

The Supply Chain Maze: The Struggles of Small and Medium Enterprises and Ways to Navigate the Challenges

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Abstract— Small and Medium Enterprises (SMEs) face significant challenges in managing supply chains due to fragmented communication, limited resources, and outdated technologies. Without a centralized platform, inefficiencies arise, leading to missed deadlines, inaccurate inventory levels, and supply-demand mismatches. This article explores these challenges and presents strategies to enhance SME resilience and profitability. By adopting modern SCM technologies such as cloud-based systems, real-time tracking, and predictive analytics, SMEs can improve operational efficiency and decision-making. Diversifying supplier relationships and leveraging trade finance solutions can help mitigate risks and ensure financial stability. Additionally, outsourcing logistics and customer service can reduce operational burdens while sustainability initiatives offer long-term cost savings and market competitiveness. Implementing these strategies will not only strengthen SME supply chains but also support policymakers in

formulating practical measures to enhance business resilience in an increasingly complex global economy.

Keywords— Supply Chain, Supply Chain Management, SCM, Small and Medium Enterprises, SMEs, SMBs

1. Introduction

E-commerce has made it possible for small and medium enterprises or businesses (SMEs / SMBs) to venture into global markets as it offers a low-cost and low-barrier entry point [1]. At the domestic level too, they are flourishing in various industries offering a variety of products and services. SMEs now constitute the backbone of the U.S. economy, contributing meaningfully towards its economic growth [2].

Micro-, small, and medium-size enterprises are the backbone of the US economy.

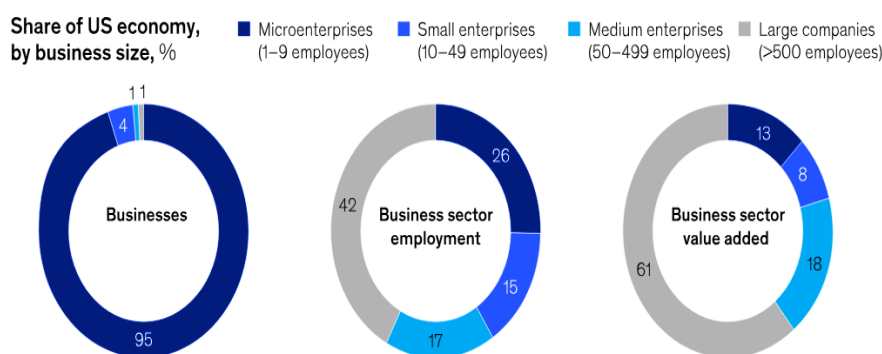


Figure 1: SMEs Strengthening the US Economy [2]

Being exposed to a larger arena their success and sustenance is largely dependent on operational and logistic efficiencies which ensure fuller and better utilization of resources at hand. Irrespective of size or stature, for all enterprises effective supply chain management has a significant bearing on their respective business successes [3]. The supply chain being a complex mesh of people and businesses that work in collaboration to manufacture a product and deliver it to the customers or render a service to the consumer [4], requires a lot of interaction and coordination between the participants. It is the objective of every business to serve its clientele well. This makes it necessary for enterprises to put in a lot of efforts towards effective control, supervision and management of their supply chains as it assumes strategic importance and hence is a priority [5]

2. Literature Review

Modern businesses are complex due to change in business dynamics and a greater application of digital technology. There is ample literary work available to provide a comprehensive look at the various challenges faced by SMEs in managing their supply chains.

2.2 SCM Challenges Faced by SMEs / SMBs

SMEs face supply chain challenges that are comparable to their larger counterparts but are likely to find it more difficult to navigate these challenges [6].

2.2.1 Changing Face of SCM – Digital World

In the modern world of trade and commerce, even a small business, such as a sole proprietor marketing products through social networks, can operate on a global scale. This is made possible by the proliferation and increasing accessibility of affordable digital tools, which enable businesses to source raw materials and components, transfer and deliver finished products, process payments, and virtualize nearly all key operations. [7].

Most of the SME players are of the opinion that technology is offering a common equal ground at the international level alongside transforming the logistics scenario which is why they are now more focussed on international market and less on

domestic, notwithstanding the shipping difficulties [8]. Emergence of eCommerce has redesigned customer expectations, by setting speed and efficiency standards that were witnessed never before. eCommerce allows customers the luxury and convenience of shopping from anywhere using internet and a smart device and get their purchase delivered to their doorsteps [9]. The key challenge is to orchestrate a seamless supply chain that will be able to keep up with the changing consumer demands while preserving cost-efficiencies. It becomes imperative for the SME players to commit substantially towards investing in robust logistics networks and in digital infrastructure such as predictive analytics, and advanced inventory management systems to limit mechanical failure as also to keep pace with the blazing speed needed to compete in the eCommerce race [10].

2.2.2 Limited Resources

Supply Chain (SC) and Supply Chain Management (SCM) have always had a significant impact on business effectiveness [11]. SMEs often struggle to navigate the complex network of suppliers, which must be coordinated to ensure seamless operations. Managing a supply chain involves overseeing a range of interdependent and intricate activities, including demand analysis, material sourcing, product manufacturing, and distribution to end consumers. SMEs frequently face challenges in areas such as inventory control, supplier management, logistics, and data analysis due to limitations in budget, workforce, and technology access. These constraints hinder their ability to optimize supply chain operations effectively.

[12].

Businesses employ ERP systems that have modules to handle key SCM functions, including planning, procurement, warehouse management, production, inventory management, and order management. Besides coordination, they enable businesses to streamline and automate SC activities to meet customer demand consistently while cutting down the cost of operation. But SMBs unlike large corporations are often unable to invest in sophisticated logistics platforms, and integrated Enterprise Resource Planning (ERP) systems due to limitation of financial resources and are left with no choice but to rely on using a blend of manual processes, disconnected software, and spreadsheets,

for SCM [3]. Budgetary constraints prove to be a huge drawback for these institutions. Inadequate resources, especially finances act as huge obstacles in small firms. Research indicate that these obstacles are almost twice in impact as the financial hurdles in big enterprises [13].

SMBs normally are plagued with limited availability of financial resources. They normally have a modest IT budget that constrains its ability to achieve the visibility needed for having a competitive supply chain and makes achieving this competitiveness a challenging task. Additionally, several of these organizations labor to attain end-to-end visibility as their resources are tied down by substantial investments in legacy systems used for SCM. Shortage of labor for carrying out logistical operations seamlessly and increasing energy costs further exacerbates challenges of SME supply chain management. In addition to this, shortages in raw material is a persistent issue affecting costs of production and its timelines. The problems are magnified by ongoing geopolitical tensions, such as the Russia-Ukraine conflict, US's foreign trade policies and unrest in the Middle East [14].

Small businesses habitually operate with a wide array of incongruent systems and applications that are far from integrated, which invariably results in inefficient operations and obstructions in the adoption of contemporary sophisticated technologies that can streamline operations and bring down supply chain expenses [15].

2.2.3 Poor Data Quality - Fragmented Data Sources

Small and medium enterprises often struggle with issues stemming from the substandard quality of data encumbering their SCM operations. Supply chain management for SMEs is developed using such data as, open orders, physical inventory balances or master data. Several SMEs face issues pertaining to the quality, accessibility, and time of the data they are using for their supply chain operations. Incomplete old, or substandard data result in formulating plans that fall short of the needs of the individual business and is most likely to be ineffective [15].

A recent study by Gartner draws attention to the fact that SMEs frequently struggle with fragmented communication, conflicting, unreliable and

unpredictable data making data management a tedious job, and overdue invoice processing while dealing with a multitude of suppliers [16]. The sanctity of data being questionable, supply chain management becomes inefficient.

2.2.4 Inefficient Communication and Coordination

Inter-dependencies can be managed, and uncertainties can be curtailed using effective coordination strategies [17]. SMEs or small and medium enterprises, however, habitually suffer from inefficiencies in communication and hence coordination. There is a significant shortcoming with respect to the existence of a formal organizational structure. Teams are closely knit and information is not always shared uniformly or explicitly among the members. Number of dedicated communication channels is also very limited leaving a lot of scope for misunderstandings that ultimately result in project delays, duplication of efforts and work, which in turn leads to decreased overall productivity. Poor interdepartmental information flow worsens this even further by locking up information which invariably hinders collaboration [18].

Coordination amongst various manufacturers, suppliers, and distributors often becomes a challenging task for the SMBs. Interactions become prone to error and can turn inefficient in the absence of a centralized platform for communication and data sharing. Such shortcomings in coordination can result in serious drawbacks such as low or misalignment between supply and demand, leading to further issues such as incorrect inventory levels and missed deliveries. Inconsistent sharing of information amongst manufacturers, suppliers, and retailers can also result in wrong alignment of delivery schedules with the inventory levels. The obvious outcomes are shortage of finished goods or raw materials inventory, delays in production, and even overstocking in warehouses leading to unjustified costs, which in turn adversely affect not only revenues and earnings but also customer loyalty [19].

2.2.5 Lack of Real-Time Tracking

In the retail sector operational strategies and the processes of decision-making have undergone significant transformation. Real-time data analytics

is an essential tool for this transformation. The U.S. retail giants have gained unparalleled knowledge and unique insights into consumer behavior, their preferences, and other market trends, leveraging real-time data analytics [20]. Enterprises can cash in on the real-time data to improve the accuracy of their demand forecasting, which in turn helps in optimizing inventory levels, and in reducing the risk of storing excess inventory or facing stock outs due to inadequate levels of necessary inventory. It has been possible for businesses to enhance the efficiency of their operations and supply chain applying cutting-edge inventory management practices which has also been instrumental in creating and maintaining a competitive edge in the markets they operate in [15]. From personalized marketing campaigns to dynamic pricing strategies, businesses are utilizing real-time analytics to optimize inventory management and enhance the overall customer experience. Advanced technologies such as RFID and IoT devices are integrated into analytics platforms, enabling seamless data flow and allowing retailers to respond quickly to evolving market conditions. [20].

Unfortunately, a significantly large number of SMBs have little to no access to real-time data on inventory, shipments, or deliveries. This specifically becomes a huge problem when goods are in transit, since the enterprise is unable to know the condition or position of their shipments until they reach. The adoption of real-time data analytics in the retail sector in the USA has not been without challenges. Small retailers have faced obstacles in adopting business analytics due to technological advancements and the associated costs [21]. SMEs, thus, frequently must writh for gaining access to and subsequently utilize real-time data, which hinders their capacity of making informed decisions and optimizing business operations, leading to further difficulties in inventory management, customer satisfaction, and other supply chain areas. SMEs rely a lot on such regular and orthodox tracking methods, as spreadsheets, manual communication with freight forwarders using phone calls and emails, or direct tracking of shipments

from the websites of the carriers. These methods are extremely time-consuming and hence is a slow and long-drawn process. Also, such methods do not encompass the critical analytical element of real-time data insights on their shipments. Real-time data serves as the basis for organizational decision-making which has significant bearing on the business. Hence the importance of data accuracy is paramount here. In accurate or erroneous information obtained would make the business process inaccurate, sluggish and redundant [22].

2.2.6 Limited Ability to Predict and Mitigate Risks - Increased Operational Costs

It is commonly seen that SMBs grapple with the problems of predicting and handling fluctuations in demand [23]. The challenges, as mentioned in the preceding paragraphs, that most SMEs face, arise from common conditions and are interconnected, including resource constraints, the absence or dearth of an unambiguous data strategy, patchy data systems, deficient and unsatisfactory IT infrastructure, inadequate data oversight, data silos and inadequate data literacy [24]. SMEs may often be short of comprehensive analytical insights essential for recognizing patterns that are consequential, within their shipments. Besides enhancing demand forecasting these insights have the capacity to help mitigate problems in warehousing and inventory management.

Businesses that implement Supply Chain Risk Management can gain numerous benefits, particularly through enhanced risk awareness and more effective mitigation strategies. Additional advantages include minimizing unexpected costs, reducing disruptions, and shortening recovery time. [35]. The absence of dependable data that can provide transportation visibility is a key factor that leads to inventory challenges and can potentially have a negative impact on cash flow and customer satisfaction [25].

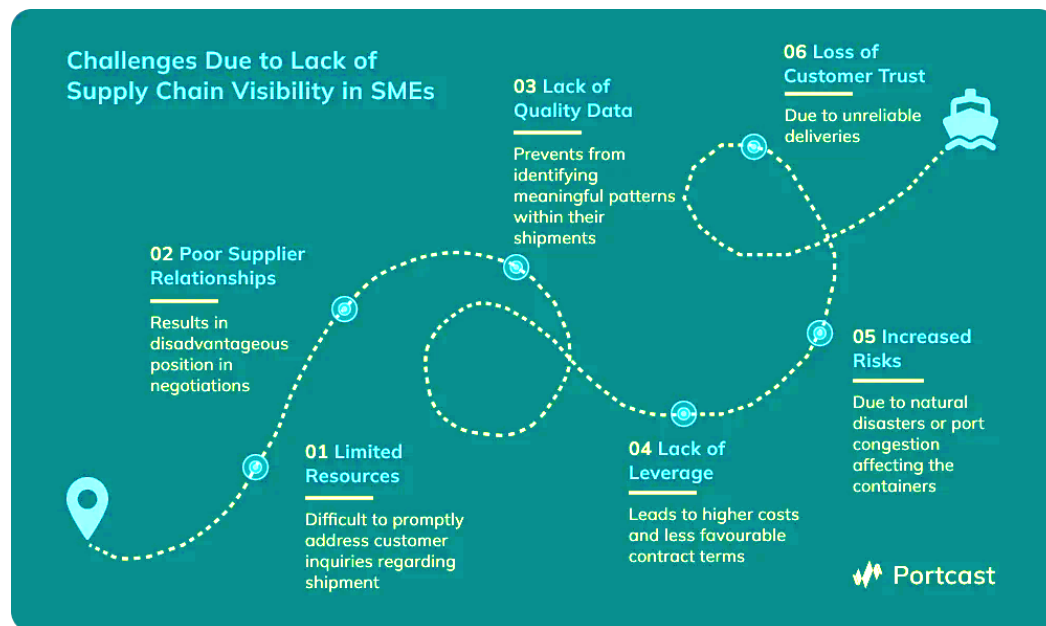


Figure 2: Outcome of Limited Ability to Predict Future [25]

It is a common feature among SMEs to have insufficient resources and inadequate expertise needed to set up a sturdy framework for risk management. This leaves them defenseless against potential threats and uncertainties [26]. In the modern world, supply chain disruptions are unavoidable, whether these are caused by transportation bottlenecks, supplier-related problems, geopolitical issues, or natural disasters. Most large corporations will have dedicated teams for management of risk and can access or avail of the resources necessary to alleviate these risks.

A key use of relevant real-time data is the prediction of demand and other significant elements that decide the fate of the business. Risk mitigation, thus being heavily dependent of data analysis, the constraints pertaining to quality data and the insufficiency of data analysis seriously limits the ability to predict risky future incidents such as market disruptions, equipment failure, changing demand patterns and customers' preferences. The obvious outcome is the inability to mitigate risk by taking timely measures.

Poor supply chain visibility is the cause of business inefficiencies that ultimately leads to increased operational costs for SMEs. Businesses that do not have accurate information, tend to understock or overstock inventory, which leads to higher warehousing costs and even loss of sales due to products being out of stock and hence not in supply. Research reveals that, to overcome the problems emanating from resource and information

constraints, some SMEs have started engaging skilled workers to handle the issues arising from the absence of an efficient and adequate information system that can manage real-time information which invariably leads to significant cost escalation. But these enterprises are still able to run a profitable business [22]. The margins, however, are getting squeezed

3. Discussion

The SME sector in the USA has a major role to play when it comes to nurturing the country's economic growth. It is not just instrumental in generating employment but also contributes meaningfully towards reducing poverty [27]. It, therefore, becomes imperative for the businesses that the supply chain risk (SCR) factors be identified accurately. This will help these businesses achieve a Supply Chain that is not only resilient but is also sustainable. A supply chain that is resilient and sustainable has the highest chances of withstanding the lashes of various uncertainties and still survive. The massive growth and adoption of modern information and communication technologies have taken businesses online and opened up a host of new opportunities for SMEs by giving access to the international business arena. But the brutalities of stiff competition have also magnified, and a plethora of new challenges have emerged.

The key problems that SMEs face while trying to meet the challenges thrown up by global

competition are resource constraints and paucity of appropriate technology that could bring about the relevant transformation [13]. According to Forbes, the U.S. is a global business hub, being home to 621 large corporations out of the 2,000 biggest companies of the world that are publicly traded. The nation also houses an exceptionally large number of very large companies, popularly referred to as superstars, that are highly productive [28].

Nevertheless, the productivity of the domestic small business is relatively average when compared with their international peers. In terms of purchasing-power-parity, SMEs in the US are almost comparable to the ones in Italy, Germany, Japan, and the United Kingdom. However, the micro, small and mid-sized companies in the U.S. are less than half as productive as the larger counterparts. This gap is much higher compared to the other developed countries of the world. A study of ten advanced economies by White et al. (2024) showed that typically small companies are 40% less productive compared to the large businesses — but small businesses in the US are 53% less productive compared to the big ones [2].

Disruptions, be it economic or be it technological, have more insensitive and rough impacts on SMBs than on large well-established businesses and brands, due to their inflexibility and dearth of resources. Any delays in transportation, shortages in essential raw material and any other unfavorable circumstances in the supply chain have the potential to cause severe damage to the business continuity by hitting and hurting their customer base [29]. The implications of disruptions are generally and sometimes even disastrous, especially for the small businesses. The COVID-19 pandemic is the best example of a recent disruption. Tons of small businesses simply died for want of resilience of supply chain. Some went out of business simply because the bricks and mortar format became practically defunct during the series of lock downs. Many had no means to mobilize raw materials or finished products that remained stored in warehouses. All these showed the need for application of automation technologies and the priorities of building sustainable and resilient supply chains.

While pandemics such as COVID-19 are among the incidents that can never be predicted, technological disruptions can be foreseen remotely. So can the changing trends in customer demand and the

dynamics of the competitive global business arena. For identification of signs of an impending change or transformation it is essential to rummage through relevant data that is generated during the course of regular business. Every business, irrespective of its size and stature, generates significant volume of data while transacting at various levels with vendors, suppliers, labor, customers, etc. Data, therefore, is a critical asset for every business from every sector, as it provides important insights into both consumer and supply behaviors that is necessary to identify underlying trends or changing business dynamics and is essential for creating and maintaining competitive advantage in this digital era.

SMEs have certain unique qualities such as close and strong connect with their communities which offers them significant and diverse opportunities to unfasten their data potential, build flexibility that is essential for responding swiftly to changes, enhance their productivity and accelerate their growth. Thanks to the growth of eCommerce, expectations continue to rise for seamless customer service. An increasing number of SMEs is coming under a lot of pressure to provide customer experiences that are comparable in standards provided by the larger players in the industry. A study by McKinsey reveals that businesses which prioritize customer experience have a better chance of achieving superior growth rates [30]. eCommerce has spoiled customers for choices and the switching over to a new seller is easy and totally inexpensive. The businesses also resort to acquiring customers aggressively to survive in a highly competitive and dynamic market. A strong and resilient supply chain is a key differentiator for the businesses. Putting such efficient strategies into action as technology adoption and supplier diversification, will help small businesses strive to build supply chains that are more robust and resilient.

4. Ways to Overcome Challenges

Product-based SMEs doing business in the US usually face economic challenges due to inflation, uncertainties, difficulties of supplier management, resource crunches, logistic management and an increasing need to transition to ecommerce for catering to new age customer' demand and hence for their own survival [31]. Nowadays unless every business has an online format, it is likely to lose customers to the ones who offer the convenience of online shopping and door-step delivery of products

purchased. Also, eCommerce widens the scope of business from national to international. Once gone global, SMEs are likely to face wider disruptions and added challenges of overseas shipment of products to Europe and beyond due to geo-political factors [14].

4.2 Focus on Risk Identification and Mitigation

For addressing risks, it is most important to identify the risks in an accurate and timely manner. A large number of small businesses lack the necessary resources and required technology to effectively detect, assess the potential expanse of the damage should the contingencies occur, supervise, and mitigate supply chain risks. The paucity of resources is not a rare occurrence. The key to drafting an effective contingency plan is to first know where the weaknesses lie. The companies need to first identify the potential vulnerabilities in their supply chains. For that it is essential to conduct a risk assessment, thoroughly.

4.3 Diversify Supply Chain & Strengthen Supplier Relationships

For mitigation of risks, SMEs must take steps to diversify their supply chains. Wherever feasible, SMEs should try to source inputs locally and also strive to build robust and long-standing relationships with suppliers. This helps to tide over disruptions as suppliers tend to prioritize customers during challenging periods. Disruptions of the past such as COVID-19 pandemic, Brexit-related trade disruptions, and ongoing incidents such as the Russia-Ukraine war have taught valuable lessons such as contingency planning, developing better technical prowess, enhancing and bettering demand forecasting, and putting in money in such imperative areas as cybersecurity. These lessons are more relevant now than ever before and will help SMEs navigate uncertainties related to their business and domain of operation. Dependence on a single source of supply always becomes dangerous in times of such crisis. It is prudent for small businesses to reduce their usual practice of single sourcing, sole sourcing or being reliant on a limited supplier base. Diversification of supplier selection base at both domestic and international levels, has a significant bearing on business continuity of SMEs when faced with supply chain disruptions.

Small businesses also need to focus on creating and maintaining better relations with their suppliers so as to ensure a resilient partnership that will stand the test of time and will help to tide over any disruptions, as and when they happen. Managing supplier relationships can be a difficult task with significant potential for conflicts on such issues as timely invoicing and payments, the quality of shipments, postponement in shipments for whatever reasons, meeting delivery deadlines, etc. Compared to their larger counterparts, small businesses generally have very little or no leverage over their suppliers. That limits the ability of these SMEs to effectively negotiate a profitable term of collaboration. The suppliers are not without complaints. They expect to get paid as soon as possible and have several complaints pertaining to the timeliness of payments. Small businesses generally tie up with small suppliers. Their relations are built on mutual trust and reliance. Many times the supplier will not have a proper tracking system in place for keeping a track of their receivables, which further complicates the situation and can strain relations as payment issues have the potential to turn out to be a point of friction for the buyer and the suppliers.

It always pays to have strong allies. Small businesses can build strong relations among themselves and collaborate with each other to seek out and identify alternative suppliers and transportation partners to derisk their supply chains. Whilst this reduces the perils of dependence on a single source of supply or transportation, it also helps to negotiate better rates leading to more efficient management of their supply chains.

4.4 Invest in Technology

Managers of SMEs, because of their small stature and scale of operations, suffer from the paucity of resources. They also face several other constraints such as flat organizational structure that causes lack of accountability leads to power struggle and confusion among employees; dearth of technical expertise, scarcity of innovative ideas or lack of originality; loss of knowledge, lack of modernization of supply chain, etc. To overcome these challenges, it is essential that the SMEs strive for technological upgradation and invest in automation, which will ultimately help the SMEs modernize their SC systems. It is possible for modern businesses to avoid astronomical upfront costs associated with legacy systems which are as it

is bulky and mature and are close to obsolesce, through the adoption and application of cloud-based supply chain solutions. This will also help the SMEs get better access to systems that are both scalable and flexible.

Inefficient inventory management is the key cause of inventory shortages and supply disruptions, that will invariably lead to delay in fulfilment of customer orders, which ultimately impacts the reputation of the business negatively. This challenge can be addressed by SMEs by leveraging cloud technology. SMEs can employ SCM software that are based on cloud technology with real-time data pertaining to inventory management and other aspects of a supply chain to generate operational visibility. Enhanced supply chain visibility empowers businesses in the sense that they help enterprises make informed decisions through the provision of valuable and comprehensive insights into inventory levels facilitated by greater accuracy of demand forecasts, and superior supplier performance. Supply chain management software that are specifically developed for SMEs can enhance the supply chain visibility by making it possible for each side to know the exact location of the product. This also makes it possible to get an approximate estimation of the date of delivery as also track the payment status. Both the SME and its suppliers will be able to better forecast lead times thus improving the order accuracy.

Liberalization of the world economy and increasing globalization have created a level playing field for all businesses across the globe that compete at the international business arena. Facing global competition successfully is not an easy job. SMEs must strive to break free of their isolation in terms of the value chain. Efficient supply chain management, therefore, can help SMEs overcome the dynamic challenges faced in both domestic and global markets, thus serving as an important tool for the small businesses [17]. There are several tech companies of all sizes that offer an opportunity for SMEs to handle the challenges they meet, on a budget [32].

SMEs can employ or implement inventory management solutions that leverage contemporary inventory management technologies. These can also provide demand forecasting tools that have better precision in anticipating customer demand and build the necessary stock of goods to serve the customers

well. This also helps to reduce the risk of stockouts and avoid wasting resources. Deploying logistics technology can provide a lot of benefits. From tracking inventory to demand forecasting and automating ordering, technology can help to rationalize cost by bringing down human intervention. Collaboration with third party logistics providers helps in better tracking information and offer better analysis of circumstances and trends that helps to identify possible issues in transportation that can be helpful for small businesses in mapping their contingency plans. Investing in technology solutions also provides small businesses the benefits of monitoring suppliers which helps to identify any potential disruptions well in advance. Automation, chatbots, and CRM systems, help to modernize customer service operations and make them more efficient to operate. However, SMEs must keep in mind that over automation can be harmful. They must be cautious in applying technology so as not to alienate customers through overly impersonal interactions as many customers prefer human interactions rather than speaking to a robot to find a suitable solution to their product or service-related problems. Personal touch can do better magic.

4.5 Become Data-driven

All transactions, especially the online ones, generate a huge volume of data related to the entire supply chain. This data can be mined and analyzed effectively to generate significant and valuable insights that can help to solve several of the SCM challenges. It also helps to formulate business strategies and find ways to optimize business operations. In order to transform into data-driven enterprises, SMEs must have a proactive and forward-thinking leadership that is ready to seize any and every opportunity to boost their business and operations.

SMEs also need to prioritize data readiness. They need to identify the relevant data sources and bring them together in a manner that is most likely to help propel stakeholder trust, besides enhancing business productivity, and building sustainability and resilience. Prioritizing valuable datasets will also ensure that IT infrastructure is robust and the investment in technology is fruitful. This will also help the SMEs unlock the potential hidden in their data and in augmenting their competitiveness [24].

4.6 Outsource to Rationalize Costs

Outsourcing can be a feasible option for MSMEs looking to optimize their operations and supply chain management. This is particularly helpful for handling logistical challenges associated with last-mile deliveries where timeliness, speed and accuracy are extremely important for not only increasing customer base but for also retaining existing customers. Partnering with third-party logistics providers allows businesses to access and effectively exploit modern technology and expertise without having to incur exorbitantly high capital expenditures. This approach usually helps SMEs to concentrate on and further develop their core competencies while saying goodbye to the complexities associated with supply chain management which can now be taken care of by specialists [33]. This will also help to improve customer experience. Superlative user experience can many times become the differentiating factor when it comes to success in eCommerce.

It is also possible to outsource customer service communications. There are third-party service providers who can help SMEs deliver superior quality, customer experiences using human agents and not machines. Besides ensuring service quality this measure helps SMEs minimize costs by reducing the need to invest in a larger human capital base. They can rationalize quantity and save on labor cost without having to compromise on quality. This helps to release part of the financial capital that can be productively used in automation and optimization of supply chains. Outsourcing communications pertaining to customer service, thus empowers SMEs to balance technology with personalization which in turn is crucial for building long-term customer loyalty. This, ensures recurrent revenue and the spread of good business reputation helps to add new customers, thus expanding sales volume and the revenue base.

4.7 Utilize Trade Financing

Due to the growth in online commerce and increased globalizations SMEs are exposed to global supply chain disruptions. COVID-19 pandemic was an eye-opener. Also, geopolitical tensions and natural disasters have revealed vulnerabilities in global SCs. The US SMEs often lack the financial strength to survive such disruptions. Trade finance can act as a lifeline by providing flexible funding options that

will enable them to pass through such uncertainties while conserving a robust supply chain [23]. By providing easier access to working capital trade finance eases financial constraints thus facilitating dynamic inventory management. This makes it possible for businesses to optimize inventory levels, successfully fulfil customer demand, while avoiding additional inventory costs.

Trade financing helps to meet the costs associated with technology integration. It is essential to integrate such sophisticated advanced technologies as IoT and data analytics into the SC processes to build, enhance and maintain competitiveness. But the initial costs involved in setting up the entire framework for application and integration of technology into the company's operations can often become daunting for SMEs. Trade finance offers the best solution to get past that initial barrier to invest in technology without having to compromise on cash flows and working capital (WC) thus fostering efficiency and innovation. The fluctuations in cash turn out to be challenging for SMEs since it leads to operational disruptions. Trade finance addresses cash flow volatility by extending WC modified and custom-built solutions that suit the specific needs of businesses. Cash flow can thus be stabilized to provide the financial stability necessary for daily routine operations.

Trade financing helps in building and maintaining strong relationships with suppliers. This is crucial for effective SCM as it helps to avoid late payments – a factor that has the potential to strain business relations. Through innovative solutions such as early payment programs that allow making payments to the suppliers ahead of schedule, trade finance can help SMEs improve cash flow for the involved parties and foster stronger collaborations.

4.8 Encompass Sustainability Initiatives

In today's world as the threats of global warming and climate change are becoming sizable, there is an increasing focus on sustainability for organizations to remain competitive and be in business. Small businesses, naturally, have come under increased pressure to adopt business practices that are eco-friendly. As per McKinsey & Company, sustainability has the power to reduce costs and can make meaningful contributions to a company's financial health by boosting operating profits by as much as 60% [34]. Trade finance can have a crucial

role in providing the essential support to green initiatives by catering for the funding requirements essential for securing sustainable raw material sourcing, implementation of energy-efficient processes, and for adopting eco-friendly packaging without putting stress on the immediate cash flows.

5. Conclusion

This study reinforces the previous studies on the challenges and issues pertaining to resource crunch and dearth of real-time data that are common challenges of modern SMEs due to the changing nature of the business arena and consumer demand. Consumers now demand speed and accuracy to come with the convenience of shopping from anywhere around the world. This has made SCs more vulnerable to external shocks and demand stronger strategies to build SC resilience along with incorporating the elements of sustainability in their SCM strategy.

The fluctuating nature of consumer demand because of uncertainties at home and abroad have made inventory management is a critical challenge that SMEs negotiate in managing their supply chain operations. This study finds the dearth of resources and limited access to modern SC technologies to be the key factors hampering effective SCM by SMEs. The study generates insights that can guide SME managers to better recognize the risk factors that can help achieve durable sustainability along with operational resilience thus enhancing the ability of the policymakers to formulate mitigation strategies that are both practical and efficient.

To overcome the plethora of SC challenges, SMEs need to modernize their SC systems and invest in technology. Adopting cloud-based SC solutions help businesses avoid high initial costs of engaging with legacy systems while gaining access to systems that are not just flexible but also scalable. SMEs also need to explore outsourcing possibilities in SCM especially the logistics and customer communications part. Partnering with a third-party logistics provider, allows businesses to access sophisticated technology and expertise for effective and efficient SCM without much capital commitment. SMEs can leave the complexities of SCM to experts to focus on their core competencies.

Such volatile elements as customer expectations, consumer demand, levels of competition because of

e-commerce expansion and increased globalization, and complex regulatory compliances create a lot of hurdles in the ways of maintaining optimal inventory levels by SME. By being data-driven organizations, SMEs can unlock insights which help to stay ahead of the curve and gain competitive advantage in a dynamic global business landscape beleaguered by volatility and uncertainty. But SMEs face unique challenges to become data ready. Technical and financial resource constraints, limited data-centric expertise and a complex mesh of data regulations severely restrict their abilities to undertake any effective data-driven decisions.

While the supply chain landscape for U.S. SMEs presents significant challenges, innovative solutions such as trade finance offer viable strategies for overcoming these hurdles. By leveraging trade finance, small businesses can strengthen resilience, foster innovation, and build strategic partnerships to stay competitive. Addressing immediate supply chain issues through financial support enables SMEs to navigate uncertainties and position themselves for long-term success.

Small businesses play a crucial role in driving economic growth, making their ability to manage supply chain disruptions vital for both the economy and society. This article underscores the importance of technology and business consulting firms in providing subsidized support to SMEs and encourages further discussion and research on sustainable supply chain solutions.

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