [4]

The World Trade Organization investigates and provides results that the volume of international trade in goods increased by 10.7% in 2021, indicating a good comeback from the Covid disruptions. In addition, 85% of the people who participated in a McKinsey and Company survey observed supply chain interruptions during the worldwide pandemic, underscoring the susceptibility of global supply systems to unanticipated occurrences, [5]. As opined by [6], controlling the movement of commodities gets complex as businesses purchase goods and components from various countries. According to a survey by the Capgemini Research Institute in 2020, 74% of companies face difficulties because of the growing complexity of their supply chains. Variations in local laws, transportation systems, and communication hurdles are the cause of this complexity, [7]. The importance of conducting research on this issue is due to investigating strategic decisions, and regional sources, and designing resilient supply chain networks while formulating risk management strategies. Research studies [8] major concern for global firms is the lack of transparency or visibility. Studies by Gartner have highlighted that 60% of firms have some level of visibility along with their immediate suppliers, whereas only 6% had full firm awareness. This impacts efficiencies while holding up processes and increases costs. Studies [9] suggest that emerging trends and enhancements due to globalization enable difficulties for firms to deal with changing consumer expectations. Hence, the authors aim to provide an exploratory study on key challenges and

opportunities created through globalization that impacts any global supply chains.

However, the issues such as complexity and fragmentation, visibility or transparency, and fluctuating customer demands have an impact on the global supply chain companies. Previous research on these challenges is done on a limited scale which does not have the required reasons and information of impact. The supply chains are becoming increasingly complicated and fragmented as they extend across borders around the world. Consumer tastes can quickly change because of the growth of online shopping and the interconnection of marketplaces, which forces the supply chain to adjust quickly. The purpose of this investigation which can reveal creative tactics for attaining supply chain visibility and cooperation is to concentrate on these global supply chain difficulties. The issues that were not identified or identified but not investigated or researched professionally are required to be addressed in this study.

The aim of this study is to examine the challenges and opportunities associated with globalization's impact on logistics and supply chain management operating on a global scale.

The key **research objectives** and **research questions** that the study aims to address are as follows.

- [1]. To identify the issues or challenges associated with global logistics and supply chain management.
- [2]. To identify and evaluate different opportunities and benefits that are gained from globalization such as access to new markets and the ability to involve modern technologies
- [3]. To evaluate the impact of globalization risk on supply chain management
- [4]. To investigate the role of technology in global logistics and supply chain management
- [5]. To suggest strategies for global businesses seeking to improve the overall impact of globalization in their supply chain management.

RQ1. What are the challenges that are currently associated with global logistics and supply chain management?

RQ2. How globalization of supply chain management provides different benefits to companies to access new market gaps?

RQ3. What is the role of modern technologies in global supply chain management?

RQ4. How can global companies improve their overall supply chain management with new strategies?

The importance of this research lies within the investigation of the challenges which are important to examine as they provide the impact of globalization on the global supply chain. This study identifies identification of reasons and ways that the above issues are located, provide impact, and affect the internal management or external activities of the global supply chain. This research offers insightful knowledge that can help firms maintain sustainability on a global scale by exploring the difficulties associated with managing and managing global supply networks.

## 2 Review of Literature

The globalization of logistics and supply chain management represents challenges like increased risks, and cross-border regulations, while also offering opportunities like enhanced collaboration and broader market access. The adoption of technological advancements is a key aspect that makes the globalization process more effective. The theoretical analysis of globalization is also discussed in the research.

### 2.1 Theoretical Analysis of the Globalisation Concept

According to the Neoliberal economic concept, globalization is a factor that encourages economic efficiency and growth by liberalizing trade and investment. As suggested by [10], open markets result in specialization, which boosts production and expands consumer options.

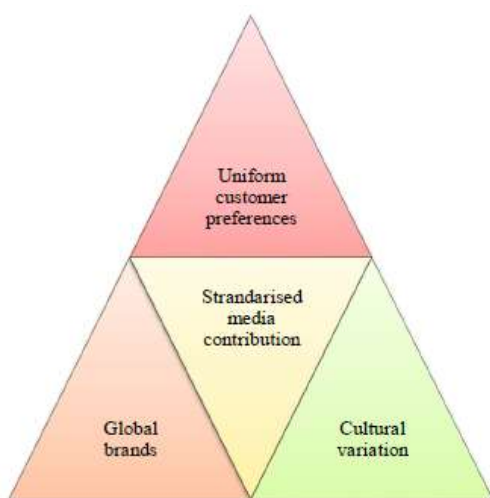


Fig. 2: Cultural Homogeneity Theory, [11]

However, this strategy frequently causes inequality because wealthy nations and multinational firms disproportionately gain from it, while impoverished countries are mostly left out. Similarly, studies have shown that social dimensions are impacted heavily where the focus is on profit margins that further fuel environmental and workforce exploitation within the sector, [12]. Therefore, the idea of globalization is a complex phenomenon that has been examined from many theoretical aspects. Cultural homogeneity theory is used to examine the cultural aspect of globalization. As commented by [13], increased connectivity develops a global culture that eliminates local boundaries. Additionally, it helps to expand popular consumer goods with the help of the media. On the contrary, as opposed to [11], emphasizing the potential erosion of cultural diversity along with dominant cultures also overpowers Indigenous inequalities. Therefore, many organizations may lose their distinctive customs and values, which could result in cultural homogeneity and loss of identity.

Figure 2 suggests the aspects of cultural homogeneity theory in the context of globalization. According to the principle of cultural homogeneity; globalization encourages uniform customer preferences, hence encouraging international brands. Despite this, cultural variety still exists and has an impact on regional adaptations. Standardized media fulfils a dual purpose by distributing international content while considering cultural nuances.

The power of globalization is explored in terms of the theory of unequal power distribution. As per the view of [14], as multinational firms and international organizations gain power, globalization weakens their authority of them. As organizations compete for international investment deregulating and lowering labour and environmental safeguards is helpful. Therefore, the global power structure favours economically powerful countries, which may undermine international relations. In contrast to that, as contradicted by [15], the idea of the "global ecological footprint" is stressed by the environmental perspective on globalisation. The possibility of shared information and team-based solutions are helpful in solving global environmental problems. However, increased cross-border trade results in greater carbon emissions and resource depletion. On the other hand, as contradicted by [16], if globalization is not properly regulated, ecological degradation may become worse. As a result, international cooperation and sustainable practices are crucial tactics for creating successful solutions to global problems. Figure 3

depicts the aspects of World systems theory, and the framework also examines global interdependence, viewing human society as interconnected, and influenced by natural forces.

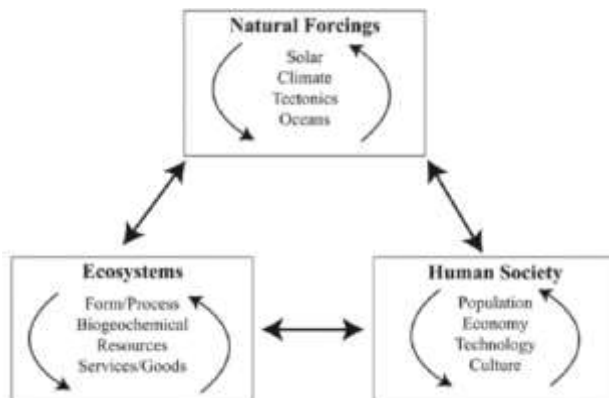


Fig. 3: World Systems Theory, [17]

It focuses on the way globalized economies impact ecosystems, emphasizing the requirement for a balanced society. According to the World Systems Theory, the globalization process has been driven by a hierarchical and global economic structure depending on global trade dynamics. Recent studies [17] global logistics and supply chains are impacted by the world system theory, which identifies the way major economies have control over supplier and manufacturing networks (in-house, outsourced). This allows the firms to shape the inventory and distribution patterns while taking advantage of more economical and competitive workforce requirements. Whereas studies by [18] highlighted those economies where growth strategy is more emphasized there is a higher proportion of inequality observed. Also, it is well noted that within a globally connected world, power dynamics and environmental sustainability push a need for intelligent governance within the markets. Hence, further understanding and acceptance of major globalization theories and frameworks enables firms to design and re-design policies to ensure that global supply chains and logistical strategies benefit from these opportunities and promote sustainable and environmentally friendly global trade between partners.

## 2.2 Globalisation in Logistics and SCM

An important paradigm that represents the transition of supply chain operations from locally focused activities to an integrated and interdependent system on a global level is “Globalisation”. Studies [19] highlighted the importance of the interconnected network of different activities, sourcing, manufacturing, distribution, stakeholders, and

resources involved in the sourcing process within global logistics and supply chains. Similarly, through increased market share and close collaborative partnerships, globalisation enhances the key areas of supply chains and logistics. Studies have also shown that the key driving forces for globalization are digital and technological advancements, trade policy changes, and competitive advantages through better utilization of resources allocation and market penetration, [20]. Therefore, it is an important requirement to identify the integration of various processes, stakeholders, and resources across global platforms to fully achieve globalization within supply chains.

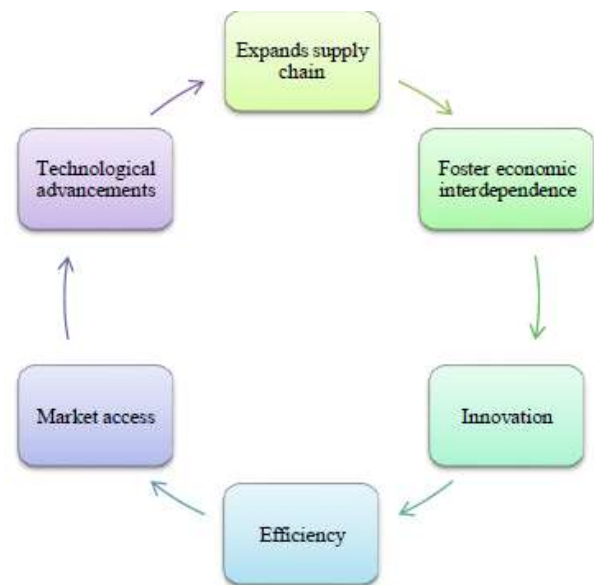


Fig. 4: Importance of Globalisation in Logistics and SCM, [15]

As shown in Figure 4, studies have highlighted the importance of globalization in logistics and supply chains as fostering economic interdependencies, applying innovation and growth, and improving efficiencies and market access, while implementing the best technological advancement required across the networks. Studies [18] highlight the need for firms to understand the expanded market reach and access to globalization approaches. Also, studies [15] suggested that firms can cater to a wider consumer market range from local and national to global through developing more robust international networks. Similarly, while updating income generation the enhanced market also enables firms to achieve diversification while lowering reliance on single markets within the network. This, however, poses some challenges across the supply chains due to global partners across the network accessing global market potentials, [21]. Hence, to create a more sustainable



and global supply chain network, firms are required to fully comprehend the key factors towards market awareness and diversity, the regulatory requirements and impacts, and cultural and political dimensions.

Studies have demonstrated the effective influence of globalization on the performance management of firms. Global logistics and supply chains are impacted by the advancement and adoption of digital technologies, including real-time tracking systems, data analytics, and communications across networks, [22]. This enables global networks to collaborate and coordinate while increasing efficiency, visibility, and knowledge sharing to allow key decision-making to be streamlined and smarter, thus improving the global supply chain process with the support of globalization. However, firms need to tackle certain drawbacks of start-up costs, the threat of cyber-attacks, key personnel training, and higher operational and maintenance costs for these digital enhancements. Thus, businesses need to embrace technology while competing in a globalized economy.

### 2.3 Globalisation in Logistics and SCM

According to [23], globalization had profoundly transformed the landscape of supply chain management, and logistics. Globalization has led to a market connectedness that is fuelled by communication and technology. As suggested by [24], the facilitation of cross-border interactions and transactions raises trade volumes and complexity. However, companies now conduct business on a global scale, obtaining raw materials and components from different countries, and distributing goods to numerous markets. Contrastingly, as stated by [22], effective and adaptable logistics solutions are now required to ensure the timely and economical transit of commodities across borders. Therefore, cross-border sourcing, global distribution networks, regulatory compliance management, and cultural adaptation are examples of new logistical operations brought on by globalization. Figure 5 depicts the necessary activities for globalization that are required in logistics, and the supply chain. As stated by [25], activities that are involved in globalization involve technological advancements, implicating information technology, and market access.

Additionally, global logistics and supply networks have undergone significant changes because of technological advancements. However, real-time visibility into the inventory, production, and transportation processes is now possible because of automation, data analytics, and the

Internet of Things (IoT). On the other hand, as argued by [26], implementing technologies such as machine learning, IoT, and artificial intelligence has required a high cost of maintenance. Integrating these technologies also has a negative impact on job loss.

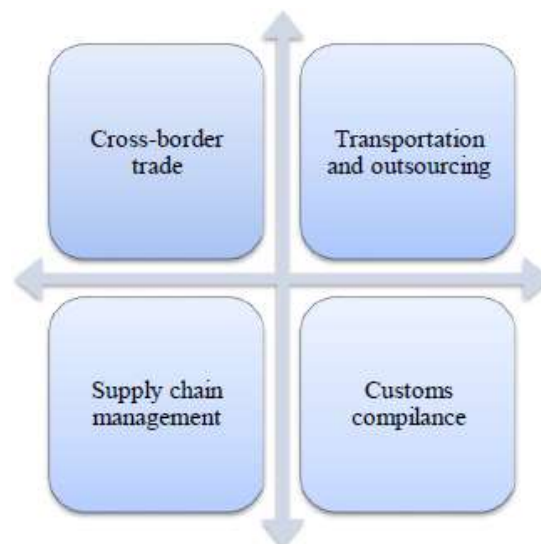


Fig. 5: Activities Related to Globalisation in Logistics and SCM [22]

As opposed to [27], due to the simplicity of online transactions and the growth of omnichannel retailing, supply chains now seamlessly integrate digital solutions to ensure effective order fulfilment and satisfied customers. Moreover, E-commerce and digital platforms revolutionized global trade, altering sales by attracting a large customer base to expand the market reach.

While globalization give opportunity, it also poses difficulties for supply chain management and logistics. As stated by [28], enhanced decision-making, fewer disruptions, and optimal resource allocation are all benefits of this globalization. Additionally, geopolitical unpredictability, a variety of customs processes, and complex international regulations can all cause delays and add to the cost of a transaction. Contrastingly, as opposed to [29], companies have used supply chain diversity to address these issues, carefully situating production sites and warehouses to reduce risks. Thus, for managing cross-border complications, collaborative collaborations with third-party logistics providers have become essential while expanding business on a global scale. Incorporating sustainable approaches in business helps to streamline transportation networks and reduces carbon footprints. According to [30], adopting sustainable practices has also become increasingly important as environmentally concerned consumers demand eco-friendly supply

chains. However, supply chains require a proper balance of efficiency and resilience. As shown by studies firms creating are required to create robust supply chains that handle global disruptions such as natural and cultural impacts, geopolitical disruptions, and higher demand levels within the markets, [31]. This further improves cost reduction while improving processes within supply chains and improving efficiencies to address any weaknesses and sudden impacts within the markets. Hence, resilience, redundancy, adaptability, and risk management strategies are crucial for creating robust global supply chains using modern technologies.

## 2.4 Opportunities in Logistics Arising from Globalization

Organizations that enter global marketplaces have access to a wider range of customers and demand patterns. As suggested by [32], globalization has successfully unlocked new landscapes for logistics, and SCM, offering new opportunities which expand beyond domestic boundaries. Complex supply chain networks that can move products across regions quickly are required for this. On the contrary [33], interlinking of the global market can cause several supply chain disruptions such as geopolitical issues, and unexpected global events. Therefore, by utilizing this increased market reach, logistics companies can diversify their offerings and serve a range of industries, increasing their ability to compete on a global scale. Modern logistics technologies have developed and been used because of globalization. As opined by [34], technological developments improve the visibility, tracking accuracy, and operational efficiency of the global supply chain, harmonizing with the interconnected trade networks facilitated by globalization.

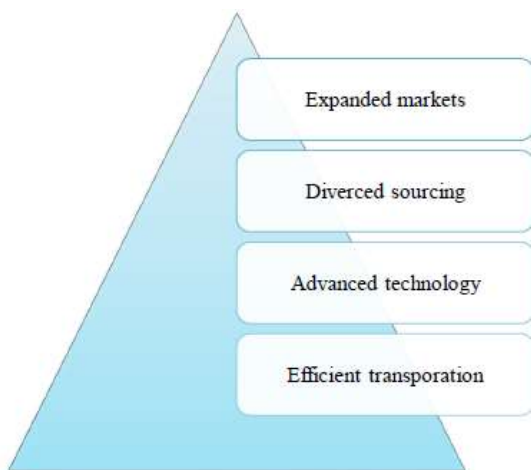


Fig. 6: Opportunities in Logistics arising from Globalisation, [33]

Some of the examples include AI-powered predictive analytics and blockchain-enabled traceability. In contrast to that, as contradicted by [33], the integration of many modern technologies in the context of globalization results in challenging compatibility issues and complex incorporation processes. However, by enhancing routes, cutting down on delays, and providing real-time cargo tracking, such efforts improve logistics efficiency and ultimately provide value for linked trade networks. Thus, in the context of globalization, promoting customer loyalty through added-value services not only fosters trust but also creates prospects for revenue diversification. Figure 6 shows the opportunities in logistics that have arisen through globalization. It encourages collaboration between several stakeholders in the logistics ecosystem. As opined by [34], to achieve seamless cross-border transfers, goods transport, transporters, customs officials, and regulatory organizations need to collaborate. Additionally, this cooperative strategy increases efficiency, decreases delays, and cuts expenses. On the contrary, as opposed to [35]; by creating alliances and partnerships, logistics enterprises may take advantage of one another's assets and strengths. Hence, it helps to provide end-to-end services that streamline global trade for companies and improve the logistics industry. The emergence of agile supply chain resilience is a crucial aspect in the context of opportunities in logistics brought on by globalisation. Studies have shown that the interconnection of global markets exposes various challenges to supply chain networks. Firms are required to address the need for agile supply networks that react to global disruptions seen in recent years such as political tensions and natural incidents, [36]. Global supply chain workforces aim to adopt more robust strategies like scenario planning, multiple sourcing solutions, and strategic inventory management practices to prepare and address globalization, to enable firms to achieve competitive advantage in global markets.

## 2.5 Drawbacks of Globalization in Supply Chain Management

The key effect of globalization on supply chains has raised challenges towards ethical standards and global workforce and labour standards. Research highlights that firms aim to reduce costs through outsourcing of production and manufacturing activities to economies with lower expenses. This further increases the chances for violation and exploitation of workforce and working conditions. While consumers get better informed about these

practices and where products are developed, thus impacting brand loyalty and consumer expectations, [37]. To resolve some of these challenges, it is important for firms to ensure ethical sourcing partners and fairer workforce standards and environments are adopted within the global supply chains. Hence, it can be noted that globalization share a level of negative contribution towards the future growth of supply chain complexities. Through addressing global markets, globalization makes supply chains more complex due to the need to address regulatory and legal frameworks and complex logistical and transportation challenges, [38].

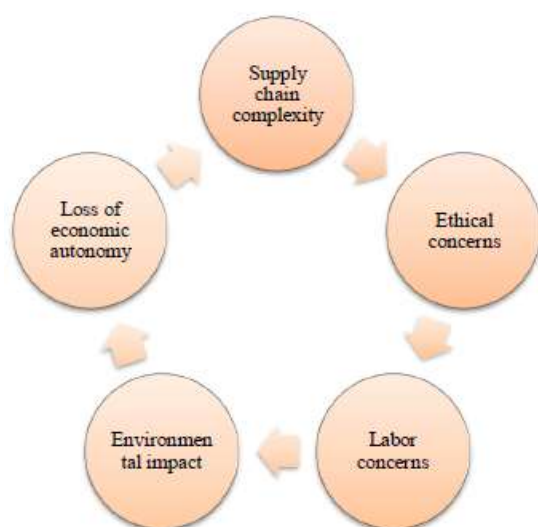


Fig. 7: Limitations of Globalisation in SCM (Adopted from [39])

Studies highlighted globalization causes higher transportation costs and vulnerabilities in supply chains through expanded global networks, [40]. However, with enhanced coordination, communication, and contingency planning, some of these challenges are addressed within global supply chains. Hence, globalization helps in successfully negotiating these complexities and maintaining operational effectiveness. Figure 7 depicts the limitations of globalization in supply chain management, and these include environmental impact, loss of economic autonomy, and ethical concerns. As described by [39], the massive movement of products involved in global supply chains raises environmental issues. Moreover, longer shipping routes generate more carbon emissions, which exacerbate climate change. UK logistics emissions grew to 112.5 million metric tonnes of carbon dioxide in 2022, up an anticipated 3.8 percent from the previous year, [41]. Additionally, poor waste management practices and

loose environmental laws in some areas can cause pollution and ecological devastation. In contrast to that, as contradicted by [40], sustainable practices are necessary to address environmental issues, such as streamlining supply chains, cutting back on packaging waste, and optimizing transportation routes. Hence, these practices are effective in reducing the carbon footprint of the firms.

The local economic autonomy is also disrupted by applying the strategies of globalisation. As per the view of [38], local economies in the firms' home countries suffer when they outsource production to low-cost nations. It may lead to decreased industrial capacity, weakened local sectors, and job losses, which would diminish the country's economic resilience. As opposed to [37], a healthy domestic economy is beneficial for maintaining the supply chain resilience of organizations. Hence, it's important to have the correct balance between cost reduction and a robust global economy within global chains to avoid any economic and global disruption.

## 2.6 Integration of Technology to Manage SCM

The recent advances in digitalization and the integration of technology have changed global supply chains. Modern firms are enabled with advanced technologies and solutions to enhance supply chain visibility, efficiency, and decision-making. Alongside this, other areas of inventory, production, and transportation activities are further improved through the use and application of technologies such as IoT sensors, RFID tracking, and real-time data analytics, [42]. This enables supply chain managers and decision-makers to optimize operations while reducing disruptions and providing enhanced client and end-customer experiences within their networks by making use of this integration. However, while few firms can advance through digitalization and technology integration, many firms are not equipped with the level of investment and resources required to benefit from this. Studies have shown that transparency and visibility within supply chains are due to the incorporation of technology. Key stakeholders can access real-time information through various locations on digital platforms and cloud-based solutions within their supply chains. Hence, the level of openness enables us to accurately estimate demands while managing levels of inventory more effectively and address key challenges earlier within the networks.

In contrast to that, as contradicted by [43], traceability is improved by the ability to track



products along their journey. Thus, it enables businesses to immediately spot and address bottlenecks, quality problems, and delivery delays.



Fig. 8: Incorporation of Technology to Manage Supply Chain Management, [44]

Figure 8 depicts the importance of technology incorporation to manage the supply chain management such as resource sharing, and decision synchronization. As illustrated by [45], supply chain procedures can be greatly streamlined by automation, and in warehouses and distribution centres, robotics and autonomous vehicles are used for activities. These activities include order picking, sorting, and loading. On the contrary, as opposed to, [43], some logistics employees do not have the technological skills to use automated technologies within the work environment. Globalization-driven automation improves accuracy and operational efficiency. They shorten lead times by coordinating with linked supply chains and increase trade made possible by global integration. Therefore, this technological integration reduces human error and improves labour for more strategic responsibilities.

Organizations obtain a thorough concept of consumer behaviour, market trends, and operational patterns as they gather and analyse data from multiple touch points. As opined by [46], the development of a competitive edge through data-driven insights is a solid justification for integrating technology in SCM. Additionally, they can create flexible plans, make educated judgments, and proactively react to shifting market situations with this knowledge. On the other hand, as argued by [42], without having proper data on the customers, logistics sectors do not understand the customer needs. Hence, businesses that successfully use technology to take advantage of data insights can establish themselves as industry leaders, fostering innovation and precisely satisfying client requests.

### 3 Research Method

Investigation of the globalization impact with opportunities and challenges affecting supply chain management is done and requires professional methods to conduct the research. In this chapter, important research techniques will be identified and interpreted on the way it is used, provide importance, and have limitations.

#### 3.1 Research Philosophy

Globalization increases the scope of making the supply chain elaborate and extended and to understand the impact of benefits and disadvantages, interpretivism philosophy has been included in the study. Interpretivism enables important insights while assessing the challenges and possibilities brought by globalization of supply chains and logistics, [47]. International supply chains are intricate, involving numerous cultures, spoken languages, and regional customs that influence decision-making. Adopting this approach the research has successfully conducted a qualitative study and explored perceptions of the research gap or the challenges of globalization's impact on supply chain management. It is noted that this philosophy recognizes diverse viewpoints of global supply chain management with opportunities and challenges getting affected by sustainability management. However, an interpretivism strategy has its limitations due to interpretation being subjective, it might not be generalizable. It may be difficult to apply findings uniformly across all global supply chain situations because they may be context-specific, [48]. In addition, because interpretivism uses qualitative methods, gathering data might take a lot of energy and time.

#### 3.2 Research Design

The investigation is being done on the impact of globalization and its influence on supply chain management which provides broader observations to extended generalized data for which an inductive research approach has been included. When assessing the difficulties and possibilities brought on by the globalization of supply chain and logistics management, this method offers insightful information. As said by [49], this descriptive research was chosen because it provided a thorough assessment of the condition of worldwide logistics at the time while identifying important trends, practices, and problems. This is especially important given the rapid pace at which the ecological footprint of global supply chains is changing, and the way additional opportunities and problems are



always being created. The method has provided an effective snapshot of the current approaches and techniques that supply chain companies deal with to maintain globalization sustainability when doing business online. As stated by [50], a descriptive study design's drawback is that of the probable lack of depth of knowledge it may reveal. Although it offers an extensive summary of the topic, it may not go in-depth on the underlying causes and mechanisms that underlie some of the possibilities and challenges brought on by globalization. Due to its emphasis on clarifying the present scenario, the technique may also have difficulties forecasting future patterns or results.

### 3.3 Research Approach

It is seen that companies operating globally focus on the development of their products and services and sell them across global regions. Due to globalization their supply chain gets affected by certain opportunities and underlying threats and to understand so, an inductive research approach provides theoretical analysis with specific data observations on such opportunities and challenges impact. As opined by [51], diverse factors, such as culture disparities, legislative frameworks, technology developments, and consumer demands, have an impact on worldwide supply chains. The rationale behind choosing an inductive method is that it enables people to become immersed in genuine circumstances, comprehend the subtleties of international logistics, and construct theories based on real-world experiences. Investigators can examine the difficulties as well as potential brought on by globalization by gathering data using secondary approaches. The limitations considered here are that small sample sizes are common in inductive studies, which could restrict the way broadly the results may be applied. Inductive reasoning's context-dependent character might not adequately capture some of the general trends and patterns found throughout many worldwide supply chains. Due to the nature of subjective information gathering and analysis methods adopted in inductive research, a higher number of key resources are required along with time, [52]. This makes it more difficult to evaluate of variety of supply chain and logistics eventualities within the areas of research studies.

### 3.4 Data Collection Method

The research adopts a preliminary study to identify key challenges and opportunities aligned to the impact of globalization on supply chains to enable the researchers in the right direction of data

collection. The study presents a secondary qualitative data collection method through the systematic literature review process. Previous studies have highlighted the importance of organized surveys of recent scholarly literature on research topics that constitute a systematic literature review, [53]. This approach of analysis enables analysing the gaps and opportunities arising from the globalization of supply chains. Similarly, a thorough literature evaluation allows researchers to identify patterns, gaps, and recent developments through the synthesis of various materials and studies within the subject area. It allows a comprehensive lens on the topic through other similar studies conducted within the field. This provides knowledge and understanding to the researcher to develop in-depth information from both historical to contemporary areas of research. For this study, the data collection method was secondary in nature through the collection of key articles and resources from Research Gate and other leading publications in areas of sustainability, globalization, supply chain management, logistics, threats and opportunities of globalization and other emerging areas of technological and digital advancements. The selection of the secondary qualitative method was due to the nature of the research and the dimensions of cultural, legal, and other market demand dynamics that could be affecting global and international logistics and supply chain providers, [54]. This approach makes it easier to grasp and identify the interplay between various aspects affecting supply chains in diverse geographical environments. However, addressing the limitations, it was also observed that due to obsolete or limited data, key decisions and judgments could be skewed or erroneous. Additionally, the interpretation of qualitative data is arbitrary in nature and subject to change between multiple researchers working on similar areas of research. Hence, it may have limited breadth and depth necessary to address the possibilities and difficulties that it poses in the current context, [55]. These restrictions may affect the validity and dependability of conclusions drawn from the collection of secondary qualitative data. The research is conducted based on a systematic literature review and it requires a proper collection of the article population which needs to be observed and to do so inclusion and exclusion criteria have been included.

The data collected is qualitative in nature and is analysed through the implication of grounded theory using axial coding and then thematic analysis. It is seen that the use of grounded theory provides the

study with opportunities to extract new theories generated from collected data. Analysis and information have been done using theories related to globalization and business supply chain management. According to [56], codes have been developed through the research papers collected and themes along with sub-themes have been developed. The codes such as globalization, challenges, opportunities, supply chain management, logistics, and sustainability have been used as filters to make the themes.

The complexity of supply chain connections may be exaggerated using axial coding, which is one of its limitations. The emphasis on classification and relationships may obscure subtleties and context-dependent information, thus resulting in a cursory comprehension of the problems. A flexible qualitative technique called thematic analysis includes finding, examining, and reporting patterns (themes) within data [57]. As it enables investigators to methodically identify common patterns across many datasets, this technique is appropriate for investigating the difficulties and opportunities with the globalization of logistics and supply chain management, [58].

### 3.5 Conceptual Framework

A conceptual framework of globalization on logistics, and supply chain is shown in Figure 9. The framework demonstrates the multifaceted issues and opportunities that are arising from the globalization of logistics, and supply chain management. The framework encompasses the examination of ethical considerations, supply chain complexities, and labour practices as the challenges. On the other hand, it also illustrates opportunities like agile resilience, collaborative partnerships, innovative technologies, and expanding market reach arising from globalization. Hence, the framework focuses on exploring interlinks between these factors. Theoretical gaps have been found in the previous studies on the specific research topic. As stated by [59], the literature lacks sufficient exploration of resilience strategies through digital innovations for supply chain disruption management during COVID-19. As opposed to [18], the lack of thorough research on the benefits of digitization in the field of international logistics is one of the gaps in the literature. In this research, it was also not mentioned the socioeconomic effects of globalization, particularly on labour rights and ethical practices. On the other hand, as argued by [60], the importance of digital interoperability in attaining a Physical Internet paradigm within

logistics and supply chain management is not adequately covered in the literature.

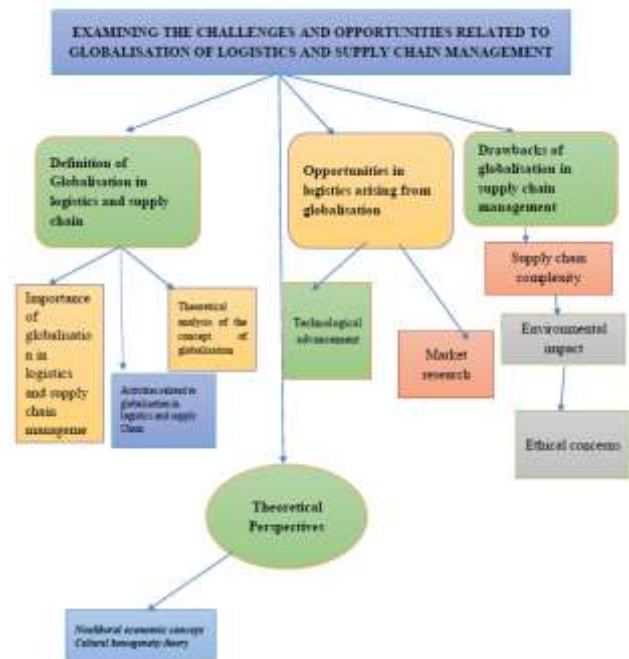


Fig. 9: Research Conceptual Framework, [59]

Therefore, this research is needed to depict and address the complexities of globalization, and opportunities in logistics, and supply chain management arising from globalization. From the above study, it has been concluded that the globalized landscape of logistics, and supply chain management brings both opportunities and challenges. Additionally, success controls adeptly navigating regulatory complexities, and solving risks, while managing technological advancements to encompass collaboration. Therefore, globalization has a positive impact on expanding logistics activities into an expanded market horizon to ensure sustainable and resilient operations.

## 4 Results and Findings

As seen through the study and previous studies, the process of globalization has greatly affected firms and global businesses. Global logistics and supply chain complexities have drawn major importance to firms while they embark on expansion and market diversification to compete on global levels. Hence, researchers aim to evaluate thematic analysis through axial coding theme identification and through further analysis and discussions within this section and as shown in Table 1.

Table 1. Thematic Coding

Source	Code	Theme
[61]	Challenges, maritime transport, global logistics	<i>Geopolitical disruption associated with global logistics and affecting supply chain management.</i>
[5]	Disruption, supply chain management, global and local	
[62]	Strategy modifications, trade disruptions	
[63]	Artificial Intelligence, globalization, economic development	<i>Globalization in promoting opportunities for companies to access new market gaps such as new market access.</i>
[64]	Global value chains, sustainability, emerging markets	
[65]	Supply chain analytics, post-pandemic growth, Triple A supply chain strategies.	
[66]	Supply Chain 4.0, maturity and research agenda	<i>Modern technologies implemented in the global supply chain for risk management and resilience of data security.</i>
[67]	The mean-variance approach, blockchain technology era, supply chain risk analysis	
[68]	Blockchain technology, sustainable supply chain	
[69]	Digital supply chain, challenges, and future directions	<i>Global strategies to improve overall supply chain management using modern technologies such as Artificial Intelligence</i>
[70]	Agile supply chain, Uncertain Supply Chain Management	
[71]	Supply Chain Performance, Innovation and Moderation, Top Management Support	
[72]	Compliance, Human Rights, Supply Chains	<i>Impact of rules and regulations of different nations providing impact on global supply chain management</i>
[73]	Tariffs, trade wars, and supply chain evolutionary design	
[74]	Laws and regulations, transportation requirements, trade regulations	

## 4.1 Analysis

**Theme 1:** Geopolitical disruption is associated with global logistics and affecting supply chain management

Trade wars and the implementation of taxes originate through geopolitical conflicts and tensions within nations, [5]. For instance, the example of trade disputes started in 2018 between the US and China, through which China responded to its own duties after the introduction of higher taxes on Chinese products by the USA. As a result of this situation, several existing supply chain networks and logistics were hugely disrupted, thus requiring firms and global networks to examine their sourcing and production strategies while shifting a global move of the key manufacturing operations. It is well noted that supply chain disruptions are mainly through the economic, political, legal, regulatory, and geopolitical tensions between nations. The trade dispute that erupted in the middle of the 2010s between the United States and China serves as an example. The enactment of tariffs and export limitations directly affected the movement of commodities between these two economic behemoths, disrupting the delivery chains of businesses that heavily rely on Chinese manufacturing, [62]. Through the identification of this theme, it is seen that the literature analysis where drawbacks are identified determines violations of national regulations and political conflicts. On the other hand, Geopolitical conflicts may result in the application of sanctions and embargoes, which would limit commerce with nations. The constraints affected the flow of goods into and out of Iran by limiting Iran's involvement in global markets. The economic restrictions that the United States and the European Union have placed on Iran serve as an example.

As stated by [61], the reason behind this was the loss of transportation resources due to the pandemic and international political biases. The rate of transportation fell from 8500 teu to 1500 teu within a few years. The difficulty of managing logistics, inventory, and information flow considerably rises as supply chains cover numerous nations and regions. This may make it difficult to coordinate activities throughout several time zones, cultural norms, and regulatory contexts, [61]. For its products, Apple Inc., for instance, relies on a global network of manufacturers and suppliers. The complexity difficulty is highlighted by the sophisticated collaboration needed to handle production across different nations, including thousands of components. As opposed by [5], organizations must abide by a variety of laws and

requirements from other nations. It might take a lot of time and money to navigate these many regulatory environments. Supply chains can be affected by geopolitical instability, which can result in port closures, difficulties in shipping, and general unpredictability. For example, the civil conflict in Yemen has had a major impact on the nation's capacity to handle imports and exports. Not only Yemen was hurt by this disruption, but additionally regional economic routes. For firms, the globalization of supply chain management and logistics brings advantages as well as difficulties. Although it expands the reach of markets, scale economies, and technical integration, it also adds coordinating challenges, elevated risks, and regulatory barriers. According to [62], to ensure compliance with the stringent requirements, the General Data Protection Regulation (GDPR) of the European Union has compelled businesses functioning on a worldwide scale to review the way they manage customer data. Exploiting possibilities and minimizing problems in a careful balance while assuring adaptation to a constantly shifting global environment are essential components of successful global supply chain management.

**Theme 2:** Globalisation helps in promoting opportunities for companies to access new market gaps such as new market access

As opined by [63], without a doubt, globalization has created fresh possibilities for businesses to fill as-yet untapped gaps in the market, giving them unprecedented access to new industries and geographic reach. Technology, communication, and transportation developments have contributed to making it simpler for companies to connect with customers all over the world, which has fostered this phenomenon.

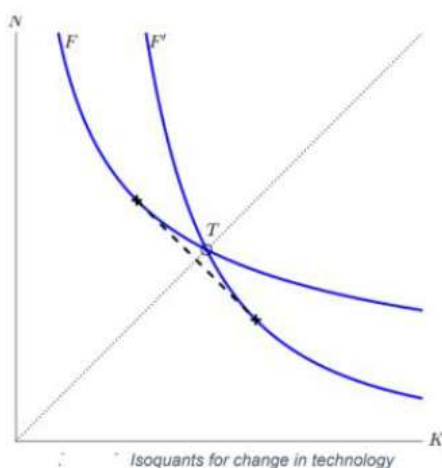


Fig. 10: Changes in Technologies due to Globalisation, [63]

Identifying the research objective and literature analysis, it is noted that one of the market gaps is accessing new marketplaces where small to medium-sized companies in many cases fail and globalization allows them to enter with strategic planning.

As per Figure 10, the findings of [63], state that rapid change in technologies around the globe such as blockchain, AI, IoT, and BIM allowed small to large companies to extend their market operations in new countries through accessing internet and digital based data management on customers and supply chain management. In the classic case of Apple Inc, the rise of Apple from a garage start-up to a major global technology company is a prime example of the influence of globalization.

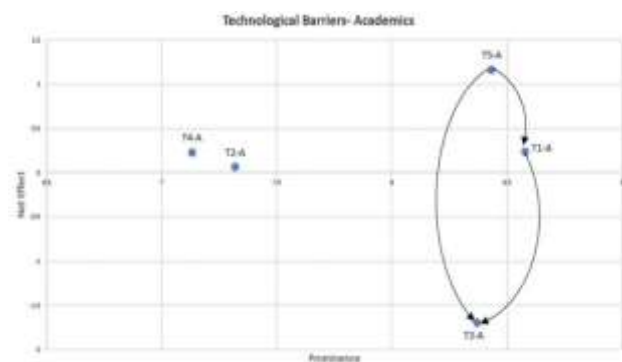
Beginning in the new millennium, Apple recognized a demand for user-friendly and attractive personal electronics. As stated by [64], Apple revolutionized the music business with the introduction of the iPod in 2001 by offering a streamlined platform for music streaming, storage, and purchasing. This invention quickly spread over national boundaries and cultural boundaries to become a phenomenon. As the firm profited from increasing consumer appetite for attractive and useful mobile devices, Apple's products like the iPhone and iPad further cemented its influence in the global economy, [64]. On the other hand, companies like Airbnb providing accommodation and residential facilities have emerged into new markets due to globalization and introduction of new technologies in digital platforms. As stated by [65], with the advent of Airbnb, a website that allowed individuals to rent out their properties to travellers, especially hospitality businesses experienced a tremendous disruption. When it was founded in 2008, Airbnb capitalized on tourists' yearning to travel like locals to fill a market vacuum. In addition to offering travellers interesting and reasonably priced lodging options, this novel strategy also allowed hosts to earn money by renting out additional space. The platform's quick spread into numerous areas throughout the world was facilitated by both its universal accessibility as well as simplicity of use. Since its founding, Airbnb has helped facilitate more than 750 million visitor arrivals altogether, illustrating the wide market reach it has attained through globalization as of 2021, [63]. Companies now have tremendous opportunities to fill new market gaps and increase their presence on a global scale thanks to globalization. Examples like Apple, Airbnb, and quick clothing retailers demonstrate the way spotting these gaps and filling them may result in



extraordinary development and success. We may anticipate more fundamental shifts in the markets in the not-too-distant future if businesses keep innovating and taking advantage of globalization.

**Theme 3:** Modern technologies implemented in the global supply chain help in risk management and resilience of data security

Global supply chains are crucial for the effective transfer of goods, services, and information across borders in the linked society of today. As per the identification of the research question, it is seen that the literature review supports the theme with analysis related to concerns with the global supply chain in the digital platform of operations. According to [66], risks associated with this complexity include interruptions brought on by geopolitical events, natural disasters, and cyber threats. Businesses are becoming more dependent on current technology to strengthen supply chain risk management and guarantee the resiliency of confidential information to handle these issues.



(T1: Security Challenge; T2: Access to Technology; T3: Negative Perception towards Technology; T4: Immutability Challenge of Technology; T5: Immaturity of Technology)

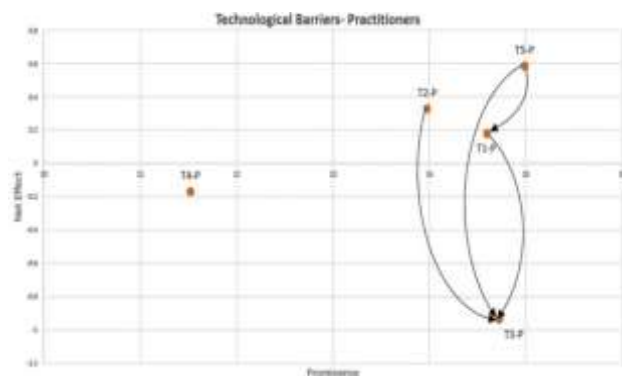


Fig. 11: Security & Technological Challenges, [68]

According to Figure 11, it is seen that [68], finds data security challenges have been one of the major issues with old technologies for companies expanding globally. To mitigate the issue, Blockchain technology, IoT, and AI for data

security and risk management have been included and used by most companies. Risks such as data breaches, inappropriate results in decision making, and complex working systems can lead to delays in supplies. As opposed to [67], Blockchain has become a potent tool for increasing the transparency and traceability of supply chains. Due to its decentralized structure, it guarantees that everyone in the supply chain has access to an identical visible and unchangeable ledger. This technology can be especially useful in determining a product's legitimacy and avoiding counterfeiting. As an example, Walmart and IBM collaborated to implement a blockchain-based system that tracks the route of pork in China, enabling customers to learn more about the product's origin and safety, [68].

Another example as stated by [67], is based on IoT were delivers real-time information on the location, state, and status of products in transit, Internet of Things (IoT) devices play a critical role in supply chain risk management. These gadgets can keep an eye on outside factors like temperatures, humidity, and more, making sure perishable commodities get to their destination in the best possible conditions. An international shipping business called Maersk uses IoT sensors to track the condition of containers and stop deterioration and harm while they are in transit.

**Theme 4:** Global strategies help to improve overall supply chain management using modern technologies such as Artificial Intelligence for Agile supply chain

In the literature analysis with links to research objectives, few strategies have been identified and among those technological investment is of high importance. AI technology offers organizations a game-changing chance to completely overhaul their global supply chain management strategy. A few of the advantages a blockchain delivers to supply chains include more transparency, fully automated processes, greater risk administration, and a decrease in counterfeit items. As per the above findings of [70], seen an agile supply chain includes modern technologies like AI, blockchain, and IoT to smooth and sustain supply chain management. Implementation of ASC has been tested and the results the way a direct relationship with global information-sharing system efficiency, [70].

Businesses may more accurately predict industry patterns and shift thanks to powered by artificial intelligence forecasting of demand. Figure 12 shows an example of agile path analysis. Businesses like Amazon use artificial intelligence systems to estimate demand through the

examination of previous information, outside influences (such as weather and social media patterns), and even macroeconomic variables. As per the findings of [69], up to 50% fewer forecasting errors have been made because of this technology, which has improved inventory control and streamlined scheduling of manufacturing.

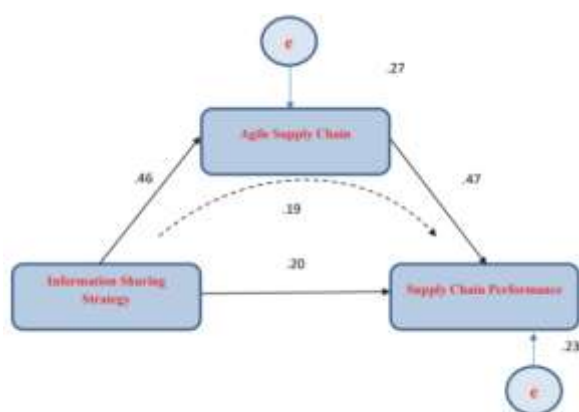


Fig. 12: Agile Path Analysis, [70]

An AI-driven demand forecasting system was introduced by Procter & Gamble (P&G), a major manufacturer of consumer goods, which decreased prediction mistakes by 30% and significantly decreased the expenses associated with unused stock. By considering variables like lead times, demand volatility, and manufacturing limitations AI helps to optimize inventory levels. AI algorithms suggest ideal reorder locations and amounts by continuously analysing real-time data, minimizing stockouts and surplus inventory, [71]. Walmart makes use of AI to streamline the management of its inventory across thousands of locations. To make sure that products are refilled at the appropriate time and in the right amounts, the system's algorithm analyses sales data, inventory levels, and outside factors. AI-driven systems for production enhance overall efficiency, decrease downtime, and forecast equipment maintenance requirements to optimize manufacturing operations. Artificial intelligence-powered predictive maintenance increases equipment lifespan and cuts unplanned downtime by up to 50%, [69]. In the supply chain, risks including geopolitical disruptions, natural disasters, and market fluctuations can be detected and mitigated with the aid of artificial intelligence (AI). AI delivers early warnings and enables proactive risk management by analysing a variety of data sources, such as news articles and social media.

**Theme 5:** Variations in rules and regulations of different nations has a negative impact on global supply chain management

The intricate web of international supply chain management links companies and customers from several countries. The effectiveness, adaptability, and general dynamics of these supply chains can be considerably impacted by the regulations and rules that are put in place by different nations. In meeting the research questions, all factors of the globalized supply chain such as technology, transportation, sales, customer management and investments are all controlled through rules and regulations of different nations.

## 4.2 Trade Policies and Tariffs

Trade policies and tariffs have a direct impact on the price and viability of obtaining items and supplies from various nations. As an example, the near trade bias among the US and China have provided outcomes in the situations of tariffs on a different section of products, upsetting established supply chains and allowing businesses to remodify where they manufacture their products, [73]. As a result of these duties, Apple moved some production from China to other Southeast Asian nations, which is a good illustration.

## 4.3 Environment

Supply chain practices may be impacted by nations' strict environmental rules. The REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) laws of the European Union forced businesses to examine the supply chains they use for potentially dangerous materials, enhancing openness and affecting supplier choice. Businesses that export to the EU from other regions were also affected by this rule in addition to those headquartered in the EU.

## 4.4 Human rights and Labor Laws

Conditions of employment and pay are impacted by various labour and equality legislation around the world, which also has an impact on manufacturing costs and supplier relationships. The Bangladesh Rana Plaza plant collapse in 2013 prompted more examination of working conditions in the textile sector. Global businesses were forced by this incident to review their sourcing plans and insist that the vendors they use adopt better labour laws, [72].

## 4.5 Protection of Intellectual Property

Laws governing the ownership of intellectual property are essential for safeguarding technological advancement and innovation. Greater intellectual property protection can have an impact on

outsourcing decisions since businesses may choose to manufacture in nations with greater IP protections. To stop the unauthorized manufacture of medications and medical items, supply chain decisions have been impacted by the pharmaceutical industry's worries about patent protection.

#### 4.6 Cyber security and Data Privacy

Privacy laws regarding data have an influence on supply chains that depend on technological advances. The General Data Protection Regulation (GDPR) of the European Union has global repercussions for businesses processing personally identifiable information of EU people. Information flows within the supply chain have changed because of enterprises adapting to their data management and sharing practices, [73].

#### 4.7 Health and Safety Requirements

As stated by [72], worldwide supply chains have been greatly impacted by health and safety laws relating to the pandemic. The COVID-19 outbreak exposed the flaws in just-in-time supply chains and forced businesses to broaden their sourcing and inventory management techniques to maintain sustainability. The lack of chips made from semiconductors, for example, caused problems for the automotive industry, highlighting the complex interdependencies within supply chains.

Global management of supply chains is substantially influenced by national legislation, which influences choices about sourcing, manufacturing, and distribution. Examples from actual life the way the way laws covering trade, the environment, labour, intellectual property, data privacy, and health and safety may disrupt the present supply networks and force businesses to change their business models. Companies must prioritize agility, transparency, and proactive risk management within their global supply chain operations if they want to successfully traverse this changing terrain.

As identified in the literature review of the previous literature geopolitical upheavals and their effects on the management of supply chains were the focus of the study. The further study in the thematic analysis clarified the weaknesses found in intricate global supply chains by looking at case studies of interruptions brought on by political turmoil, trade disputes, and emergencies. On the other hand, the study looked at the way businesses might now take advantage of untapped markets thanks to globalisation. Previous research, as seen in the literature review demonstrated the way these innovations can result in cost reductions and

efficiency gains. The thematic analysis in the findings the way that usage of globalisation increased customer satisfaction through a comparative comparison of businesses using AI for demand forecasting, inventory optimization, and routing optimization, [75]. Through focusing on this problem, the study not only the ways the way businesses can take advantage of international marketplaces, but it also adds to the body of previous research by highlighting the necessity of a balanced strategy that considers regional differences. With focusing on this issue, the study helps to close the knowledge gap on the strategic significance of geopolitics in supply chain management. The results emphasised the necessity for flexible methods that include contingency planning, nimble logistics, and diversification sourcing. Considering the third theme, it is seen that the findings of the articles have provided analysis on different technologies implemented. The research studied in literature review looked at the way businesses might now take advantage of untapped markets thanks to internationalization. The study highlighted the value of cultural understanding, responsiveness to local circumstances, and market adaptation through a thorough analysis of both successes and challenges faced by multinational firms, [76]. Similarly, the thematic analysis investigated the field of AI-driven optimization of supply chains techniques. By highlighting the way AI can completely transform current the supply chain's processes this analysis or findings contributes to the study. By filling in the gaps in literature, the study offers practical suggestions and practical suggestions to companies looking to effectively embrace globalisation, harness advances in technology for resilience, adopt AI-driven strategies, and navigate the complex web of global regulations.

The research evaluates the impact of several governmental and legislative frameworks towards the management of global supply chains through various sectors and markets. Study also identifies specific examples through exploring key trade policy changes, international legal, regulatory and compliance changes that impacts supply chain flows. The study also aims to explore appropriate methodologies that can address some of these factors that impact global supply chains.

Through the requirement of a thorough understanding of international legislation and development of more appropriate methods and approaches, the study aims to address some of these gaps within the literature, [29]. Finally, the study aims to further develop understanding of the area

and to support firms with the knowledge to approach highly competitive and global markets. Through the exploration of each factor and ways it impacts the management of global supply chains, the study has aimed to address and fulfil its key objectives. The study also added to the knowledge gap through use of real-life cases with strategic suggestions. This enables firms with practical understanding and knowledge to improve their global networks while achieving longer term sustainability in an ever evolving and changing market.

## 5 Conclusions and Future Research

This research and the conceptual framework examined the challenges and future potential aligned to the globalisation of supply chains, while developing understanding factors that influences global competitive firms. The study aimed to answer certain research outcomes as highlighted earlier as set of research objectives and have aimed to fulfil them through various interactions within the study. Many of the research themes highlighted certain challenges on global supply chain and logistics. These challenges involved addressing ethical and geopolitical inequalities along with regulatory and trade law requirements. The study further addressed the ways how extended supply chain networks are affected by global events such as that of covid19 pandemic. Additionally, concerns around sustainability and ethical requirements have gained popularity thus requiring stakeholders to review methods and approaches to more stable and responsible supply chains.

The study also demonstrates the possibility of utilising several resources and markets that promotes innovation and competitive advantage. The study's importance extends beyond academic and research contribution as it aims to expand on existing information and knowledge for policymakers, practitioners and researchers. Similarly, study also highlights wide range of possibilities through globalisation of distribution networks within logistics environments. Research studies [2] highlight the sharing of knowledge and best practices within global collaborative networks.

Firms should develop measures for reduction of risks while improving tolerance through awareness of challenges identified within this study. Through exploration of major areas explored within the study, transportation and logistical providers could adopt more agile operations within networked communities. Digital and technology integration in the form of data analytics has become an important

tool for improving effectiveness, traceability, and transparency. Through exploration of complex topics with studies enabling the possibilities of key factors and challenges impacting the globalisation of logistics and supply chains. The findings from the study also aimed to answer the initial research objectives, while emphasizing the importance of using comprehensive strategies to engage in global supply chains. The results and key findings from this study aim to act as a guide for improving decision-making and achieving sustainable growth for global firms.

### 5.1 Fulfilment of Research Objectives

**Linking to objective 1:** Studies have shown global logistics and supply chains are facing several challenges due to globalization, [10]. These are communication challenges, complex legal frameworks, cultural variations, longer lead times, and quality frameworks. Hence, this study aims to examine real-life instances of global firms that have been successful in achieving these challenges, and cases where supply chain disruptions occurred due to these challenges.

**Linking to objective 2:** As a result of globalization, firms can access novel markets and possibilities. These advantages have been investigated and assessed by the research, which are the ways the way businesses can access a wide range of consumers, tap into emerging economies, and broaden their market reach. The paper emphasizes the way contracting and using advantages of scale can result in cost reductions; and illustrates the way globalization can result in higher profitability through a comparison of various market penetration tactics.

**Linking to objective 3:** Studies have highlighted that political unpredictability, natural disasters, and other unforeseen events, risk management is essential in worldwide supply chains, [77], [78]. Hence, this study aims to examine several cases of interruptions and the effects of these risks on global supply chains. The study provides key insights to create robust and resilient supply chains through diversification of risks, effective inventory management practices, and flexibility towards sourcing and procurement methods.

**Linking to objective 4:** Aims at addressing certain challenges while improving operations within global supply chains where automation is a key requirement. The study aimed to investigate ways emerging digital technologies such as the internet of



Things (IoTs), blockchain, and data analytics have been adopted to improve accountability, visibility, and logistical efficiencies. The paper aimed to present cases where firms have successfully incorporated the adoption of some of these technologies that facilitated operations across networks while enhancing stakeholder interactions.

**Linking to Objective 5:** Studies highlight that firms require stable plans to benefit from the advances of globalization while reducing risks associated with them, [79]. The study is a combination of industry practitioners' and prospective international firms' dimensions in suggesting appropriate strategies. Stronger local alliances, agile supply chain models, and recruitment of key personnel with expertise across cultures enable us to address major interruptions. This study aims to support this goal by providing of conceptual toolkit for firms aiming to improve their supply chain networks. It has been noted that the globalization of logistics and supply chains has emerged as critical for firms aiming to achieve a competitive edge while expanding on global markets, [80]. Hence, the study aimed to fulfil its goals by highlighting the challenges, assessing key possibilities while evaluating risks, and addressing the key technological effects while providing options through careful analysis of case studies and industry insights. This further enabled to the presentation of a comprehensive perspective on the dynamics involved within the management of global supply chains while enabling firms to fulfil these more effectively.

## 5.2 Recommendations

**Recommendation 1:** To embrace technological and digital advancements to enhance visibility and efficiency. Studies proved that utilizing cutting-edge technology to improve visibility within supply chains, traceability, and overall effectiveness through technologies such as the Internet of Things (IoT), blockchain, and artificial intelligence (AI), [81]. Firms can receive real-time insights within their global supply chain operations through the integration of these technologies while enhancing thorough choice selections, shorter delays, and improvement in risk management methods. For example, one of the largest commercial container operations firm firms, Maersk collaborated with IBM to adopt blockchain-based platform automating paperwork processes required in cross-border exchanges. Through this intervention, cargo movement was more effective and quicker thus reducing administrative costs as processing time was shortened. This improved their supply chain

visibility and addressed any bottlenecks while eliminating the effects of any unplanned events occurring within the transportation network.

**Recommendation 2:** Optimising cultural and regulatory understanding for global compliance. To successfully navigate multiple worldwide marketplaces and maintain compliance with various trade laws and regulations, require regulatory knowledge and training. To prevent misunderstanding and legal entanglements, it is essential to grasp cultural differences and abide by local laws. As observed by [82], correct cultural sensitivity also makes it easier to communicate and negotiate with multinational colleagues, which improves teamwork and client connections. Global bank HSBC provides its consumers with a Cultural Navigator tool which offers knowledge about social mores and cultural variances across several nations. Through interacting with customers and business partners in culturally appropriate ways, organizations may forge stronger global connections.

**Recommendation 3:** Foster Industry 4.0 sustainable practices for resilient supply chains.

As per the views of [83], strategies for supply chains should incorporate sustainability by taking environmental, social, and governance (ESG) considerations into account. This cover employing fair labour practises through the manufacturing chain, cutting back on carbon emissions, and purchasing products ethically. Consumers who care about the natural world are drawn to environmentally friendly manufacturing practices, which also result in cost savings and improved resilience. Businesses with ethical and sustainable supply chains are better equipped to reduce the risks associated with legislative changes, reputational harm, and the effects of climate change. Consumer goods behemoth Unilever launched the Sustainable Living Plan with the goal of halving the company's environmental footprint while tripling its revenue. Unilever not only has a good effect on the environment by decreasing waste and procuring its materials environmentally friendly, but it also strengthens its supply chain.

**Recommendation 4:** Development of an Agile supply chain to navigate volatility and uncertainty. Develop flexible supply chain strategies that can easily respond to shifting marketplace circumstances, risks related to geopolitics, and other unknowns. Companies that are agile can react quickly to disturbances, whether they are caused by

changes in demand, international crises, or natural calamities. According to [84], businesses can lessen the effect of unplanned catastrophes on their supply chains by creating contingency plans and diversifying their suppliers and modes of delivery. The nimble supply chain of multinational apparel retailer Zara is well-known. The organization manufactures fewer of its products in larger numbers and frequently changes its assortments, enabling it to quickly adapt to shifting customer tastes and cut down on inventory holding expenses.

For firms, the globalization of management of supply chains and logistics offers both benefits and challenges. Companies may successfully negotiate the complexity of the global manufacturing ecosystem by embracing technological improvements, optimizing cultural and regulatory understanding, supporting environmental practices, and implementing agile initiatives. These suggestions explain the way organizations can overcome obstacles and prosper in a globalized commercial environment, along with the examples that are given.

### 5.3 Research Limitations and Future Scope

It is critical to recognize and take steps to overcome some constraints when conducting research on the globalization of the management of supply chains and logistics. These constraints could restrict the breadth and depth of the study. The accessibility and calibre of the data are a key restriction. It can be difficult to obtain accurate and up-to-the-minute data from different worldwide areas. It has taken a lot of time to conduct studies regarding supply chain management and logistics' globalisation. Data collection over long periods of time was somewhat difficult; especially considering the way quickly global markets and technologies are evolving.

Factors such as trade disputes, changes to tariffs and other political tensions impact global supply chains. These factors are iterative in nature and subject to sudden changes, and hence the area of global logistics and supply chain is continually evolving due to the recent rise and dependency of digital improvements. Some recent studies have focussed highly on this context where technological advancements have impacted globalisation, and hence future studies should focus more on key constraints while evaluating key difficulties that arise within supply chains.

Studies have shown the adoption of key technologies such as blockchain, the internet of Things and artificial intelligence within supply chains is crucial for its success, [65]. Future studies should explore further how these digital

advancements impact on supply chain visibility while improving procedures and enabling thorough traceability within networks. Further consideration should address the potential implications of excessive use of automation and robotics while reducing levels of risks. Studies should also address ways which firms can achieve efficiency through the creation and development of integrated collaborative networks. This could include partnership and alliance development, appropriate and timely information sharing across platforms and further enhancement of administrative approaches, while observing cultural and legal requirements for firms.

Studies suggests that rules and regulatory reforms, tariff changes and global trade agreements such as that of free trade arrangement (FTAs) impacts global transportation and logistics sectors. Hence, future research should aim to examine improved ways to achieve effective operational while addressing the need for trade policy changes impacting supply chain networks, [80]. Finally, it has been evident from multiple studies that supply chains are prone to impacts including geopolitical unpredictability, trade and bilateral policies, global market changes, and cyber threats. This requires further enhancement of risk management practices and methods to ensure safety and security of key information, financial and competition, while fulfilling compliance to global standards.

### Declaration of Generative AI and AI-assisted Technologies in the Writing Process

The authors wrote, reviewed and edited the content as needed and they have not utilised artificial intelligence (AI) tools. The authors take full responsibility for the content of the publication.

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