

# Modeling customer-centric supply chain management for sustainable competitive advantage

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**Abstract** - This paper presents a customer-centric supply chain management (CSCM) paradigm designed to create a sustainable competitive advantage (SCA). The proposed CSCM model seeks to enhance customer satisfaction and achieve SCA by leveraging its distinctive core competencies (DCCs). An exploratory research design has been chosen for this study, employing an exploratory approach to comprehensively examine relevant articles and books and develop a strategic model. The practical outcome of the research is an integrated model that serves as a comprehensive framework for businesses operating in highly competitive, dynamic environments to leverage DCCs and achieve sustainable competitive advantage (SCA). The multidimensional CSCM model integrates various concepts—including business process reengineering (BPR), value chain analysis, competitive strategies, and SCA—into a unified framework to help businesses navigate complex, dynamic market environments. The suggested model helps reduce order cycle times, inventory levels, and costs, while improving accuracy, efficiency, and customer service for organizations that adopt it.

## 1 Introduction

Firms today seek global competitiveness and sustainable competitive advantage (SCA) by adopting efficient and resilient supply chains (SCs) [1]. Strategic thinking, which includes substantial, far-reaching ideas for addressing challenges in innovative, unexpected, and creative ways, is the source and nourishment of SCA [2]. Today's SC must react to shifting, turbulent, and uncertain environments by proactively positioning itself for fierce competition. Businesses develop SC strategies considering new, global, and sustainable needs [3, 4, 5]. In recent years, businesses have utilized SCs to enhance their financial, operational, and market performance. Companies are compelled to update or rebuild their SCs due to the interplay of globalization, volatility in demand and supply, and sustainability considerations.

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The unprecedented SC shocks increased the importance of sustainability, risk, and resilience. SC has become increasingly complicated and ambiguous due to the requirements of operational efficiency and commercial competitiveness. Through business activities, SCs must react innovatively and aggressively to market dynamics to create SCA [2].

Existing SCs, which primarily prioritize efficiency and profit, urgently need to be redesigned to focus on sustainability and resilience in light of the recent pandemic [5, 6]. According to earlier research, catastrophes and disasters increase uncertainty, which in turn poses a variety of dangers. For example, the COVID-19 pandemic, which has affected every country in the world, has raised public health hazards globally and sent the world economy to catastrophic lows while simultaneously increasing other threats. According to Schoenfeld [6], crises such as the COVID-19 pandemic pose financial risks, as they force companies to shut down, idle manufacturing facilities, and increase layoffs. Ashokka et al. [7] highlight dangers to health and safety, miscommunication, misinformation, and coordination issues as also occurring during the outbreak.

A thorough customer-centric supply chain management (CSCM) model is necessary for SCA, according to the literature review. Despite being extensively accepted and discussed by scholars and practitioners, SCA models in CSCM are still in their infancy, according to the search results. The study's basic assumption is that SCs adjust to external changes by implementing organizational efforts to reduce existing pressures, create new opportunities, and leverage their distinctive core capabilities (DCCs). To deploy an integrative CSCM, SC organizations must undergo a fundamental restructuring from product-centered, hierarchical structures to customer-centric, networked ones.

This paper uses DCCs and SCA to develop a multidimensional, customer-centric CSCM model that addresses increasingly competitive, dynamic business contexts. This research unifies dispersed concepts, such as business process reengineering (BPR), value chain, competitiveness strategies, and SCA, into a single, multidimensional model. The CSCM model originates in several literary works, combined into a single, unified model to promote systems thinking.

## **2 Conceptual foundations**

To achieve SCA, an SC design and strategy must incorporate numerous interconnected BPR components and be dynamically aligned, or "in equilibrium," with one another [8]. An effective CSCM strategy offers a comprehensive approach that considers both business and network perspectives. When SCs become customer-oriented, their rigid functional structures and legacy pyramid must be abandoned in favor of a process-centered approach. As people, design, processes, and technology interact externally with the environment and dynamically with SC strategy, the goal is to improve internal and external congruency through innovative and continuous organizational learning and adjustment activities.

The five forces that drive industrial competition are as follows: the threat of new entrants, the availability of substitute goods and services, customer and supplier bargaining power, and within-industry rivalry [9]. Despite being essential, market demand is usually fleeting and carries different significance for consumers and performance compared to competitors. The firm's resource-based view (RBV), on the other hand, emphasizes internal organizational capabilities — such as people, capital, facilities, and technology — as a crucial component in creating and preserving a competitive market position. According to this theory, the leading cause of long-term SCA is the development of new capabilities that provide barriers to imitation, substitution, or transfer. Obstacles to automation arise from scarce, poorly transportable, imitable, or replaceable resources [10, 11].

SCA relates to the capacity to conduct business in a manner or in various ways that prevent competitors from duplicating it. Companies establish the foundation for a strategy that generates an SCA by having its SCS. Resources and capacities used to produce goods and services make up the SCA. The organization's internal resources, as well as its tangible and intangible assets, are sources of SCS. Financial, physical, and technological resources are considered tangible assets, whereas people, inventions, creativity, and reputation are considered intangible assets. Intangible assets, including structural, relational, and customer capital, form the basis of SCA [12].

An SCA is a hard-to-copy feature that helps a company sustain its dominance and outperform its rivals over time. Gaining SCA depends on a committed effort and the ability to innovate continually. A company's customer service can help develop an SCA that increases client loyalty and fosters fruitful client relationships. More substantial market positions can only lead to a brief surge in a firm's cash flow. Contrarily, companies with more robust technological resources or competencies can perform better in SCA [13]. However, determining from whence SCA might draw its resources, skills, or core competencies is essential. The convergence of one or more concerns, substance between the real and the abstract, and three-dimensional temporal frames are all aspects of strategic thinking. In highly competitive corporate environments, strategic thinking is essential. Over time, a strategy thinker may begin to employ multidimensional, dynamic thinking to consider a range of subjects at increasingly higher levels of abstraction and detail [14].

The value added to customers and business partners is directly tied to DCCs, which often represent the organization's value chain (VC). Core competencies are developed progressively through group learning and information sharing. The task they have to finish is crucial to the organization's goal. The unique and essential core competencies, known as DCCs, enable companies to understand their customers better and deliver value-added products and services. Companies can outpace rivals and gain a competitive advantage by using DCCs to facilitate the creation of an SCA.

As a consequence, SCs must select the competitive focus for their bases of competition. Examples include operational excellence, customer relationships, product/service development leadership, and the creation of unique or established products or services. For instance, when dealing with contracting business cycles, SCs aim to develop and exploit people, processes, and technology-based learning

more effectively and efficiently to increase revenue and maintain product leadership through shorter time-to-market and, if feasible, longer product life cycles. Therefore, it is necessary to provide adaptable features and capabilities to minimize the product development cycle [15].

### 3 Empirical evidence

In today's volatile and hyper-competitive global market, SCM has evolved from a cost-centric function to a strategic enabler of customer satisfaction and business sustainability. A CSCM strategy aligns operations with consumer expectations, enabling firms to deliver personalized value while maintaining agility, resilience, and environmental responsibility.

A study by Singh et al. [16] analyzed 150 manufacturing firms across Asia and Europe and found that companies with customer-focused supply chains achieved 18% higher customer retention rates, a 12% reduction in inventory holding costs, and a 22% improvement in order fulfillment speed. These outcomes were attributed to real-time demand sensing, personalized logistics, and collaborative customer planning.

Kumar and Rahman [17] found that 72% of consumers prefer brands with transparent, sustainable supply chains. Firms that adopted circular supply chain models—such as reverse logistics and eco-packaging—saw a 30% increase in brand loyalty and a 25% growth in market share among Gen Z consumers.

### 4 Methodology

This study employs an exploratory and descriptive research design. Developing an integrated CSCM model involves a systematic literature review (SLR) to inform SCA implementation. When a researcher wants to investigate something novel or explain complex issues in a particular circumstance, and a specific area of interest needs to be precisely defined, exploratory research is used [18].

#### 4.1 Model formulation

Model formulation offers a structured approach to developing a model based on existing literature, while also providing insights to address gaps in current knowledge and to formulate a proposed model. This process involves synthesizing existing literature, identifying gaps, and integrating theories, frameworks, or empirical findings into a cohesive structure.

The procedure for the adopted modeling approach includes conducting a literature review to identify related studies and a research gap, and defining the purpose by specifying the goal of the proposed model and its constructs through a comprehensive CSCM diagram. The literature review search protocol includes the following elements:

- Selected databases: include Google Scholar, Web of Science, and Scopus.
- Publication criteria: books and papers presented at conferences or peer-reviewed journals.
- Language: English-language books and articles.
- The search time frame is 1985–2021.
- Search fields: Keywords, abstract, and title.

- The search terms are supply chain strategic planning, sustainable competitive advantage, process reengineering, and distinctive core competencies.

### 5 Results

Businesses frequently employ customer relationship management (CRM) and enterprise resource planning (ERP) solutions to facilitate communication between and within SC members. When suppliers and customers successfully integrate with the business's external VC system, a value-added SC can be achieved. The coordinated, planned-source-make-deliver-and-return processes [17] that form the foundation of CSCM promote cooperation amongst end users, business partners, and employees of the same company. CSCM systems leverage process automation and trading partner collaboration to improve visibility into events upstream and downstream.

The suggested CSCM model, illustrated in Figure 1, leverages DCCs and synergies to enhance intra- and inter-organizational processes in manufacturing and service businesses, thereby achieving SCA. The VC entails using SC's core functions—inbound logistics, operations, outbound logistics, marketing and sales, and service—as a system rather than as a collection of independent components.

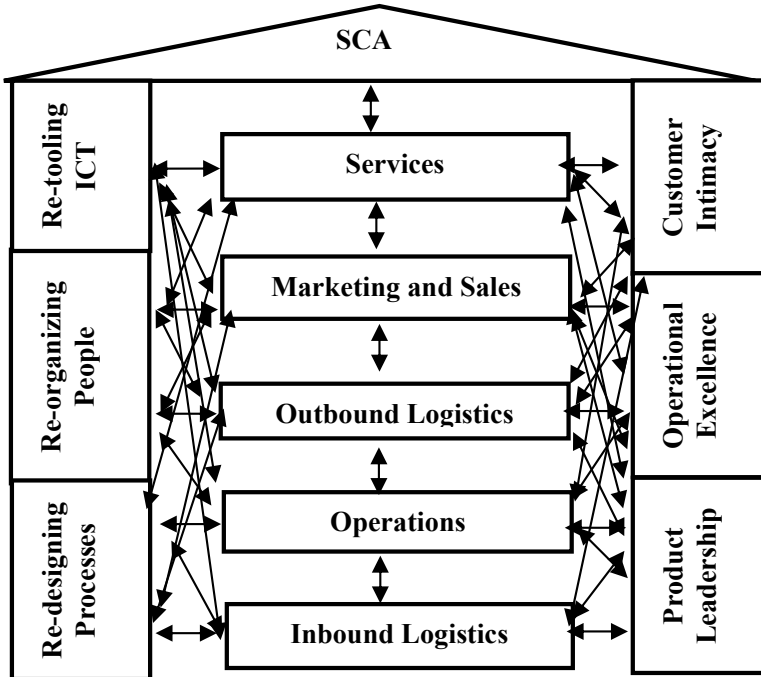


Fig. 1. A Proposed CSCM Model for SCA

A corporation gains an edge over rivals in its industry by maximizing any of the five fundamental activities. The five significant tasks the VC requires to be streamlined are infrastructure, human resource management, technology development, and procurement [9]. The BPR activities, such as rethinking processes, reorganizing people, and retooling information and communication technologies (ICT) systems,

represent the support activities in the suggested model. The competitive strategies are product leadership, operational excellence, and close customer relationships.

Figure 1 provides a detailed overview of the CSCM model, including an explanation of the interconnections between core elements such as "BPR activities" and "Competitive Strategies." Arrows or directional flows, along with brief labels indicating process logic (e.g., input-output relationships), were added to improve technical clarity and understanding of model dynamics.

Each of the 3 BPR activities (redesigning process, reorganizing people, and retooling ICT systems) can be paired with 5 VC operations (inbound logistics, operations, outbound logistics, marketing and sales, and services) and 3 CRM strategies (product leadership, operations excellence, and customer intimacy), generating 45 hierarchical row-level conceptual positions. For example, in the first proposition, the BPR process redesign activity is paired with VC inbound logistics, using the product leadership CRM strategy to achieve an SCA.

## 6 Conclusion

Businesses are increasingly recognizing the importance of customer intimacy as the center of their SC strategies. CSCM is not merely a trend—it is a transformative approach that enables organizations to build resilience, foster loyalty, and achieve SCA. The CSCM involves designing and executing SC processes that prioritize customer satisfaction, responsiveness, and personalization. Unlike traditional SCs, which focus primarily on cost efficiency and internal optimization, CSCM emphasizes external alignment with customer expectations, preferences, and behaviors.

The suggested CSCM model can help organizations determine where to provide value to their suppliers or customers. To increase the efficiency of processing purchase orders, the CSCM connects front-office and back-office operations, enabling shops to check their sock stock before placing orders and minimizing product/process cycle times. The CSCM approach also gives producers an SCA because each manufacturer's networked system is electronically connected to the order entry system, making it easier for clients to place orders with that manufacturer than with other manufacturers.

Since the CSCM's weakest link determines its strength, it is useless to optimize the performance of individual connections within a CSCM if those links have little to no integration or visibility into what is happening upstream and downstream. The practical usefulness of this study is limited because it does not explore real-world applications or case studies that validate the CSCM framework. Incorporating an illustrative example or discussing how the CSCM model could be applied in a business setting in future studies would strengthen the study's practical relevance.

## References

1. S. K. Sharma, P. R. Srivastava, A. Kumar, A. Jindal, and S. Gupta, Supply chain vulnerability assessment for the manufacturing industry. *An. of Oper. Res.*, **326**, 1–31 (2021).
2. R. Swift, R. Accelerating customer relationships: Using CRM and relationship technologies, (Prentice-Hall, 2001).

3. R. Hammami and Y. Frein. Redesign of global supply chains with integration of transfer pricing: Mathematical modeling and managerial insights. *International J. of Prod. Econ.*, **158**, 267–277 (2014).
4. A. M. N. Mohib and A. M. Deif, Supply chain multi-state risk assessment using a universal generating function. *Prod. Plan. & Cont.*, **31**, 9, 699–708 (2020).
5. J. Sarkis, Supply Chain Sustainability: learning from the COVID-19 Pandemic." *International J. of Oper. & Prod. Man.* **41**, 1, 63–73 (2020).
6. J. Schoenfeld, The invisible risk: Pandemics and the financial markets. Tuck School of Business Working Paper, No. 3567249 (2020).
7. B. Ashokka, S. Ong, K. H. Tay, N. H. W. Loh, C. F. Gee, and D. D. Samarasekera, Coordinated responses of academic medical centers to pandemics: Sustaining medical education during COVID-19. *Medic. Teach.*, **42**, 7, 762–771 (2020).
8. M. Scott-Morton and T. J. Allen, *Information technology and the corporation of the 1990s*, (Oxford University Press, 1994).
9. M. E. Porter, *Competitive advantage: Creating and sustaining superior performance* (The Free Press, 1985).
10. R. M. Grant, The resource-based theory of competitive advantage: Implications for strategy formulation, *Calif. Man. Rev.*, **33**, 3, 113–135 (1991).
11. N. Slack, S. Chambers, R. Johnston, and A. Betts, *Operations and process management: Principles and practice for strategic impact*, (Pearson Education, 2006).
12. J. Papula and J. Volná, Core competence for sustainable competitive advantage. In *Multidisciplinary Academic Research*, pp. 1–7, (MAC Prague, 2013).
13. K. Huang, R. Dyerson, L. Wu, and G. Harindranath, From temporary competitive advantage to sustainable competitive advantage. *Brit. J. of Man.*, **26**, 4, 617–636 (2015).
14. B. Boar, B., *The art of strategic planning for information technology*, (John Wiley, 1994).
15. K. Dalkir, *Knowledge management in theory and practice*, (Elsevier Butterworth-Heinemann, 2005).
16. R. Singh, R., A. Gupta, and P. Mehta. Customer-Centric Supply Chains and Performance Outcomes. *J. of Oper. Man.*, **45**, 3, 210–225, 2022.
17. V. Kumar, and Z. Rahman. Sustainable Supply Chains and Consumer Loyalty. *Int. J. of Log. Man.*, **34**, 1, 55–78, 2023.
18. J. F. Hair, M. Page, and N. Brunsveld, *Essentials of business research methods* (Routledge, 2019).
19. S. Fawcett, L. Ellarm, and J. Ogden, *Supply chain management: From vision to implementation*, (Pearson/Prentice-Hall, 2007).
20. E. Adida and V. DeMiguel, Supply chain competition with multiple manufacturers and retailers. *Oper. Res.*, **59**, 1, 156–172, 2011.