Use of Generative Artificial Intelligence to Create Sustainable Supply Chain Management: An Online Retail Perspective

Bharat Thakre

Amazon, Georgia Institute of Technology

Supply Chain and Operations Management Professional
Chicago, IL, 60605 USA

bharatthakre@yahoo.com

Received Mar 09, 2025, **Revised:** Mar 21, 2025, **Accepted:** Apr 10, 2025, **Published Online:** Apr 27, 2025
Reviewers: Anonymous Peer Review
Citation: Thakre, B. (2025). Use of Generative Artificial Intelligence to Create Sustainable Supply Chain Management: An Online Retail Perspective. *International Journal of Supply Chain Management, 14*(2), 55-65, https://doi.org/10.59160/ijscm.v14i2.6303

***Abstract*— Generative artificial intelligence (AI) refers to the type of AI that is capable of creating such new contents as music, images, texts, videos, and codes, using expansive AI models, known as foundation models, that will help to learn from and simulate large volumes of data. Modern e-commerce businesses have realized that application of such sophisticated technology in supply chain management (SCM) to create efficient and sustainable supply chains. This article explains how Generative AI can be useful in this respect especially in a world where SCM is undergoing significant transformations due to changing consumer behavior and the changing nature of trade and commerce in an internet driven world.**

***Keywords*—** *Artificial Intelligence, AI, Generative AI, Supply Chain, Supply Chain Management, SCM, e-commerce.*

1. Introduction

Generative AI signifies deep-learning models that are capable of generating superior quality texts images, and other content on the basis of the data that they are fed and trained on [1]. AI has undergone several exhilarating development cycles, but ChatGPT marks a turning point in its history. The scope of applications for this technology is ever-expanding, and businesses are just beginning to explore the possibilities [2]. SCM is a mammoth task to handle with a multiplicity of complexities involved. Given the incessant changes and disruptions that plague today's markets, this task is becoming increasingly complicated [3]. Evolution of supply chain, therefore, still needs comprehensive studies to explore and understand the application of modern technology to create a sustainable supply chain that can withstand intermittent disruptions. This article explores the application of AI in creating a sustainable supply chain for e-commerce companies. There are a large number of stellar studies that provide theoretical and descriptive insights into the possibilities of using generative AI for supporting operations and improving SCM but there is a paucity of large-scale investigative studies. This article explores the potential of this new technology and the challenges the come with it.

2. Literature Review

Supply chain per se is a huge topic and is being widely covered by research studies. Several aspects of this subject that are being studied. This article adds to the pool of literature that researches the application of this sophisticated technology, generative AI, in creating an efficient and sustainable supply chain, an area that still remains relatively underexplored.

2.2 Modern Supply Chain (SC)

Modern supply chain is growing in terms of complexity because of such factors as globalization, consistently enlarging number of stakeholders,

complex product designs, rising customer demands for customization, and the demand for quicker deliveries – thanks to the growth and expansion of e-commerce (eCom) and Quick Commerce (QC). All these factors contribute towards creating a network of interrelated entities that need advanced level of management for operating efficiently [4].

This is the era of new modes of production accompanying new modes of distribution. It demands state-of-the-art logistical set up with advances in the field of physical distribution of finished products and hence superior SCM. Logistics represents a complete system of space and time interdependencies [5], a high level of synchronization. It assumes prime importance in the success of modern trade and commerce – especially in the face of relentless developments triggered by changing consumer needs and the state of technology that supports it. Companies need to employ advanced technologies to be able to handle their supply chains that are undergoing tremendous transformation in this new era.

Over the past decade, SCs have evolved into intricate networks, spanning across vast and varied geographies, involving a wide assortment of stakeholders. Globalization of markets, rapid advancements in information and communication technological (ICT) together with growing consumer expectations, has led to the creation of a dynamic environment that presents major challenges for modern eCom businesses [4]. Inputs are sourced from all over the world, large number of workers employed at various factories, warehouses, distribution centers, etc. at various locations, clients placed all across the globe, and communication problems at every turn, are some of the major challenges faced by any modern-day supply chain.

2.3 Impact of Changing Consumer Behavior

Modern supply chains are extremely complex for such reasons as growing cross-border trade, growing involvement of a plethora of stakeholders in the SC, global resourcing, and the higher complexity of the outputs. But, by far, the most deciding factor in both managing supply chains and commercial operations, is consumer demand which remains ever changing and ever-evolving. Consumers being the lifeline of any business, their tastes and preferences and their specific requirements are central to any SCM policy. Modern consumer is used to a fast-paced life, is spoilt for choices and demands instant gratification. The companies have to ensure that while their products conform to consumer choices and are fit to withstand competition from rivals, they must also reach the end-users with the minimum amount of delay. Alacrity and accuracy are of paramount importance if a modern business is to thrive in the fiercely competitive e-commerce arena.

2.4 Rise of e-commerce and new complexities in SCM

Supply chain management in e-commerce refers to the process of managing the movement of goods and information from production to delivery [6]. Effective SCM makes the network transparent thereby making it possible to supervise the status of the different activities that take place throughout chain viz procurement, manufacturing, warehousing, and distribution. It also ensures all-embracing tracking and management of the processes involved from procurement finished goods to its shipping of to the final consumer.

SCM is a herculean task and extremely is complex to handle. Wildly and incessantly changing market dynamics intertwine with various disruptions, from technological to geopolitical, disorient the markets but along with making the SCs more complex. Market uncertainties can lead to unexpected changes than can have serious implications across the entire value network, from procurement to logistics, and from manufacturing to sales. e-commerce activities are being spread across vast territories. Cross border trades almost inevitably lead to expanding the number of partners and result in making SCM even more complicated [3].

E-commerce enhances the complexity of SCM considerably because of such factors as rapid demand fluctuations, wide array of product offerings, the requirement for faster delivery of products, and the need for more elaborate logistical set up capable of handling the plethora of small orders spread across numerous locations, while simultaneously taking care of customer expectations for speedy and accurate fulfillment [7].

2.5 Importance of Sustainable SCM

A supply chain needs to be designed in a manner so as to be able to respond timely and efficiently, without negatively affecting business operations in order to handle the risks arising from time to time. Such SCs must possess the agility to recover quickly, and the capacity to bounce back to their normal condition, and restart operations following any

disruption, while ensuring that the customer demands are met as usual [8].

A sustainable SCM (SSCM) understands the importance of cumulative efforts of the assortment of entities comprising the SC, including manufacturers, vendors, and courier companies, in creating and maintaining an efficient and reliable supply chain [9]. Every component of the chain is crucial and a missing link can actually break the entire chain thereby adversely impacting the ways in which or the time within which the products reach their customers. A sustainable eCom SCM, therefore concentrates on running a supply chain in the most economical and proficient manner. There exists a plethora of techniques and strategies that can help an eCom business, while managing its supply chain, achieve higher levels of efficacy, productivity and hence better profitability [6].

Sustainable supply chain practices provide a competitive advantage to businesses while contributing to their long-term success. It is possible for companies to enhance their performances while simultaneously addressing their socio-environmental concerns through integration of SSCM into their principal strategic framework [10]. Sustainable Supply Chain Management Practices (SSCMPS) generally have positive implications for and influence on environmental performance. SSCMPs are considered essential organizational philosophy that can help achieve broader organizational objectives including higher profits and larger market share [11]. Large businesses including Google and IBM are already using AI to their fullest in SCM. Even businesses from other industries that are not usually prominent for employing advanced AI software are now beginning to turn to Generative AI as the preferred solution for achieving broader organizational objectives of which profitability of operations and SC sustainability are important components.

.

3. Methodology

In today's era of globalization where supply chains have crossed the local boundaries and have become global in scope, there are new opportunities and threats that are constantly surfacing. The supply chains are evolving accordingly along with SCM process and a vast array of literature is coming into existence which is covering various aspects of this transition. The past decade has seen extensive research on SCM which gave rise to a wealth of scholarly literature, a part of which has been reviewed in this article. This article examines theories and data published by renowned agencies through reports, magazines, journals, books, and other publications, both national and international over the period 2015 to 2025 (up to the present), together with such other available resources as government data, reputable business periodicals, and other reliable sources

4. Facts and Figures

4.2 Growth of e-commerce in the last Decade

According to Statista, online sales have become increasingly significant in global retailing. e-commerce accounted for more than 19% of global retail sales in 2023. According to forecasts, by 2027, the online segment will contribute nearly a quarter of total retail sales worldwide [12]

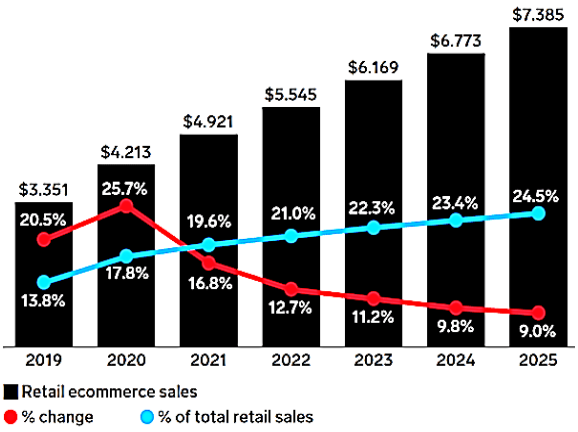

Figure 1: Global Retail eCom Growth ($ in trillion) [13]

Over the last one decade there has been significant growth in global e-commerce which is reflected in the sales skyrocketing to more than $4.2 trillion in 2020 from $572 billion in 2010 which signifies an exponential rise in in online shopping worldwide. Global eComm sales is anticipated to stand at $6.86 trillion in 2025, reflecting an 8.37% growth over 2024. The sales are expected to grow at a CAGR of 7.8% between 2025 to 2027 reaching $8 trillion by 2027. Growing at over two times the rate of growth of physical stores [14].

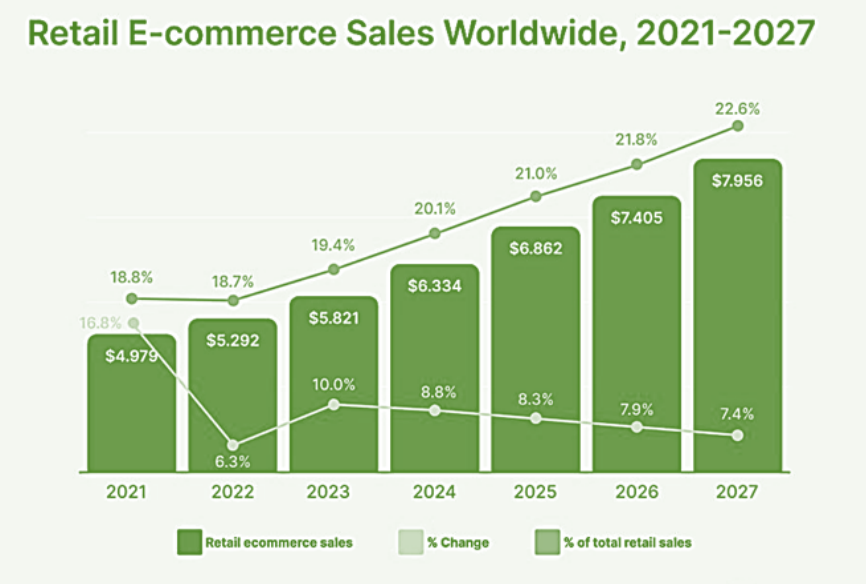

Figure 2: Share of eCommerge in Global Commerce [14]

It is evident from these numbers that e-commerce is fast turning into the most profitable choice for companies across the world.

e-commerce uptake in the U.S. lagged behind other countries for several years, before picking up speed. The growth, at present, is on a robust uphill trajectory, powered by convenience the eComm provides to its consumers and the key legacy mall brands turning into omnichannel retailers [15].

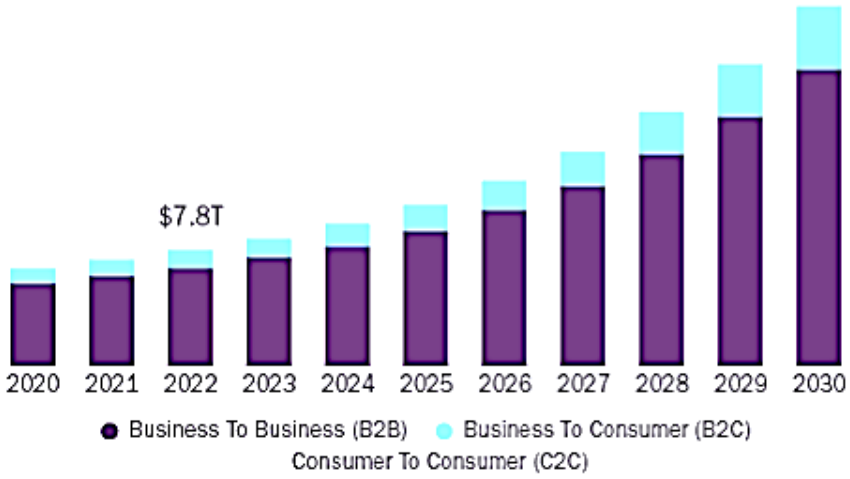

Figure 3: US eComm Market Size ($ in Trillion)

The e-commerce market in the U.S. is expected to grow at a CAGR of 16.4% during 2024-30, driven by rapid technological evolution and integration of modern technology into SCM that will streamline operations and enhance user experiences besides providing novel avenues for innovation [16]. Meticulous Research predicts the U.S. eComm market to grow at a CAGR of 16.9% to reach $21,169 billion by 2030 [17].

4.3 Emergence of Quick Commerce

By prioritizing speed and convenience, quick commerce is transmuting the eComm landscape. This sector of the retail market leverages sophisticated technologies to deliver goods within a remarkably short while from the time of placing the order. The timeframe is typically lower than an hour.

The Global Quick Commerce Market size is expected to be worth around USD 626.5 Billion by 2033, from USD 75.9 Billion in 2023, growing at a CAGR of 23.5% during the forecast period from

2024 to 2033 [18].

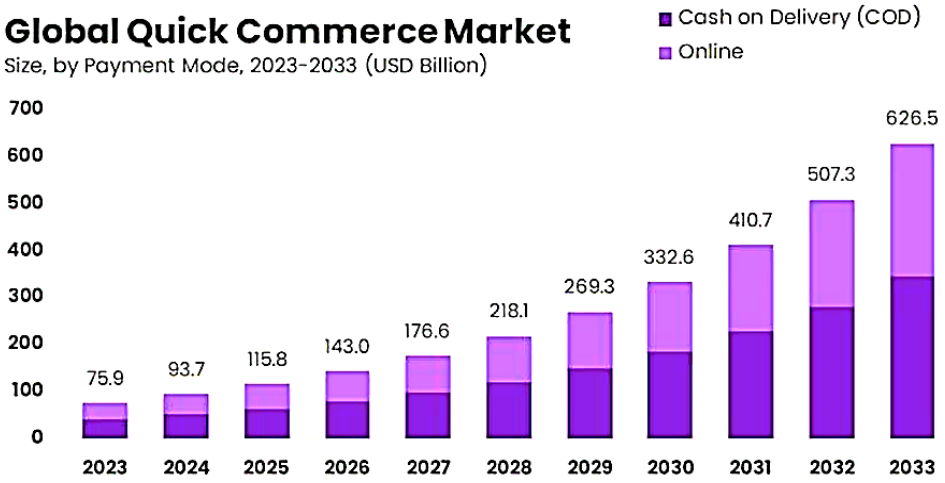

Figure 4: Global Quick Commerce Market [18]

The U.S. Quick Commerce market is estimated to cross $626 bn in terms of revenue in 2025 reflecting CAGR of 6.94% during 2025-2029, resulting in a projected market volume of $81.91bn by 2029 [19], driven by significantly higher penetration of the internet and smart mobile devices, greater use of social media, growth pf social commerce, and growth and development of the multiplicity of payment modes, notwithstanding the rise in the threat of growing threat to cybersecurity and of online frauds.

4.4 Expansion in the number of dark stores

This increasing popularity of online shopping and the expansion of grocery delivery services has led to the rise in the number of dark stores in the United States. The global dark store market size is estimated to be worth $ 31.61 bn in 2025 and is predicted to cross $ 588 billion by 2034, expanding at a CAGR of 38.40% during 2024-34. The dark store market size in North America stood at $8.22 billion in 2024 and is projected to grow at a CAGR of 38.57% during 2024-34 [20].

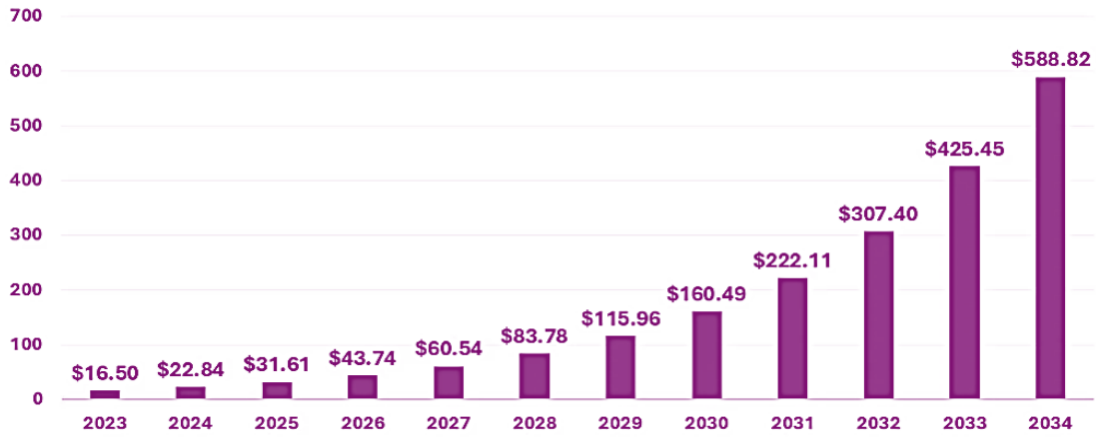

Figure 5: Dark Store Market Size & Forecast ($ bn) 2024-34 [20]

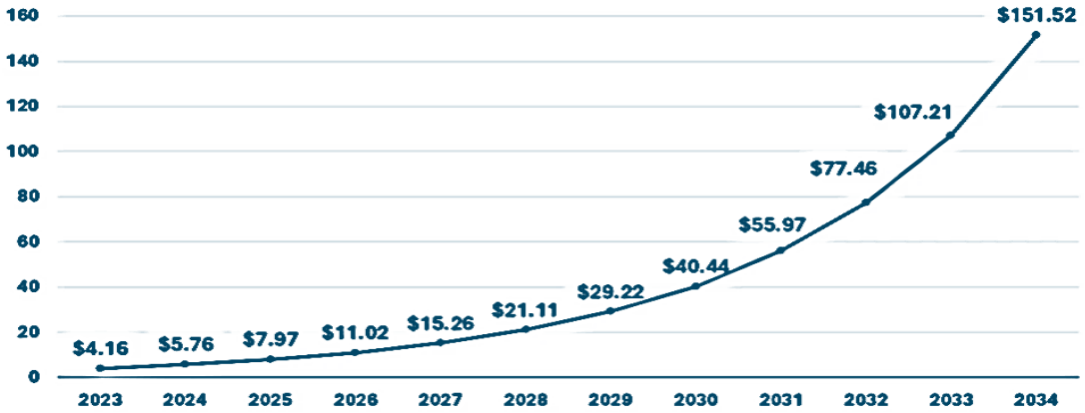

Figure 6: US Dark Store Market Size ($ bn) 2023-34 [20]

The dark store market in the U.S. is expected to grow at a CAGR of 33.9% from 2024 to 2030

5. Discussion

Since ages, the interweaving relationship between procurement, production, transportation and logistics has constantly influenced the way goods and services are moved and managed through the supply chain. With the evolution of logistics, SCM rose above and beyond its military origins, to find applications in various sectors and industries [21]. The emergence of digital technologies has changed and modernized business operations, transmuting conventional businesses and firms into dynamic e-business and e-commerce landscapes.

eCom has ushered in a fresh lease of transformation to the global retail industry while broadening its expanse. The obvious fall out of this is greater complexity of SC which has made SCM a more complicated and difficult job. One of the major reasons behind this advent and this transition is the penetration of advanced ICT and proliferation in the use of hand-held smart devices.

Due to globalization, the second half of the 20th century saw supply chains expanding beyond national borders. Manufacturers and marketers started sourcing labor and materials from all across the globe [21]. No component of a modern supply chain is independent of each other, irrespective of their number and location, which makes it an extremely complex mesh. For efficient handling such a complicated network, a business needs to possess end-to-end supply chain visibility. It should be able to decide the nature of complexity and agree on the probable benefits [22].

Other than globalization and a massive supplier base, SC complexities can result from several other factors. In a modern supply chain network, the comprising entities would typically exchange a huge volume of data and information among themselves. Due to the generation of such massive volume of data in their day-to-day functioning, there are high chances that different stakeholders interpret this data in a different manner as each has its own perspective which may be very different from the rest of the players. This is most likely to lead to inaccurate projections, conjectures and analysis. There is also the chance of data being lost as bulk of the useful data may not have been acquired or acquired in a manner that is less useful and therefore cannot be leveraged [22].

5.2 Problems of Quick Delivery

Internet and smartphones allow buyers to simply order anything online from the comfort of their homes and get it delivered to their doorstep without much time lag. There is hardly any need to travel long distances to visit preferred stores. The consumers can now get whatever they want, whenever they want, delivered at their doorstep. This ease of online shopping has led to the rise of Quick Commerce driven by modifications in consumers' buying behavior and has expanded both consumerism and consumer demand [23]. However, it poses significant difficulties for QC players since consumers hardly ever want to spend money for availing doorstep deliveries or premium for shorter delivery time. E-commerce players are left with the only option of drastically improving their SC efficiencies through the betterment of the logistics and the delivery services they offer to their customers.

Major issues with quick commerce SCM in the USA are the high costs of operations caused by the proliferation of small "dark stores", shortages of man-power impacting delivery speeds, intensifying competition leading to pricing pressure, rapid delivery needs of customers, problems of managing inventory in small-sized, localized stores, and the requirement for huge fleet of delivery vehicles and drivers to meet demands for fast deliveries [24].

Businesses need to strategically position their micro-fulfillment centers in urban areas for facilitating rapid delivery. All these significantly impacting profitability.

5.3 Generative AI (GAI) Can Provide a Solution

AI transforming the ways and means of e-commerce businesses across the world and changing how they manage their supply chains. Employing smart algorithms, automation, and data analysis, businesses can effectively implement AI for SCM optimization including demand forecasting, management of inventory and logistics, and customer service [25]. This article focuses on adoption of GAI to logistics management and the application of AI in sustainable supply chain management.

Digital technology continues to shape and alter the process of transaction and interaction between suppliers, manufacturers, and customers across the globe. Modern SCM has evolved from being simply an in-house approach that primarily focused on cost rationalization to a highly integrated system driven by data that leverages technology for optimizing operations across the complete SC network. It includes associating with external partners, incorporation of such elements as agile adaptation to changing market conditions, demand forecasting, and real-time visibility through the stages of logistics, transportation, physical distribution. This now needs to align with the era of digitalization and integration of AI with SCM to create a sustainable SC that is not only resilient but is also eco-friendly. The ability of generative AI to create novel and personalized solutions has the potential to addresses both operational disruptions and sustainability goals.

Predictive analytics, AI-powered chatbots, and digital assistants are now imperatives as e-commerce customer care components [26]. While offering real-time assistance these intelligent solutions provide prompt answers to consumer queries, and help in the process of making purchase decision, thus enhancing complete user experience. Emergence of voice commerce has become rampant among eCom businesses with advent of voice-activated virtual assistants like Alexa of Amazon.com, Inc., Google Assistant, Sony Xperia Hello, Apple Inc's Siri, and Microsoft Cortana. eCom platforms are now integrating voice-activated features which allows users to browse through the catalogued goods, place orders, and track shipments through the use of voice queries. Voice commerce is making life easier and simpler for modern online shoppers especially while doing it hands-free [16].

Integration of GAI into SCM is transforming conventional approach to procurement and sourcing. GAI offers an advanced approach, that swiftly scrutinizes massive volume of data from numerous potential suppliers, in contrast with manual analysis and decision-making methods, [27]. For creating an optimal supplier portfolio, the process considers several parameters, including product quality, operational efficiency, cost effectiveness, reliability, and sustainability.

Furthermore, GAI magnifies SC inclusivity and equality through active recommendation of policies and approaches for incorporation of enterprises that are owned by minorities, women, or veterans. AI leverages its text generation capabilities, to provide complete descriptions that detail strengths and weaknesses of individual suppliers. Moreover, it helps to formulate a range of negotiation tactics and contractual terms using historical data and expected behavior of the supplier [28]. GAI is proficient in swift and comprehensive management of enormous datasets that helps to redefine the back drop for sourcing and procurement activities. Amalgamation of complex criteria while promoting diversity, rationalizes the selection process of suppliers besides enhancing the supply chain's overall resilience and social responsibility [29].

21st century is seeing sustainability take the center stage when it comes to SCM and logistics management. Global warming is looming large and every firm is striving to cut don carbon emission thereby reducing their carbon footprint while optimizing their operations. To achieve all that it is necessary to adopt advanced technology to reshape logistics. AI and automation are the frontrunners. Generative AI offers several potential solutions that can handle the challenges that emerged in SSCM. While predictive analytics and autonomous vehicles have high potential to enhance the efficiency of supply chains, generative AIs such as Chatbots offer superior customer service. Both predictive analytics and GAI are forms of AI, the formers' focus is on forecasting future outcomes and trends by analyzing historical data while the latter creates new outputs such as texts, images and codes by utilizing learning pattern. Efficient SCM in a dynamic environment requires a subtle balance between strategic planning, technical innovation and robust collaborations. Generative AI takes a step ahead of predictive analytics but cannot replace it. AI assistance enhances agents' productivity – they are able to resolve, on an average, 14% more customer issues per hour which includes 34% betterment for workers who are novice and low-skilled. The impact on experienced and highly skilled workers, however, was minimal

[1].

GAI's predictive capacity has completely modified traditional methods by allowing enterprises to forecast demand, expedite procurement procedures and optimize inventory, with unprecedented precision. e-commerce logistics sector has almost completely adopted AI at various points of their SC, from arrangement of truck drivers to scheduling procurement and distribution of products. GAI's success and usability are attributed to various factors including higher computing power, innovative model architecture, the potential for 'pre-training' and enable proactive reactions to changing market conditions [29]. GAI uses dynamic decision-making skills to make real-time adaptation possible through pre-training using huge volumes of data.

An increasing number of businesses are turning to harnessing data and AI for gaining competitive edge which can put them in a better position to react to and preemptively plan for possible disruptions in a fast changing and immensely competitive environment. Surveys by McKinsey indicate SCM to be among the leading investment targets in several companies [30] with a growing number of corporates are investing in AI solution development in SCM.

5.4 Why Generative AI is the best technology to handle

Benefits of AI adoption are immense. The most successful companies are employing both core and advanced AI practices including Machine Learning (ML) which are underpinning their growth stories and offering earnings boosts. The origin of Generative AI can be traced back to early days of ML. SC dynamism together with such environmental factors as environmental heterogeneity and market disruptions, have a bearing on the effectiveness of application of digital technology. Being a subcategory of digital technologies, Generative AI, can learn, adapt, and produce creative outputs on the basis of patterns learned from data which makes it better placed to react to situations, compared to general digital technologies that operate based on predefined rules and algorithms. The goal is always keeping pace with the changes in customer preferences.

Rapid development in mobile technology and wider penetration of the internet has changed the modern perspective of consumer satisfaction, with eCom opening up a whole new world to the consumers characterized by instant gratification. Customers are now spoilt for choice and sometimes confused as to what exactly to choose. eCom companies can employ GAI to help customers deal with such problems, thus improving their own customer service and enhancing user experience. GAI can help customers search and locate the exact products that they desire to purchase. But the demand for instant gratification has created a lot of problem for AI companies.

Lower latency 5G network makes real-time interactions possible [31]. Hence such events as virtual bazaars and live broadcasting of new product launches have now become more realistic. 5G technology enables e-Commerce platforms to deliver excellent multimedia content, enhance user experiences so far mobile shopping is concerned, through integration of novel technologies. This also helps in adoption of Generative AI. It can, not only produce innovative solutions, but also provide vastly personalized experiences. Hence, JD.com, Google, and Amazon, and other leading e-commerce firms, are aggressively expanding the penetration of GAI usage – they are amplifying the intensity and augmenting the scale of usage of GAI through its integration into SCM and organizational practices.

5.5 Problems of Implementing Generative AI

Value of GAI cannot be maximized unless it is successfully embedded it into regular business operations of the organization (Sirmon et al., 2011). Where there exist differences in technological adoption and organizational readiness, in terms of specific supply chain applications – it means that there is inconsistent use of GAI in SCM. GAI holds a lot of promises but for them to materialize an organization needs to possess particular skills and understanding that do not occur universally. Hence it is necessary to delve deeper into the mechanisms by which generative AI usage influences sustainable supply chain performance (SSCP). Significant challenges surface while implementing GAI in SCM. Obstacles such as scalability issues, skill gaps, complexities of data integration and ethical considerations, need strategic routing and organizational preparedness. GAI has an extremely promising future so far as its application in SCM is concerned. It would be essential for sustainability.

Novel AI tools have significant potential to alter how the workers perform and learn, but their impacts on the job is still not fully understood. Skill shortage continues to haunt [32]. But probably the biggest concern is whether GAI will replace humans completely so far as consumer service, an important aspect of supply chains, is concerned. Also, we have limited understanding about whether access to GAI can enhance productivity, as significant heterogeneity exists in effects across

workers. Success of SSCP performance depends heavily on the scale of implementation, which again depends on the robustness of computing power applied for training, the multiplicity of model parameters, and dataset size [33]. Pre-training large language models (LLMs) require significant resource commitment – the costs involved are large and sometimes even prohibitive. There is also the problem of handling massive volume of data and requires a plethora of security checks and measures to ensure that sensitive data is not leaked. Data security involves added and substantial spend.

Organizations in the modern digital era, face several management issues, which span across both technological advancements and strategic decision-making processes. Rapid technological innovation has forced businesses to implement digital transformation which requires major alterations in organizational culture, processes, and strategies [34]. It also requires leveraging such emerging technologies as AI, ML, blockchain, and the Internet of Things (IoT) to attract innovation, improve operational efficiency and enhance customer engagement. However, integration of novel technologies into existing infrastructure is a challenging task for organizations, since it involves overcoming resistance to change while ensuring that the digital initiatives align with the business objectives [35]

6. Conclusion

This article explains the rationale of using GAI for achieving sustainable SCM and sets the floor for further investigation into the specific needs for the success of such implementation. While generative AI can offer effective solutions for addressing roadblocks in sustainable supply chain management (SSCM), not every organization is positioned to effectively master the ways and means of employing GAI and reap the potential benefits. GAI is an extremely useful and important technological asset that organizations have, but the goals they try to achieve utilizing that asset is more important. SSCM is every firm's target nowadays but for an e-commerce firm there are added obstacles that need to be handled for which GAI can become an effective tool. GAI holds significant promises for SSCMP for an enterprise of the future but its success hinges on the availability of skilled personnel for effective implementation.

GAI will make SCM more efficient but in the process some jobs will be lost while others will open up. This article substantiates that the adoption, implementation and integration of this sophisticated technology is unavoidable. Over time GAI will completely redefine SC models through transition to autonomous SCs that will have adaptive resilience to disruptions, and bring in greater decision-making transparency.

References

[1] E. Brynjolfsson, L. Danielle and L. R. Raymond, "Generative AI at Work. Technical Report.: NBR Working Paper," NATIONAL BUREAU OF ECONOMIC RESEARCH, Cambridge, MA, U.S.A., 2023.

[2] IBM, "What is generative AI?," 23 Apr 2023. [Online]. Available: https://research.ibm.com/blog/what-is-generative-AI. [Accessed 31 Jan 2025].

[3] T. Toivonen, "The future of supply chain management will be increasingly data-enabled and complex| Futurice," 20 Nov 2022. [Online]. Available: https://www.futurice.com/blog/future-supply-chain-management. [Accessed 01 Feb 2024].

[4] Armstrong, "How to Manage the Growing Complexity of a Dynamic Supply Chain," 17 Oct 2024. [Online]. Available: https://www.goarmstrong.com/resources/optimize-complex-supply-chains/. [Accessed 31 Jan 2025].

[5] SCMDOJO, "Evolution of Supply Chain Management and Logistics," 25 Mar 2024. [Online]. Available: https://www.scmdojo.com/history-and-evolution-of-supply-chain-and-logistics/#:~:text=The%20First:%20The%20Transportation%20Era,AI%20in%20SCM%20(2024%20onwards). [Accessed 31 Jan 2024].

[6] Choco Up, "E-commerce Supply Chain Management: A Complete Guide," 02 Oct 2024. [Online]. Available: https://choco-up.com/blog/e-commerce-supply-chain-management#:~:text=role%20in%20this.-,What%20is%20e%2Dcommerce%20supply%20chain%20management?,in%20managing%20your%20supply%20chain.. [Accessed 07 Feb 2025].

[7] A. Rebello, "Supply Chain Management in E-commerce: Components, Process, Advantages, Best Practices," 08 Oct 2024. [Online]. Available: https://cleartax.in/s/supply-chain-

management-in-e-commerce. [Accessed 08 Feb 2025].

[8] P. Kumawat, "Impact of Artificial Intelligence in Building Supply Chain Resiliency," Int. J Sup. Chain. Mgt, vol. 13, no. 6, pp. 10-20, 2024.

[9] S. Callarman, "E-commerce Supply Chain: How to Strategize Your Supply Chain for Growth | ShipBob," 28 Aug 2024. [Online]. Available: https://www.shipbob.com/blog/e-commerce-supply-chain/#:~:text=a%20trustworthy%20brand.-,What%20is%20e-commerce%20supply%20chain%20management?,profit%20margins%20and%20customer%20satisfaction.. [Accessed 07 Feb 2025].

[10] E. N. Shebeshe, "Sustainable supply chain management and organizational performance: the mediating role of competitive advantage in Ethiopian manufacturing industry," Future Business Journal, vol. 10, no. 47, 15 Mar 2024.

[11] E. Mugoni, J. Kanyepe and M. Tukuta, "Sustainable Supply Chain Management Practices (SSCMPS) and environmental performance: A systematic review," Sustainable Technology and Entrepreneurship, vol. 3, no. 1, pp. 1-11, 2024.

[12] D. Coppola, "E-commerce as share of total retail sales worldwide 2021-2027 | Statista," May 2024. [Online]. Available: https://www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/. [Accessed 05 Feb 2025].

[13] Velotrade, "Global Growth of e-commerce Markets," 02 Feb 2023. [Online]. Available: https://www.velotrade.com/blog/global-growth-of-e-commerce-markets/. [Accessed 02 Feb 2025].

[14] Sellers Commerce, "43 e-commerce Statistics In 2024 (Global and U.S. Data)," 10 Sep 2024. [Online]. Available: https://www.sellerscommerce.com/blog/e-commerce-statistics/#:~:text=Growing%20at%20more%20than%202x,profitable%20choice%20for%20companies%20worldwide.&text=Source:%20eMarketer.&text=The%20United%20States%20retail%20e-commerce,Source:%20United%20States%20Cen. [Accessed 15 Oct 2024].

[15] J.P. Morgan , "Global e-commerce trends report," JPMorgan Chase & Co., 2021.

[16] Grand View Research, "Market Analysis Report: E-commerce Market Size, Share & Trends Analysis Report By Product, By Model Type (Business-to-Business, Business-to-Consumer, Consumer-to-Consumer), By Region, And Segment Forecasts, 2024 - 203," Grand View Research, 2023.

[17] M. Research, "E-commerce Market by Business Model, Browsing Medium, Payment Mode (Card Payments, Digital Wallets, Bank Transfer), Operational Channel, Offering (Beauty & Fashion, Food & Beverage, Electronic, Household) - Global Forecast to 2030," Meticulous Research, 2023.

[18] Market.Us, "Market Research Report:," Market.Us, 2024.

[19] Statista Market Insights, "Quick Commerce - United States | Statista Market Forecast," Jul 2024. [Online]. Available: https://www.statista.com/outlook/emo/online-food-delivery/grocery-delivery/quick-commerce/united-states#:~:text=The%20Quick%20Commerce%20market%20in,US%2481.91bn%20by%202029.. [Accessed 07 Feb 2025].

[20] Precedence Research, "Dark Store Market Size, Share, and Trends 2024 to 2034," 15 Nov 2024. [Online]. Available: https://www.precedenceresearch.com/dark-store-market. [Accessed 09 Feb 2025].

[21] Genex Logistics, "History of Logistics and Supply Chain Management," 14 Sep 2023. [Online]. Available: https://www.genexlogistics.in/history-of-logistics-and-supply-chain-management/#:~:text=Throughout%20history%2C%20the%20intertwining%20relationship,find%20applications%20in%20various%20industries.. [Accessed 31 Jan 2023].

[22] GEP, "5 Ways to Effectively Deal With Supply Chain Complexity - GEP," 10 Apr 2023. [Online]. Available: https://www.gep.com/blog/strategy/supply-chain-complexity-5-ways-to-effectively-deal-with-it#:~:text=Modern%20supply%20chains%20are%20extremely,and%20potential%20benefits%20if%20any.. [Accessed 01 Feb 2025].

[23] Y. Jain, "The rise of e-commerce and its implications for logistics and supply chain

management | Financial Express," 15 Jun 2023. [Online]. Available: https://www.financialexpress.com/business/industry-the-rise-of-e-commerce-and-its-implications-for-logistics-and-supply-chain-management-3126149/. [Accessed 05 Feb 2025].

[24] Krishna, "Challenges Faced By Quick Commerce and How To Overcome Them? | Zopox," 16 Sep 2024. [Online]. Available: https://zopoxo.com/challenges-faced-by-quick-commerce-and-how-to-overcome-them/#:~:text=Cost%20Pressures.%20Do%20you%20know%20that%20one,players%20to%20offer%20free%20delivery%20or%20discounts.. [Accessed 07 Feb 2025].

[25] P. Kumawat, "Leveraging Artificial Intelligence in Supply Chain Execution in E-commerce," International Journal of Supply Chain Management, vol. 13, no. 5, 2024.

[26] Horizon, Grand View Research, "Chatbot Market Size, Share & Trends Analysis Report By Offering (Solution, Services), By Type, By Medium, By Business Function, By Application, By Vertical By Region, And Segment Forecasts, 2025 - 2030," Grand View Research, 2021.

[27] K. Lal, V. K. R. Ballamudi and U. R. Thaduri, "Exploiting the Potential of Artificial Intelligence in Decision Support Systems," ABC Journal of Advanced Research, vol. 7, no. 2, pp. 131-138, 2018.

[28] R. G. RicheyJr, S. Chowdhury, B. D. Sramek, M. Giannakis and Y. K. Dwivedi, "Artificial intelligence in logistics and supply chain management: A primer and roadmap for research.," Journal of Business Logistics, vol. 44, no. 4, pp. 532-549, 2023.

[29] A. Shekhar, D. P. Prabhat, V. Yandrapalli, D. Umar, F. Abdul and W. D. Wakjira, "Generative AI in Supply Chain Management," International Journal on Recent and Innovation Trends in Computing and Communication, vol. 11, no. 9, pp. 4179-4185, 2023.

[30] McKinsey & Co., "The state of AI in 2021," 08 Dec 2021. [Online]. Available: https://www.mckinsey.com/capabilities/quantumblack/our-insights/global-survey-the-state-of-ai-in-2021. [Accessed 08 Feb 2025].

[31] S. Bahri, "How 5G's Low Latency Drives New Applications and Use Cases | Telit Cinterion," 13 Nov 2023. [Online]. Available: https://www.telit.com/blog/5g-low-latency-applications-use-cases/. [Accessed 08 Feb 2025].

[32] L. Li, W. Zhu, L. Chen and Y. Liu, "Generative AI usage and sustainable supply chain performance: A practice-based view," Transportation Research Part E: Logistics and Transportation Review, Vols. 192, December 2024, 103761, 2024.

[33] I. Jacksona, D. Ivanov, A. Dolguic and J. Namdara, "Generative artificial intelligence in supply chain and operations management: a capability-based framework for analysis and implementation," International Journal of Production Research, vol. 62, no. 17, pp. 6120-6145, 2024.

[34] G. Westerman, D. Bonnet and A. McAfee, Leading digital: Turning technology into business transformation, Harvard Business Press: Harvard Business Press, 2014.

[35] D. Xudayberdiyeva, "NAVIGATING THE COMPLEXITIES OF E-BUSINESS AND E-COMMERCE MANAGEMENT: CHALLENGES AND STRATEGIES IN THE DIGITAL AGE," 2024: II International Multidisciplinary Conference "Prospects and Key Tendencies of Science in Contemporary World" , pp. 13-17, 2024.

[36] P. Sykes, "Last Mile Delivery Costs — Challenges and Solutions | Routific," 09 Jun 2023. [Online]. Available: https://www.routific.com/blog/last-mile-delivery-costs. [Accessed 10 Feb 2025].

[37] L. Li, W. Zhu, L. Chen and Y. Liu, "Generative AI usage and sustainable supply chain performance: A practice-based view," Transportation Research Part E: Logistics and Transportation Review, Vols. 192, 103761, 2024. .