

Impact of Supply Chain Integration and Agility on Supply Chain Orientation and Performance Relation - A Study on Bulk Drug Companies in Andhra Pradesh and Telangana

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DOCTOR OF PHILOSOPHY

In

MANAGEMENT STUDIES

By

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DECLARATION

I, Gunupuru Koteswara Rao, hereby declare that this thesis entitled “Impact of Supply Chain Integration and Agility on Supply Chain Orientation and Performance Relation - A Study on Bulk Drug Companies in Andhra Pradesh and Telangana” submitted by me under the guidance and supervision of Prof. G.V.R.K. Acharyulu is a bonafide research work. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma.

Place: Hyderabad

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CERTIFICATE

This is to certify that the thesis entitled “Impact of Supply Chain Integration and Agility on Supply Chain Orientation and Performance Relation - A Study on Bulk Drug Companies in Andhra Pradesh and Telangana” submitted by Gunupuru Koteswara Rao bearing Reg. No.14MBPH15, in partial fulfilment of the requirements for the award of Doctor of Philosophy in the School of Management Studies, is a bonafide work carried out by him under my supervision and guidance.

The thesis has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

Research articles related to the topic of this thesis have been:

A. Published in the following Journal:

1. “Circular Economy In Various Primary Sector Industries: A Detailed Analysis” Book of abstracts International Research Conference on mindfulness, IIM Bodhgaya, 3rd-5th Feb 2022.
2. “A Conceptual Roadmap for Implementing Localization in the Indian Automotive Industry in a post-pandemic Scenario” Academy of Strategic Management Journal volume 21, special issue 1, 2022.
3. “Can Firm Size Moderate Navigating Economic Performance through strategic purchasing?” – Book: Data Driven Decision Making for long-term Business Success, Chapter 16, IGI Global, 21 Dec 2023.

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C. Further, the student has passed the following courses towards the fulfilment of coursework requirements for PhD:

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(Gunupuru Koteswara Rao)

Abstract

This thesis investigates the dynamics of Supply Chain Management (SCM) within the pharmaceutical industry in Andhra Pradesh and Telangana, with a focus on how Supply Chain Orientation (SCO), Supply Chain Integration (SCI), and Supply Chain Agility (SCA) influence Supply Chain Performance (SCP). Given the strategic importance of the pharmaceutical sector in these regions, which is characterised by a highly regulated environment and has a critical role in both local and global markets, this study provides significant insights into optimising SCM practices.

Utilising a combination of the Resource-Based View (RBV), Dynamic Capabilities (DC) Framework, and Relational View (RV), this research empirically tests the interrelationships between SCO, SCI, SCA, and SCP. The study adopts a quantitative methodology, employing a structured survey distributed among supply chain executives in large pharmaceutical companies in Andhra Pradesh and Telangana. The data collected was analysed using structural equation modelling to validate the proposed theoretical model and hypotheses.

The findings reveal that SCO significantly enhances SCP by promoting operational efficiencies and adaptability within supply chains. SCI is identified as a crucial mediator that not only directly impacts SCP but also enhances the effect of SCO on performance, supporting the integration of inter-organizational practices as a core component of effective SCM. Similarly, SCA is shown to mediate the relationship between SCO and SCP, highlighting agility as a strategic asset that enables firms to respond rapidly to market changes and uncertainties.

Theoretically, this thesis contributes to the SCM literature by integrating and extending the RBV, DC, and RV in the context of the pharmaceutical industry. It quantitatively

demonstrates the mediating roles of SCI and SCA, providing a deeper understanding of how strategic orientations and capabilities interact to improve supply chain outcomes. Managerially, the study offers actionable insights for supply chain executives, emphasising the importance of fostering an integrated and agile supply chain environment to achieve superior performance.

This research underscores the complex interplay of strategic orientation, integration, and agility within SCM and provides a framework for future studies to explore these dynamics in other industries and regions. The findings also prompt a re-evaluation of current supply chain practices, advocating for a more holistic approach to managing the intricate demands of the pharmaceutical supply chain in a globally competitive market.

Keywords: Supply Chain Management, Pharmaceutical Industry, Supply Chain Orientation, Supply Chain Integration, Supply Chain Agility, Supply Chain Performance, Resource-Based View, Dynamic Capabilities, Relational View, Andhra Pradesh, Telangana.

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List of Abbreviations

SCM	- Supply Chain Management
SCP	- Supply Chain Performance
SCO	- Supply Chain Orientation
SCI	- Supply Chain Integration
SCA	- Supply Chain Agility
EFA	- Exploratory Factor Analysis
CFA	- Confirmatory Factor Analysis
SEM	- Structural Equation Model
RBV	- Resource-Based View
DC	- Dynamic Capabilities
RV	- Relational View

Chapter - I

Introduction

1 Introduction

The introduction chapter systematically outlines the context and framework for examining the pharmaceutical industry in India, with a particular focus on Andhra Pradesh and Telangana. It begins by detailing the global significance of India's pharmaceutical sector, emphasising its role in generic drug production and the impact of globalisation and regulatory challenges on its supply chains. The discussion extends to the strategic importance of specialised industrial parks in Hyderabad, which support the sector's innovation and manufacturing capabilities.

Subsequent sections of the introduction address the study's core challenges and research gaps, particularly highlighting the need for improved supply chain management practices within the region's pharmaceutical industry. It lays out specific research questions and objectives aimed at exploring the impact of supply chain orientation, integration, and supply chain agility on total performance. The significance of the study is articulated in terms of potential enhancements to global competitiveness and operational efficiencies. The introduction concludes with precise definitions of key constructs, setting a clear analytical path for the thesis.

1.1 Background of the Study

The pharmaceutical industry has been greatly affected by globalisation, regulatory limitations, and evolving market demands. As a result, there is now a strong emphasis on the efficacy and punctuality of the supply chain in a business. The pharmaceutical business in India plays a crucial part in the worldwide healthcare sector and is known for its strong manufacturing capabilities and broad distribution networks. The industry is widely recognised for its significant contributions to the global supply of generic drugs. It has a vital function in

the global pharmaceutical industry and is specifically known for providing cost-effective medicinal solutions on a global scale.

India's pharmaceutical industry has traditionally functioned as a technological advancement and economic expansion centre. Given the Indian pharmaceutical industry's substantial reliance on medication production, Understanding the intricacies of supply chain management is absolutely necessary. Andhra Pradesh and Telangana, two notable states in Southern India, have emerged as significant hubs in the pharmaceutical business due to their extensive manufacturing capabilities and favourable market access.

1.1.1 Pharmaceutical Industry in India

India's pharmaceutical business is a major contributor to the global pharmaceutical sector and is renowned for its substantial manufacturing and international distribution of generic medications. It has a crucial function in the worldwide health system, supplying significant quantities of medications at very affordable prices to both advanced and developing nations. The industry's substantial expansion is bolstered by stringent regulatory restrictions and a thriving market with a highly qualified workforce and research capabilities.

Summary and Magnitude

India is the third-largest manufacturer of pharmaceuticals in the world, based on quantitative measures. Nevertheless, when evaluated in terms of monetary worth, it holds the 14th position worldwide. The significant disparity in ranking based on volume and value underscores the industry's emphasis on the development of generic medications, which often incur lesser expenses in comparison to proprietary drugs. Approximately 3,000 pharmaceutical businesses are based in India, and they are supported by a robust network of approximately 10,500 production facilities (InvestIndia, 2023). The industry provides more than 50% of the worldwide need for different vaccinations, 40% of the generic need in the United States, and 25% of all medications in the United Kingdom (InvestIndia, 2023).

Regulatory Framework:

The Central Drugs Standard Control Organization (CDSCO), which operates under the administration of the Ministry of Family and Health Welfare, is the entity responsible for the supervision of the regulatory system in India (Rihimpharma, 2023). The CDSCO is accountable for authorising pharmaceuticals, conducting clinical trials, and ensuring the safety and effectiveness of products. India's regulatory structure has seen substantial development over time, according to global norms, in order to enhance quality control and assurance.

Economic Impact:

The Indian pharmaceutical business is a significant contributor to the country's economic output but also in terms of employment. The industry is seen as a pivotal sector for expansion, as the Government of India has unveiled numerous initiatives to enhance output and foster research and development. The objective of initiatives such as 'Pharma Vision 2020' is to position India as a dominant force in the complete process of pharmaceutical production on a global scale (pharmexcil, 2023).

Main Hubs in India;

Significant pharmaceutical centres in India are comprised of Gujarat, Maharashtra, Telangana, and Andhra Pradesh. Hyderabad, located in the state of Telangana, is commonly known as the "Pharma Capital of India" because it has a significant concentration of pharmaceutical companies and a strong infrastructure that facilitates manufacturing and research and development activities (EYIndia, 2023).

The Indian pharmaceutical business has demonstrated substantial growth and innovation in 2023, solidifying its vital position in the global arena.

1.1.2 Overview of Key Industry Reports on the Indian Pharmaceutical Sector

Market Growth: India's pharmaceutical sector experienced a compound annual growth rate ranging from 6% to 8% between fiscal year 2018 and 2023. This growth was primarily driven

by an 8% increase in export activity. It is anticipated that the domestic market will experience a growth rate of 8-10% during the fiscal year 2023-24 ("Indian Pharmaceuticals Industry Analysis," 2023). India's strong position in the global pharmaceutical scene is reinforced by its sustained growth.

Global Impact: India has a significant global influence as it supplies more than half of the world's vaccines and meets 40% of the generic medicine demand in the United States (pharmexcil, 2023). This capability strengthens India's reputation as the global leader in pharmaceutical production.

Innovation and Research & Development (R&D): The sector places significant emphasis on innovation, particularly in the fields of advanced biologics and gene therapies. Indian corporations are progressively engaging in partnerships with research institutions and start-ups to stimulate innovation. These initiatives are positioned to revolutionise patient care by offering more individualised and efficient treatment alternatives.

Projection of Growth: It is estimated that the Indian pharmaceutical market will have a valuation of around \$130 billion by the year 2030 (Sharma, 2022). The growth is propelled by a rise in domestic demand and India's expanding presence in the global market.

Investment: The industry has had a significant rise in Foreign Direct Investment (FDI), with a total FDI equity inflow of \$21.58 billion from April 2000 to September 2023, accounting for approximately 3.3% of the overall FDI inflow ("Indian Pharmaceuticals Industry Analysis," 2023).

Exports: Exports in the pharmaceutical sector have demonstrated strong performance, with a value of Rs. 2,08,231 crore (US\$ 25.3 billion) for FY23. This represents an 8.14% growth between April and October 2023 ("Indian Pharmaceuticals Industry Analysis," 2023).

These observations emphasise the rapid expansion and crucial significance of the Indian pharmaceutical sector in both local and global markets. India's unwavering commitment

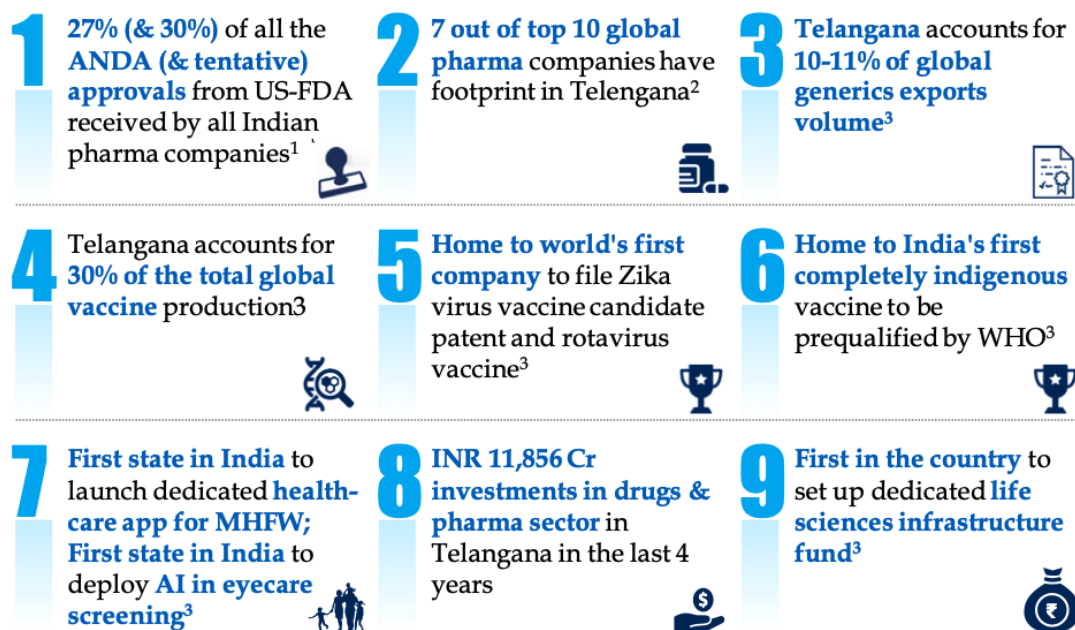
to research and its deliberate emphasis on innovation create the ideal conditions for the country to achieve its ambitious growth objectives and enhance healthcare results globally.

1.1.3 The Pharmaceutical Industry in Telangana and Andhra Pradesh

It is common knowledge that the states of Telangana and Andhra Pradesh have made significant contributions to the manufacturing of generic medications in India to a significant degree. Both large-scale and small- to medium-sized pharmaceutical enterprises that specialise in the production of active pharmaceutical ingredients (APIs) and generic medications call these states their home. These states are home to a significant number of pharmaceutical companies from all over the world. This importance is largely because of favourable government policies that have been implemented with the intention of bolstering the pharmaceutical industry. These policies, which include tax incentives and subsidies, have resulted in major investments being made into the region from both domestic and international sources. These states also have the advantage of having a robust infrastructure, which includes well-established transport networks and proximity to large ports, which makes it easier to export medications.

Figure 1
Life Sciences Industry Landscape in Telangana

Telangana leading the life sciences growth story in the country



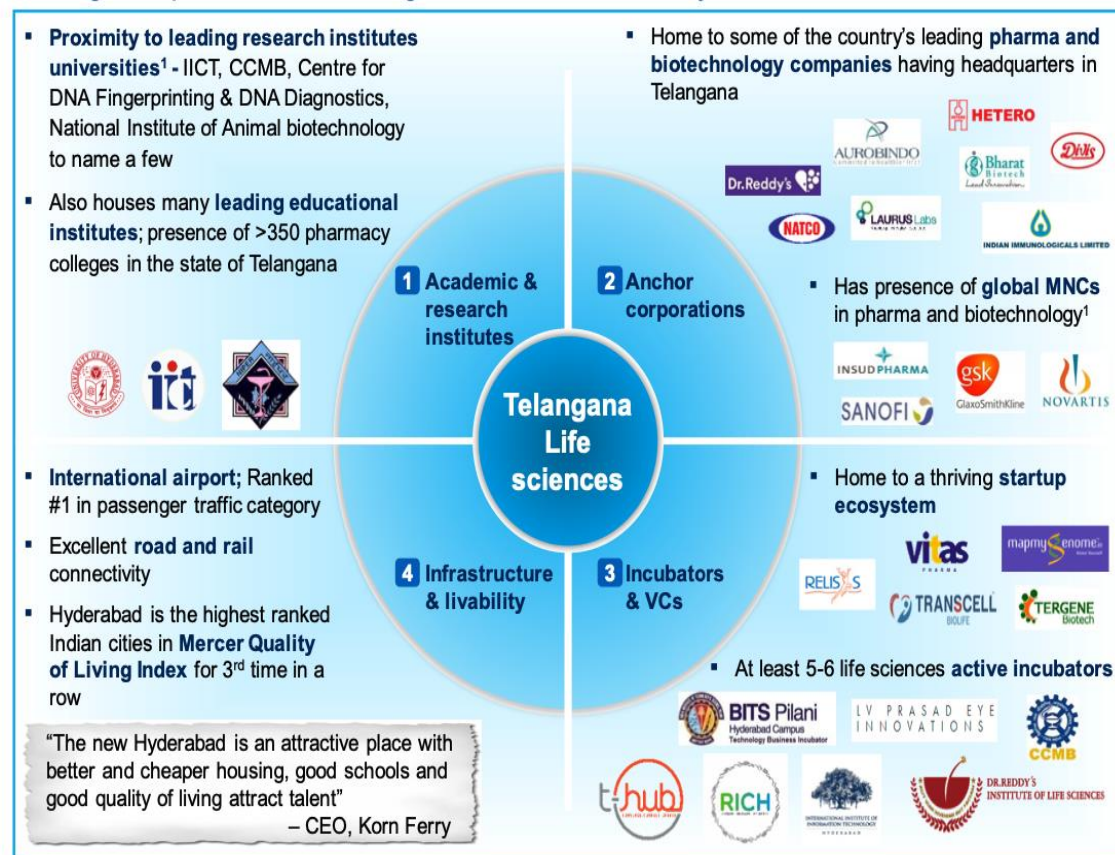
1 IKP-BIRAC Report; 2. Pharma City & Med Tech Park are planned; 3. Press search

Note: Source- "Telangana Life Sciences: Vision 2030" (2020)

The region's robust infrastructure, competent labour, and favourable governmental climate have all contributed to the growth of the pharmaceutical industry. Telangana's pharmaceutical industry is anchored by Hyderabad, known as "India's Pharmaceutical Capital", and home to numerous significant pharmaceutical companies and research institutes ("Telangana Life Sciences: Vision 2030," 2020).

Figure 2
Life Sciences Ecosystem in Telangana

Telangana provides a strong life sciences eco-system



Note: Source- "Telangana Life Sciences: Vision 2030" (2020)

1.1.4 Specialised Industrial Parks in Hyderabad: Fostering Pharmaceutical Growth

The city of Hyderabad, which is commonly referred to as the "Pharmaceutical Capital of India," is home to a number of specialised industrial parks that are essential to the biotechnology and pharmaceutical sectors. These parks are established with the purpose of supplying the industry with cutting-edge infrastructure, regulatory compliance frameworks, and a network that encourages innovation and collaboration among businesses ("Indian Pharmaceuticals Industry Analysis," 2023).

The following is a list of some of the most notable industrial parks in Hyderabad that have had a significant impact on the pharmaceutical industry:

Genome Valley

Genome Valley is recognised as India's pioneering and highly accomplished biotechnology cluster, distinguished by its dense presence of esteemed academic institutes and state-of-the-art biotechnology and pharmaceutical enterprises. This extensive compound is ideally situated in close proximity to Hyderabad and is specifically constructed to serve as a central location for life sciences and biotech research and development. Genome Valley boasts cutting-edge facilities, an innovation hub, and a special economic zone (SEZ) that provides a range of financial and legal advantages. Companies located in Genome Valley gain advantages from the collaborative connections allowed by their near proximity to prominent scientific research institutions and other biotechnology firms.

Jawaharlal Nehru Pharma City (JNPC)

Despite being previously noted and situated in Visakhapatnam, it is worth reiterating the significance of JNPC due to its strategic value to the pharmaceutical sector in the vicinity of Hyderabad. It is a fully integrated industrial centre that specialises in medicines, providing support for all stages of development and manufacturing. JNPC is renowned for its comprehensive infrastructure that caters to enterprises involved in the pharmaceutical, fine chemicals, and biotechnology industries. This park also prioritises environmental sustainability, utilising innovative effluent treatment processes to minimise its environmental footprint.

Hyderabad Pharma City

The construction of Hyderabad Pharma City, which is set to become the largest pharmaceutical industrial park in the world, is now in progress near Hyderabad, India. Its purpose is to create a comprehensive environment for pharmaceutical manufacturing and research. The park's objective is to establish a self-sufficient ecosystem that showcases cutting-edge infrastructure, encompassing specialised areas for manufacturing, research and

development, and logistics. The objective of Hyderabad Pharma City is to optimise operations for both major corporations and small to medium-sized businesses, allowing them to enhance operational effectiveness and comply with international pharmaceutical production standards.

The IKP Knowledge Campus

IKP Knowledge Park is a specialised research park and incubator that aims to promote development in the fields of biotechnology, life sciences, healthcare, and pharmaceuticals. Situated in Hyderabad, it provides a favourable atmosphere for fostering innovation with its incubation facilities and laboratories specifically built for start-ups and research & development firms. The park enables the transformation of research into practical goods by offering the required scientific, technical, and organisational assistance.

The Turkapally Industrial Park

Despite its smaller size compared to other parks, Turkapally Industrial Park near Hyderabad is a notable location that specialises in pharmaceutical manufacturing. This park provides necessary facilities and has been developing as a centre for small and medium-sized pharmaceutical companies. Companies in this location gain strategic logistical benefits because the park is close to key transportation networks.

1.1.5 Effects and Contribution of Specialized Industrial Parks

These specialised industrial parks not only improve the infrastructure of the pharmaceutical sector but also have a crucial impact on promoting innovation, economic growth, and employment in the region. These entities offer an ideal environment for fostering cooperation among academics, research institutes, and the pharmaceutical industry, which is essential for advancing novel pharmaceutical products and technologies. Furthermore, these parks comply with global benchmarks, guaranteeing the production of superior-quality products and bolstering India's standing in the international pharmaceutical market. The triumph of these industrial parks in Hyderabad highlights the city's position as a worldwide

pharmaceutical centre and showcases the efficacy of targeted governmental and private sector initiatives in fostering sector-specific expansion and progress.

1.2 Supply Chain Management

Supply Chain Management (SCM) was specifically defined by Mentzer et al. (2001) as the deliberate and coordinated management of traditional business operations and strategies throughout an organisation and its supply chain partners. To improve the overall performance of individual businesses as well as the supply chain as a whole throughout the course of time is the goal.

Supply Chain Management is the efficient integration of activities within the supply chain, together with the corresponding sharing of information. It entails enhancing and harmonising activities throughout the supply chain to streamline the production and delivery of goods (Saragih et al., 2020).

The field of supply chain management has garnered considerable interest from both researchers and practitioners over the course of many years, owing to its substantial impact on the performance of supply chains (Cooper et al., 1997; Stadtler et al., 2015).

As stated in "The Chief Supply Chain Officer Report" (2014) by SCM World, supply chain practitioners should shift their focus away from traditional cost reduction, improving standard operating procedures and distribution management. Instead, they should prepare for a new era of comprehensive supply chain management. There are two clear and noticeable things: i) To succeed and grow in the market, organisations must build integration with partners in the supply chain. ii) The role of supply chain management (SCM) is evolving, requiring a comprehensive approach to improve the overall performance of the supply chain.

Mentzer et al. (2001) argue that the only way to achieve a comprehensive approach to Supply chain management, SCM is by embracing a concept known as supply chain orientation (SCO). The acronym SCO, which stands for Supply Chain Orientation, refers to the recognition

by an organization of the more comprehensive and strategic significance of the operational tasks that are involved in managing the numerous components that are spread out across a supply chain (Mentzer et al., 2001). In accordance with Slone et al. (2007)'s definition, SCO is a forerunner of SCM. This is because SCM involves all supply chain participants' adoption of SCO.

An efficiently managed supply chain is one in which all member firms embrace and execute Supply Chain Orientation practices, leading to improved overall supply chain performance (SCP). Previous supply chain management SCM models have mostly focused on cost, as demonstrated by studies conducted by (Cohen & Lee, 1988; Estampe et al., 2013; Lee & Feitzinger, 1995). Additionally, other researchers Altiook and Ranjan (1995), Cook and Rogowski (1996), Droge et al. (2012), and Voudouris and Consulting (1996) have incorporated a combination of customer-based performance indicators and cost into their models. SCP is a metric used to quantify the productivity of supply chain management.

1.2.1 A Discussion of the Most Important Ideas in Supply Chain Management and Their Influence on the Pharmaceutical Industry.

I. Supply Chain Integration (SCI)

Supply Chain Integration, SCI is the act of coordinating and merging processes and information across different tasks and entities within a supply chain (Flynn et al., 2010). Through an improvement in the collection and processing of information pertaining to planning, operational, and logistical activities, Supply Chain integration (SCI) makes it possible for businesses to deal with unpredictability and effectively manage risks in the supply chain environment (Munir et al., 2020). Supply chain integration (SCI) plays a crucial role in boosting operational efficiencies and reducing costs, ultimately leading to enhanced overall supply chain performance (Fabbe-Costes & Jahre, 2008). Effective supply chain integration (SCI) is crucial in the pharmaceutical business, where strict laws and standards must be

followed. SCI facilitates the efficient movement of goods and services while also ensuring compliance with health and safety standards, making SCI an integral part of the supply chain's overall performance and efficiency (Das, 2011).

II. Supply Chain Agility (SCA)

In order to acquire a competitive edge in a dynamic business climate, organisations must synchronise their operations with suppliers and consumers and engage in collaborative efforts to attain a satisfactory level of agility (Zhu & Gao, 2021). The ability of a supply chain to quickly adapt to changing circumstances and respond to shifts in demand and uncertainties in the market is what refers to the concept of supply chain agility (Gligor & Holcomb, 2012). As organisations confront unpredictable marketplaces and swiftly shifting consumer tastes, this attribute is progressively emerging as a competitive advantage. Agility in the pharmaceutical industry allows businesses to swiftly adjust to changes in regulatory requirements, market withdrawals, and the rapid launch of new drugs (Swafford et al., 2006). The agility of a supply chain improves its capacity to manage risks and uncertainties, therefore impacting its overall efficacy and performance.

III. Linking SCI and SCA to Supply Chain Performance (SCP) and Supply Chain Orientation (SCO)

Companies that pursue high levels of exploratory activities—like developing new products, discovering new ways to meet customer demands, and venturing into new markets—not only enhance their supply chain agility but also foster stronger integrations with suppliers and customers, thereby enabling faster market responsiveness (Shukor et al., 2021).

Supply Chain Orientation, SCO refers to the recognition of the interconnected and systematic character of supply chains within the culture of a business (Mentzer et al., 2001). There is a hypothesis that suggests that both SCI (Supply Chain Integration) and SCA (Supply Chain Agility) have a substantial impact on SCO (Supply Chain Orientation), which in turn

affects Supply Chain Performance (SCP). Supply chain performance (SCP) encompasses key indicators such as on-time delivery, adaptability, cost control, and client contentment, which are vital for the prosperity of any organisation, particularly in a high-risk sector like medicines (Li et al., 2006).

Supply chain integration in the pharmaceutical sector enhances its ability to promptly adapt to market fluctuations, in addition to simplifying operations. In this context, supply chain integration, or SCI, refers to the coordination of an organisation's internal operations with its external partners in order to maximise the efficiency of its manufacturing and distribution processes. Maintaining the flow of materials and information is critical, especially in an industry with as many regulations as the pharmaceutical sector. This integration makes this possible.

Conversely, Supply Chain Agility (SCA) refers to an organisation's capacity to swiftly modify its supply chain activities in reaction to outside fluctuations and unpredictability. Agility becomes a competitive advantage in the dynamic pharmaceutical business, where demand might spike abruptly owing to events like health crises or changes in regulations.

A company that prioritises advanced supply chain procedures as a fundamental aspect of its business operations is said to be adopting Supply Chain Orientation (SCO). For pharmaceutical businesses in Andhra Pradesh and Telangana that want to take advantage of their economic and geographic locations in the domestic and global markets, this perspective is essential. Supply chain performance in this industry is directly impacted by how efficiently businesses integrate and modify their supply chain processes. Metrics, including operational efficiency, cost-effectiveness, and customer satisfaction, are considered for quantifying supply chain performance. Implementing Supply Chain Integration (SCI) and Supply Chain Agility (SCA) effectively can lead to enhanced Supply Chain Performance (SCP), which is crucial for sustaining growth and remaining competitive in the global market.

1.3 Problem Statement

The pharmaceutical industry in Andhra Pradesh and Telangana, which is crucial due to its extensive drug production capabilities and critical global positioning, faces significant operational inefficiencies in its supply chains. Although the areas possess a sophisticated technological foundation and provide significant economic contributions, there is a clear obstacle to attaining optimal performance. This obstacle arises from inadequate integration and agility within the supply chain operations. The dynamic nature of the global pharmaceutical market exacerbates this scenario, as swift reactions to regulatory changes, market demands, and health crises are essential.

With the ongoing growth of the sector, it is crucial to have a supply chain which is both interconnected and compliant. However, the specific influence of Supply Chain Orientation (SCO) on Supply Chain Performance (SCP), considering the involvement of Supply Chain Integration (SCI) and Supply Chain Agility (SCA) as intermediaries, has not been thoroughly comprehended or studied in this specific geographical context. In order to maximise the efficiency and responsiveness of their supply chain, businesses operating in the pharmaceutical industry need to have a solid understanding of the ways in which these components interact with one another. This understanding is crucial for leveraging their geographic and economic advantages in both domestic and international markets.

This problem statement provides a framework for investigating relationships, as well as the impact those interactions have on the operation of supply chains in the pharmaceutical industry of Andhra Pradesh and Telangana. The goal is to contribute to the strategic improvement of supply chain frameworks in these regions.

1.4 Research Gaps

Despite the fact that supply chain management has been the subject of a significant amount of study, there is a dearth of studies that specifically investigate the relationships between supply chain orientation, integration, performance, and agility in the pharmaceutical business, particularly in the rising markets of India.

This gap presents a unique opportunity to study these processes in an area where the pharmaceutical business has a significant economic influence but faces special challenges, such as diverse legislation and fragmented markets.

In the course of our examination of the relevant literature, we discovered the following research gaps:

- The primary objective of the investigation ought to be the construction and empirical verification of a prognostic model for SCO. Possible areas of research include investigating the factors that enable and the results that arise from the implementation of SCO, as discussed by Omar et al. (2012).
- Additional investigation is required to ascertain the relationship and interaction between SCO (Supply Chain Orientation) and inter-organizational Supply Chain Management (SCM) in order to understand their impact on company performance. More research is required in order to incorporate more aspects that have the potential to influence the outcomes of supply chain orientation (SCO) on the overall performance of a company because it is vital to incorporate these extra factors (Patel et al., 2013).
- An inquiry into the management of suppliers and the effectiveness of the supply chain of goods and services is required in order to fulfil the requirements of the Supply Chain Orientation (SCO) concept, which is a relatively new development (Schulze-Ehlers et al., 2014). There is the possibility of doing research into the impact of behavioural

antecedents on the integration of supply chain partners, as well as the ways in which such integration influences supply chain performance (S. Tsanos et al., 2014).

- The majority of the investigations have been conducted in wealthy nations. Few studies have examined the impact of the Indian manufacturer's Supply Chain Operations (SCO) on SCP (supply chain performance). It is necessary to construct a unified SCO-SCP structure.

The majority of studies on supply chain management are predominantly qualitative, with limited emphasis on empirical, data-driven research. While qualitative methods are useful for obtaining detailed insights into narratives and situations, they sometimes lack the statistical data required to justify theoretical frameworks. Thus, integrating data-driven research can enhance and reinforce existing techniques. This thesis seeks to address this deficiency by employing a quantitative methodology to extract fresh insights from primary data. This technique not only enhances the academic argument with useful empirical information but also increases the extent to which the findings can be applied to a wider variety of contexts, potentially leading to more robust and practical conclusions.

1.5 Research Questions

1. How significant is the impact of Supply Chain Orientation (SCO) on Supply Chain Performance (SCP)?

- The purpose of this inquiry is to quantify and elucidate the specific effects that supply chain Orientation (SCO) methods have on the effectiveness and outcomes of supply chain operations.

2. To what extent does supply chain integration (SCI) have an impact on the relationship between supply chain orientation (SCO) and supply chain performance (SCP)?

- This question aims to investigate the intermediate effects of SCI, examining whether and how it enhances or modifies the impact of SCO on SCP.
- 3. How does the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP) come about as a result of the influence of Supply Chain Agility (SCA)?**
- This question aims to comprehend the role of SCA in influencing the interaction between SCO and SCP, potentially providing insights into how agility might modify or strengthen this relationship.
- 4. What kind of an overall impact does the integration of the supply chain and the increase in its agility have on the relationship between the supply chain's orientation and its performance?**
- This question investigates the collective influence of Supply Chain Integration (SCI) and Supply Chain Agility (SCA) on the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP). The goal is to comprehend the interaction between these two components and their impact on the overall effectiveness of the supply chain.

1.6 Research Objectives

- 1. Analyse the impact of SCO (Supply Chain Orientation) on Supply Chain Performance (SCP):**
- Objective: To quantitatively analyse the influence of Supply Chain Orientation (SCO) on the performance parameters of supply chain operations, such as efficiency and output quality.
- 2. Examine the extent to which Supply Chain Integration (SCI) acts as a mediator between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP):**

- Objective: This study's purpose is to investigate the impact that supply chain orientation (SCO) has on supply chain performance (SCP) within the context of supply chain management via the intermediary function of supply chain integration (SCI). The objective is to ascertain the manners in which SCI mediates or facilitates the effects of SCO on SCP in order to identify potential constraints or leverage points in integrated supply chain processes.

3. Evaluate the influence of Supply Chain Agility, SCA on the correlation between Supply Chain Operations, SCO and Supply Chain Performance, SCP:

- Objective: The purpose of this research is to investigate the influence that Supply Chain Agility (SCA) has on the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP), with a specific emphasis on the manner in which agility improves the ability to change and react in the context of supply chain dynamics.

4. Examine the combined impact of supply chain agility (SCA) and supply chain integration (SCI) on the relationship between supply chain orientation (SCO) and supply chain performance (SCP):

- Objective: The goal is to examine how the combined influence of SCI (Supply Chain Integration) and SCA (Supply Chain Agility) affects SCP (Supply Chain Performance) when facilitated by SCO (Supply Chain Orchestration). The idea is to understand how the integration and agility of supply chains collectively impact their effectiveness and performance.

1.7 Significance of the Study

In the bulk pharmaceuticals business of Andhra Pradesh and Telangana, This study seeks to examine the impact of supply chain integration and agility on the structure and

operations of supply chains. Comprehending these correlations will yield perceptive consequences for pharmaceutical supply chain tactics and enhance the wider scholarly conversation on supply chain administration in developing economies.

Understanding how Supply Chain Orientation (SCO), Supply Chain Integration (SCI), and Supply Chain Agility (SCA) contribute to improved SCP (Supply Chain Performance) will fill a knowledge gap in academic research and provide industry executives with useful advice on how to optimise their supply chain operations in the face of intensifying global competition and complex market demands. This study aims to provide valuable contributions to both academic understanding and practical implementation Within the realm of supply chain management, particularly emphasising the vital pharmaceutical industry.

1.8 Operational Definitions of Constructs

This section outlines the precise definitions of important concepts used in the study. The objective is to have a clearly defined and uniform structure for analysis. The constructs encompassed in this context are Supply Chain Orientation (SCO), Supply Chain Agility (SCA), Supply Chain Integration (SCI), and Supply Chain Performance (SCP). The study's parameters are aligned with known academic definitions by precisely defining each term and referencing current literature. This methodology guarantees that the theoretical foundation of the study is robust, facilitating a comprehensive examination of the interaction between these ideas in the realm of supply chain management. Let us examine the following definitions to acquire a more thorough comprehension of the constructs utilised in this study:

Supply Chain Orientation (SCO):

Supply Chain Orientation (SCO) refers to the extent to which members of a supply chain regard it as a cohesive unit and prioritise synchronised efforts to fulfil the supply chain's needs (Tucker, 2011).

Supply Chain Integration (SCI):

Supply Chain Integration (SCI) is defined as the level of strategic cooperation and seamless information flow across the supply chain, which entails aligning and integrating business operations across various companies to deliver value to customers (Huang et al., 2005).

Supply Chain Agility (SCA):

Supply chain agility refers to the capacity of a supply chain to quickly and efficiently adjust to fluctuations in demand and market circumstances, which is made possible by the network's flexibility and rapid flow of information (Gligor & Holcomb, 2012).

Supply Chain Performance (SCP):

Supply Chain Performance is the evaluation of how effectively a supply chain meets its goals in terms of cost, quality, flexibility, and delivery by generating customer value and attaining operational efficiency.

1.9 Structure of the Thesis

Chapter 1 – Introduction

The thesis introduction establishes the context for analysing the supply chain dynamics of the pharmaceutical business in Andhra Pradesh and Telangana. It highlights the importance of the pharmaceutical industry in India, which is well-known for its large-scale manufacturing of generic medications and its crucial position in international markets. The introduction outlines the difficulties faced by the industry due to globalisation and strict regulatory frameworks, as well as the important role played by specialised industrial parks in Hyderabad in promoting innovation and increasing production capabilities. The chapter provides an overview of the study topic, aims, and questions, highlighting the need to improve supply chain

procedures to increase global competitiveness and operational efficiencies in the local pharmaceutical industry.

In the later section of the introduction, the thesis provides a comprehensive examination of the precise meanings of important concepts such as Supply Chain Orientation (SCO), Supply Chain Integration (SCI), and Supply Chain Agility (SCA). This text provides a detailed explanation of the research gaps that have been identified in previous literature. It also highlights the importance of the study in addressing and closing these gaps. The introduction finishes by outlining the thesis's structure, which serves as a roadmap for the next chapters. This establishes a distinct analytical framework for examining the impact of strategic supply chain efforts on overall performance in a heavily regulated organisation.

Chapter 2 – Review of Literature

Chapter 2 presents a methodical examination of relevant literature on supply chain management in the pharmaceutical business. It specifically explores the association between supply chain orientation, performance, integration, and agility. The literature review systematically conducts searches on databases such as Web of Science and Scopus, employing specific keywords to collect pertinent studies. This chapter examines the development of important concepts and their connections as discovered in previous studies, emphasising the influence and effects of supply chain integration (SCI) and supply chain agility (SCA) on improving supply chain operations (SCO) and supply chain performance (SCP) in pharmaceutical supply chains.

The analysis highlights a notable lack of research on the empirical examination of these concepts in the specific setting of India's rapidly growing pharmaceutical market, specifically in Andhra Pradesh and Telangana. The chapter ends by formulating theories that are ready to tackle these gaps. The text gives a conceptual model that visually represents the theoretical connections between the constructs, preparing for empirical testing. This thorough assessment

not only supports the theoretical basis of the study but also connects it with contemporary academic discussions, highlighting the importance of integrated and adaptable supply chain systems in improving industry performance.

Chapter 3 – Research Methodology

In the third chapter of the thesis, a quantitative technique is presented. This methodology was utilised to study the interactions between supply chain practices and performance in the pharmaceutical industry. The text provides a detailed overview of the research design, which includes the sampling methods and data collection processes that were utilised in order to obtain information from supply chain executives in the area that was designated. The chapter elucidates the process of constructing and validating the questionnaire, which is specifically devised to assess diverse constructs pertaining to supply chain management.

In addition, the methodology incorporates sophisticated statistical analyses, such as Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modelling (SEM), which are utilised in order to validate the hypotheses that have been provided. This chapter establishes the dependability and validity of the research findings by elucidating the analytical techniques and instruments employed. It offers a sturdy framework for analysing the empirical data gathered throughout the investigation.

Chapter 4– Data Analysis

Chapter 4 provides an in-depth examination of the data gathered from the survey. The analysis commences by examining descriptive statistics of demographic characteristics in order to establish a comprehensive profile of the respondents and verify the sample's representativeness of the target population. The chapter subsequently evaluates the measurement models for each concept examined in the study, confirming their reliability and validity using a range of statistical tests.

With the help of advanced statistical methods, the connections amongst the constructs are studied. The results of the structural equation modelling are analysed in this study. The results shed light on the impact that supply chain direction, integration, and agility have on the overall performance of the supply chain in the pharmaceutical business. This chapter not only confirms the proposed conceptual model but also emphasises important statistical links that provide evidence for the study's hypotheses.

Chapter 5– Discussion and Conclusion

The findings that were gained from the data analysis are incorporated into the closing part, which also covers an examination of the theoretical and managerial implications of the examination. The findings are placed within the context of the current body of knowledge on supply chain management, which is the focus of the study, with a specific emphasis on the pharmaceutical sector in Andhra Pradesh and Telangana. The talk explains how the implementation of supply chain techniques such as integration and agility can improve the performance and competitiveness of companies in this industry.

At the end of the chapter, a brief summary of the contributions that the study has made to both theoretical knowledge and practical application is presented. It also proposes specific tactics that can be used by professionals in the sector. Additionally, it delineates the constraints of the present study and suggests opportunities for future research, promoting greater investigation into the intricacies of supply chain management in developing economies. The concluding section of this thesis guarantees that it presents a thorough analysis of the study's influence, providing significant observations and suggestions for improving supply chain operations in the pharmaceutical sector.

Chapter - II

Review of Literature

2 Review of Literature

2.1 Literature Review Process

i) Search and Selection

The literature review began by employing a systematic method to find pertinent scholarly articles, books, and reports that specifically address different facets of supply chain management. The process entailed a meticulous keyword search that specifically targeted terms that were crucial to the study's focus. These terms include "Supply Chain Orientation," "Holistic Supply Chain Management," "Supply Chain Philosophy," "Supply Chain Integration," "Supply Chain Agility," and "Supply Chain Performance." The collection of these keywords was done meticulously to encompass the wide-ranging topic areas that are relevant to comprehending the intricacies and fluctuations of supply chains in the pharmaceutical sector.

ii) Databases Utilized

The main databases utilised for the search were Web of Science and Scopus. The selection of these platforms was based on their extensive coverage of scholarly literature in various fields, making them a reliable source of top-notch peer-reviewed articles, conference papers, and influential reports. By leveraging these databases, the review ensured access to a wide variety of research outputs, which encompassed current ideas, methodology, and discoveries in the subject of supply chain management.

iii) Systematic Review Approach

After obtaining the original set of documents, a methodical review was carried out. This entailed a meticulous evaluation and integration of the gathered literature to determine the current research patterns, approaches, and results. The objective of this thorough analysis was to analyse and categorise the current state of knowledge, recognise noteworthy empirical and

theoretical advancements, and, importantly, identify areas in the literature that require additional investigation.

iv) Identification of Research Gap and Hypothesis Formation

The systematic review process had a crucial role in identifying a research gap that had not been sufficiently discussed in the existing literature. The study emphasised the necessity for further examination of the influence of Supply Chain Integration (SCI) and Supply Chain Agility (SCA) on Supply Chain Orientation (SCO) and, consequently, Supply Chain Performance (SCP) in the pharmaceutical industry in Andhra Pradesh and Telangana. In light of this recognised requirement, conjectures were developed to direct the empirical investigation, with the objective of offering novel perspectives on the strategic relationships among these crucial supply chain aspects.

Through the process of conducting a systematic literature review, the theoretical foundation of the study was strengthened, and it was ensured that the research was founded on an in-depth analysis of publications that are both current and prominent in the field of supply chain management. The results of this procedure are anticipated to make a substantial contribution to both theoretical understanding and real-world implementation in the supply chain operations of the pharmaceutical business.

2.2 Evolution, Development, and Linkages of Key Constructs

2.2.1 Supply Chain Orientation

According to Adana et al. (2024), supply chain orientation has a favourable effect on the ability to distribute decision-making power, leading to increased resilience through the promotion of agility, collaboration, and situational awareness. Liu and Wei (2022) argue that supply chain disruption orientation (SCDO), which is supported by effective supply chain risk management techniques and advanced analytics capabilities, enhances the resilience of supply chains.

SCO is divided into two groups: i) The strategic SCO consists of three dimensions: Commitment, Organizational Capability, and Top Management Support. Additionally, ii) the structural SCO can be divided into three dimensions. Cooperative Norms, Credibility, and Benevolence.

SCM and superior business performance are not achieved if only a single firm within a supply chain has SCO. These can be achieved only if SCO is implemented across the various firms involved in the supply chain. The SCM philosophy promotes the idea that a company can enhance its supply chain performance by implementing the following strategies:

- Systemic Approach: The supply chain is considered as a whole entity.
- Strategic Affinity: Having a strategic alignment towards collaboration and establishing goals that are in sync with one another are the primary focuses of this endeavour.
- Customer Focus: All endeavours are aimed at generating value for the ultimate customer.

The SCM concept is the foundational basis for the literature on supply chain management. Implementing the SCM philosophy results in Supply Chain Orientation (SCO), which in turn leads to the achievement of SCM and ultimately enhances company performance.

As originally proposed by Mentzer et al. (2001), argues that the supply chain should be viewed as a cohesive unit and emphasises the importance of effectively addressing the needs of the entire chain in a synchronised manner for supply chain orientation (SCO). Therefore, they have developed another compelling justification for SCI as a facilitating factor in conjunction with RV theory. SCI might be regarded as a facilitator of SCO. For enterprises to achieve success in the marketplace, it is essential to integrate with supply chain partners. However, they must also be prepared to adapt to the always-evolving business conditions (Braunscheidel & Suresh, 2009).

Agility is widely recognised as the primary competitive weapon for gaining a competitive edge (Tseng & Lin, 2011). Supply chain Agility (SCA) has become crucial due to the shift in economic competition from individual entities to interconnected value chains (Christopher & Gattorna, 2005; Handfield & Nichols, 2004). According to Gligor and Holcomb (2012) suggestions, Collaboration and coordination among supply chain actors, known as Supply Chain Orientation (SCO), are crucial for effectively adapting to changes in the business environment. Therefore, SCA might be seen as a key enabler of SCO.

The construct of SCO is significant yet lacks extensive research. Most of the studies on SCO have been carried out using the qualitative technique. Therefore, quantitative analysis, particularly the empirical analysis of SCO, is a legitimate research area. The majority of studies connected to the SCO are carried out in wealthy nations. Consequently, the exploration of SCO studies in poor countries is still lacking. In addition, researchers have not yet investigated the output of the SCO and the characteristics that facilitate it. Therefore, there is a significant opportunity to analyse the outcomes (SCP) and variables (SCI and SCA) that intervene or affect SCO.

2.2.2 Supply Chain Performance

Supply chain performance, or SCP for short, is heavily influenced by supply chain integration, or SCI, which is a major area of study in supply chain management today. SCI (supply chain integration) refers to the process of aligning and connecting the various processes and systems inside and between organisations. This enables the seamless and effective movement of information, goods, and finances throughout the supply chain. Recent studies have shown that companies with higher degrees of supply chain integration (SCI) tend to demonstrate superior supply chain performance (SCP). This is defined by improved responsiveness, agility, and cost-efficiency, as well as stronger collaborations and collaborative innovation (Flynn et al., 2010).

In addition, the implementation of digital technology has been a significant contributor to the development of SCI, as demonstrated by research on the impact that blockchain technology has had on SCP technologies. Due to the fact that it is able to give transparency, traceability, and confidence, blockchain technology has been recognised as having the potential to enhance supply chain integration (SCI) among supply chain participants. This, in turn, leads to improvements in supply chain performance (SCP) (Hald & Kinra, 2019). Furthermore, incorporating big data analytics into supply chain processes can enable firms to make decisions based on data, hence improving supply chain performance through enhanced resilience and innovation capabilities (Wamba et al., 2017).

SCP is the prevailing exogenous variable in the field of operations management. In recent decades, there has been a substantial body of literature focused on performance management. These studies focused on measuring company performance (Marr & Schiuma, 2003) or defining performance measures (Neely et al., 1997).

Researchers have extended the performance management concept to different domains, including lean manufacturing, warehouse and distribution management and supply chain management. The main reason for opting for any performance management is for quantifying processes (Neely et al., 1997).

According to Drucker (2013), “If you can’t measure anything, you can’t manage it”. So, in general, performance management is directed to the quantification of efficiency and effectiveness of processes and systems. Cost is utilised as a metric to quantify several performance indicators, such as inventory carrying cost and holding expenses. Measures of customer-based performance include things like lead time, stock-out probability, customisations, and fill rate.

But measuring SCP is a difficult and complicated task. Some of the issues in managing SCP as described by Brewer and Speh (2000) are as follows:

Overcoming mistrust: Supply chain management (SCM) actors are commonly seen as having a primary focus on their own profitability. Hence, trust is necessary to provide equal access to information. This is exemplified by the kindness and credibility component of the SCO.

Lack of understanding: Supply chain managers often prioritise internal performance and overlook the importance of addressing the multi-organizational nature of metrics. The cooperative norm feature of SCO addresses this issue.

Lack of control: Supply chain managers typically depend on indicators that are within their jurisdiction. Measuring inter-organizational performance indicators is quite difficult. The commitment and organisational compatibility components of SCO address this issue.

Different goals and objectives: Supply Chain Management (SCM) is a complex interconnection of several organisations. Every company has distinct objectives, which necessitate the use of varying metrics. The organisational compatibility feature of SCO addresses this issue.

Difficulty in connecting measures to customer value: Managing the connection to stakeholder value is becoming increasingly challenging. Customers' behaviours are evolving. The customer value created by the supply chain management (SCM) philosophy of supply chain orientation (SCO) tackles this problem.

Deciding where to begin: Implementing the comprehensive method to capture system performance is highly challenging. This is because collaborating firms lack a completely secure and impenetrable separation, namely in terms of the system aspect of SCO.

Lack of standardised performance measures: There is limited consensus on performance measures pertaining to the units to be used, organisation, format, and other related aspects.

In the context of SCP, under-determination occurs when variables that are employed as a proxy to quantify SCP might not fully capture all characteristics of the output (Beamon,

1999). The selection of appropriate SCP measures is decisive because supply chain managers need to evaluate their supply chains as a whole rather than on an individual basis.

As the level of integration with the supply chain partner increases, information asymmetry issues get reduced (Leuschner et al., 2013; Prajogo & Olhager, 2012; Sahin & Robinson, 2002) . Thus, there is a strong chance that SCI is a facilitator for SCP.

2.2.3 Supply Chain Integration

SCI (supply chain integration) is widely recognised as a crucial element in enhancing supply chain performance (SCP). The synergy generated by SCI goes beyond simple coordination of activities, forming a complex network of interrelated processes that enhance the supply chain's ability to respond effectively and its overall strength. Tiwari (2021) conducted a systematic research that explores the connection between supply chain integration (SCI) and Industry 4.0. The research highlights the profound and transformative impact of digitisation on supply chain processes and performance. Industry 4.0 technologies facilitate the integration of many components, allowing for seamless operation and cooperation throughout the supply chain. This eventually enhances the overall performance of the organisation.

Khanuja and Jain (2020) offer a detailed examination of the several factors that facilitate and define supply chain integration (SCI), emphasising how these components enhance supply chain performance (SCP). Their research identifies internal integration, supplier integration, and customer integration as crucial aspects, highlighting the importance of a well linked supply chain in attaining operational excellence. These contributions highlight the clear connection between successful SCI and improved performance results, such as increased efficiency, responsiveness, and creativity.

Integration between organisations facilitates the exchange of information between supply chain partners, allowing them to quickly respond to disruptions by sharing information and coordinating their actions. Corporate integration promotes the sharing of risk information

among various divisions within the firm (Liu & Lee, 2018). The typical way of managing a supply chain is by adoption of new techniques (ex: JIT, Lean and ERP) (Gunasekaran et al., 2004). SCI refers to the strategic integration of processes within an organisation as well as between different organisations (Flynn et al., 2010).

In order to promote the smooth and effective movement of goods and services, information, and financial resources from their point of origin to their final destination, the fundamental objective of supply chain integration (SCI) is to facilitate as much of this movement as possible (Frohlich & Westbrook, 2001; Leuschner et al., 2013; Wong et al., 2011).

The absence of a supply chain integration (SCI) has significant ramifications on the scientific community, particularly due to the low rate of inventory turnover, procurement delays, inappropriate forecasts, degradation of quality, etc., resulting in losses for individual firms and supply chain member firms. This will ultimately destroy consumer satisfaction.

SCI consists of two primary dimensions: (1) External integration and (2) Internal integration (Flynn et al., 2010; Wong et al., 2011).

In the context of manufacturing, internal integration refers to the extent to which a company adapts its own organisational goals and processes in order to align them with the expectations of its customers (Kahn & Mentzer, 1996). Internal integration fosters collaboration across different departments within the organisation (Wong et al., 2011). Efforts to eliminate internal operational hurdles and facilitate the smooth flow of resources between different departments result in internal integration inside the organisation (Gunasekaran et al., 2004).

The lack of internal integration and competing objectives of the specific departments concerned leads to duplicity of work and wastage of resources. This will ultimately affect the

overall performance of the supply chain (Pagell, 2004). Internal integration helps in reducing information asymmetry (Narasimhan & Kim, 2002).

External integration refers to the incorporation of operations and processes with suppliers and customers. There are several tactics and benefits to integrating with the supplier. These activities encompass the exchange of knowledge, cooperative strategising, collective prediction, and shared manufacturing (Ragatz et al., 2002).

Customer integration enables the focus organisation to enhance customer service, seize market possibilities, and promptly address customer needs (Swink & Song, 2007). According to Yu et al. (2013), Internal integration facilitates outward integration, which in turn impacts customer performance and financial performance. The essence of external integration is to establish and sustain an interactive connection with suppliers and consumers. Both internal integration and external integration are crucial for improving supply chain performance (SCP).

2.2.4 Supply Chain Agility:

The concept of agility was initially developed in the context of manufacturing systems, but it has since expanded to include organisational contexts as well as the full supply chain because of its expanding scope. Speed, flexibility, competence, and reactivity are some of the qualities that define agility in the supply chain. Additional dimensions include agility in the supply chain. The requirement for a mix of intricate resources poses a challenge in terms of replication, hence establishing a sustainable competitive advantage (Morita et al., 2024).

Ongoing research involves examining and analysing the elements of SCA, suggesting realistic definitions and frameworks, and recommending areas for future study, such as the incorporation of agility and its cost-benefit trade-offs. This study is currently being conducted with the intention of enhancing the conceptual understanding of SCA (supply chain agility) and its impact on the performance of supply chains. The ultimate goal is to offer practical and

valuable insights to supply chain managers operating in the current dynamic and unpredictable business landscape (Patel & Sambasivan, 2022).

In a broad sense, the research on supply chain agility (SCA) can be divided into two primary areas: the first area has an emphasis on the responsiveness and rapidity of supply networks, while the second area places an emphasis on the awareness and adaptation to change. The SCA research on change awareness emphasises the significance of information in establishing a connection with supply chain participants (Dove, 2005; Prajogo & Olhager, 2012; Swafford et al., 2008; Yang, 2014).

According to Gligor and Holcomb (2012), the supply chain agility (SCA) of a company is described as "the capability of a company to rapidly adjust strategies and operations within its supply chain in order to react or adapt to changes, threats or opportunities in its environment."

A conceptual framework for an agile supply chain was presented by Agarwal et al. (2007). This paradigm incorporates IT-enabled virtual integration, collaborative planning, and strategic management of human resources. Chiang et al. (2012), argue that flexibility is a necessary condition for achieving agility. Flexibility and agility are closely intertwined concepts. Swafford et al. (2008) explored the distinction between agility and flexibility and determined that agility pertains to external factors, while flexibility refers to internal and operational capacity. On the other hand, Braunscheidel and Suresh (2009) state that their definition of agility includes both internal and external capabilities.

The majority of research on SCA primarily examines Western/developed nations. Research on the supply chain agility (SCA) of developing economies like India is lacking. This is a matter of concern.

Furthermore, no research has been done on the impact of the manufacturer's supply chain agility (SCA) on supply chain performance (SCP) and supply chain orientation (SCO).

2.3 Theoretical Foundation

Three key frameworks serve as the basis for this study's theoretical foundation. These frameworks are the Relational View (RV), the Resource-Based View (RBV), and the Dynamic Capabilities (DC) framework. With the help of these frameworks, one can acquire a full grasp of the strategic significance of supply chain orientation, integration, and agility inside the pharmaceutical business.

Resource-Based View (RBV)

Companies that are competent to obtain resources and competencies that cannot be replicated by others are valuable and cannot be replicated by others will have an advantage over their companies that are in direct competition with them (Barney, 1991; Rumelt, 1984; Wernerfelt, 1984).

Dynamic Capabilities (DC)

The capability of the company to incorporate, create, and adapt both internal and external capabilities in order to deal with rapidly changing events or situations.

Relational View (RV)

The theory of resource-based view (RV) suggests that firms can achieve competitive advantages that go beyond their own boundaries. It has been demonstrated by researchers that improved performance may be accomplished through the utilisation of relation-specific investments and the collaborative efforts of other business partners (DYER, 1996).

Application to Supply Chain Performance (SCP): A comprehensive knowledge of the ways in which supply chain orientation (SCO), supply chain integration (SCI), and supply chain agility (SCA) collectively effect supply chain performance (SCP) is the goal of this study, which tries to achieve this by combining various theoretical viewpoints. Whereas the DC framework places an emphasis on the necessity of adaptation, the RV emphasises the value of

strong inter-organizational relationships. The RBV emphasises the significance of internal capabilities. For the purpose of analysing and improving the supply chain strategies of pharmaceutical businesses, these frameworks, when taken together, provide a significant foundation.

Propositions and Hypotheses: Several statements can be produced to describe the links between key concepts, and these propositions can be developed based on the theoretical underpinnings that have been established. It has been suggested, for instance, that a strong supply chain orientation will have a favourable affect on supply chain performance by driving improved integration and efficiency. It is also possible to hypothesise that the integration and agility of supply chains play a mediating function in strengthening the overall impact that supply chain orientation has on performance results. A road map for empirical testing and validation in this study is provided by these propositions, which are based on previously published research and offer a foundation for the investigation.

2.4 Hypotheses Specification

Building upon the integrated framework of the resource-based view, dynamic capabilities framework, and relational view, the following hypotheses aim to empirically test the theoretical propositions. These hypotheses are designed to explore the dynamic interactions between supply chain integration (SCI), supply chain orientation (SCO), supply chain performance (SCP), and supply chain agility (SCA), thus providing insights into their collective impact on supply chain management effectiveness.

Supply Chain Orientation (SCO) and Supply Chain Performance (SCP):

The resource-based view (RBV) emphasizes the importance of utilizing internal skills that are distinctive and challenging to duplicate. supply chain orientation (SCO) is a strategic resource that improves operational efficiencies and agility, leading to better supply chain

performance. SCO represents the company's dedication to efficiently managing interconnected activities in the supply chain, resulting in enhanced responsiveness and customer satisfaction.

H1: Supply Chain Orientation (SCO) has a significant influence on Supply Chain Performance (SCP).

Supply Chain Orientation (SCO) and Supply Chain Integration (SCI):

The relational view suggests that effective supply chain orientation fosters better integration across the supply chain, enhancing collaborative efforts. This hypothesis explores the influence of SCO on the integration of supply chain activities.

H2: Supply Chain Orientation (SCO) has a significant influence on Supply Chain Integration (SCI).

Supply Chain Integration (SCI) and Supply Chain Performance (SCP):

Supported by both the relational view and the resource-based view, this hypothesis asserts that integration acts as a strategic resource, improving overall supply chain efficiency and performance.

H3: Supply Chain Integration (SCI) has a significant influence on Supply Chain Performance (SCP).

Supply Chain Integration (SCI), Supply Chain Orientation (SCO) and Supply Chain Performance (SCP):

Drawing on the dynamic capabilities framework, this hypothesis suggests that SCI dynamically adjusts SCO's impact on SCP, effectively translating strategic orientation into performance outcomes.

H4: Supply Chain Integration (SCI) mediates the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP).

Supply Chain Orientation (SCO) and Supply Chain Agility (SCA):

Under the dynamic capabilities framework, SCO is seen as fostering agility, a capability crucial for adapting to market fluctuations and enhancing responsiveness.

H5: Supply Chain Orientation (SCO) has a significant influence on Supply Chain Agility (SCA).

Supply Chain Agility (SCA) and Supply Chain Performance (SCP):

This hypothesis leverages the dynamic capabilities framework, proposing that agility enhances performance by enabling the firm to respond swiftly to environmental changes.

H6: Supply Chain Agility (SCA) has a significant influence on Supply Chain Performance (SCP).

Supply Chain Agility (SCA), Supply Chain Orientation (SCO) and Supply Chain Performance (SCP):

Here, SCA is conceptualised as a dynamic capability that not only enhances performance but also serves as a crucial intermediary, optimising the effectiveness of SCO in dynamic markets.

H7: Supply Chain Agility (SCA) mediates the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP).

Supply Chain Integration (SCI), Supply Chain Agility (SCA), Supply Chain Orientation (SCO), and Supply Chain Performance (SCP):

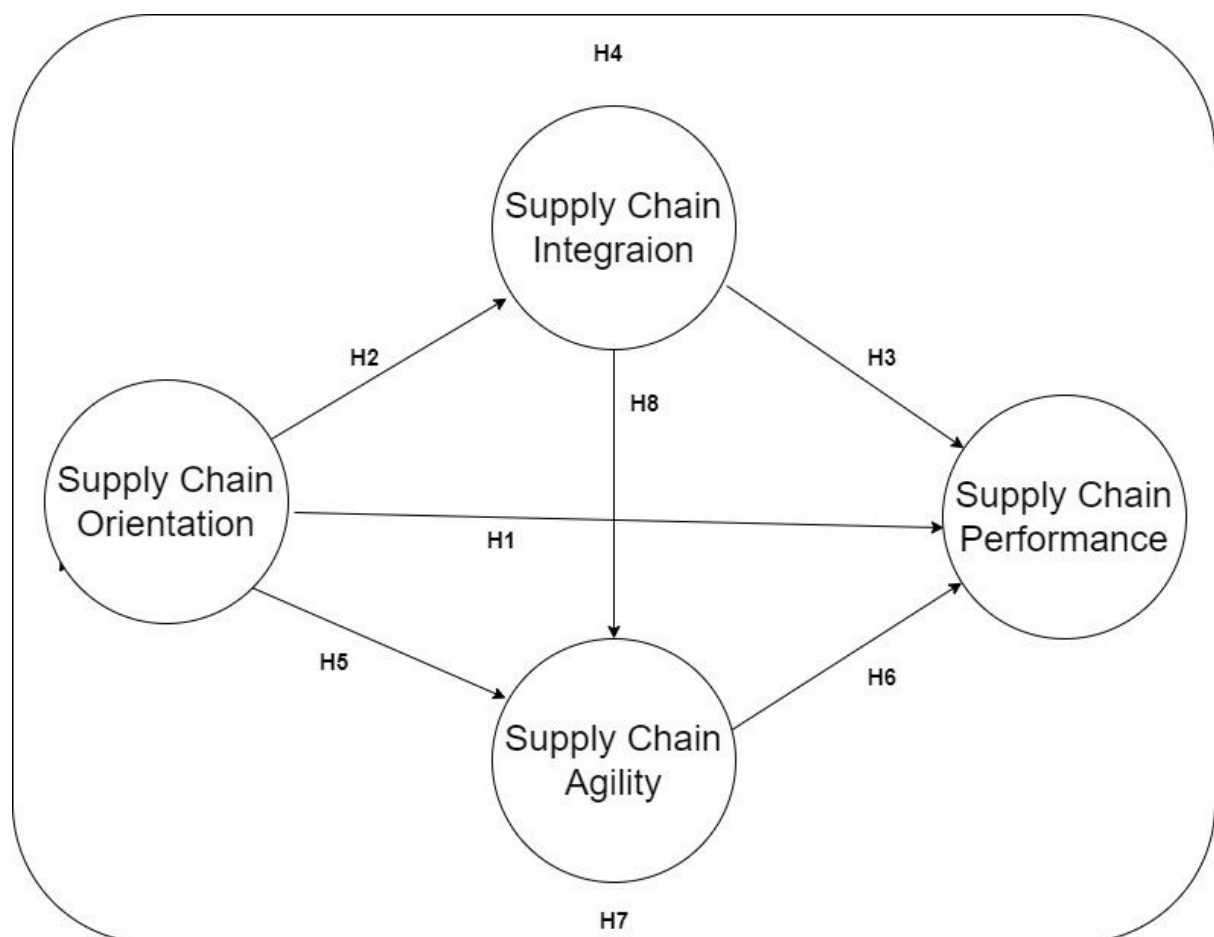
Combining insights from the dynamic capabilities framework and the relational view, this hypothesis posits that SCI and SCA together enhance the transformative impact of SCO on SCP, highlighting the synergy between integration and agility.

H8: Both Supply Chain Integration (SCI) and Supply Chain Agility (SCA) mediate the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP).

2.5 Conceptual Model

The conceptual model is defined, establishing the nomological network that outlines the relationships between supply chain orientation (SCO), supply chain integration (SCI), supply chain agility (SCA), and supply chain performance (SCP). This network clarifies the cause-and-effect relationships and theoretical assumptions that support the study hypothesis. The structure will provide a framework for the empirical investigation, outlining the study's method for examining how these factors interact to impact the effectiveness and resilience of supply chain operations.

Figure 3
Conceptual Model



Chapter - III

Research Methodology

3 Research Methodology

3.1 Research Design

A summary of research design is provided in Table 3-1. This study uses a quantitative and cross-sectional design to assess managerial practices across various levels (high, middle, low) within bulk drug companies. Data was collected through an online questionnaire aimed at managers in different tiers of the organisational hierarchy. The sample size for this study was determined to be a minimum of 200, following the recommendations provided by Kline (2023). However, the study ultimately compiled a sample of 237 managers using purposive sampling to ensure the inclusion of diverse management levels. Statistical analysis was carried out using Descriptive Analysis, EFA (Exploratory Factor Analysis), CFA (Confirmatory Factor Analysis), SEM (Structural Equation Modelling), and Mediation Analysis. These analyses were carried out using IBM SPSS V28, SPSS Amos 26, and the Process Macro software.

Table 3-1
Research Design

Quantitative and Cross-Sectional	
Data collection method	Online questionnaire
Sampling Technique	Purposive Sampling
Sample Inclusion Criteria	Managers of various levels (High, Middle, Low) of bulk drug companies
Sample size criteria	Minimum 200 observations (Kline, 2023)
Sample Size	237
Statistical Techniques	Descriptive, EFA, CFA, SEM, and Mediation Analysis
Statistics software	IBM SPSS V28, SPSS Amos 26, and Process Macro

3.1.1 Questionnaire Design

This study's objective is to analyse the psychological elements of supply chain management inside pharmaceutical firms based on the findings of the previous research. In order to achieve this objective, a questionnaire has been designed to gather primary data regarding these perceptions. A web-based questionnaire was created to gather initial data from

the participants that is relevant to the research goals. The survey used in this study included demographic questions and factors relevant to hypothesis testing. Thus, we have utilised established scales from prior research to measure the constructs. The scale instruments included in the survey questionnaire are available in Annexure 1.

3.1.2 Measures of Constructs

This section provides a detailed explanation of the operational measures that were utilised in our research to evaluate the primary constructs. The selection of scales is based on the validity and reliability of many scales that have been established via previous research. The quantification of the theoretical constructs that form the basis of our research and the verification of the reliability of our empirical findings are both fundamentally dependent on these measures. An overview of each construct is presented in Table 3-2. This overview includes the scale that was utilised, the authors who were responsible for developing these scales, and the number of items that were included in each scale. Each item is measured using the 5- point Likert scale (Strongly Agree -5, Agree-4, Neutral-3, Disagree-2, Strongly Disagree-1)

A summary of the scales that were chosen for our research is provided in the following table:

Table 3-2
Summary of Measures of Constructs

Scale	Author	No. of Items
Supply Chain Orientation	Min et al. (2007)	19
Supply Chain Integration	Huang et al. (2014)	5
Supply Chain Agility	Gligor et al. (2013)	5
Supply Chain Performance	Li et al. (2009); Stank et al. (2001)	5

Each of the following supply chain constructs—supply chain orientation, supply chain integration, supply chain agility, and supply chain performance—are evaluated and evaluated. For the purpose of putting each of these ideas into action, we make use of scales that are derived

from the most significant research that has been conducted in the field of supply chain management.

3.1.3 Sampling Process

The sampling process for this study was carefully designed to accurately represent the bulk drug manufacturing sector in India, specifically focusing on the states of Andhra Pradesh and Telangana. We employed a purposive sampling technique, which is particularly useful in targeting a specific group of people that best meet the study criteria. The total population from which the sample was drawn included over 3,000 bulk drug companies across India, with 423 of these located in Andhra Pradesh and Telangana. The sampling criteria were focused on managers at various levels within these companies, aiming to gather diverse insights from different managerial perspectives. Despite the large number of potential companies, the final sample size was obtained from 237 managers. This size was deemed sufficient to achieve statistical significance while allowing for comprehensive data analysis within the targeted regional context of the bulk drug industry.

3.1.4 Data Collection

To acquire the requisite data for this examination, an online survey was conducted among managers working in bulk medication companies in the states of Andhra Pradesh and Telangana. These managers were at various levels of their respective organisations. The goal was to ensure that a full grasp of the dynamics of the supply chain was achieved by targeting managers who were classified as high, medium, and low job positions. Through the use of this stratified technique, it was possible to collect a wide range of insights that reflected the many levels of power and responsibility that existed within the companies.

During the survey, respondents were asked a series of structured questions that were aimed to evaluate key constructs that were associated with supply chain management practices and performance. Participants were told about the intention of the research and provided

assurance that their answers would be kept anonymous in order to raise the likelihood that they would be willing to deliver their responses in a truthful and exact manner. The online format was selected because of its effectiveness and its capacity to reach a geographically scattered sample within the allotted timeframe for data collection. This was done in order to conform to the rigorous timetables that were required by the thesis requirements. After accounting for missing values and data errors, a final sample of 237 respondents was retained for analysis.

3.2 Data Analysis Procedure

Figure 4 outlines a structured and progressive methodology for the data analysis procedure employed in the study.

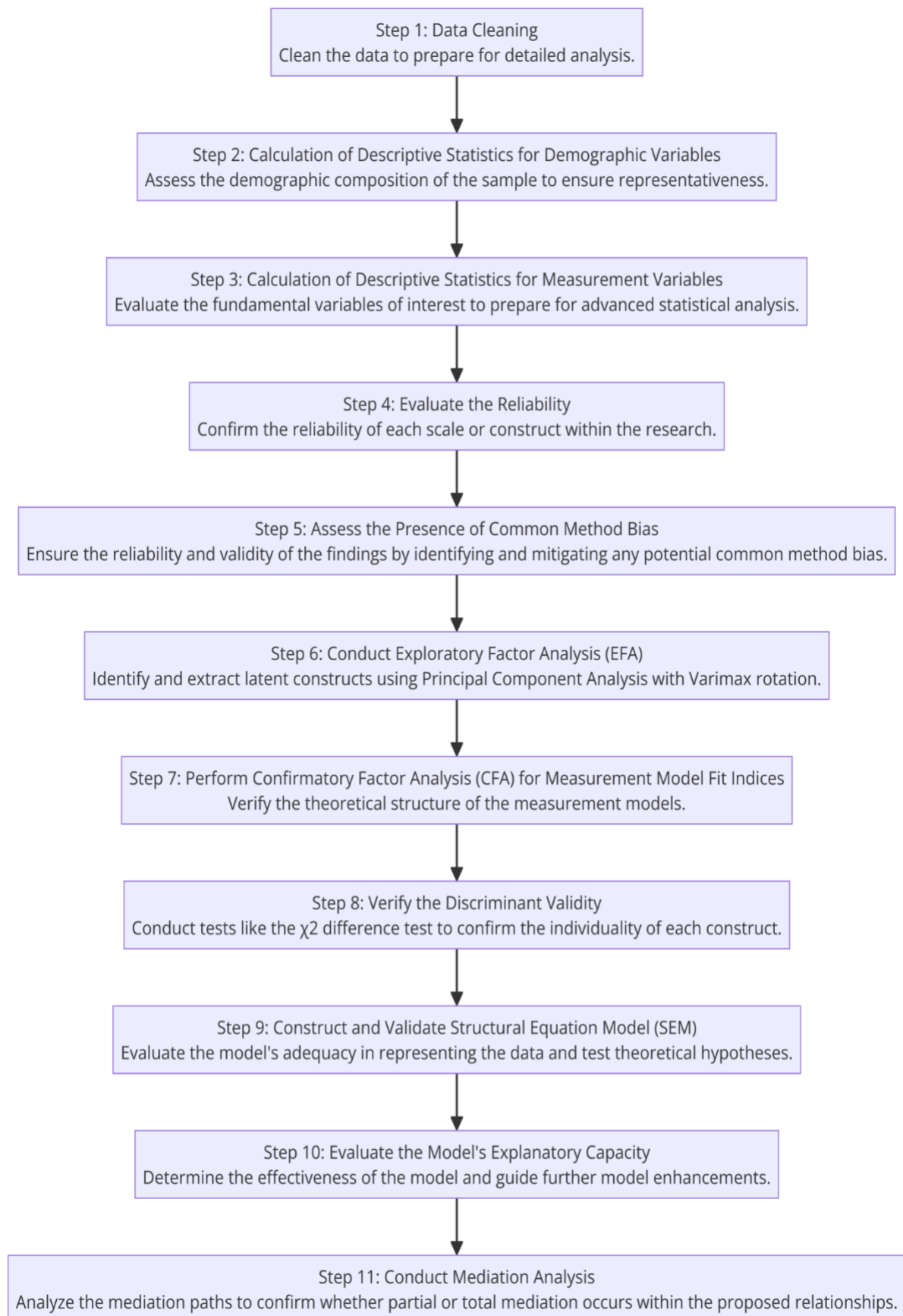
Step 1: Data Cleaning

The initial phase involved cleaning the data to ensure the completeness of the responses, after which the analysis was carried out. In this stage, the data underwent a thorough examination to identify and remove any missing values and outliers. The data investigation indicated that the current data set did not exhibit any non-response bias. The surveys that were not completed or filled out correctly by the respondents were excluded from the analysis. Additionally, any questionnaires with duplicate responses were also discarded to ensure unbiased results.

Step 2: Calculation of Descriptive Statistics for Demographic Variables:

We initiated the study by providing descriptive statistics that outlined the demographic characteristics of the participants, including their age, gender, and employment roles. The second step involves conducting a descriptive analysis by examining frequencies, calculating the mean, and determining the standard deviations. This preliminary step facilitated our comprehension of the composition of the sample and guaranteed its representativeness.

Figure 4
Data Analysis Process



Step 3: Calculation of Descriptive Statistics for Measurement Variables

We categorised the descriptive statistics into certain relevant areas for our investigation. This stage enabled us to conduct a first analysis of the fundamental variables of interest. This step involves conducting a descriptive analysis by examining frequencies, calculating the mean, and determining the standard deviations. This level of detail aids in evaluating the size and extent of the variables, allowing us to adequately prepare for more intricate statistical analyses like factor analysis and SEM(structural equation modelling). In addition, the data is assessed for normality, which is a crucial requirement for examining symmetry using the skewness and kurtosis values. This is because data normality is a necessary assumption for doing multivariate data analysis.

Step 4: Evaluate the Reliability

Reliability tests were performed on each scale or construct utilised in the study to verify the constant accuracy of the measurements. The assessment of the measurement devices' reliability was conducted using Cronbach-alpha coefficients. This tool calculates the Coefficient of Correlation between items within a construct. Finally, the construct-wise reliability is assessed to determine the reliability of each measure, which is derived from known scales.

Step 5: Assess the presence of common method bias.

The Common Method Bias (CMB) test is a crucial component of research methodologies that utilise survey or questionnaire data, especially when both predictors and outcomes are assessed using the same instrument simultaneously. We conducted a thorough examination to identify any potential bias that may have been introduced by the data collection process, therefore assuring that the findings were not biased by the methodology itself.

Our methodology involved using Harman's single-factor test to evaluate and mitigate any possible common method biases, ensuring the reliability of our findings and minimising the influence of measurement errors.

Step 6: Conduct Exploratory Factor Analysis (EFA)

Factor analysis is a useful tool for evaluating the correlation between different items, allowing us to identify and extract underlying factors and dimensions. The extraction relies on the pre-existing theory and conceptual investigation, which aids in defining variables/constructs for the study (Hair et al., 2014). Factor analysis requires certain conditions to be met, which are outlined below.

(a) The minimum required sample size should exceed 100. (ii) The appropriateness of factor analysis is assessed using the Barlett test, which involves estimating the correlation matrix. The test value should be greater than 0.05. (iii) The sampling adequacy is estimated using the Kaiser-Meyer-Olkin measure (KMO), where the value should be equal to or greater than 0.5.

Before conducting factor analysis, we evaluated the suitability of the data by using KMO and Bartlett's test. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity are statistical techniques employed to evaluate the appropriateness of data for factor analysis. Once the prerequisites of factor analysis have been fulfilled, Principal Component Analysis is employed to identify latent constructs using the varimax rotation approach.

Total Variance Explained: We evaluated the extent to which each extracted factor accounted for the observed variance. The acceptance criteria for significant values are based on an Eigenvalue of at least 1, which indicates the minimal amount of variation explained. A threshold of 60% is considered satisfactory. The decision to use Varimax rotation is based on its ability to maximise the total variance of the required loadings in the factor matrix.

The outcomes of EFA solely rely on the data. Consequently, in order to ensure that the factor structure is applicable to a wider population, it is necessary to validate it. To accomplish this, it is acceptable to assess the measurement theory (Hair et al., 2014).

Step 7: Perform Confirmatory Factor Analysis (CFA) for Measurement Model Fit Indices:

The next phase in inferential statistics is to evaluate the framework based on theoretical evidence in order to assess the theoretical parameters. The measuring model's validity is evaluated by Confirmatory Factor Analysis (CFA). The CFA confirms the correctness of the suggested construct. Structural Equation Modelling (SEM) examines the relationships and calculates the interconnections, measurement inaccuracies, and structural links using theoretical foundations. The statistical significance is determined by calculating standardised loadings of 0.5 or above. A value of 0.7 is considered to be ideal. We assessed the degree to which the model accurately represented the data.

Convergent Validity: We took measures to guarantee that each construct was sufficiently assessed by its indicators. Convergent validity is assessed by measuring the Average Variance explained. The proposed measurements have a threshold of 0.5, as stated by (Fornell & Larcker, 1981).

Step 8: Verify the Discriminant Validity

We conducted tests to verify the distinctiveness of the constructs and to guarantee that they were not excessively connected, thus confirming the individuality of each construct. Discriminant validity assesses the uniqueness of the constructs and is determined by taking the square root of the average variance extracted (AVE). The values measured using the χ^2 difference test should be smaller than it (Bagozzi et al., 1991).

Step 9: Construct and Validate Structural Equation Model (SEM)

Indices assessing the degree of accuracy for the structural model: We evaluated the level of agreement between the theoretical model and the empirical data.

Hypothesis Testing: The structural model was employed to assess the postulated theoretical connections between the constructs. The model fit indicators of the Structural model are used to test Hypotheses H1, H2, H3, H4, H5, H6, H7, H8.

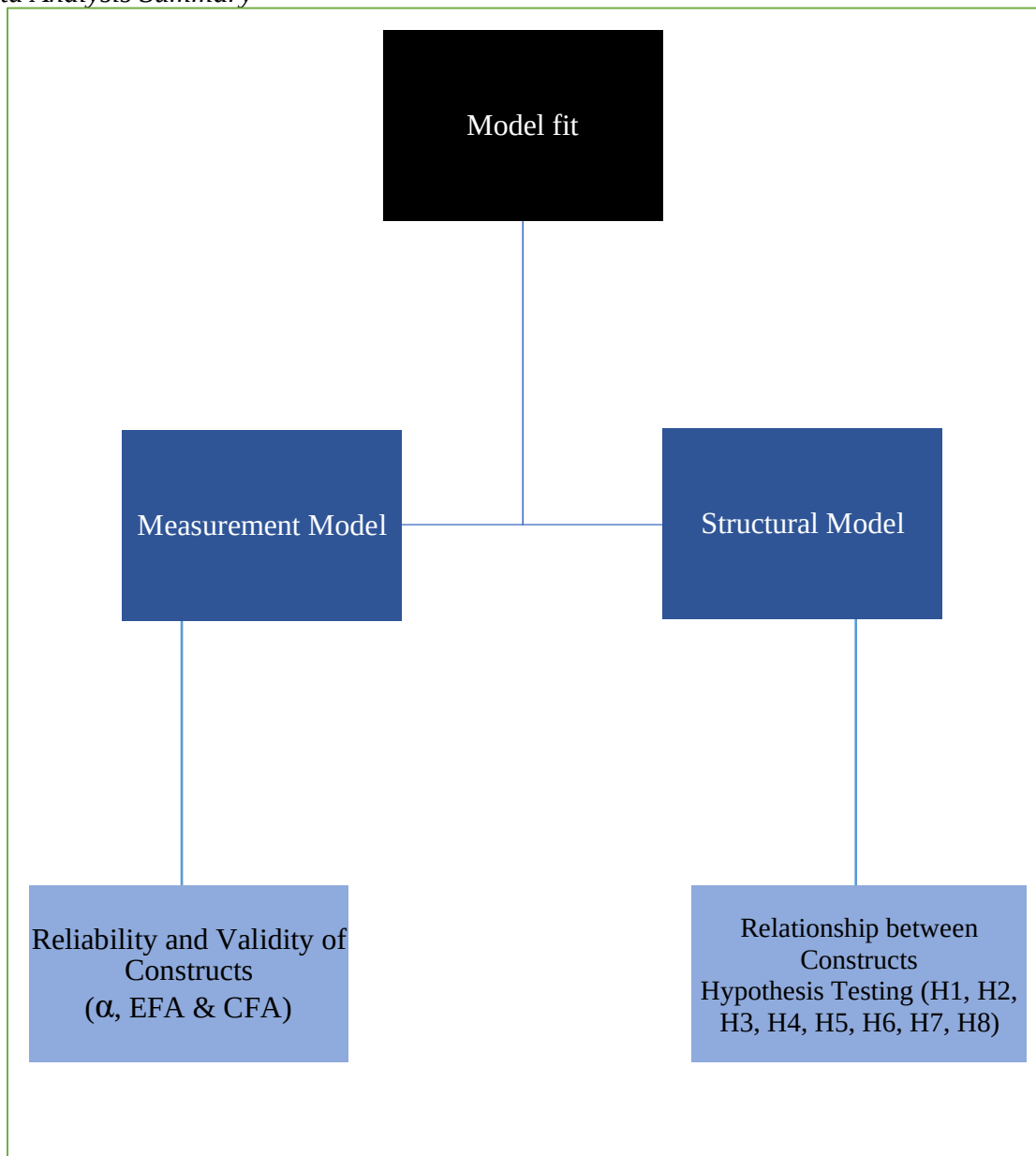
Step 10: Evaluate the Model's Explanatory Capacity

Squared multiple correlations (R^2) are employed in the structural equation model to quantify the extent to which independent variables account for the variance in a dependent variable. R^2 , The coefficient of determination, which is computed as the square of the correlation between observed and predicted values, ranges from 0 to 1. The presence of values that are close to one indicates that the model possesses a significant level of explanatory potential. This statistic is essential for evaluating the efficiency of a model, comparing other models, and directing enhancements in decision-making based on models.

Step 11: Conduct Mediation Analysis

During this stage, the mediation hypotheses were examined by analysing the direct and indirect values derived from the mediation analysis using process macro. The impacts are substantial when the lower and upper limit values do not include zero. Partial mediation occurs when both the direct and indirect relationships between variables are statistically significant. If the single indirect effect is statistically significant, it can be concluded that there is total mediation. If the only direct effect is substantial, it indicates the absence of any mediation effect.

Figure 5
Data Analysis Summary



Note: Source: Created by Author

Chapter - IV

Data Analysis and Interpretation

4 Data Analysis and Interpretation

4.1 Descriptive Statistics of Demographic Variables

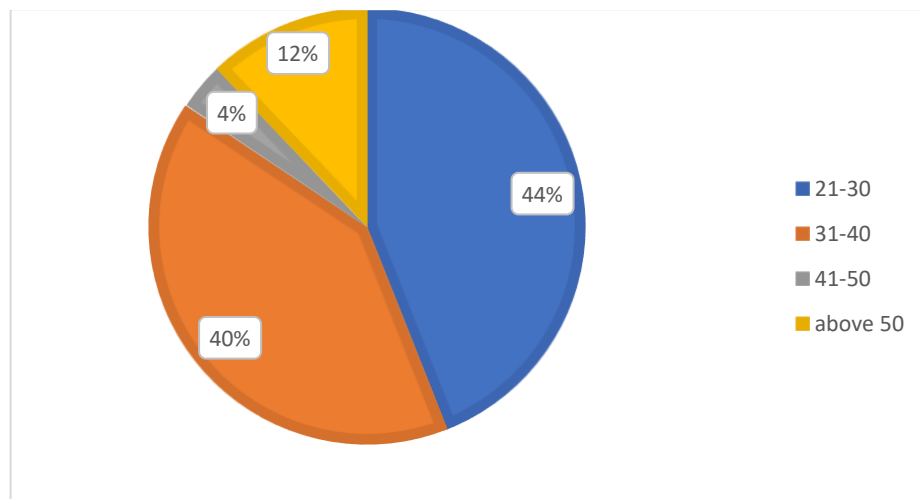
In this section, we conduct a thorough analysis of the demographic variables gathered in our survey, offering valuable insights into the makeup and attributes of our study population. Descriptive statistics provide us with crucial insights into the demographic characteristics of our participants, encompassing variables such as age, gender, Job position, industry experience, educational background, and company ownership type. This analysis enables us to verify that our sample accurately represents the larger population and to identify any significant trends or patterns that could influence the outcomes of the study. Furthermore, it facilitates the verification of the applicability of the findings and aids in formulating conclusions and recommendations that are highly influenced by the particular demographic intricacies of our participants. Let's explore the descriptive statistics of all the demographic variables listed below:

4.1.1 Age

Age is an important variable associated with employee service at work, and it is associated with perceptions of supply chain management. From Table 4-1, Out of 237 respondents, 44% (105) of the employees fall within the age range of 21-30 years, while 40.4% (95) fall within the age range of 31-40 years, 3.38% (8) belongs to the age group of 41-50 years of employees, 12.24% (29) belongs to the age group of above 50 years of employees. The data indicates that most of the employees in the sample fall within the age range of 21 to 30 years, with the next highest group being those aged 31 to 40.

Table 4-1*Distribution of respondents by age*

	Frequency	Age		Cumulative percent
		Percent Valid	Percent	
21-30	105	44.30	44.30	44.30
31-40	95	40.08	40.08	84.39
41-50	8	3.38	3.38	87.76
Above 50	29	12.24	12.24	100.00
Total	237		100.0	

Figure 6*Distribution of respondents by age*

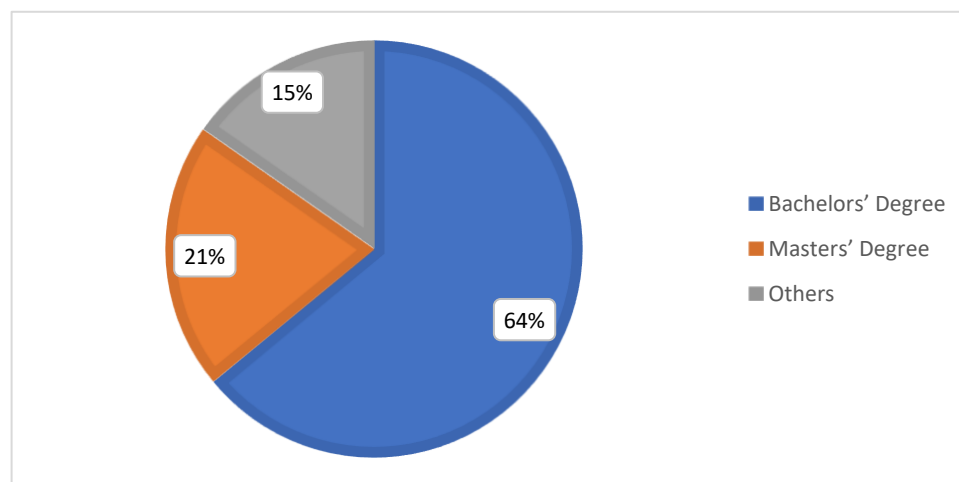
4.1.2 Education Background

Education is related to the employee's acquired knowledge over time and will affect the employee's understanding of the organisation's culture and climate, which is associated with the perceptions of supply chain management. Table 4-2 shows that out of 237 respondents, 64.0% (152) of the sample unit of the employees have a Bachelor's Degree, followed by 20.68% (49) of employees who have a Master's Degree, 15.19% (36) of employees has other qualifications which indicate that most of the employees hold a Bachelor's Degree qualification.

Table 4-2
Distribution of respondents by education

Education				
	Frequency	Percent	Valid Percent	Cumulative Percent
Bachelors' Degree	152	64.14	64.14	64.14
Masters' Degree	49	20.68	20.68	84.81
Others	36	15.19	15.19	100.00
Total	237	100.0	100.0	

Figure 7
Distribution of respondents by education



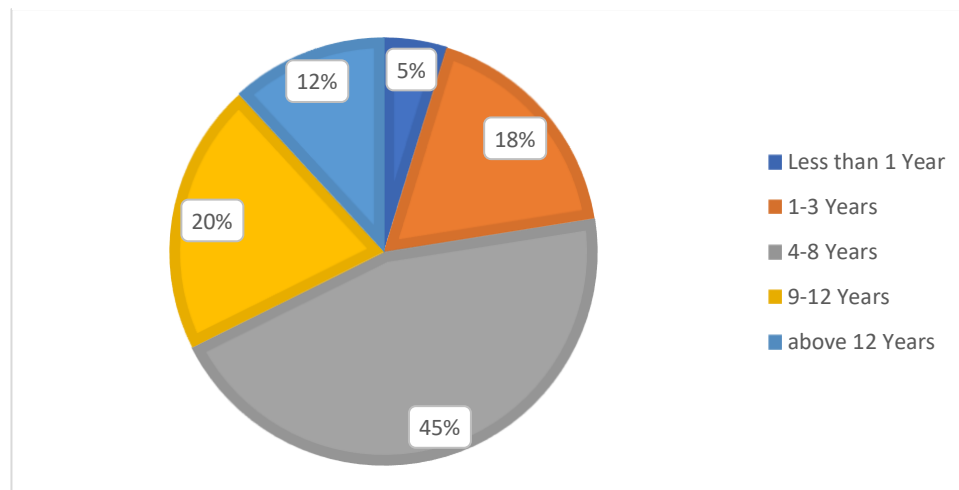
4.1.3 Total Years of Experience in the Pharma Industry

Work experience is closely associated with managers' perception of supply chain management in the organisation. From Table 4-3, it is inferred that out of 237 respondents, 5.06% (12) of the sample unit of employees have less than one year of experience, 18.14% (43) of employees have 1-3 years of experience, 44.73% (106) of employees having 4 - 8 years of experience, 19.83% (47) of employees having above 9 - 12 years of experience, and 12.24 % (29) of employees have above 12 years of experience. It is noted that the majority of the employees have less than 4-8 years of experience in the Pharma industry.

Table 4-3
Distribution of respondents by experience

	Experience			
	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 Year	12	5.06	5.06	5.06
1-3 Years	43	18.14	18.14	23.21
4-8 Years	106	44.73	44.73	67.93
9-12 Years	47	19.83	19.83	87.76
above 12 Years	29	12.24	12.24	100.00
Total	237	100.0	100.0	

Table 4-4
Distribution of respondents by experience



4.2 Descriptive Statistics of Measurement Variables

Descriptive Statistical Analysis offers a statistical overview for each item, encompassing the standard deviation, mean, skewness, and kurtosis. The standard deviation and mean offer insights into the central tendency and dispersion of answers. Skewness and kurtosis values offer insights into the extent of asymmetry and peakedness of distribution in relation to a normal distribution. Understanding the spread of variables is essential for choosing suitable statistical tests and understanding the findings in social sciences research.

These statistics offer an initial examination of the distribution patterns and data normality, which are essential for choosing suitable statistical tests in the subsequent phases of

our investigation. An in-depth comprehension of the implications of the descriptive statistics that are supplied within the context of our research objectives will be provided by the analysis that will be presented in the following section.

4.2.1 Descriptive Statistics of Supply Chain Orientation

The descriptive statistics in Table 4-5 offer a comprehensive summary of the several factors that constitute Supply Chain Orientation (SCO) within the study's framework. The aspects encompassed are Top Management Support (TMS), Credibility (CRD), Benevolence (BNV), Comparative Norms (CN), Organizational Compatibility (OC), and Commitment (CMT). In this analysis, we examine the consequences of the means, standard deviations, skewness, and kurtosis for these items.

Table 4-5
Descriptive Statistics of Supply Chain Orientation

Items	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
TMS1	3.14	1.214	-0.534	0.158	-0.798	0.315
TMS2	3.38	1.061	-0.69	0.158	-0.2	0.315
TMS3	3.37	1.052	-0.713	0.158	-0.173	0.315
TMS4	3.27	1.118	-0.742	0.158	-0.336	0.315
TMS5	3.3	1.111	-0.773	0.158	-0.28	0.315
CRD1	3.24	1.116	-0.625	0.158	-0.401	0.315
CRD2	3.3	1.161	-0.613	0.158	-0.449	0.315
CRD3	3.35	1.146	-0.633	0.158	-0.379	0.315
CRD4	3.34	1.133	-0.64	0.158	-0.333	0.315
BNV1	3.29	1.059	-0.626	0.158	-0.212	0.315
BNV2	3.26	1.081	-0.638	0.158	-0.279	0.315
BNV3	3.31	1.043	-0.654	0.158	-0.102	0.315
CN1	3.35	0.983	-0.588	0.158	-0.333	0.315
CN2	3.32	1.036	-0.573	0.158	-0.416	0.315
CN3	3.3	1.025	-0.509	0.158	-0.439	0.315
OC1	3.3	1.438	-0.562	0.158	-1.094	0.315
OC2	3.31	1.424	-0.574	0.158	-1.05	0.315
CMT1	3.49	1.007	-0.8	0.158	0.111	0.315
CMT2	3.43	1.074	-1.019	0.158	0.207	0.315

Note: TMS-Top Management Support, CRD- Credibility, BNV-Benevolence, CN-

Comparative Norms, OC-Organisational Compatibility, CMT-Commitment.

The mean ratings for the items vary from 3.14 (TMS1) to 3.49 (CMT1), demonstrating that respondents typically had a good perception towards supply chain orientation components. The data indicates that participants generally express agreement or a positive perception towards the components of SCO being evaluated.

The standard deviations range from 0.983 (CN1) to 1.438 (OC1), which suggests that there is a substantial amount of heterogeneity in the responses across various items. The significant diversity in OC1 indicates varying levels of consensus regarding organisational compatibility, which may be attributed to varied organisational contexts or experiences among the respondents.

The skewness and kurtosis of all items indicate a negative skewness, suggesting that the distribution of responses is skewed towards higher scores. The skewness observed in most items is very moderate, with the exception of CMT2, which exhibits a skewness of -1.019. This indicates a notable inclination among respondents to rank commitment in a highly positive manner.

The majority of kurtosis values are negative, suggesting that the distribution of responses is less peaked than the normal distribution for most items. Two exceptions worth mentioning are CMT1 and CMT2, which exhibit positive kurtosis values of 0.111 and 0.207, respectively. This indicates a distribution that is more peaked. This suggests that comments regarding commitment are more likely to be grouped closely around the average compared to other criteria.

The overall high average scores in all SCO components indicate a favourable inclination towards efficient supply chain management methods among the questioned population.

The little skew towards higher scores is promising as it suggests a widespread agreement or recognition of the significance of certain SCO components. Nevertheless, the prevalence of negative kurtosis in most categories indicates that although many respondents acknowledge the significance, there are still diverse experiences or perspectives that could influence the overall performance of the supply chain.

4.2.2 Descriptive Statistics of Supply Chain Integration

Table 4-6 shows the descriptive statistics for five items that assess different aspects of Supply Chain Integration (SCI) in the study. This approach facilitates comprehension of how participants see the incorporation of supply chain operations in their companies. Below is an elaborate analysis of the results:

Table 4-6
Descriptive Statistics of Supply Chain Integration

Items	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
SCI1	3.35	1.065	-0.855	0.158	-0.109	0.315
SCI2	3.44	1.059	-0.984	0.158	0.223	0.315
SCI3	3.35	1.108	-0.85	0.158	-0.231	0.315
SCI4	3.37	1.087	-0.891	0.158	-0.071	0.315
SCI5	3.32	1.077	-0.841	0.158	-0.218	0.315

Note: SCI-Supply Chain Integration.

The mean scores for the SCI items vary from 3.32 to 3.44, demonstrating a predominantly favourable impression of supply chain integration among the respondents. The ratings indicate that participants generally agree or grade their employers' integration efforts positively. However, the average scores are not particularly high, indicating that there is some space for improvement.

The standard deviations exhibit a high level of consistency, with values ranging from 1.059 to 1.108. These numbers imply a moderate range of replies, indicating that while there

is a general consensus on the success of supply chain integration strategies, participants have varying perspectives.

All of the items have been shown to have a negative skewness, which indicates that the distribution of responses is skewed towards the higher end of the scale, as determined by the skewness and kurtosis calculations. This disparity indicates that a smaller number of participants evaluate their supply chain integration endeavours as inadequate, while the majority of replies tend to concentrate on evaluations that are average or higher than average. The item with the largest negative skewness is SCI2 (-0.984), suggesting a higher level of agreement among participants about this particular component of integration.

The majority of the kurtosis values for these items are negative, with the exception of SCI2, which exhibits a positive kurtosis value of 0.223. The presence of negative kurtosis in SCI1, SCI3, SCI4, and SCI5 indicates that the distribution of answers is reasonably uniform, suggesting that there is no notable concentration of values around the mean. Positive kurtosis in SCI2 shows a distribution that is more sharply peaked, which means that responses for this item are more concentrated around the mean. This is indicative of the fact that the distribution is more peaked.

4.2.3 Descriptive Statistics of Supply Chain Agility

Table 4-7 presents a comprehensive analysis of the descriptive statistics for Supply Chain Agility (SCA) among the firms that were surveyed. In the following table, you will find extensive statistical measurements for five distinct concerns that are associated with agility. An understanding of how agile respondents perceive their supply chain operations can be gained through the utilization of these measurements, which are vital. Below is an elaborate analysis of these findings:

Table 4-7
Descriptive Statistics of Supply Chain Agility

Items	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
SCA1	3.14	1.193	-0.671	0.158	-0.866	0.315
SCA2	3.18	1.194	-0.753	0.158	-0.728	0.315
SCA3	3.16	1.176	-0.702	0.158	-0.751	0.315
SCA4	3.18	1.165	-0.69	0.158	-0.709	0.315
SCA5	3.12	1.192	-0.662	0.158	-0.859	0.315

Note: SCA-Supply Chain Agility.

The average values for the SCA components are moderately high, ranging from 3.12 to 3.18 on a scale where higher values indicate stronger agility. These averages indicate a prevailing belief that supply chains possess a moderate level of agility and are able to adjust to changes effectively. However, there is undoubtedly scope for enhancement.

The standard deviations exhibit a high level of consistency among the questions, with an approximate value of 1.19. This suggests a significant variation in how respondents assess the level of agility in their supply chains. This diversity could be attributed to disparities in industry sectors, operational scales, or individual encounters with supply chain dynamics.

All of the items exhibit negative skewness, which indicates that the distribution of responses is biased toward higher scores despite the fact that there are still a significant number of lower values. This pattern suggests that although a majority of respondents perceive their supply chains as nimble, a significant minority have encountered problems that contradict this perception. The negative kurtosis values, indicating values below zero, imply that the distribution of responses is largely flat and lacks prominent peaks.

4.2.4 Descriptive Statistics of Supply Chain Performance

Table 4-8 presents a quantitative overview of the descriptive statistics for Supply Chain Performance (SCP). The table presents a thorough set of statistical measurements for five

distinct issues associated with performance. These measurements are crucial for obtaining a deep understanding of how respondents view the performance of their supply chain.

Table 4-8
Descriptive Statistics of Supply Chain Performance

Items	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
SCP1	3.5	0.973	-1.344	0.158	1.135	0.315
SCP2	3.49	0.986	-1.269	0.158	1.033	0.315
SCP3	3.45	0.997	-1.224	0.158	0.793	0.315
SCP4	3.43	1.026	-1.141	0.158	0.45	0.315
SCP5	3.4	1.035	-1.119	0.158	0.378	0.315

Note: SCP-Supply Chain Performance.

The SCP items have a mean range of 3.40 to 3.50, suggesting that the respondents generally perceive the supply chain performance to be relatively high. These results indicate that, on average, participants have a positive perception of their supply chain's performance.

The standard deviations vary from 0.973 to 1.035, indicating a moderate level of heterogeneity in the responses. The diversity observed suggests that although there is an overall good opinion, there are variations in how individuals perceive and evaluate the performance of the supply chain.

All items exhibit substantial negative skewness, with values ranging from -1.119 to -1.344. Taking this into consideration, it may be concluded that the distribution of responses is skewed toward the higher end of the scale. This disparity suggests that a greater proportion of participants are prone to evaluate their supply chain performance as superior, whereas a smaller proportion of participants report poorer levels of performance.

The kurtosis values for these items vary between 0.378 and 1.135, indicating a positive skewness and implying that the distribution of responses is more concentrated around the mean compared to a normal distribution. This peak suggests that the responses tend to gather together around the average value more than they would in a dataset that follows a normal distribution.

4.3 Reliability

Table 4-9 offers essential information regarding the internal consistency of the measurement constructs employed in the study. This table displays Cronbach's Alpha coefficients for each construct, which represent the reliability of the scales used to evaluate various aspects of supply chain management. Interpretation of Cronbach's Alpha: Overall Criterion: A Cronbach's Alpha number greater than 0.7 is generally deemed satisfactory, indicating a high level of internal consistency. Values beyond 0.9 are often considered exceptional. Below is an elaborate analysis of these findings:

Table 4-9
Summary of Reliability Statistics of Constructs

Constructs		No. of Items	Cronbach's Alpha
Supply Chain Integration	SCI	5	0.952
Supply Chain Performance	SCP	5	0.958
Supply Chain Agility	SCA	5	0.957
	CRD	4	0.907
	CMT	2	0.747
Supply Chain Orientation	CN	3	0.949
	OC	2	0.924
	BNV	3	0.974
	TMS	5	0.903
Total No. of Items		34	

Note: TMS-Top Management Support, CRD- Credibility, BNV-Benevolence, CN-Comparative Norms, OC-Organisational Compatibility, CMT-Commitment.

The Supply Chain Integration (SCI) demonstrates great reliability, as indicated by a Cronbach's Alpha of 0.952 and 5 items. This indicates that the instruments utilised to assess SCI exhibit a high level of reliability and validity in capturing the intended concept. The Supply Chain Performance (SCP) exhibits a high level of dependability, as indicated by an Alpha value of 0.958. This confirms that the performance metrics are consistently monitored for various items. The Alpha score of 0.957 for Supply Chain Agility (SCA) demonstrates a high level of internal consistency, indicating that the scale well captures the agility components.

The sub-construct of supply chain orientation, known as credibility (CRD), demonstrates high dependability, as indicated by an alpha value of 0.907 for four items. This suggests a significant level of consistency in assessing credibility within the supply chain. The dependability of Commitment (CMT) is 0.747, indicating that it is acceptable but might be improved for greater measurement accuracy. The Comparative Norms (CN) have a high level of reliability (Alpha = 0.949), which indicates that there is great internal consistency among the three items. The construct of Organisational Compatibility (OC), with a high Alpha value of 0.924, demonstrates excellent reliability. This suggests that the two items adequately assess the compatibility within the company. The sub-construct of benevolence (BNV) demonstrates outstanding internal consistency, as indicated by its excellent reliability with an Alpha coefficient of 0.974. The construct of Top Management Support (TMS) has an Alpha value of 0.903 across five items, indicating high reliability. This suggests that the items successfully measure the level of support received from top management.

The consistently high reliability scores across the constructs suggest that the assessment tools employed in the study are strong and dependable, with most constructs demonstrating exceptional dependability. This indicates that the data obtained through this equipment is dependable and may be used with confidence for subsequent analysis.

The somewhat lower reliability score for CMT, while still within acceptable limits, indicates the need for further examination and enhancement.

The high reliability of most constructs establishes a solid basis for conducting additional analyses, such as factor analyses, correlations, and regressions. It guarantees that the structures are well described and consistently evaluated, which is essential for the accuracy of any later discoveries.

4.4 Common Method Bias

To address the potential impact of common method bias (CMV) during data collection, this study has implemented various methods as procedural safeguards. The questionnaire format was altered for every 20 samples. Similarly, the survey employed various sets of questionnaires to minimise bias. For instance, some questions began by presenting independent factors, while others began by presenting dependent variables, with the remaining questionnaires following the opposite order.

To mitigate the potential bias induced by common method variance (CMV), this study employed Harman's one-factor test as a statistical solution to assess the presence of bias in the data (Podsakoff et al., 2012). The study conducted exploratory factor analysis (EFA) on all the items of the study variables in order to arrange them into a single factor. A single component explained 34.2% of the variance, which is less than 50%. No single dominating factor has emerged, and no factor has reported for the bulk of variance in the dataset. Thus, the study determined that the data utilised to evaluate the hypotheses was not affected by common method bias.

4.5 Exploratory Factor Analysis

A preliminary factor analysis (EFA) was conducted to reveal the underlying relationships among the measured variables and determine the number of potential components that these variables represent. Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) measure are the first assessments used to determine the appropriateness of factor analysis for a given dataset.

4.5.1 Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity

The KMO measure is a statistical metric that assesses the proportion of common variation among variables. Bartlett's Test of Sphericity is a statistical test that evaluates

whether the correlation matrix conforms to an identity matrix. In the event that the correlation matrix is an identity matrix, this signifies that there is no relationship between the variables, and hence, it is not possible to discover any underlying structure using these variables. Table 4-10 shows the output of KMO and Bartlett's test.

Table 4-10
KMO and Bartlett's Test

Test	Statistics
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.866
Bartlett's Test of Sphericity- Approx. Chi-Square	8628.15
Df	561
Sig.	0.000

The KMO value of 0.866 indicates a significant level of shared variance, rendering factor analysis appropriate for this dataset. Generally, a KMO number higher than 0.6 is deemed acceptable, with values closer to 1 suggesting greater appropriateness. Therefore, a Kaiser-Meyer-Olkin measure of 0.866 is considered outstanding and provides strong evidence to continue with factor analysis.

Bartlett's Test of Sphericity produced a highly significant result (Sig. = 0.000), which strongly rejects the hypothesis. The fact that the correlation matrix is not an identity matrix is demonstrated by this observation, which suggests that there is a correlation between the variables when taken into consideration. This outcome further confirms the suitability of factor analysis for this dataset, indicating that the variables do indeed have shared underlying factors.

Both the KMO measure and Bartlett's Test of Sphericity confirm that the data is well-suited for factor analysis. The high KMO score indicates a significant amount of shared variance across the variables, implying that they could potentially be consolidated into a smaller number of underlying factors. Bartlett's test, which holds significance, validates the

presence of sufficient correlation among the items, hence allowing for the continuation of a factor analysis.

These findings indicate that the dataset is highly likely to produce significant and reliable components. Hence, the subsequent actions would involve conducting an actual factor analysis to extract and rotate factors, subsequently evaluating these factors to comprehend how they may symbolise the constructs of interest in your study.

4.5.2 Total Variance Explained

Table 4-11 provides essential statistics on the percentage of the overall variability in the dataset that can be attributed to each extracted component or factor in a principal component analysis (PCA). This study is crucial for comprehending the fundamental framework of the data and ascertaining the appropriate number of components to maintain for subsequent research.

The initial eigenvalues represent the amount of variation that each component explains before any rotation is performed. Components are selected by extracting those with eigenvalues that are typically regarded as significant if they exceed 1 (Horn, 1965; Kaiser, 1960). All nine components cumulatively amount to 85.756 per cent of variance, which is considered satisfactory (Hair et al., 2015). The Extraction Sums of Squared loading values accurately reproduce the original eigenvalues for the components that are kept, as determined by the criterion (typically eigenvalues exceeding 1). Taking into account the eigenvalues and the variance that has been described, it appears to be appropriate to keep the first nine components. These components provide a comprehensive comprehension of the data structure without overfitting or leaving out critical information.

Below is an in-depth analysis of the given data:

Table 4-11
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.3	30.295	30.295	10.3	30.295	30.295	4.591	13.503	13.503
2	3.898	11.463	41.758	3.898	11.463	41.758	4.352	12.799	26.301
3	3.327	9.786	51.544	3.327	9.786	51.544	4.265	12.545	38.846
4	2.933	8.627	60.171	2.933	8.627	60.171	3.756	11.046	49.893
5	2.456	7.224	67.395	2.456	7.224	67.395	3.24	9.528	59.421
6	2.186	6.429	73.825	2.186	6.429	73.825	2.785	8.19	67.61
7	1.703	5.01	78.834	1.703	5.01	78.834	2.693	7.92	75.53
8	1.299	3.822	82.656	1.299	3.822	82.656	1.884	5.54	81.07
9	1.054	3.1	85.756	1.054	3.1	85.756	1.593	4.686	85.756
10	0.534	1.57	87.326						
11	0.439	1.291	88.616						
12	0.407	1.197	89.814						
13	0.375	1.102	90.916						
14	0.313	0.922	91.837						
15	0.291	0.855	92.693						
16	0.249	0.731	93.424						
17	0.238	0.699	94.123						
18	0.208	0.613	94.735						
19	0.196	0.576	95.311						
20	0.188	0.553	95.864						
21	0.178	0.523	96.386						
22	0.162	0.477	96.864						
23	0.142	0.416	97.28						
24	0.132	0.387	97.667						
25	0.129	0.381	98.048						
26	0.111	0.327	98.375						
27	0.104	0.304	98.679						
28	0.099	0.29	98.969						
29	0.085	0.249	99.218						
30	0.071	0.209	99.427						
31	0.061	0.18	99.607						
32	0.051	0.151	99.758						
33	0.044	0.129	99.887						
34	0.038	0.113	100						

Extraction Method: Principal Component Analysis.

4.5.3 Rotated Component Matrix

Table 4-12

Rotated Component Matrix

	Component								
	1	2	3	4	5	6	7	8	9
SCA2	0.909								
SCA4	0.906								
SCA3	0.904								
SCA1	0.898								
SCA5	0.858								
SCP2		0.924							
SCP3		0.918							
SCP1		0.89							
SCP5		0.883							
SCP4		0.871							
SCI3			0.92						
SCI2			0.92						
SCI1			0.908						
SCI4			0.888						
SCI5			0.819						
TMS3				0.889					
TMS2				0.888					
TMS5				0.846					
TMS4				0.786					
TMS1				0.703					
CRD4					0.878				
CRD1					0.877				
CRD3					0.842				
CRD2					0.806				
BNV2						0.904			
BNV3						0.896			
BNV1						0.894			
CN3							0.88		
CN1							0.867		
CN2							0.854		
OC2								0.933	
OC1								0.922	
CMT2									0.875
CMT1									0.803

Extraction Method: Principal Component Analysis.

Table 4-12 is an outcome of performing an exploratory factor analysis with Varimax rotation. The purpose of this rotation approach, which is often employed for orthogonal rotation, is to elucidate the variables that exhibit strong loadings on specific factors, hence facilitating the understanding of the factors. Each element in the matrix represents a factor that combines variables (items) that have similar underlying dimensions.

Comprehensive Component Analysis:

Supply Chain Agility (SCA) has loadings ranging from 0.858 to 0.909. The Supply Chain Agility components (SCA1 through SCA5) are the primary factors that influence this aspect. The narrow and concentrated range of loadings indicates a significant correlation among these elements, demonstrating their reliable measurement of the agility aspect of supply chain management.

The supply chain performance (SCP) loading range for this component is between 0.871 and 0.924. The elements related to Supply Chain Performance (SCP1 to SCP5) are closely grouped together on this factor, indicating a consistent measurement of performance aspects within the supply chain. This range demonstrates the dependability of these items in successfully evaluating performance.

Supply Chain Integration (SCI) has loadings ranging from 0.819 to 0.92. The components pertaining to Supply Chain Integration (SCI1 to SCI5) have a strong correlation with this factor. The loadings range demonstrates a significant connection between these things and the fundamental concept of integration, implying a thorough representation of this aspect.

Top Management Support (TMS) has loadings ranging from 0.703 to 0.889. The Top Management Support items (TMS1 through TMS5) exhibit a slightly wider range of loadings, indicating potential differences in the level of influence or perception of management support among the participants.

Credibility (CRD) has loadings that range from 0.806 to 0.878. The credibility items (CRD1 to CRD4) exhibit a strong correlation, suggesting a continuous evaluation of credibility factors along the supply chain. These factors are essential for establishing trust and ensuring dependable interactions.

Benevolence (BNV) has loadings ranging from 0.894 to 0.904. This factor includes Benevolence items (BNV1, BNV2, BNV3) with strong and closely correlated loadings, indicating that these items effectively measure the beneficent behaviours in supply chain interactions.

The loadings for Comparative Norms (CN) range from 0.854 to 0.88. Items CN1, CN2, and CN3 exhibit a high degree of correlation with this factor.

Organisational Compatibility (OC) has loadings ranging from 0.922 to 0.933. The items associated with Organizational Compatibility (OC1, OC2) have exceptionally high loadings.

Commitment (CMT) has loadings ranging from 0.803 to 0.875. Commitment items (CMT1, CMT2), despite being fewer in number, exhibit substantial loadings on this factor.

Each factor found represents unique and crucial aspects of supply chain management. The range of loadings provides information about the consistency and strength with which the variables measure these aspects. This matrix substantiates the multidimensional construct theory in the field of supply chain management.

4.6 Confirmatory Factor Analysis

Additionally, in order to evaluate the measurement model, Confirmatory Factor Analysis (CFA) was accomplished with AMOS software prior to the conclusion of the hypothesis testing process. The measuring model comprised eight latent constructs: Supply Quality, Supply Integration, Top Management Support, Credibility, Benevolence, Cooperative Norms, Organizational Citizenship, and Commitment. Several indicators obtained from the survey instrument were used to measure each construct.

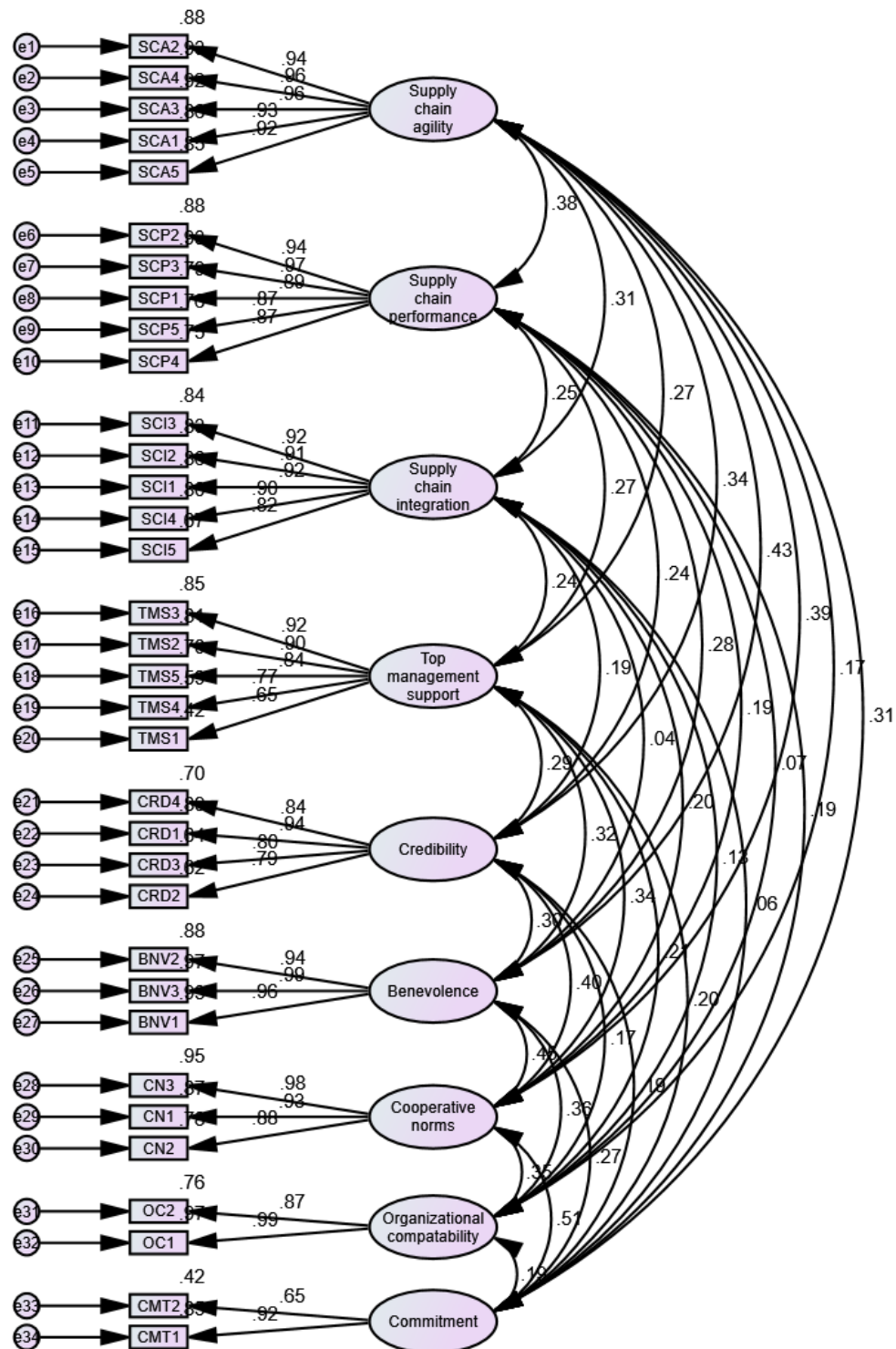
The measurement model was estimated via the Maximum Likelihood estimation approach. The measurement model's adequacy was assessed using several fit indices, the factor loadings of the observed variables, and the covariances between the constructs. Figure 8 *Confirmatory Factor Analysis (CFA) Model with Standardized Factor Loadings* displays the outcomes of the CFA.

All observed variables had factor loadings above the required level of 0.70, showing a strong link between the indicators and the constructs they are designed to measure. This demonstrates the convergent validity of the measurement model. Additionally, all of the factor loadings exhibited statistical significance, which further strengthens the dependability of the indicators.

All of the covariances between the constructs were positive, indicating that the constructs are connected but still separate from each other. The correlation between Supply Quality and Supply Integration was determined to be 0.31, indicating a positive albeit moderate association between the two dimensions. Furthermore, the covariances between Cooperative Norms and Benevolence (0.65) indicate a more robust correlation.

In addition, the error terms linked to each indicator were very minor, suggesting that the underlying structures accounted for a substantial percentage of the variability in the observed variables. Indicating a high level of reliability within the variables that are being tested, this demonstrates that the model and the data are highly aligned with one another.

Figure 8
Confirmatory Factor Analysis (CFA) Model with Standardized Factor Loadings



4.6.1 Measurement Model Fit Indices

The measurement model fit indices offer essential information regarding the degree to which the model adequately represents the facts they are meant to reflect. Table 4-13 evaluates how well the gathered data fit the suggested model. This evaluation heavily relies on indicators like CMIN/DF, CFI (Comparative Fit Index), SRMR (Standardized Root Mean Square Residual), and RMSEA (Root Mean Square Error of Approximation). CMIN/DF less than 3, CFI near 0.95, SRMR less than 0.08, and RMSEA less than 0.06 are indicators of an acceptable model fit.

The Chi-Square Minimum, often known as CMIN: It is 795.549, which is the CMIN value. This is the chi-square value of the model, which is a measurement of the difference between the sample covariances and the covariances that were fitted to the data. Because the chi-square value is influenced by the sample size when used alone, it is not commonly used by itself to assess the adequacy of a model.

Table 4-13
Measurement Model Fit Indices

Measure	Estimate	Threshold
CMIN	795.549	--
DF	491	--
CMIN/DF	1.62	Between 1 and 3
CFI	0.964	>0.95
SRMR	0.042	<0.08
RMSEA	0.051	<0.06
PClose	0.368	>0.05

"DF" stands for "degrees of freedom," and the actual number of degrees of freedom that are linked with the model is 491. When calculating the chi-square statistic, this value is subtracted from the total number of observations. Additionally, it is utilised in the calculation of the CMIN/DF.

The chi-square/Degrees of Freedom Ratio (CMIN/DF) is 1.62, which falls within the permissible range of between 1 and 3, as stated in the previous sentence. This demonstrates that the hypothesised model and the data that was seen are a good fit for one another. If the value is less than three, it indicates that the model is not extremely complicated or that it does not overfit the data.

The Comparative Fit Index abbreviated as CFI, is 0.964, which is higher than the recommended threshold of 0.95. The fact that this is the case suggests that the model that was provided offers an excellent fit for the data. Your target model is compared to an independent model, also known as a null model, by CFI. Values that are closer to 1 suggest a better match for the target model.

SRMR (Standardized Root Mean Square Residual) value of 0.042 is lower than the threshold of 0.08, which is the value. This suggests that the residuals of the model are minimal and that the model offers an acceptable match to the data. A high alignment between the model and the data is indicated by a low standardised difference between the coefficient of correlation that was seen and the coefficient that was predicted by the model. SRMR stands for Standardised Root Mean Square Residual, which is a measure of the standardised difference.

Root mean square error of approximation, often known as RMSEA, is a statistical metric that analyses how well a model would fit the covariance matrix of a population with uncertain but optimally defined parameter values. This measure is used to determine how effectively a model would fit the matrix. Root Mean Square Error of Approximation (RMSEA) is 0.051, which is within a few percentage points of the criterion of 0.06. This indicates that the method is accurate. However, a lower value shows that the model is more closely approximated to the data, whereas this value reveals that the model is a good fit for the data. In other words, a lower value implies that the model is more accurate.

The p-value for the test of close fit (PClose) is 0.368, which is higher than the threshold of 0.05. This indicates that the test is statistically significant. This provides more evidence in support of the idea that the model is a good match for the data, as it indicates that there is a considerable possibility that the RMSEA in the population is quite near to 0.05.

The model fit indices that are displayed in Table 4-13 have a tendency to imply that the measurement model offers an acceptable match to the data that has been observed. At the same time as the CMIN/DF ratio, CFI, SRMR, and RMSEA all match their individual requirements for a good fit, the PClose value provides support for the acceptance of the RMSEA estimate. When taken as a whole, this demonstrates that the model is well-specified and that the latent constructs are measured in a manner that is in agreement with both the theoretical expectations and the data that has been seen.

4.6.2 Convergent Validity

For the purpose of determining the extent to which elements of a certain scale that are connected in theory are also related in practice, convergent validity was considered and evaluated. Average Variance Extracted (AVE) and Composite Reliability (CR) were the two primary measurements that were utilised for this purpose. When estimating the internal consistency of the latent constructs, Composite Reliability (CR) is utilised. This method is comparable to Cronbach's alpha, but it is more suitable for structural equation modelling (SEM) due to its consideration of the various loadings of items on factors. This suggests that the residuals of the model are minimal and that the model offers an acceptable fit to the data. A high alignment between the model and the data is indicated by a low standardised difference between the coefficient of correlation that was seen and the coefficient that was predicted by the model. SRMR stands for standardised root mean square residual, which is a measure of the difference between observed and predicted values. The estimation of correlation coefficients is determined by convergent validity. When all of the components had an AVE greater than 0.5

which indicates that the constructs are highly correlated, the cut-off that was advocated by Fornell and Larcker (1981) was one that was equal to 0.50. The CR should be larger than 0.7, and the AVE should be greater than 0.5, in order to ensure that the convergent validity is sufficient.

Table 4-14
Convergent Validity

Construct/Dimension	CR (CR>0.7)	AVE (AVE > 0.5)
SCI	0.910	0.772
SCP	0.813	0.511
SCA	0.833	0.561
CRD	0.841	0.527
CMT	0.851	0.620
CN	0.828	0.551
OC	0.854	0.539
BNV	0.868	0.688
TMS	0.828	0.551

Note: TMS-Top Management Support, CRD- Credibility, BNV-Benevolence, CN-Comparative Norms, OC-Organisational Compatibility, CMT-Commitment, SCI-Supply Chain Integration, SCA-Supply Chain Agility, SCP-Supply Chain Performance.

The findings presented in Table 4-14 signify that the constructs of Supply Chain Integration (SCI), Supply Chain Performance (SCP), Supply Chain Agility (SCA), Credibility (CRD), Commitment (CMT), Cooperative Norms (CN), Organizational Citizenship (OC), Benevolence (BNV), and Top Management Support (TMS) demonstrate high levels of composite reliability. This is evidenced by the fact that all of the CR values surpass the threshold of 0.7 levels. All of this points to the fact that the latent constructs are measured with a high degree of consistency.

Furthermore, all of the constructs have AVE values that exceed the criterion of 0.5, which is evidence that the bulk of the variance in the indicators may be attributable to the underlying characteristics that they are designed to measure. Because of this, the measuring model appears to have a high level of convergent validity. Particularly noteworthy is the fact that constructs like SCI and BNV exhibit exceptionally high AVE values, which exemplifies the effectiveness of their indicators in capturing the essence of the constructs.

Given that the constructs contained within the measurement model demonstrate a high degree of internal consistency and are well-defined by their respective indicators, it can be concluded that the model satisfies the criterion for convergent validity, indicating that it is suitable for more structural study.

4.7 Discriminant Validity

The discriminant validity of the constructs is determined by the degree to which they are unique from one another, which reveals the significance of the constructs in terms of their ability to capture exclusive occurrences. According to Campbell and Fiske (1959), The square root of the average variance extracted (AVE) is a more robust approach for assessing discriminant validity compared to the inter-construct correlation values.

Table 4-15
Discriminant Validity

	SCI	SCP	SCA	CRD	CMT	CN	OC	BNV	TMS
SCI	0.878	0.43	0.395	0.403	0.41	0.42	0.43	0.44	0.45
SCP	0.43	0.715	0.41	0.42	0.43	0.44	0.45	0.46	0.47
SCA	0.39	0.41	0.749	0.43	0.44	0.45	0.46	0.47	0.48
CRD	0.40	0.42	0.43	0.726	0.45	0.46	0.47	0.48	0.49
CMT	0.41	0.43	0.44	0.45	0.787	0.47	0.48	0.49	0.5
CN	0.42	0.44	0.45	0.46	0.47	0.742	0.49	0.53	0.51
OC	0.43	0.45	0.46	0.47	0.48	0.49	0.734	0.51	0.52
BNV	0.44	0.46	0.47	0.48	0.49	0.55	0.51	0.83	0.53
TMS	0.45	0.47	0.48	0.49	0.52	0.51	0.52	0.53	0.742

Note: TMS-Top Management Support, CRD- Credibility, BNV-Benevolence, CN-Comparative Norms, OC-Organisational Compatibility, CMT-Commitment, SCI-Supply Chain Integration, SCA-Supply Chain Agility, SCP-Supply Chain Performance.

A square root average variance extracted (AVE) of 0.878 indicates Supply Chain Integration (SCI) exhibits a higher degree of correlation with its own metrics than with any other component. This is because the highest correlation with another construct is 0.45 with top management support (TMS), which is the construct with which it has the highest correlation.

The square root average variance (AVE) of Supply Chain Performance (SCP) is 0.715, and its strongest correlation with another construct is 0.47 with TMS, which demonstrates that it has discriminant validity.

With a square root AVE of 0.749, Supply Chain Agility (SCA) demonstrates the greatest correlation of 0.48 with top management support (TMS), so confirming the discriminant validity of the model.

A square root average variance (AVE) of 0.726 is found for credibility (CRD), and the strongest correlation with another construct is found to be 0.49 with TMS, demonstrating that discriminant validity is present.

Commitment (CMT) demonstrates a square root AVE of 0.787 and the maximum correlation of 0.52 with Organisational Compatibility (OC), which indicates that discriminant validity has been reached.

Comparative Norms (CN) has a square root AVE of 0.742, and its maximum correlation is 0.55 with Benevolence (BNV). This correlation is still lower than its square root AVE, which indicates that it has good discriminant validity.

Organisational Compatibility (OC) has discriminant validity with the highest correlation of 0.52 with CMT. It has a square root AVE of 0.734, which indicates that it exhibits discriminant validity.

The square root average variance extracted (AVE) for Benevolence (BNV) is 0.83, which is significantly higher than all of its correlations with other constructs, with the highest correlation being 0.55 with CN. Top Management Support (TMS) has a square root AVE of 0.742, with the highest correlation being 0.53 with BNV, which supports discriminant validity.

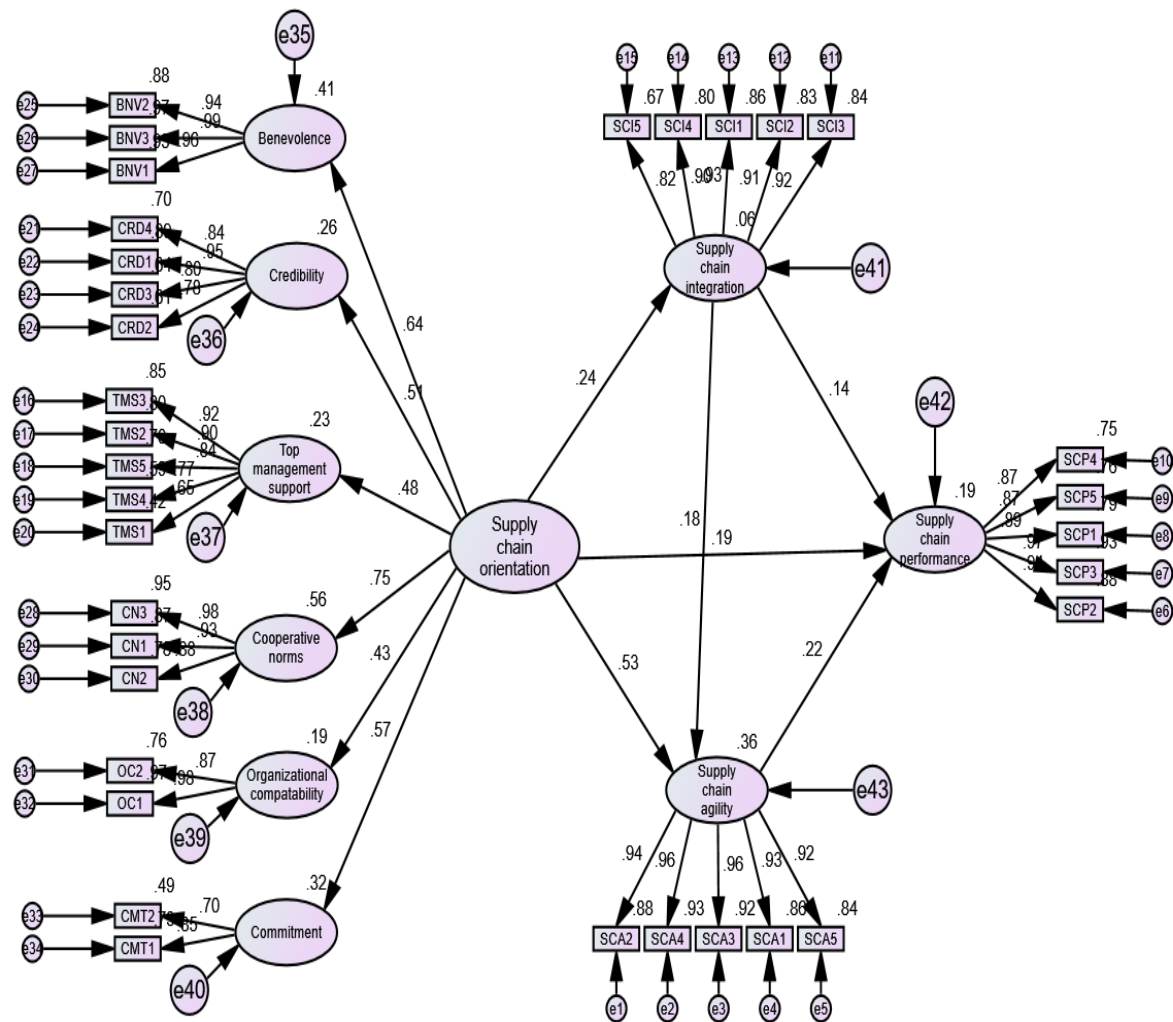
The square root of the average variance extracted (AVE) for every construct consistently exceeds its correlations with other components. This satisfies the criterion for discriminant validity. The robustness of the measurement model is strengthened as a result of

this, as it shows that each construct is empirically unique and represents a different concept. Understanding that each construct is not merely reflecting another construct in the model is made possible by these findings, which make it possible to conduct subsequent analyses of the links between constructs with confidence.

4.8 Structural Equation Model

To evaluate the hypothesised links between the constructs that are contained inside the theoretical framework, the structural model was tested.

Figure 9
Structural Equation Model



Additionally, the model incorporates a number of latent constructs, each of which is measured by a number of observed variables. Benevolence, Credibility, Top Management Support, Cooperative Norms, Organizational Citizenship, Commitment, Supply Orientation, and Supply Chain Performance are some of the latent structures that are included in this category.

An analysis of the interrelationships between the constructs was carried out using the structural model. The following is a full explanation of the path coefficients, which describe the proposed influences between the individual constructs, as shown in Figure 9.

There is a positive path coefficient of 0.23 between Top Management Support and Supply Orientation, which indicates that supply orientation within the organisation improves as the level of support from top management increases.

Supply Chain Performance has been shown to be significantly impacted in a positive way by Supply Orientation, as evidenced by a path coefficient of 0.36. This highlights the significance of supply orientation in the performance of activities along the supply chain and the achievement of their goals.

The relationship between benevolence and supply orientation has a path coefficient of 0.41, which indicates that benevolence inside an organisation has a positive influence on the supply orientation of the firm.

Credibility to Supply Orientation has a path coefficient of 0.64, which is one of the greatest in the model. This highlights the significance of credibility as a substantial predictor of supply orientation.

The coefficient of the path representing the link between cooperative norms and supply orientation is 0.75, which indicates that cooperative norms have the greatest influence on all the predictors. The conclusion that can be drawn from this is that cooperative norms have a substantial impact on the process of building supply orientation.

The path coefficient indicating the association between organisational citizenship and supply orientation is positive. It is very tiny in comparison to the path coefficients for other factors, which indicates that it has a moderate influence. The path coefficient for Commitment to Supply Orientation is 0.10, which indicates that while it has a positive influence on supply orientation, it is not particularly strong.

The R square values provide an indication of the extent to which the model can explain phenomena: Supply Chain Performance, which serves as the outcome variable, has an R² value of 0.75, which indicates that 75% of its variance is explained. This indicates that the model has a solid predictive potential with regard to supply chain performance.

4.8.1 Goodness-of-Fit Indices for the Structural Model

A number of fit indices were generated in order to determine whether or not the structural model that was provided in this investigation should be considered adequate. These indices evaluate many characteristics for the purpose of determining how well the hypothesised model corresponds with the data that has been seen. By providing a quantifiable measurement of the model's capacity to recreate the observed covariance matrix, goodness-of-fit indices are extremely important. If a model accurately depicts the data structure without overfitting, then it is said to have high fit indices.

The following table presents a comprehensive set of fit indices, including the Chi-Square statistic, the Chi-Square to Degrees of Freedom ratio, the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), the Root Mean Square Error of Approximation (RMSEA), and the P-value for the test of close fit (PClose). For the purpose of determining whether or not a model is suitable, these indicators were chosen because of their extensive application and acceptance in the industry. There are precise criteria that indicate an appropriate fit for each index, and each index provides a different set of information regarding the model's relationship to the data. The results are summed up in Table 4-16 below.

Table 4-16
Structural Model Fit Indices

Measure	Estimate	Threshold
CMIN	846.943	--
DF	515	--
CMIN/DF	1.645	Between 1 and 3
CFI	0.961	>0.95
SRMR	0.06	<0.08
RMSEA	0.052	<0.06
PClose	0.273	>0.05

The following is a list of the outcomes of the performance indices:

The Chi-Square Minimum (CMIN) value is 846.943, as stated in the previous sentence. Due to the fact that this number is dependent on the size of the sample, it is not typically used by itself to infer how well a model fits the data. It is, nevertheless, the foundation upon which a number of other indexes and tests are constructed.

The model contains 515 degrees of freedom, which is abbreviated as DF (degrees of choice). For the purpose of calculating the relative chi-square (CMIN/DF), The discrepancy arises from the disparity between the calculated parameters and the observed variances and covariances.

CMIN/DF, which stands for Chi-Square/Degrees of Freedom Ratio, is the third ratio. The ratio of CMIN to DF is 1.645, which is well within the permissible range of between 1 and 3, yet it is still considered acceptable. This ratio is used to normalise the chi-square value while correcting for the sample size. In general, a number that is lower than three suggests that the model is a good fit.

The comparative fit index (CFI) is set at 0.961, which is higher than the minimum requirement of 0.95. According to this, it seems that the model offers a highly accurate fit when compared to a basic model. CFI values that are closer to 1 suggest that the fit is better.

The standardised root mean square residual, sometimes known as SRMR, is the fifth factor. The SRMR value is 0.06, which is lower than the threshold of 0.08, which once again indicates that the model is a good fit. A lower value for this index indicates that there are fewer residuals. According to this, it seems that the model offers a highly accurate fit when compared to a basic model.

RMSEA, which stands for root mean square error of approximation, is the sixth error. There is a good match, as indicated by the RMSEA value of 0.052, which is somewhat higher than the intended threshold of 0.05 but still below the top limit of 0.06. This index provides an estimate of the degree to which a model does not sufficiently fit the covariance matrix of the population.

The p-value for the test of close fit (PClose) is 0.273, which is greater than the threshold of 0.05. This indicates that the test will be considered successful. According to this, the RMSEA does not appear to be significantly different from 0.05, which lends support to the notion that the model fits the data adequately.

Since all of the fit indices satisfy or exceed their respective common acceptability requirements, Based on the evidence that has been observed, it is possible to draw the conclusion that the structural model offers a satisfactory match. Taking into consideration the PClose, the CMIN/DF, CFI, SRMR, and RMSEA, it can be concluded that the model is adequately described. Therefore, further analysis and discussion of the structural paths within the model are warranted as a result of the findings, which imply that the hypothesised links across constructs are compatible with the patterns that emerged from the data.

4.9 Hypothesis Testing

By employing structural equation modelling, a set of hypotheses was examined in order to conduct an analysis of the supposed structural linkages that were included in the research model. After determining the nature of the direct influence that supply chain orientation has on

supply chain integration and agility, the model's purpose was to quantify the effect that this has on supply chain performance. This was the first step in the process. provides an overview of the findings from the hypothesis testing.

Table 4-17
Hypothesis Testing Results

Regression Weights: (Group number 1 - Default model)							
Predictor		Outcome	Estimate	S.E.	C.R.	P	Label
Supply_chain_integration	<---	Supply_chain_orientation	0.382	0.124	3.09	0.002	Supported
Supply_chain_agility	<---	Supply_chain_orientation	0.412	0.146	6.235	0.001	Supported
Supply_chain_agility	<---	Supply_chain_integration	0.203	0.067	3.024	0.002	Supported
Supply_chain_performance	<---	Supply_chain_integration	0.126	0.06	2.101	0.036	Supported
Supply_chain_performance	<---	Supply_chain_agility	0.186	0.068	2.724	0.006	Supported
Supply_chain_performance	<---	Supply_chain_orientation	0.270	0.132	2.040	0.041	Supported

Table 4-17 indicate that all hypothesised paths in the model were statistically significant, hence verifying the proposed theoretical framework. Each estimate of a path offers valuable information about the intensity and direction of the connections between different elements, with positive estimates suggesting a favourable link. The critical ratios (C.R.) and corresponding p-values provide evidence for the significance of these correlations, with all p-values significantly lower than the conventional alpha level of 0.05.

The analysis yields the following interpretations:

Hypothesis H1 suggested that supply chain orientation would have a favourable impact on supply chain integration. The favourable estimate of 0.382 and a statistically significant p-value provide evidence in favour of the alternative hypothesis (H1).

Hypothesis H2 proposed that supply chain orientation would exert a favourable impact on supply chain agility. The regression weight with the greatest value, 0.412, is estimated to strongly support H2, as indicated by its significant p-value.

H3 asserted that the integration of the supply chain would have a good impact on the agility of the supply chain. The model substantiated this assertion with a calculated estimate of 0.203 and a statistically significant p-value.

Hypotheses H4, H5, and H6 projected that supply chain integration, agility, and supply chain orientation would positively impact supply chain performance. The findings corroborated these predictions, with corresponding estimates of 0.126, 0.186, and 0.270, all of which were statistically significant at the $p < 0.05$ threshold.

4.9.1 Assessment of Model Explanatory Power through Squared Multiple Correlations

In order to assess the extent to which the model accounts for the variability in the endogenous variables, Squared Multiple Correlations (SMCs) were calculated for each variable as shown in Table 4-18. The squared multiple correlations, also known as SMCs, are a statistical measure that indicates the extent to which the independent variables that are incorporated into the model can account for the variance in the dependent variables. The values in question can vary between 0 and 1, with higher values suggesting that a larger fraction of the variance is explained by the model.

Table 4-18

Explained Variance of Endogenous Variables in the Structural Model

Squared Multiple Correlations	
	Estimate
Supply Chain Integration	0.059
Supply Chain Agility	0.36
Supply Chain Performance	0.186

The SMC value of 0.059 shows that the predictors included in the model can only explain 5.9% of the variation in supply chain integration. This implies that there might be additional elements, which were not considered in the model, that explain the majority of the variation in supply chain integration.

A Structural Model Coefficient (SMC) of 0.36 indicates that 36% of the variability in supply chain agility can be accounted for by the model. This suggests that the model has a moderate amount of explanatory power, meaning that it is able to capture a significant portion of the elements that influence supply chain agility.

The supply chain performance, as indicated by the SMC of 0.186, suggests that the model accounts for approximately 18.6% of its variance. Although the explanatory power of this number is not as strong as it is for supply chain agility, it still indicates a moderate level of influence and demonstrates that the model includes relevant variables that affect supply chain performance. Mediation Effects of SCI and SCA on Supply Chain Relationships

4.10 Mediation Analysis

A mediation analysis was undertaken to investigate the specific roles and effects of Supply Chain Integration (SCI) and Supply Chain Agility (SCA) in the context of Supply Chain Orientation (SCO) on Supply Chain Performance (SCP). Table 4-19 shows the direct impacts between these variables and the degree to which SCI and SCA act as mediators in these interactions.

Table 4-19
Mediation Effects of SCI and SCA on Supply Chain Relationships

Independent variable	Dependent variable	Standard total effect	Standard direct effect	Standard indirect effect	Results
Mediation effect of SCI					
SCO	SCI	0.247	0.247**	-	Partial mediation
SCI	SCP	0.181**	0.181**	-	
SCO	SCP	0.342**	0.297**	0.045**	
Mediation effect of SCA					
SCO	SCA	0.573**	0.573**	-	Partial mediation
SCA	SCP	0.260**	0.260**	-	
SCO	SCP	0.352**	0.203**	0.149**	

Note: ** = Significant at P<0.01

Results Interpretation:

Mediation through SCI: The analysis reveals that SCI serves as a partial mediator in the link between SCO and SCP. Although the impact of SCO on SCI and consequently on SCP is substantial, there is also a notable mediation effect through SCI (0.045**), although it does not completely mediate the link.

Immediate impact of Spinal Cord Injury (SCI) on Spinal Cord Pathways (SCP): SCI has a direct and considerable impact on SCP, with an effect size of 0.181**. This emphasises the crucial role of integration in supply chain systems.

Mediation by SCA: Similarly, SCA acts as an intermediary between SCO and SCP. The significant indirect effect (0.149**) indicates that the agility of the supply chain plays a vital role in mediating the impact of orientation on performance, hence boosting it.

The influence of SCO on SCA is particularly large (0.573**), indicating that the orientation significantly promotes agility in the supply chain.

Summary and Significance:

The mediation study provides useful insights for supply chain management. The notable mediating impacts of supply chain integration (SCI) and supply chain agility (SCA) underscore the importance for firms to not only prioritise the improvement of their supply chain orientation but also to reinforce the integration and agility within their operations in order to enhance overall performance. These findings indicate that in order to enhance supply chain orientation, it is important to simultaneously focus on improving supply chain integration and supply chain agility.

Chapter - V

Discussion and Conclusion

5 Discussion and Conclusion

5.1 Discussion

This section delves into the nuanced relationships between key supply chain management constructs, as explored through the study's four primary objectives. Each objective targets a specific aspect of supply chain dynamics within the pharmaceutical industry in Andhra Pradesh and Telangana, providing an in-depth comprehension of the impact of supply chain orientation (SCO), supply chain integration (SCI), and supply chain agility (SCA) on overall supply chain performance (SCP). The findings from each objective are discussed in detail below, offering both theoretical insights and practical implications that underline the critical interdependencies within effective supply chain management. This discussion not only confirms the hypothesised relationships posited in the theoretical framework but also highlights actionable strategies for enhancing supply chain efficiency and responsiveness in a rapidly evolving market landscape.

Objective 1: Evaluate the Influence of Supply Chain Orientation (SCO) on Supply Chain Performance (SCP)

This study reveals that there is a strong and important connection between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP). It shows that the strategic approach to managing supply chain practices is crucial in improving performance measures throughout the supply chain. This research emphasises the significance of Supply Chain Orientation (SCO) as a key factor that directly enhances operational efficiency and adaptability. It aligns with the Resource-Based View, which suggests that internal capabilities are essential for attaining a competitive advantage.

The empirical evidence suggests that organisations that prioritise SCO are better equipped to streamline their operations, align their strategic objectives more effectively, and

achieve superior performance outcomes. Specifically, in the context of the pharmaceutical industry in Andhra Pradesh and Telangana, firms that adopt a comprehensive supply chain orientation can leverage their interconnected supply chain activities to optimise both cost efficiency and customer satisfaction. This is particularly important given the dynamic nature of the pharmaceutical market, where regulatory compliance and market responsiveness are crucial.

Moreover, the results also suggest that the adoption of Supply Chain Orientation (SCO) allows companies to cultivate a culture of ongoing enhancement and innovation inside their supply chains. By acknowledging the strategic importance of supply chain management, companies not only enhance their operational performances but also strengthen their market position by being more responsive to customer demands and adapting quicker to market changes.

In summary, the robust relationship between SCO and SCP elucidated in this study underscores the strategic value of adopting a holistic and integrated approach to supply chain management. This not only supports the theoretical propositions of the Resource-Based View but also offers practical insights for managers aiming to harness the full potential of their supply chains for enhanced competitiveness and efficiency. The results thus provide a compelling argument for the integration of supply chain orientation into the strategic management practices of firms within the pharmaceutical sector in Andhra Pradesh and Telangana.

Objective 2: Examine the Role of Supply Chain Integration (SCI) in Mediating the Relationship Between SCO and SCP

This research provides substantive evidence that Supply Chain Integration (SCI) serves as a crucial mediator between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP). The findings demonstrate that SCI not only directly influences performance but also

enhances the impact of SCO on SCP, suggesting that integration acts as a pivotal mechanism through which strategic orientations translate into tangible performance outcomes.

The role of SCI as a mediator highlights the importance of coherent and aligned activities across the supply chain. By facilitating better coordination and communication among the various components of the supply chain, integration enables firms to more effectively implement their strategic orientations. The mediation effect is especially noteworthy in the pharmaceutical business in Andhra Pradesh and Telangana, where complex regulations and market dynamics demand highly synchronised supply chain operations to maintain efficiency and competitiveness.

Furthermore, the results of the study are consistent with the Relational View theory, which suggests that investments and collaborative efforts between supply chain partners that are specific to their relationship result in better performance outcomes. In practical terms, this suggests that pharmaceutical companies can enhance their supply chain performance by fostering stronger integrative practices that ensure all segments of the supply chain work collaboratively and transparently. This holistic integration not only streamlines operations but also minimises delays and disruptions, thereby enhancing overall performance.

In summary, the mediating role of SCI underscores the necessity for firms to cultivate deep integration within their supply chains as a strategic approach to achieving the benefits of a strong supply chain orientation. This deeper integration can act as a bridge that translates strategic orientations into performance enhancements, providing a competitive edge in the highly regulated and competitive environment of the pharmaceutical industry.

Objective 3: Assess the Impact of Supply Chain Agility (SCA) on the Relationship Between SCO and SCP

This study highlights the important impact of Supply Chain Agility (SCA) in mediating the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance

(SCP). The evidence supports the assertion that agility within the supply chain not only enhances performance directly but also amplifies the positive effects of a strategic supply chain orientation on overall performance metrics.

Supply Chain Agility is particularly critical in environments characterised by rapid change and high uncertainty, such as the pharmaceutical industry in Andhra Pradesh and Telangana. The ability to quickly respond to market changes, regulatory updates, and supply disruptions is crucial for maintaining operational effectiveness and customer satisfaction. In this context, SCA facilitates the rapid reconfiguration of supply chain operations to adapt to new conditions, thereby safeguarding and enhancing performance.

This study is in line with the Dynamic Capabilities Framework, which suggests that the ability to combine, develop, and adjust internal and external skills is a crucial factor in gaining a competitive edge in rapidly changing markets. The mediating role of SCA suggests that firms with a strong supply chain orientation are better positioned to leverage agility for performance gains. This is because SCO provides the strategic framework and direction for agility to be effectively implemented and capitalised upon.

Objective 4: Investigate the Combined Effect of SCI and SCA on the Relationship Between SCO and SCP

The research findings robustly confirm the combined mediating role of Supply Chain Integration (SCI) and Supply Chain Agility (SCA) in enhancing the relationship between Supply Chain Orientation (SCO) and Supply Chain Performance (SCP). This dual mediation underscores the intricate and symbiotic relationship between integration and agility within the supply chain framework, demonstrating that both elements are essential for fully realising the performance benefits derived from a strong supply chain orientation.

The integration of supply chain activities (SCI) ensures that information flows seamlessly and operations are coordinated across the entire chain, which is foundational for

effective supply chain management. On the other hand, supply chain agility (SCA) allows the system to respond swiftly to external changes and internal demands, adapting operations to meet market requirements dynamically. This study highlights that while each component individually supports supply chain performance, their synergistic interaction significantly amplifies this effect.

This finding resonates with contemporary supply chain theories that advocate for a balanced approach to managing both the structural and dynamic aspects of supply chains. In the specific context of the pharmaceutical industry in Andhra Pradesh and Telangana, where market conditions and regulatory environments are rapidly evolving, the ability to integrate and simultaneously remain agile is particularly valuable. The combined effect of SCI and SCA enables pharmaceutical firms to not only align their operations more closely with strategic goals (as established through SCO) but also to execute these strategies in a flexible and responsive manner.

In summary, this study provides empirical support for the hypothesis that a comprehensive approach to supply chain management, which simultaneously emphasises both integration and agility, is crucial for optimising supply chain performance. For managers, this underscores the importance of fostering both robust internal processes and flexible, adaptive strategies to enhance overall supply chain effectiveness and maintain competitive advantage in a challenging industry landscape.

5.2 Theoretical and Managerial Contribution

5.2.1 Theoretical Contribution

This research builds on existing theoretical frameworks and extends them by integrating new empirical findings within the pharmaceutical industry in Andhra Pradesh and Telangana. Each theoretical contribution is contextualised against the backdrop of prior

studies, as mentioned in the literature review, thereby deepening the understanding of supply chain management dynamics.

1. Enhancing Resource-Based View (RBV) and Dynamic Capabilities (DC)

Frameworks:

The Resource-Based View (RBV) highlights the strategic significance of internal resources, as highlighted by Barney (1991) and Wernerfelt (1984), who suggest that unique, inimitable resources within a firm can provide a competitive advantage. This study extends this view by demonstrating how supply chain orientation (SCO) acts as a strategic resource that enhances supply chain performance (SCP). Similarly, the Dynamic Capabilities Framework, as discussed by Teece et al. (1997), Indicates that the capacity to adapt and modify both internal and external skills and abilities is essential in rapidly changing contexts. This study empirically validates this assertion by showing how Supply Chain Agility (SCA), when enhanced by SCO, allows firms to adapt to rapid market changes, thereby operationalising these frameworks within the specific context of the pharmaceutical industry.

2. Operationalizing Relational View (RV):

The Relational View (RV) as proposed by Dyer and Singh (1998) argues that unique inter-organizational relationships can provide competitive advantages. This research contributes to the RV by showing how Supply Chain Integration (SCI) can operationalise these relational advantages by facilitating superior collaboration and coordination across the supply chain. The study's findings suggest that effective SCI not only supports but amplifies the benefits derived from a strategic supply chain orientation, thereby adding a quantitative dimension to the predominantly qualitative assessments seen in previous studies, such as those by Flynn et al. (2010).

3. Quantifying the Impact of Supply Chain Agility:

While previous research such as that by Swafford et al. (2006) has highlighted the importance of agility in supply chains, it has largely focused on qualitative assessments. This study advances the literature by quantitatively demonstrating the mediating role of SCA in enhancing SCP. This not only supports the assertions made by Gligor and Holcomb (2012) about the competitive advantage provided by agility but also provides a methodological foundation for quantitatively assessing its impact.

5.2.2 Managerial Contributions:

1. Strategic Emphasis on Supply Chain Orientation:

Managers are advised to foster a strong supply chain orientation within their organisations to enhance overall performance. This research underscores the importance of strategic alignment across the supply chain, highlighting how a unified approach can facilitate improved operational efficiencies and adaptability to market changes.

2. Leveraging Integration for Competitive Advantage:

The mediating role of supply chain integration provides managers with a clear pathway to enhance both agility and performance. By investing in integrated technologies and processes, managers can ensure that information and resources flow seamlessly across the supply chain, reducing bottlenecks and improving response times.

3. Agility as a Strategic Asset:

Given the volatile nature of the pharmaceutical market, agility emerges as a strategic asset that firms should develop. This study provides a framework for managers to understand and implement agility within their supply chains, emphasising its importance in maintaining competitiveness and meeting customer demands promptly.

4. Practical Implementation of Theoretical Models:

Finally, this research bridges the gap between theory and practice by offering a practical, empirically tested framework that managers in the pharmaceutical industry can adopt. By aligning their supply chain strategies with the insights provided, firms can better navigate the complexities of the market and regulatory environment in Andhra Pradesh and Telangana.

In summary, this thesis not only contributes to the academic literature but also offers tangible, strategic insights that can significantly enhance the management and performance of supply chains in the pharmaceutical sector. By adopting these recommendations, firms can ensure more robust, efficient, and responsive supply chain systems poised for success in an increasingly competitive and dynamic market.

5.3 Limitations

This study, while providing significant insights into supply chain management within the pharmaceutical industry in Andhra Pradesh and Telangana, is susceptible to several restrictions that must be taken into account while evaluating the outcomes:

Geographical Limitations: The research was confined to the pharmaceutical industry in Andhra Pradesh and Telangana. While these regions are significant due to their substantial role in the pharmaceutical sector, the findings may not be generalisable to other regions or countries with different economic, regulatory, and market dynamics. Further studies could expand the geographic scope to include other regions in India or globally to test the applicability of the findings.

Cross-Sectional Design: The study utilised a cross-sectional design, which collects data at a specific moment in time. This technique restricts the capacity to determine causality or observe changes over a period of time. Longitudinal studies could provide deeper insights into the dynamics of supply chain management and how they evolve with changes in the business environment or regulatory landscape.

Scope of Supply Chain Constructs: While this study extensively covers aspects like supply chain orientation, integration, and agility, there are other dimensions of supply chain management that were not explored. Constructs such as supply chain risk management, sustainability practices, or technological innovation could also significantly impact supply chain performance but were outside the scope of this research.

Quantitative Focus: The reliance on quantitative methods provides a robust basis for testing hypotheses but may overlook nuanced factors that qualitative approaches could reveal. Qualitative data, such as interviews or case studies, might provide deeper insights into the strategic decisions behind supply chain integration and agility practices, offering a more comprehensive understanding of the context and mechanisms driving the observed relationships.

Data Collection Method: The data was collected through surveys, which may be subject to biases such as response bias or the self-reporting nature of the data. Although measures were taken to mitigate common method bias, these may not fully eliminate potential distortions in how participants report their practices and performances.

By recognising these constraints, this study not only guarantees a clear and analytical evaluation of its results but also establishes the foundation for future research that can expand on this work to offer more profound insights into efficient supply chain management techniques.

5.4 Directions for Future Research

The examination of supply chain management in the pharmaceutical business in Andhra Pradesh and Telangana in this study presents various opportunities for future research. The purpose of these recommendations is to specifically target the limits that have been recognised and to expand the comprehension of supply chain dynamics even more.

Broaden Geographic Scope: Future research should contemplate extending the geographic scope to encompass additional locations within India or perhaps making a comparative comparison across different countries. This expansion would improve the capacity to apply the findings to a wider range of situations and offer a deeper understanding of how differences in economic conditions, market dynamics, and regulatory regimes in different regions affect supply chain management techniques.

Longitudinal Studies: In order to accurately depict the changes in supply chain behaviours over a period of time, future studies could utilise longitudinal methods. This methodology would enable researchers to systematically analyse the consequences of strategic modifications in supply chain management, evaluate the enduring effects of supply chain orientation, integration, and agility on performance, and get a deeper comprehension of causal links.

Incorporate Additional Constructs: By integrating additional supply chain structures such as sustainability, risk management, and technology innovation, a more holistic understanding of the components that impact supply chain performance can be achieved. Subsequent research endeavours could investigate the manner in which these dimensions interrelate with the components examined in this study, hence influencing the overall effectiveness of the supply chain.

Qualitative Methodologies: Utilizing qualitative approaches such as case studies, interviews, or ethnographic research has the potential to enhance the quantitative findings. These methodologies would enable a more thorough investigation into the contextual elements, managerial decisions, and internal dynamics that impact supply chain tactics and their results.

Wide-ranging Industry Applications: Although this study only examined the pharmaceutical business, employing the same approach in other industries could uncover industry-specific obstacles and advantages in supply chain management. Conducting comparative research

across different sectors could reveal both common and distinct strategic variables that are crucial for supply chain success.

Analysis of Technological Impact: Because of the rapid pace at which these technologies are developing, it is imperative that future studies in supply chain management especially investigate the influence of emerging technologies such as artificial intelligence, blockchain, and the Internet of Things (IoT). An analysis of how these technologies either enable or impede supply chain integration and agility would yield useful insights into contemporary supply chain operations.

Interdisciplinary Studies: Incorporating knowledge from other fields, including economics, environmental science, and technology studies, could enhance our comprehension of supply chain management, both in theory and in practice. Interdisciplinary research has the potential to reveal previously unknown aspects that impact supply chain strategies and performance.

By following these instructions, future research can further develop the initial findings of this study, providing a more comprehensive and profound understanding of efficient supply chain management strategies and their crucial impact on organisational achievements.

References

References

- Adana, S., Manuj, I., Herburger, M., Cevikparmak, S., Celik, H., & Uvet, H. (2024). Linking decentralization in decision-making to resilience outcomes: a supply chain orientation perspective. *The International Journal of Logistics Management*, 35(1), 256-280. <https://doi.org/10.1108/IJLM-07-2022-0308>
- Agarwal, A., Shankar, R., & Tiwari, M. K. (2007). Modeling agility of supply chain. *Industrial Marketing Management*, 36(4), 443-457. <https://doi.org/https://doi.org/10.1016/j.indmarman.2005.12.004>
- Altioek, T., & Ranjan, R. (1995). Multi-stage, pull-type production/inventory systems. *IIE Transactions*, 27(2), 190-200. <https://doi.org/10.1080/07408179508936731>
- Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly*, 36(3), 421-458. <https://doi.org/10.2307/2393203>
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120. <https://doi.org/10.1177/014920639101700108>
- Beamon, B. M. (1999). Measuring supply chain performance. *International Journal of Operations & Production Management*, 19(3), 275-292. <https://doi.org/10.1108/01443579910249714>
- Braunscheidel, M. J., & Suresh, N. C. (2009). The organizational antecedents of a firm's supply chain agility for risk mitigation and response. *Journal of Operations Management*, 27(2), 119-140. <https://doi.org/https://doi.org/10.1016/j.jom.2008.09.006>
- Brewer, P. C., & Speh, T. W. (2000). Using the Balanced Scorecard to Measure Supply Chain Performance. *Journal of Business Logistics*.
- Chiang, C. Y., Kocabasoglu-Hillmer, C., & Suresh, N. (2012). An empirical investigation of the impact of strategic sourcing and flexibility on firm's supply chain agility. *International Journal of Operations & Production Management*, 32(1), 49-78. <https://doi.org/10.1108/01443571211195736>
- The Chief Supply Chain Officer Report. (2014). https://www.logisticsmgmt.com/article/the_chief_supply_chain_officer_report_2014
- Christopher, M., & Gattorna, J. (2005). Supply chain cost management and value-based pricing. *Industrial Marketing Management*, 34(2), 115-121. <https://doi.org/https://doi.org/10.1016/j.indmarman.2004.07.016>

- Cohen, M. A., & Lee, H. L. (1988). Strategic Analysis of Integrated Production-Distribution Systems: Models and Methods. *Operations Research*, 36(2), 216-228. <https://doi.org/10.1287/opre.36.2.216>
- Cook, R. L., & Rogowski, R. A. (1996). Applying JIT principles to continuous process manufacturing supply chains. *Production and Inventory Management Journal*, 37(1), 12. <https://www.proquest.com/scholarly-journals/applying-jit-principles-continuous-process/docview/199878256/se-2>
- Cooper, M. C., Lambert, D. M., & Pagh, J. D. (1997). Supply Chain Management: More Than a New Name for Logistics. *The International Journal of Logistics Management*, 8(1), 1-14. <https://doi.org/10.1108/09574099710805556>
- Das, K. (2011). A quality integrated strategic level global supply chain model. *International Journal of Production Research*, 49(1), 5-31. <https://doi.org/10.1080/00207543.2010.508933>
- Dove, R. (2005). Agile Enterprise Cornerstones: Knowledge, Values, and Response Ability. In R. L. Baskerville, L. Mathiassen, J. Pries-Heje, & J. I. DeGross, *Business Agility and Information Technology Diffusion* Boston, MA.
- Droge, C., Vickery, S. K., & Jacobs, M. A. (2012). Does supply chain integration mediate the relationships between product/process strategy and service performance? An empirical study. *International Journal of Production Economics*, 137(2), 250-262. <https://doi.org/https://doi.org/10.1016/j.ijpe.2012.02.005>
- Drucker, P. F. (2013). *Measurement Myopia* [Interview]. <https://drucker.institute/thedx/measurement-myopia/>
- DYER, J. H. (1996). Specialized Supplier Networks as a Source of Competitive Advantage: Evidence from the Auto Industry. *Strategic Management Journal*, 17(4), 271-291. [https://doi.org/https://doi.org/10.1002/\(SICI\)1097-0266\(199604\)17:4<271::AID-SMJ807>3.0.CO;2-Y](https://doi.org/https://doi.org/10.1002/(SICI)1097-0266(199604)17:4<271::AID-SMJ807>3.0.CO;2-Y)
- Estampe, D., Lamouri, S., Paris, J.-L., & Brahim-Djelloul, S. (2013). A framework for analysing supply chain performance evaluation models. *International Journal of Production Economics*, 142(2), 247-258. <https://doi.org/https://doi.org/10.1016/j.ijpe.2010.11.024>
- EYIndia. (2023). *India's healthcare and pharma leaders set sight on disruptive innovation by 2047: EY Parthenon – OPPI report*. https://www.ey.com/en_in/news/2023/11/india-s-healthcare-and-pharma-leaders-set-sight-on-disruptive-innovation-by-2047-ey-parthenon-oppi-report
- Fabbe-Costes, N., & Jahre, M. (2008). Supply chain integration and performance: a review of the evidence. *The International Journal of Logistics Management*, 19(2), 130-154. <https://doi.org/10.1108/09574090810895933>

- Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, 28(1), 58-71. <https://doi.org/https://doi.org/10.1016/j.jom.2009.06.001>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Frohlich, M. T., & Westbrook, R. (2001). Arcs of integration: an international study of supply chain strategies. *Journal of Operations Management*, 19(2), 185-200. [https://doi.org/https://doi.org/10.1016/S0272-6963\(00\)00055-3](https://doi.org/https://doi.org/10.1016/S0272-6963(00)00055-3)
- Gligor, D. M., & Holcomb, M. C. (2012). Understanding the role of logistics capabilities in achieving supply chain agility: a systematic literature review. *Supply Chain Management: An International Journal*, 17(4), 438-453. <https://doi.org/10.1108/13598541211246594>
- Gligor, D. M., Holcomb, M. C., & Stank, T. P. (2013). A Multidisciplinary Approach to Supply Chain Agility: Conceptualization and Scale Development. *Journal of Business Logistics*, 34(2), 94-108. <https://doi.org/https://doi.org/10.1111/jbl.12012>
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333-347. <https://doi.org/https://doi.org/10.1016/j.ijpe.2003.08.003>
- Hair, J. F., Gabriel, M., & Patel, V. (2014). AMOS covariance-based structural equation modeling (CB-SEM): Guidelines on its application as a marketing research tool. *Brazilian Journal of Marketing*, 13(2).
- Hald, K. S., & Kinra, A. (2019). How the blockchain enables and constrains supply chain performance. *International Journal of Physical Distribution & Logistics Management*, 49(4), 376-397. <https://doi.org/10.1108/IJPDLM-02-2019-0063>
- Handfield, R. B., & Nichols, E. L. (2004). Key issues in global supply base management. *Industrial Marketing Management*, 33(1), 29-35. <https://doi.org/https://doi.org/10.1016/j.indmarman.2003.08.007>
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30(2), 179-185. <https://doi.org/10.1007/BF02289447>
- Huang, M.-C., Yen, G.-F., & Liu, T.-C. (2014). Reexamining supply chain integration and the supplier's performance relationships under uncertainty. *Supply Chain Management: An International Journal*, 19(1), 64-78. <https://doi.org/10.1108/SCM-04-2013-0114>
- Huang, S. H., Sheoran, S. K., & Keskar, H. (2005). Computer-assisted supply chain configuration based on supply chain operations reference (SCOR) model. *Computers & Industrial Engineering*, 48(2), 377-394. <https://doi.org/https://doi.org/10.1016/j.cie.2005.01.001>

- Indian Pharmaceuticals Industry Analysis. (2023). <https://www.ibef.org/industry/indian-pharmaceuticals-industry-analysis-presentation>
- InvestIndia. (2023). Formulating success: The Indian pharmaceutical industry. <https://www.investindia.gov.in/sector/pharmaceuticals>
- Kahn, K. B., & Mentzer, J. T. (1996). EDI and EDI Alliances: Implications for the Sales Forecasting Function. *Journal of Marketing Theory and Practice*, 4(2), 72-78. <https://doi.org/10.1080/10696679.1996.11501725>
- Kaiser, H. F. (1960). The Application of Electronic Computers to Factor Analysis. *Educational and Psychological Measurement*, 20(1), 141-151. <https://doi.org/10.1177/001316446002000116>
- Khanuja, A., & Jain, R. K. (2020). Supply chain integration: a review of enablers, dimensions and performance. *Benchmarking: An International Journal*, 27(1), 264-301. <https://doi.org/10.1108/BIJ-07-2018-0217>
- Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications.
- Lee, H. L., & Feitzinger, E. (1995). Product configuration and postponement for supply chain efficiency. Institute of Industrial Engineers, Fourth Industrial Engineering Research Conference Proceedings,
- Leuschner, Rudolf, Rogers, D. S., & Charvet, F. F. (2013). A Meta-Analysis of Supply Chain Integration and Firm Performance. *Journal of Supply Chain Management*, 49(2), 34-57. <https://doi.org/https://doi.org/10.1111/jscm.12013>
- Li, G., Yang, H., Sun, L., & Sohal, A. S. (2009). The impact of IT implementation on supply chain integration and performance. *International Journal of Production Economics*, 120(1), 125-138. <https://doi.org/https://doi.org/10.1016/j.ijpe.2008.07.017>
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124. <https://doi.org/https://doi.org/10.1016/j.omega.2004.08.002>
- Liu, C.-L., & Lee, M.-Y. (2018). Integration, supply chain resilience, and service performance in third-party logistics providers. *The International Journal of Logistics Management*, 29(1), 5-21. <https://doi.org/10.1108/IJLM-11-2016-0283>
- Liu, H., & Wei, S. (2022). Leveraging supply chain disruption orientation for resilience: the roles of supply chain risk management practices and analytics capability. *International Journal of Physical Distribution & Logistics Management*, 52(9/10), 771-790. <https://doi.org/10.1108/IJPDLM-04-2021-0135>

- Marr, B., & Schiuma, G. (2003). Business performance measurement – past, present and future. *Management Decision*, 41(8), 680-687. <https://doi.org/10.1108/00251740310496198>
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining Supply Chain Management. *Journal of Business Logistics*, 22(2), 1-25. <https://onlinelibrary.wiley.com/doi/abs/10.1002/j.2158-1592.2001.tb00001.x>
- Min, S., Mentzer, J. T., & Ladd, R. T. (2007). A market orientation in supply chain management. *Journal of the Academy of Marketing Science*, 35(4), 507-522. <https://doi.org/10.1007/s11747-007-0020-x>
- Morita, M., Machuca, J. A. D., Marin-Garcia, J. A., & Alfalla-Luque, R. (2024). Drivers of supply chain adaptability: insights into mobilizing supply chain processes. A multi-country and multi-sector empirical research. *Operations Management Research*. <https://doi.org/10.1007/s12063-024-00474-4>
- Munir, M., Jajja, M. S. S., Chatha, K. A., & Farooq, S. (2020). Supply chain risk management and operational performance: The enabling role of supply chain integration. *International Journal of Production Economics*, 227, 107667. <https://doi.org/https://doi.org/10.1016/j.ijpe.2020.107667>
- Narasimhan, R., & Kim, S. W. (2002). Effect of supply chain integration on the relationship between diversification and performance: evidence from Japanese and Korean firms. *Journal of Operations Management*, 20(3), 303-323. [https://doi.org/https://doi.org/10.1016/S0272-6963\(02\)00008-6](https://doi.org/https://doi.org/10.1016/S0272-6963(02)00008-6)
- Neely, A., Richards, H., Mills, J., Platts, K., & Bourne, M. (1997). Designing performance measures: a structured approach. *International Journal of Operations & Production Management*, 17(11), 1131-1152. <https://doi.org/10.1108/01443579710177888>
- Omar, A., Davis-Sramek, B., Myers, M. B., & Mentzer, J. T. (2012). A Global Analysis of Orientation, Coordination, and Flexibility in Supply Chains. *Journal of Business Logistics*, 33(2), 128-144. <https://doi.org/https://doi.org/10.1111/j.0000-0000.2012.01045.x>
- Pagell, M. (2004). Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics. *Journal of Operations Management*, 22(5), 459-487. <https://doi.org/https://doi.org/10.1016/j.jom.2004.05.008>
- Patel, B. S., & Sambasivan, M. (2022). A systematic review of the literature on supply chain agility. *Management Research Review*, 45(2), 236-260. <https://doi.org/10.1108/MRR-09-2020-0574>
- Patel, P. C., Azadegan, A., & Ellram, L. M. (2013). The Effects of Strategic and Structural Supply Chain Orientation on Operational and Customer-Focused Performance. *Decision Sciences*, 44(4), 713-753. <https://doi.org/https://doi.org/10.1111/deci.12034>

- pharmexcil. (2023). *19 th Annual Report- Pharmaceuticals Export Promotion Council Of India*. <https://pharmexcil.com/annual-report>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of Method Bias in Social Science Research and Recommendations on How to Control It. In S. T. Fiske, D. L. Schacter, & S. E. Taylor (Eds.), *Annual Review of Psychology*, Vol 63 (Vol. 63, pp. 539-569). <https://doi.org/10.1146/annurev-psych-120710-100452>
- Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, 135(1), 514-522. <https://doi.org/https://doi.org/10.1016/j.ijpe.2011.09.001>
- Ragatz, G. L., Handfield, R. B., & Petersen, K. J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, 55(5), 389-400. [https://doi.org/https://doi.org/10.1016/S0148-2963\(00\)00158-2](https://doi.org/https://doi.org/10.1016/S0148-2963(00)00158-2)
- Rihimpharma. (2023). *Everything You Need to Know About MD5 Manufacturing License Requirements by CDSCO in India*. <https://www.rihimpharma.com/post/everything-you-need-to-know-about-md5-manufacturing-license-requirements-by-cdsco-in-india>
- Rumelt, R. (1984). Towards a Strategic Theory of the Firm in Competitive Strategic Management. Engelwood Cliffs, NJ: RB Lamb. In: Prentice-Hall.
- S. Tsanos, C., G. Zografos, K., & Harrison, A. (2014). Developing a conceptual model for examining the supply chain relationships between behavioural antecedents of collaboration, integration and performance. *The International Journal of Logistics Management*, 25(3), 418-462. <https://doi.org/10.1108/IJLM-02-2012-0005>
- Sahin, F., & Robinson, E. P. (2002). Flow Coordination and Information Sharing in Supply Chains: Review, Implications, and Directions for Future Research. *Decision Sciences*, 33(4), 505-536. <https://doi.org/https://doi.org/10.1111/j.1540-5915.2002.tb01654.x>
- Saragih, J., Tarigan, A., Pratama, I., Wardati, J., & Silalahi, E. F. (2020). The impact of total quality management, supply chain management practices and operations capability on firm performance. *Polish Journal of Management Studies*, 21(2), 384-397.
- Schulze-Ehlers, B., Steffen, N., Busch, G., & Spiller, A. (2014). Supply chain orientation in SMEs as an attitudinal construct. *Supply Chain Management: An International Journal*, 19(4), 395-412. <https://doi.org/10.1108/SCM-07-2013-0241>
- Sharma, N. C. (2022). Indian pharma in 2023: Industry experts give big thumbs up to the sector; here's what they are saying. *Business Today*. <https://www.businesstoday.in/industry/pharma/story/indian-pharma-in-2023-industry-experts-give-big-thumbs-up-to-the-sector-heres-what-they-are-saying-357290-2022-12-21>

- Shukor, A. A. A., Newaz, M. S., Rahman, M. K., & Taha, A. Z. (2021). Supply chain integration and its impact on supply chain agility and organizational flexibility in manufacturing firms. *International Journal of Emerging Markets*, 16(8), 1721-1744. <https://doi.org/10.1108/IJOEM-04-2020-0418>
- Stadtler, H., Stadtler, H., Kilger, C., Kilger, C., Meyr, H., & Meyr, H. (2015). *Supply chain management and advanced planning: concepts, models, software, and case studies*. Springer. <https://link.springer.com/book/10.1007/978-3-642-55309-7>
- Stank, T. P., Keller, S. B., & Daugherty, P. J. (2001). SUPPLY CHAIN COLLABORATION AND LOGISTICAL SERVICE PERFORMANCE. *Journal of Business Logistics*, 22(1), 29-48. <https://doi.org/https://doi.org/10.1002/j.2158-1592.2001.tb00158.x>
- Swafford, P. M., Ghosh, S., & Murthy, N. (2006). The antecedents of supply chain agility of a firm: Scale development and model testing. *Journal of Operations Management*, 24(2), 170-188. <https://doi.org/https://doi.org/10.1016/j.jom.2005.05.002>
- Swafford, P. M., Ghosh, S., & Murthy, N. (2008). Achieving supply chain agility through IT integration and flexibility. *International Journal of Production Economics*, 116(2), 288-297. <https://doi.org/https://doi.org/10.1016/j.ijpe.2008.09.002>
- Swink, M., & Song, M. (2007). Effects of marketing-manufacturing integration on new product development time and competitive advantage. *Journal of Operations Management*, 25(1), 203-217. <https://doi.org/https://doi.org/10.1016/j.jom.2006.03.001>
- Telangana Life Sciences: Vision 2030. (2020). <https://lifesciences.telangana.gov.in/wp-content/uploads/2020/12/Telangana-Life-Sciences-Vision-2030.pdf>
- Tiwari, S. (2021). Supply chain integration and Industry 4.0: a systematic literature review. *Benchmarking: An International Journal*, 28(3), 990-1030. <https://doi.org/10.1108/BIJ-08-2020-0428>
- Tseng, Y.-H., & Lin, C.-T. (2011). Enhancing enterprise agility by deploying agile drivers, capabilities and providers. *Information Sciences*, 181(17), 3693-3708. <https://doi.org/https://doi.org/10.1016/j.ins.2011.04.034>
- Tucker, T. (2011). Supply Chain Orientation: Refining a Nascent Construct.
- Voudouris, V. T., & Consulting, A. (1996). Mathematical programming techniques to debottleneck the supply chain of fine chemical industries. *Computers & Chemical Engineering*, 20, S1269-S1274. [https://doi.org/https://doi.org/10.1016/0098-1354\(96\)00219-0](https://doi.org/https://doi.org/10.1016/0098-1354(96)00219-0)
- Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J.-f., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70, 356-365. <https://doi.org/https://doi.org/10.1016/j.jbusres.2016.08.009>

- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171-180. <https://doi.org/https://doi.org/10.1002/smj.4250050207>
- Wong, C. Y., Boon-itt, S., & Wong, C. W. Y. (2011). The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management*, 29(6), 604-615. <https://doi.org/https://doi.org/10.1016/j.jom.2011.01.003>
- Yang, J. (2014). Supply chain agility: Securing performance for Chinese manufacturers. *International Journal of Production Economics*, 150, 104-113. <https://doi.org/https://doi.org/10.1016/j.ijpe.2013.12.018>
- Yu, W., Jacobs, M. A., Salisbury, W. D., & Enns, H. (2013). The effects of supply chain integration on customer satisfaction and financial performance: An organizational learning perspective. *International Journal of Production Economics*, 146(1), 346-358. <https://doi.org/https://doi.org/10.1016/j.ijpe.2013.07.023>
- Zhu, M., & Gao, H. (2021). The antecedents of supply chain agility and their effect on business performance: an organizational strategy perspective. *Operations Management Research*, 14(1), 166-176. <https://doi.org/10.1007/s12063-020-00174-9>

Annexure

Questionnaire

Gunupuru Koteswara Rao Research Scholar		Under the supervision of: Prof. GVRK Acharyulu School Of Management Studies University Of Hyderabad
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Questionnaire on

“Impact of Supply Chain Integration and Agility on Supply Chain Orientation and Performance relation- A Study on Bulk Drug Companies in Andhra Pradesh and Telangana”

- The purpose of this study is to know the perception of supply chain managers of bulk drug industries.
- The questionnaire is designed to collect data which will be used purely for the academic (Doctoral Research) purpose only.
- Please mark your response about the statements. There is no right or wrong answer.

Section A

Demographic Details

1. Name (Optional): _____
2. Age (years) _____
3. Gender _____
4. E- mail Id: _____
5. Contact Number: _____
6. Your Educational Background: _____
7. Total years of experience in pharma industry _____
8. Name of your (Current) Organization: _____
9. Year of establishment of Organization: _____
10. Type of Organization: Small / Medium / Large _____
11. Total number of employees in your organization: _____
12. Your designation in this organization: _____
13. For how many years you have been with this organization: _____
14. Are you a part of any other organization/s before joining this organization. If yes please indicate your total experience (in years) in supply chain domain:

While considering your organization supply chain, to what extent do you agree with each of the following statements?

Section B

Part-A

In terms of Orientation of supply chain activities with your supply chain members, to what extent you agree with each of the following statements.

Please indicate a tick (✓) for your answer on 5-point rating scale, where 1 stands for strongly disagree (SD), 2 for disagree, 3 for neutral, 4 for agree, and 5 strongly agree (SA).

Q. No	Questions	SD	D	N	A	SA
1	Promises made to our supply chain members by our business unit are reliable	1	2	3	4	5
2	Our business unit is knowledgeable regarding our products and/ or services when we are doing business with our supply chain members	1	2	3	4	5
3	Our business unit does not make false claims to our supply chain members	1	2	3	4	5
4	Our business unit is not open in dealing with our supply chain members	1	2	3	4	5
5	When making important decisions, our supply chain members are concerned about our welfare	1	2	3	4	5
6	When we share our problems with our supply chain members, we know they will respond with understanding	1	2	3	4	5
7	In the future we can count on our supply chain members to consider how their decisions and actions will affect us	1	2	3	4	5
8	When it comes to things that are important to us, we can depend on our supply chain members' support	1	2	3	4	5
9	We defend our supply chain members when outsiders criticize them if we trust them	1	2	3	4	5
10	We are patient with our supply chain members when they make mistakes that cause us trouble but or not repeated	1	2	3	4	5
11	Our business unit is willing to make cooperative changes with our supply chain members	1	2	3	4	5
12	We believe our supply chain members must work together to be successful	1	2	3	4	5
13	We view our supply chain as a value-added piece of our business	1	2	3	4	5

14	Our business unit's goals and objectives consistent with those of our supply chain members	1	2	3	4	5
15	Our CEO and CEOs of our supply chain members have similar operating philosophies	1	2	3	4	5
16	Top management repeatedly tell employees that this business unit's survival depends on its adapting to supply chain management	1	2	3	4	5
17	Top managers repeatedly tell employees that building maintaining, and enhancing long	1	2	3	4	5
18	Top managers repeatedly tell employees that sharing valuable strategic/ tactical information with our supply chain members is critical to this business unit's success	1	2	3	4	5
19	Top managers repeatedly tell employees that sharing risk and rewards is critical to this business unit's success	1	2	3	4	5
20	Top management offers various education opportunities about supply chain management	1	2	3	4	5

Part-B

In terms of integration of supply chain activities with your supply chain members, to what extent you agree with each of the following statements.

Q. No	Questions	SD	D	N	A	SA
1	We have high level of information exchange among suppliers within the supply chain	1	2	3	4	5
2	We have high level of information exchange between our company and major customers	1	2	3	4	5
3	We have high level of interdependence in technology between our company and major customers	1	2	3	4	5
4	We have high level of interdependence in business between our company and major customers	1	2	3	4	5
5	We have high level of interdependence in business among suppliers within the same supply chain	1	2	3	4	5
6	We have high level of interdependence in technology among suppliers within the same supply chain	1	2	3	4	5

Part-C

In terms of flexibility of supply chain activities, to what extent you agree with each of the following statements.

Q. No	Questions	SD	D	N	A	SA
1	Our firm can promptly identify opportunities/threats in its environment	1	2	3	4	5
2	We always receive the information we demand from our suppliers and customers	1	2	3	4	5
3	My organization can make firm decisions to respond to opportunities/threats in its environment	1	2	3	4	5
4	My firm can increase its short-term capacity as needed	1	2	3	4	5
5	We can adjust the specification of orders as requested by our customers	1	2	3	4	5
6	We are always able to adjust our product portfolio as fast as required by the market	1	2	3	4	5
7	When needed, we can adjust our supply chain operations to the extent necessary to execute our decisions	1	2	3	4	5

Part- D

In terms of performance of supply chain, to what extent you agree with each of the following statements.

Q. No	Questions	SD	D	N	A	SA
1	Our customers seem happy with our responsiveness to their problems	1	2	3	4	5
2	Customer standards are always met by our plant	1	2	3	4	5
3	Our customers have been well satisfied with the quality of our products over the past three years	1	2	3	4	5
4	Our unit cost of manufacturing is lower than major competitors	1	2	3	4	5
5	Our inventory turnover is higher than major competitors	1	2	3	4	5
6	Our on-time delivery performance is higher than major competitors	1	2	3	4	5
7	Our conformance to product specifications is higher than major competitors	1	2	3	4	5

Impact of Supply Chain Integration and Agility on Supply Chain Orientation and Performance Relation - A Study on Bulk Drug Companies in Andhra Pradesh and Telangana

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A CONCEPTUAL ROADMAP FOR IMPLEMENTING LOCALIZATION IN THE INDIAN AUTOMOTIVE INDUSTRY IN A POST-PANDEMIC SCENARIO

Boopalan Balu, National Institute of Technology, Tiruchirappalli
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ABSTRACT

The automotive industry has one of the most sophisticated global supply chains, with multi-national import-export flows running through every major automaker. Internationalization in the 1990s brought about a high degree of global sourcing along with organizational changes which brought out much needed increased in productivity. But with the COVID-19 pandemic halting many trade routes, many manufacturers are switching to regional suppliers and are therefore accelerating the process of localization. Such a change is not only beneficial to the economy of the home country, but also is considered as an environment-friendly initiative in line with green supply chain strategies. This study aims to provide a roadmap for bringing about such a change in the Indian automotive sector by combining the best localization practices followed by automakers across the world. Specific components which can be localized are studied in detail and separate strategies for localizing these components are presented. Such a roadmap will support the Indian Government's existing initiatives such as the 'Make in India' and will also lay the foundation for supporting India's vision of an 'Atma Nirbhar Bharat'.

Keywords: Supply Chain Management, Localization, Automotive Industry, India.

INTRODUCTION

Since the late nineteenth century, when the first few prototypes were made, the automotive sector, which includes automobiles and auto parts, has been in constant evolution. The automobile sector has emerged as a driver of growth prospects in developing countries, owing to the industry's extensive interconnections with other industries.

The automotive parts supply chain works as one of several layers in the overall operation of the automotive supply chain. It does, however, account for the majority of automotive supply chain operations in terms of complexity and market valuation. The component supplier universe involves a range of players, including Original Equipment Manufacturer (OEM)-owned captive manufacturing units, contract manufacturers who work under OEM production and supply agreements, and independent suppliers who may or may not be part of the OEM's distributor network if they meet the latter's quality and other technical requirements.

As original equipment manufacturers form the primary consumer category of auto components, the automotive component industry's patterns are influenced by changes in the automotive industry. The key components that are traded internationally are gearboxes, drive axles, clutches, bumpers, radiators, road wheels, suspension shock absorbers, steering wheels and brakes.

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