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Collaborative supply chain network: Confusion or way ahead

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Abstract

In today's interconnected business environment, effective supply chain management is crucial for success. This article explores collaborative supply chain networks, which emphasize cooperation among stakeholders, including suppliers, manufacturers, and customers. Unlike traditional linear models, these networks enhance efficiency, responsiveness, and competitiveness by fostering strategic partnerships and sharing resources. The shift from conventional models to collaborative networks involves breaking down organizational boundaries and promoting real-time information sharing and transparency.

The evolution towards collaborative networks has been driven by the complexities of global markets, technological advancements, and increasing customer demands for faster, more personalized services. These networks provide real-time visibility into inventory, production, and logistics, enabling quicker decision-making and better risk management. While they offer benefits such as improved operational efficiency and cost savings, challenges like building trust, aligning goals, and overcoming cultural differences persist.

Strategies for successful collaboration include setting clear objectives, investing in digital technologies, and nurturing a collaborative culture. Looking ahead, the integration of technologies like AI, blockchain, and the Internet of Things, alongside a focus on sustainability and customer-centric approaches, is expected to further revolutionize collaborative supply chain networks. These advancements are essential for organizations aiming to navigate the complexities of modern business and achieve long-term resilience and competitiveness.

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Introduction

In today's increasingly interconnected and globalized business landscape, the management of supply chains has become a critical determinant of success for organizations. A collaborative supply chain network, which emphasizes cooperation and partnership among multiple entities within the supply chain, has emerged as a promising approach to enhance efficiency, responsiveness, and competitiveness. This article delves into the concept of collaborative supply chain networks, exploring whether they represent a source of confusion or a path forward for modern supply chain management ^[10].

The traditional linear model of supply chain management, characterized by sequential and siloed processes, is giving way to a more dynamic and interconnected approach based on collaboration. A collaborative supply chain network involves various stakeholders, including suppliers, manufacturers, distributors, retailers, and customers, working together seamlessly to share information, resources, and responsibilities. This collaborative model aims to break down organizational boundaries, foster trust and transparency, and create value for all participants along the supply chain ^[15].

At the heart of collaborative supply chain networks lies the recognition that no single entity can optimize the entire supply chain in isolation. By forging strategic partnerships and leveraging each other's strengths, organizations can achieve greater flexibility, agility, and cost efficiency in responding to market demands and disruptions. Collaboration enables real-time visibility into inventory levels, production schedules, transportation routes, and customer preferences, enabling faster decision-making and better risk management^[2].

The shift towards collaborative supply chain networks is driven by several factors, including the increasing complexity of global supply chains, growing customer expectations for faster deliveries and personalized experiences, and the rise of digital technologies that enable real-time communication and data sharing. By breaking down traditional barriers and fostering a culture of collaboration, organizations can harness the collective expertise and resources of all supply chain partners to drive innovation and create value for customers^[11].

In the sections that follow, we will delve deeper into the historical context of collaborative supply chain networks, examining the challenges and benefits of collaboration, exploring strategies for success, envisioning the future outlook, and offering concluding thoughts on the transformative potential of collaborative supply chain networks. Join us on this journey to unravel the complexities and opportunities presented by collaborative supply chain networks in today's dynamic business environment.

Historical Context

The evolution of supply chain management towards collaborative networks has been a gradual but significant transformation shaped by changing market dynamics, technological advancements, and shifting consumer demands. Traditional supply chain models, characterized by linear and hierarchical structures, often struggled to adapt to the increasingly volatile and unpredictable business environment. As a result, organizations began to explore new approaches that prioritize collaboration, agility, and flexibility^[5].

The concept of collaborative supply chain networks can be traced back to the late 20th century when companies started to recognize the limitations of traditional supply chain practices. The emergence of global trade, just-in-time manufacturing, and lean principles necessitated a more integrated and holistic approach to supply chain management.

Organizations realized that to remain competitive and responsive to market changes, they needed to forge closer relationships with suppliers, manufacturers, and distributors^[20].

In the 1990s, the term "supply chain collaboration" gained prominence as companies sought to streamline processes, reduce costs, and improve service levels through closer partnerships with their supply chain partners. Collaborative initiatives such as vendor-managed inventory, collaborative planning, forecasting, and replenishment (CPFR), and shared distribution centers became popular strategies to enhance coordination and communication along the supply chain^[19]. Early 2000s witnessed a proliferation of collaborative technologies and platforms designed to facilitate information sharing, real-time visibility, and collaborative decision-making among supply chain partners. Cloud-based solutions,

digital supply chain networks, and data analytics tools enabled organizations to break down information silos, optimize inventory levels, and synchronize production and distribution activities more effectively^[6].

The global financial crisis of 2008 served as a wake-up call for many organizations, highlighting the vulnerabilities of fragmented and disconnected supply chains. Companies that had invested in building collaborative relationships with their partners proved to be more resilient and agile in weathering the economic downturn. This crisis reinforced the importance of collaboration as a strategic imperative for risk mitigation and business continuity.

Fast forward to the present day, and collaborative supply chain networks have become essential for navigating an increasingly complex and interconnected business landscape. The COVID-19 pandemic further underscored the critical role of collaboration in managing supply chain disruptions, emphasizing the need for agility, visibility, and redundancy in supply chain operations^[8].

As we look to the future, the trend towards collaborative supply chain networks is expected to continue gaining momentum. Advancements in technologies such as blockchain, artificial intelligence, and the Internet of Things hold the potential to further enhance collaboration, streamline processes, and drive innovation in supply chain management. By embracing a collaborative mindset and leveraging the power of digital tools, organizations can position themselves for success in an ever-evolving and competitive marketplace^[7].

In the subsequent sections, we will delve deeper into the challenges and benefits of collaborative supply chain networks, explore strategies for successful collaboration, and envision the future outlook for this transformative approach to supply chain management. Join us as we unravel the complexities and opportunities presented by collaborative supply chain networks in shaping the future of supply chain management.

Challenges of Collaboration

While collaborative supply chain networks offer numerous benefits, they are not without their share of challenges and complexities. Successfully implementing and sustaining collaboration across multiple entities within the supply chain requires overcoming various barriers and obstacles that can hinder the effectiveness of collaborative initiatives.

One of the primary challenges of collaboration in supply chain networks is the issue of trust. Establishing trust among supply chain partners is essential for sharing sensitive information, aligning goals, and making joint decisions. Trust is built over time through consistent communication, reliability, and transparency. However, cultural differences, conflicting interests, and past experiences of betrayal can erode trust and impede collaboration efforts^[18].

Another significant challenge is information sharing. Effective collaboration relies on timely and accurate exchange of data and insights among supply chain partners. However, disparate systems, incompatible technologies, data security concerns, and resistance to sharing proprietary information can hinder seamless information flow. Overcoming these barriers requires investing in integrated IT systems, data standardization, and cybersecurity measures to ensure secure sharing of information^[3].

Communication breakdowns represent a common challenge in collaborative supply chain networks. Misunderstandings,

misinterpretations, and lack of clear communication channels can lead to delays, errors, and inefficiencies in collaborative processes. Language barriers, time zone differences, and varying communication styles among global partners further complicate effective communication. Building strong communication protocols, fostering open dialogue, and leveraging collaboration tools can help mitigate communication challenges in supply chain networks^[13].

Closely related to communication breakdowns is the challenge of developing alignment among supply chain partners. Collaborative initiatives require a shared vision, mutual goals, and commitment to collective success. Misaligned incentives, diverging priorities, and conflicting objectives among partners can undermine collaboration efforts and hinder progress towards common goals. Establishing clear objectives, performance metrics, and incentives aligned with shared outcomes is crucial for building alignment and fostering collaboration^[16].

Furthermore, organizational culture and mindset play a significant role in shaping the success of collaborative supply chain networks. Resistant attitudes, siloed mentalities, and lack of collaboration-oriented leadership can impede cultural change and hinder the adoption of collaborative practices. Overcoming cultural barriers requires promoting a culture of openness, inclusivity, and continuous learning within organizations and across supply chain partners^[17].

Additionally, managing complexity within collaborative supply chain networks presents a considerable challenge. As supply chains become more global, interconnected, and multi-tiered, the complexity of coordinating activities, managing risks, and ensuring compliance escalates.

Balancing the trade-offs between centralization and decentralization, complexity and simplicity, and standardization and customization becomes a delicate dance in collaborative supply chain networks^[4].

While collaborative supply chain networks offer tremendous potential for driving value and innovation, addressing the challenges of trust, information sharing, communication, alignment, and complexity is essential for realizing the full benefits of collaboration. By proactively identifying and mitigating these challenges, organizations can foster strong partnerships, enhance supply chain resilience, and unlock new opportunities for growth and competitiveness in today's dynamic business environment.

Benefits of Collaboration

Collaborative supply chain networks offer a host of benefits that can positively impact the performance, efficiency, and resilience of supply chain operations. By fostering closer relationships, sharing resources, coordinating activities, and aligning objectives among supply chain partners, collaboration can lead to transformative outcomes that drive competitive advantage and value creation^[13].

One of the key advantages of collaborative supply chain networks is improved operational efficiency. By working together seamlessly, supply chain partners can streamline processes, reduce lead times, and eliminate redundancies in operations. Shared information, real-time visibility, and integrated workflows enable faster decision-making, optimized inventory management, and smoother order fulfillment, leading to cost savings and operational excellence^[1].

Collaboration also enhances supply chain responsiveness and agility. In today's fast-paced and volatile business

environment, the ability to adapt quickly to market changes, customer demands, and supply disruptions is crucial for staying competitive. Collaborative supply chain networks enable rapid decision-making, proactive risk management, and flexibility in adjusting production schedules, inventory levels, and distribution channels in response to changing conditions^[12].

Another significant benefit of collaboration in supply chain networks is enhanced service levels and customer satisfaction. By aligning processes, sharing data, and coordinating activities across the supply chain, organizations can deliver superior customer experiences, meet delivery deadlines, and respond quickly to customer inquiries and requests. Timely and accurate information exchange among partners improves order accuracy, reduces lead times, and strengthens customer relationships^[5].

Cost savings and economies of scale are additional advantages of collaborative supply chain networks. By pooling resources, consolidating shipments, and optimizing transportation routes through collaboration, organizations can achieve cost efficiencies, reduce transportation costs, and minimize excess inventory. Shared warehousing, cross-docking, and collaborative distribution centers further drive cost savings and resource optimization across the supply chain^[13].

Collaboration also fosters innovation and value creation within supply chain networks. By bringing together diverse perspectives, expertise, and capabilities from multiple partners, organizations can co-create new products, services, and solutions that address evolving market needs. Collaborative research and development, joint product design, and knowledge sharing stimulate creativity, drive continuous improvement, and spark innovation throughout the supply chain^[12].

Furthermore, collaboration in supply chain networks strengthens risk management and resilience. By sharing data, insights, and resources, organizations can proactively identify and mitigate risks, such as supply shortages, demand fluctuations, geopolitical disruptions, and natural disasters. Collaborative risk assessment, scenario planning, and contingency strategies help build supply chain resilience and ensure business continuity in the face of uncertainties.

Environmental sustainability is another significant benefit of collaborative supply chain networks. By coordinating efforts to reduce waste, optimize energy consumption, and minimize carbon emissions across the supply chain, organizations can contribute to environmental stewardship and social responsibility. Collaboration enables the sharing of best practices, adoption of eco-friendly technologies, and alignment of sustainability goals among supply chain partners^[14].

Collaborative supply chain networks offer a myriad of benefits that can drive value creation, innovation, efficiency, and sustainability in supply chain operations. By fostering trust, sharing information, enhancing communication, aligning objectives, nurturing a collaborative culture, and managing complexity effectively, organizations can unlock the full potential of collaboration and reap the rewards of collaborative supply chain management. Embracing collaboration as a strategic imperative can position organizations for success in today's interconnected and dynamic business landscape, enabling them to thrive in the face of challenges and capitalize on opportunities for growth and competitive advantage.

Strategies for Success

Implementing and sustaining successful collaboration in supply chain networks requires a strategic approach that addresses key challenges, leverages opportunities, and fosters a culture of partnership and innovation. To maximize the benefits of collaborative supply chain networks, organizations can adopt a range of strategies and best practices that enhance communication, alignment, flexibility, and resilience across the supply chain.

Establish Clear Goals and Objectives

Effective collaboration starts with setting clear, measurable goals and objectives that align with the strategic priorities of all supply chain partners. By defining shared outcomes, performance metrics, and milestones, organizations can create a common vision and roadmap for collaboration. Clear goals help build alignment, focus efforts, and track progress towards mutual success ^[13].

Build Trust and Relationships

Trust is the foundation of successful collaboration in supply chain networks.

Organizations should invest time and effort in building strong relationships, fostering open communication, and demonstrating reliability and integrity in their interactions with partners. Trust is built through transparency, consistency, and mutual respect, and it lays the groundwork for effective collaboration and problem-solving ^[18].

Invest in Technology and Data Sharing

Digital technologies play a critical role in facilitating collaboration and improving visibility across the supply chain. Organizations can leverage collaborative platforms, cloud-based solutions, data analytics tools, and supply chain management software to share information, coordinate activities, and make informed decisions in real time. Investing in integrated IT systems and data sharing protocols enables seamless communication and collaboration among supply chain partners ^[7].

Foster Open Communication

Effective communication is essential for driving collaboration in supply chain networks.

Organizations should establish clear communication channels, protocols, and feedback mechanisms to ensure that information flows freely among partners. Regular meetings, status updates, and performance reviews help keep all stakeholders informed, aligned, and engaged in collaborative initiatives. Open communication fosters trust, builds relationships, and resolves conflicts promptly ^[2].

Develop Collaborative Practices and Processes

Standardizing collaborative practices and processes helps streamline operations, eliminate inefficiencies, and enhance coordination among supply chain partners. Organizations can establish shared workflows, protocols, and performance standards that govern collaborative activities such as demand planning, order management, inventory replenishment, and supplier collaboration. Consistent practices drive predictability, reliability, and efficiency in collaborative supply chain networks ^[15].

Embrace Cross-Functional Collaboration

Collaboration should extend beyond traditional supply chain

functions to encompass cross-functional teams and departments within organizations. By breaking down silos and fostering collaboration across functions such as sales, marketing, operations, finance, and IT, organizations can achieve greater alignment, innovation, and responsiveness in supply chain management. Cross-functional collaboration enhances information sharing, breaks down barriers, and drives holistic decision-making ^[11].

Develop Risk Management Strategies

Effective risk management is crucial for building resilience in collaborative supply chain networks. Organizations should proactively identify, assess, and mitigate risks across the supply chain, including disruptions in supply, demand, logistics, and finance. Collaborative risk assessments, scenario planning, and contingency strategies help organizations prepare for and respond to uncertainties, minimizing the impact of disruptions on supply chain operations.

Establish Performance Metrics and KPIs

Measuring the success of collaborative initiatives requires defining key performance indicators (KPIs) and metrics that track the impact of collaboration on supply chain performance. Organizations can monitor metrics such as on-time delivery, inventory turnover, lead time, cost savings, and customer satisfaction to assess the effectiveness of collaborative efforts.

Performance data provides valuable insights for continuous improvement and optimization of collaborative supply chain networks ^[6].

Cultivate a Culture of Collaboration

Creating a collaborative culture within organizations and among supply chain partners is essential for driving sustained success in collaborative supply chain networks. Organizations should promote values such as teamwork, trust, communication, innovation, and continuous learning to foster a culture of collaboration. Leadership support, employee engagement, and recognition of collaborative behaviors help instill a collaborative mindset and reinforce the importance of partnership across the supply chain ^[17].

Continuously Evaluate and Improve

Collaborative supply chain networks are dynamic and evolving ecosystems that require continuous evaluation and improvement. Organizations should regularly assess the effectiveness of collaborative initiatives, solicit feedback from partners, and identify opportunities for enhancement and innovation. By fostering a culture of continuous improvement and adaptability, organizations can stay ahead of market trends, respond to changing customer needs, and drive sustained success in collaborative supply chain management ^[4].

Implementing successful collaboration in supply chain networks requires a holistic and strategic approach that integrates technology, relationships, processes, and culture. By following these strategies for success and adopting best practices in collaborative supply chain management, organizations can unlock the full potential of collaboration, drive value creation, and achieve sustainable competitive advantage in today's interconnected and dynamic business environment. Embracing collaboration as a core competency and strategic imperative positions organizations for success

in navigating the complexities and opportunities of modern supply chain management.

Future Outlook

As organizations navigate an increasingly complex and interconnected business landscape, the role of collaborative supply chain networks is poised to become even more critical in driving innovation, resilience, and competitiveness. Emerging trends, advancements in technology, and evolving customer expectations are shaping the future of supply chain management, heralding a new era of collaboration and transformation in the way organizations orchestrate their supply chain operations.

Digital Transformation and Industry 4.0

The Fourth Industrial Revolution, often referred to as Industry 4.0, is reshaping the manufacturing and logistics industries through the integration of digital technologies such as the Internet of Things (IoT), artificial intelligence (AI), machine learning, and big data analytics.

Collaborative supply chain networks are embracing digital transformation to enhance visibility, agility, and decision-making capabilities across the supply chain. IoT-enabled devices, smart sensors, and predictive analytics are revolutionizing how organizations monitor inventory levels, track shipments, and optimize production schedules in real time. AI-powered algorithms are automating demand forecasting, inventory optimization, and supply chain planning processes, enabling organizations to proactively identify risks, opportunities, and inefficiencies in the supply chain [7].

Blockchain and Supply Chain Transparency

Blockchain technology is revolutionizing supply chain transparency, traceability, and trust among supply chain partners. By creating secure, decentralized ledgers of transactions, blockchain enables end-to-end visibility into every step of the supply chain, from raw material sourcing to final product delivery. Collaborative supply chain networks are leveraging blockchain to improve product provenance, prevent counterfeiting, and enhance compliance with regulatory standards. Smart contracts on blockchain platforms automate payment processes, enforce supply chain agreements, and ensure accountability among partners. The adoption of blockchain technology is expected to drive greater efficiency, integrity, and sustainability in collaborative supply chain networks [8].

Sustainability and ESG (Environmental, Social, and Governance) Practices

As organizations increasingly focus on sustainability, corporate social responsibility (CSR), and ESG practices, collaborative supply chain networks are aligning their operations with environmental and social values. Sustainable sourcing, ethical labor practices, carbon footprint reduction, and circular economy initiatives are becoming integral components of collaborative supply chain strategies. Organizations are partnering with suppliers, manufacturers, and distributors that share their commitment to sustainability, driving responsible production, waste reduction, and resource conservation throughout the supply chain.

Collaborative efforts to promote sustainability not only contribute to environmental stewardship but also resonate with customers, investors, and other stakeholders who value

ethical and eco-conscious business practices [14].

Supply Chain Resilience and Risk Management

The COVID-19 pandemic exposed vulnerabilities in global supply chains, prompting organizations to prioritize resilience and risk management in their supply chain strategies. Collaborative supply chain networks are enhancing their resilience by diversifying sourcing locations, building redundancy in supply chains, and implementing agile response plans to mitigate disruptions. Scenario planning, supply chain mapping, and real-time collaboration tools enable organizations to proactively identify risks, assess vulnerabilities, and develop contingency strategies in anticipation of future disruptions. Collaborative risk management practices that promote information sharing, joint decision-making, and rapid response capabilities are essential for building supply chain resilience in an uncertain and volatile business environment.

Customer-Centricity and Personalization

Changing consumer preferences, omnichannel retailing, and the rise of e-commerce are driving organizations to adopt customer-centric supply chain strategies that prioritize speed, convenience, and personalization. Collaborative supply chain networks are focusing on delivering seamless and personalized experiences to customers by optimizing last-mile delivery, enhancing order visibility, and offering flexible fulfillment options. Data analytics, customer segmentation, and demand forecasting tools enable organizations to anticipate customer needs, tailor product offerings, and create targeted marketing campaigns that resonate with consumers. Collaborative partnerships with logistics providers, technology vendors, and third-party service providers help organizations meet evolving customer expectations and differentiate themselves in a competitive marketplace [5].

Reshoring and Nearshoring Initiatives

Global trade tensions, geopolitical uncertainties, and supply chain disruptions have prompted organizations to reevaluate their sourcing strategies and consider reshoring or nearshoring production closer to home. Collaborative supply chain networks are exploring regionalization, localization, and onshoring initiatives to reduce supply chain risks, improve agility, and enhance supply chain resilience. By collaborating with local suppliers, manufacturers, and logistics providers, organizations can reduce lead times, transportation costs, and dependency on distant suppliers. Proximity to markets, reduced carbon emissions, and greater control over quality and production processes are driving the reshoring and nearshoring trend in collaborative supply chain networks [3].

The future of collaborative supply chain networks is characterized by innovation, resilience, sustainability, and customer-centricity. Organizations that embrace digital transformation, blockchain technology, sustainability practices, risk management strategies, customer-centric approaches, and reshoring initiatives are poised to thrive in a rapidly evolving and interconnected supply chain environment. By leveraging collaborative partnerships, cutting-edge technologies, and forward-thinking strategies, organizations can position themselves for success in shaping the future of supply chain management and driving value creation across the supply chain ecosystem. Collaborative

supply chain networks hold the potential to revolutionize how organizations collaborate, compete, and create value in a dynamic and interconnected global marketplace ^[23].

Conclusion

Collaborative supply chain networks are becoming hubs of innovation where organizations collaborate with partners, suppliers, and even competitors to drive continuous improvement, explore new business models, and co-create value-added solutions. Innovation is no longer confined within organizational boundaries but thrives in open ecosystems where knowledge sharing, experimentation, and creativity flourish. By fostering a culture of collaboration and embracing open innovation principles, organizations can harness collective intelligence, leverage external expertise, and spark innovative breakthroughs that drive competitive advantage and market differentiation ^[22].

Open innovation in supply chain networks enables organizations to tap into a broader pool of ideas, technologies, and capabilities beyond their traditional scope, accelerating the pace of innovation and unlocking new opportunities for growth. Collaborative research and development projects, joint ventures, and strategic partnerships with startups and industry disruptors stimulate creativity, foster cross-pollination of ideas, and catalyze breakthrough innovations that transform supply chain operations and drive business success ^[24].

Furthermore, collaborative supply chain networks are embracing strategic foresight and scenario planning to anticipate future trends, disruptions, and opportunities in the rapidly evolving business landscape. By developing a forward-looking mindset and cultivating a culture of innovation, organizations can stay ahead of market shifts, anticipate customer needs, and pivot their strategies proactively to capitalize on emerging trends. Agile and adaptable supply chain networks that prioritize experimentation, learning, and course correction are better positioned to navigate uncertainty, drive innovation, and seize competitive advantage in dynamic markets ^[26].

Robust collaboration platforms, digital ecosystems, and innovation networks are empowering organizations to co-create next-generation solutions, such as predictive analytics, autonomous supply chains, digital twins, and augmented reality-enabled logistics. These technologies enable real-time optimization, predictive maintenance, and intelligent decision-making in supply chain operations, enhancing efficiency, visibility, and agility across the supply chain. Collaborative supply chain networks are leveraging AI-driven insights, machine learning algorithms, and prescriptive analytics to optimize demand forecasting, inventory management, and supply chain planning, driving operational excellence and customer satisfaction ^[21].

The future outlook for collaborative supply chain networks is characterized by a convergence of digital innovation, sustainability practices, customer-centricity, and risk management strategies that reshape the landscape of supply chain management. By embracing collaboration, fostering innovation, and cultivating a culture of openness, organizations can unlock new possibilities, drive transformative change, and create sustainable value in their supply chain operations. The evolution of collaborative supply chain networks signifies a paradigm shift towards interconnected, agile, and resilient ecosystems that adapt to disruptions, anticipate market shifts, and pioneer novel

solutions that shape the future of supply chain management in a rapidly changing world. Embracing collaboration as a cornerstone of strategic resilience and innovation enables organizations to thrive, lead, and succeed in an era of unprecedented complexity, uncertainty, and opportunity in global supply chains ^[27].

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