

**A STUDY ON DEVELOPING AN INTEGRATED SYSTEMS FRAMEWORK FOR
VIALE FEASIBLE DEFENSIBLE SUPPLY CHAIN MANAGEMENT
FROM SCRATCH****Soni Priya D**

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ABSTRACT

A viable, practical, or defensible value chain management system is one of the critical necessities of all organizations striving for long-term success, while considering sustainable practices in turn uplifts the supply chain performance. Although sustainable supply chain techniques have been the subject of much research, current studies frequently look at these practices separately, contributing to disjointed theoretical viewpoints. This conceptual paper addresses this gap by developing an improvement process that understands real-world problems by supplying relevant knowledge from several disciplines to support viable, feasible, and defensible supply chain management. The brief plan explains how to integrate concepts from System Theory, understanding that an industry is an interconnected system in which different dimensions work together to achieve organizational objectives; Stakeholder Theory, which implies that the interests of stakeholders of the organization should be considered while making managerial decisions; and how collaboration with main contributors supports achieving sustainable supply chain practices and improving organizational performance. Resource-Based View showcases environmental capabilities to gain sustainability; the Triple Bottom Line illustrates that system success depends not on financial performance, but also on its social and environmental contributions; and Circular Economy Theory focuses on the effective utilization of resources; it supports closed-loop supply chain management practices that reduce costs, focus on environmental performance, and long-term organizational sustainability. Integrating the capabilities of all the above theoretical models leads to organisational sustainability, enlightening organisational performance. This investigation examines theoretical articles available in indexed journals published under Scopus, Web of Science, and Direct Science, not based on grey literature and other databases, and combines them into a single integrated system model and recommends future empirical tests in different sectors.

Keywords:

Viable, Feasible, or Defensible SCM; Natural Resource-Based View Theory; System Theory; Stakeholder Theory; Triple Bottom Line Theory; Circular Economy Theory.

INTRODUCTION:

The Value Chain has become increasingly complex due to the escalating difficulties and gravity of global affairs, digital transformation, climate conditions, and unanticipated shocks, including pandemics, geopolitical tensions, and shifting structural dynamics. The drawbacks of conventional supply chain models have been made clear by these complications, underscoring the necessity of effective supply systems that are workable, practicable, and defensible in unforeseen situations. For this reason, most of the industries are working to generate a sustainable value chain integrating ESG frameworks.

Diverse conceptual lenses, such as "Systems Theory (ST)", "Stakeholder Theory", "Triple Bottom Line" (TBL), "Natural Resource-Based View" (NRBV), and "Circular Economy" (CE) principles, have been developed by numerous experts over the past 10 years to reach sustainable value chain management.

All of these theories individually contribute toward sustainable supply chain management. In particular, by incorporating a business interaction with the environment, the NBRV expands the conventional perspective. It claims that by merging three strategic capabilities-reducing emissions, safeguarding natural resources, and pursuing sustainable development- a company can gain a competitive edge. Whereas the Triple Bottom Line takes into account all three pillars of sustainability- fiscal, community-based, and natural environment protection- instead of only the conventional revenue model, the Circular Economy principles encourage efficiency through reuse, recycling, and reverse logistics. According to Stakeholder theory, it is crucial to create value for all key actors that have an impact on a company's operations, including workers, clients, suppliers, and the local

community, rather than concentrating only on generating money for its owners.

Despite these important inputs, the majority of the literature now in publication either examines these theories on their own or applies them to precise supply chain conditions. Because of disjointed models, there is insufficient knowledge on the results that can be achieved by combining the theories into an integrated system model that proceeds to gain a viable, feasible, and defensible value chain. The detailed conceptual structure justifies the relationship between many theoretical principles that provide productive solutions for planning and decision-making under the value chain as many organizations navigate through inevitable events, keeping in consideration economic, governance, and social factors to achieve sustainability.

To achieve viable, feasible, and defensible supply chain management, this investigation merges the existing theoretical perspectives from System Theory, Stakeholder Theory, Resource-Based View, Triple Bottom Line, and Circular Economy Theory to build a standardized framework by examining the existing literature instead of collecting new data. The study assumes an interrelated system that includes all suppliers, manufacturers, distributors, retailers, customers, and the reverse logistics network, which is interconnected to create economic, environmental, and social value.

The study is organized as follows: The author will review together the conceptual and theoretical literature on sustainable supply chain management available in various databases and develop an Integrated System Model. In addition to this, the study also provides a theoretical foundation, managerial implications, contributions, limitations, and future scope of research.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK:

Viable, Feasible, and Defensible Supply Chain Management

Increasing ecological challenges, especially global collaboration, technological changes, and unexpected events, have led to value chain disruption; as a result, value chain management has become a focus in recent years. Academics have developed several practices to improve supply chain resilience, commercial performance, and sustainable development. A viable supply chain emphasizes a company's ability to persevere in the face of difficulties; a feasible supply chain concentrates on operational practicality, resource management, and sound decision-making. In a similar vein, defensible supply chain management illustrates organisational preparedness, governance, compliance, and risk management. Although these studies have made a substantial contribution to the subject, they typically explore these ideas separately rather than as related parts of an all-encompassing supply chain system.

Unified Systems model reveals that System Theory is an interconnected system that includes all suppliers, manufacturers, distributors, and retailers, dependent on one another. A change or disturbance in one part of the system affects the entire supply chain. Hence, the System Theory acts as the overall theoretical foundation of the framework. Stakeholder theory serves as the instrument that establishes associations among constituent entities. The establishment of a viable, feasible, and defensible value chain is possible by combining resource efficiency of the Circular Economy; environmental capabilities perspective from the Resource-Based View, and fiscal, economic, and environmental principles from Triple Bottom Line. When merged as a whole, these corroborative concepts explain how organizations can achieve social, ecological, and financial sustainability, leading to supply chain performance.

Patel (2025). This study examined existing literature about Sustainable Supply Chain Management (SSCM) and found various gaps and unsolved research issues. Proposed an Integrated Systems for Value Chain framework including environmental and technological aspects compared to conventional frameworks. Though the investigation addresses existing gaps and remains conceptual, not an empirical study. Therefore, both quantitative and qualitative research methods should be explored to check the validation of the framework by combining multiple theoretical parameters, identifying risks, disruptions, and critical components that influence sustainability and resilience. Examine the framework among various industries to develop a standardization model.

Gomaa (2026): Proposes an integrated approach combining emerging technologies, human capabilities, and viable, feasible, and defensible supply chain principles. This study offers a strong supply chain risk management framework fully aligned with Industry 4.0 and 5.0 paradigms, blending fragmented, reactive practices into proactive, resilient, sustainable, and ethically led supply chain management by integrating Lean Six Sigma (define, measure, analyse, improve, control) with strategic objectives. Despite its contributions, the approach remains idea-based and must be empirically validated across a variety of industries and multi-tiered supply chains. Adoption may be limited in resource-constrained settings, as implementation may require substantial investment in technology, organizational changes, and stakeholder involvement. Future studies should focus on creating blended, AI-driven risk insights for flexible, ethical, and mindful decision-making to advance SCRM in the Industry

4.0 and 5.0 era.

Dmitry Ivanov (2026). The study integrates supply chain viability and supply chain resilience into a conceptual model (VRSC). Rather than a conventional approach that focuses on survival during disruption, it adopts a more comprehensive perspective by proposing the VRSC for overall development, in which supply chains function as a driving force, strengthening the ecosystem and renewing the supply chain. This investigation is based on existing literature and examiners' expert opinion, which may introduce subjective bias. Future studies are recommended to use an empirical method and to measure whether ecosystem viability is achieved or at risk. Further research should be conducted after the current research, measuring resilience, collaboration, sustainability, and digital capability, and measuring and analysing independent, dependent, mediating, or moderating variables. More than a theoretical framework, it is based on real-world evidence, useful for managers and policymakers, helps in decision-making, and increases confidence in applying the framework in practice.

Xu, J., Li, G., Li, Y. & Li, X., (2025). The study developed a conceptual framework based on the Natural-Based View and Stakeholder Theory to examine the relationships among SSCM, stakeholder pressure, sustainable process management, and performance, positioning sustainable process management as a mediator and stakeholder pressure as a moderator to deepen insight into SSCM. Future research should include multi-country, multi-industry validation, a longitudinal study, stakeholder-specific analysis, and consideration of supply chain risk factors, since this investigation is based solely on cross-sectional data from Chinese manufacturing firms; key actors' expectations were treated as a single construct, and contextual risk factors were not considered.

Ferrer-Serrano and Salesa (2025). The study analyzed 815 publications over 20 years, which shows the evolution of Circular Economy (CE) research from a sustainability perspective and the transition of the closed-loop economic system from an operational concept to a systemic sustainability approach. Highlight the significant gaps, particularly inadequate integration of the social verticals and lack of standardized circularity measurement and KPIs. Further research should focus on deep, viable, feasible, and defensible SC metrics, strengthening the social dimension, performing on content-based TBL dimensions, and adopting a more comprehensive database to facilitate effective utilization of the Circular Economy.

Mohsin et al. (2025). The study examines carefully collected & selected relevant research on sustainable supply chain using a structured and transparent method and quantitatively examined published data in various databases, and provides a thorough and detailed framework stating the evaluation of sustainability supply chain management over the period 2000-2023. A distinct shift from early green supply concepts, integrated, data-driven approaches that prioritize stakeholder engagement, the use of newly trending technological innovation, and meeting dynamic regulatory requirements may be explained by the growth of SSCM practices. A more thorough and inclusive understanding of SSCM would be possible if future assessments expanded to include a wider variety of sources and viewpoints.

RESEARCH GAP:

The present studies investigate viability, feasibility, resilience, governance, and sustainability separately, but there is no cohesive framework merging viable, feasible, and defensible supply chain management using multiple theoretical perspectives.

RESEARCH OBJECTIVES:

- To assess the present written works on viable, feasible & defensible supply chain management.
- To identify theoretical gaps in viable, feasible, and defensible supply chains.
- To enhance an integrated conceptual framework.
- To illustrate the relationships among Systems Theory, Stakeholder Theory, Triple Bottom Line, NRBV, and Circular Economy.

RESEARCH METHODOLOGY:

This paper recommends a conceptual framework for viable, feasible, and defensible supply chain management that interconnects several ideas. Rather than gathering empirical data, the system was created by a thorough synthesis of recent literature.

This study follows a Methodical Works Review that adheres to the PRISMA procedure to identify, evaluate, and integrate relevant approaches to sustainable supply chain management, viability, feasibility, resilience, governance, risk management, a resource-circulation system, and advanced technology.

Key concepts, theoretical perspectives, and research gaps are reviewed through publications in Scopus, ScienceDirect, and Web of Science-indexed journals.

Theories such as System Theory (ST), Resource-Based View (RBV), Stakeholder Theory, Triple Bottom Line

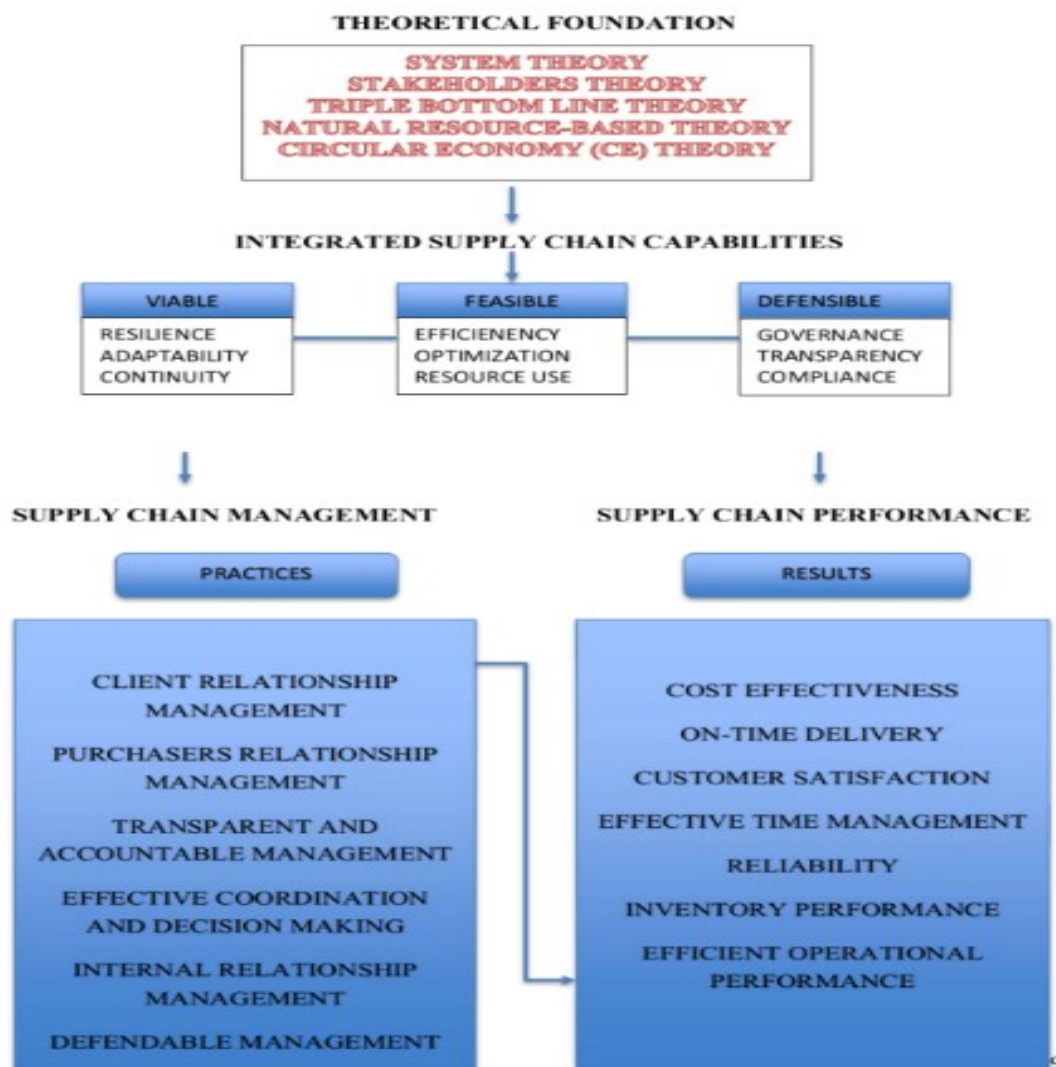
Theory, and Circular Economy Theory are combined to create a conceptual framework. Collectively, they offer a theoretical framework in understanding how the organisation or business entities could achieve sustainability and increase operational effectiveness, create value for key actors, fortify governance, and effectively manage natural resources.

This study is a conceptual framework concentrated on concepts, theories, and findings from the present written work that is indexed in a publication and is not based on empirical data. This framework studies the interconnection between viable, feasible, and defensible supply chain capabilities and incorporates them into a single integrated system framework by linking them with concepts, theories, and findings from the present available literature, enhancing understanding of sustainable supply management. As it's a conceptual framework, further empirical research is needed to evaluate its effectiveness and applicability across multiple industries.

THEORETICAL FOUNDATION:

Systems Theory and Stakeholder Theory reinforce each other by underlining that organisational dimensions and Stakeholder connection work together to achieve organisational objectives. Preventing pollution, reducing waste, and engaging in eco-friendly manufacturing to gain the competitive edge is the Resource-Based View; Triple Bottom Line reassures a stable focus on financial, conservational, and community sustainability, and the Circular Economy boosts means productivity by reducing waste, reuse, and remanufacturing.

Proposed Theoretical Framework:



DISCUSSION:

As per the Integrated System Framework, no single theory adequately explains viable, feasible, and defensible value chain management. Instead, integrating theories such as Natural Resource-Based View, Triple Bottom Line, Systems theory, Stakeholder theory, and Circular Economy brings a multidimensional perspective by merging these concepts and theories, which will result in a resilient, sustainable, resource-efficient, and capable of achieving long-term success.

Systems theory states that disruption in one part of the supply chain will affect the entire network, as the system is interconnected with each other in coordination, communication, and system-wide adaptability to maintain operational continuity.

To meet stakeholder expectations and act effectively during disruptions, organizations must cooperate with suppliers, manufacturers, consumers, governments, and other key actors, as stakeholder theory highlights. Organizations must engage stakeholders in ways that build trust and enable information exchange for collaborative decision-making.

The Three Pillars of Sustainability state that instead of focusing on financial results, organizations should integrate fiscal, ecological, and environmental components for long-term value development.

Green innovation, sustainable sourcing, and resource efficiency are the components of the Natural Resource-Based View, and these are competitive assets that lead the organization to gain a competitive advantage.

Circular Economy promotes source productivity concepts, which in turn reduce waste, improve effective resource utilization, and build a strong supply chain by reducing the consumption of limited natural resources that cannot be replaced and reducing the negative effects of business activities on the environment.

This design is developed by combining five interrelated theories that provide an Integrated System framework combining the perspectives of System Theory, Stakeholder Theory, Natural Resource-Based View, Triple Bottom Line, and Circular Theory; each with different scopes when integrated, will give rise to Viable, Feasible, and Defensible Supply Chain Management. Systems theory views supply chain management as an interconnected system that comprises suppliers, manufacturers, distributors, and customers working together to achieve organisational objectives. Stakeholder Theory emphasizes cooperation among the key actors to meet the expectations of sponsors. Natural Resource-Based View encourages ecological capabilities such as sustainable innovation to gain a competitive advantage. Triple Bottom Line is also known as the Three Pillars of sustainability, encouraging the balance of economic, environmental, and social values not only for business but also for society and the environment. Circular Economy places more emphasis on reapplication, material recovery, and product recovery, which is resource efficiency.

THEORETICAL CONTRIBUTIONS:

This investigation focuses on developing an Integrated Conceptual Framework by combining literature on multiple theories related to supply chain management to attain sustainability by understanding the Viable, feasible, and defensible capabilities. The framework includes System Theory; Stakeholder Theory; Natural-Based View; Triple Bottom Line; and Circular Economy to deliver a multidisciplinary perspective on sustainable supply chain management by introducing viable, feasible, and defensible capabilities into a single approach to achieve adaptability, process optimization, accountability, and sustainable value.

The study shows that stakeholder collaboration, Viable, feasible, and defensible capabilities, and sustainable supply chain management practices work together to accomplish sustainable performance. Rather than examining these parameters individually, virtuous to be integrated into a single model, thereby adding extra knowledge to the existing SSCM literature.

Finally, this paper offers a strong conceptual framework that lacks empirical study and recommends quantitative, qualitative, and mixed research methodologies; the study proposes to validate it in various settings and different countries. Further, it extends to examine the correlation among variables such as VFD capabilities, stakeholders, sustainable practices, and value chain performance to enhance the framework.

Managerial Implications:

This VFD-SCM is an integrated framework that explains to managers how to improve efficiency and performance, harmonizing economic, social, and environmental components into business practices and overcoming disruptions.

VFD-SCM framework recommends several strategies to make the supply chain more elastic and robust by building a strong relationship with key actors of value change so that they can respond quickly to any changes, building a multiple-supplier network instead of relying on single sourcing, using multiple technologies to track and monitor inventory, and developing the ability of employees and managers to handle the disruptions, prepare a possibility plans for possible risk such as pandemic, natural disasters or supplier failures.

Functioning challenges such as supplier delay, machine breakdown, transportation issues, inventory shortage, or production failures, ecological issues such as pollution, climatic changes, natural disasters, and social risk such as labor rights, worker safety, unethical practices, the VFD-SCM framework helps the manager of the organization to identify and assess these risks earlier to ensure smooth flow of supply chain operations.

VFD-SCM states that managers should be accountable and transparent, provide timely information about supply chain activities to stakeholders, conduct business honestly and fairly, adhere to legal compliance with ethical practices, and maintain regular communication with suppliers, manufacturers, distributors, and customers to build a supply chain that is ethical, transparent, and trustworthy.

The framework further explains that managers should integrate theories such as the Triple Bottom Line, which considers the pillars such as fiscal, ecological, and social aspects while planning and the decision-making process; the Natural Resource-Based View concept of strategic capabilities to achieve competitive advantage; resource efficiency practices of the circular economy; and highlights the significance of key actors' collaboration in stakeholder theory and view the subsystem into single framework as explained in system theory.

Finally, VFD-SCM empowers the organization to achieve market position by integrating eco-innovation with efficient operations. By designing value chains that are viable, feasible, and defensible, any organization can adapt to handle uncertainties, meet stakeholders' expectations, and create economic, social, and ecological value. This framework supports the organisation in being more resilient, economically competitive, and socially accountable to a rapidly changing global business environment.

CONCLUSION:

The study developed an Integrated System framework merging capabilities of Viable, Feasible, Defensible Supply Chain Management (VFD-SCM) based on contemporary literature and integrating Systems Theory to promote an integrated framework; Stakeholder Theory to improve collaboration with key actors associated with operational functioning for meeting the expectation of stakeholder; Nature Resource-Based View promotes environmental capabilities to attain competitive advantage; Triple Bottom Line balances economic, social, and environmental aspects; Circular Economy promotes resource efficiency. This framework combines viability, feasibility, and defensibility into a single structured approach addressing the research gap in the existing literature. To achieve long-term resilience and organizational competitiveness, sustainability requires combining viability, which is maintaining stable and reliable operation during disruptions. Implementing realistic strategies, establishing policies, accountability, and decision-making processes, working closely with suppliers, manufacturers, distributors, government, and other networks, and following ethical business practices. This study proposed a VFD-SCM framework to facilitate academic knowledge by providing a complete model that explains how the organisation can design its supply chain management for contemporary entities.

LIMITATIONS:

The literature review is a systematic analysis based on indexed articles from Scopus, Web of Science, ScienceDirect and not collected from grey literature or other databases; in addition, it lacks empirical investigation and is entirely conceptual in nature. The generalizability of this framework is limited; it hasn't been empirically tested and hasn't been applied to multiple industries or business environments. Its effectiveness and applicability remain uncertain.

FUTURE SCOPE OF RESEARCH:

The proposed Integrated System Framework should be applied in multiple settings and industries under supply chain management, using quantitative, qualitative, or mixed-methods research designs. Statistical analysis should be conducted using Structural Equation Modelling to examine the relationships among viability, feasibility, and defensibility variables. Technical tools such as enhanced AI tools, digital twins, internet-connected devices, blockchain, and the Fifth Industrial Revolution should be integrated to achieve supply chain resilience and sustainability; the researcher suggests that further examination through comparative studies should be executed in different countries and industries.

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