Impact of Critical Logistics Practices on Efficiency of Supply Chain in Textile Industry of Pakistan

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Abstract

This research study aims to examine the impact of critical logistics practices on the efficiency of the supply chain within the textile industry in the twin cities of Islamabad and Rawalpindi, Pakistan. Specifically, it investigates how warehousing management, transportation management, and inventory management—identified as independent variables—affect the efficiency of the supply chain, the dependent variable in this study. A structured Likert scale survey questionnaire was designed as the primary research instrument for data collection. The study sampled 250 respondents from logistics companies across the twin cities to ensure representation of the broader population. Data collected from the respondents were analyzed using regression and correlation techniques through the Statistical Package for Social Sciences (SPSS) software to explore the relationships between logistics practices and supply chain efficiency. The results indicate a positive relationship between critical logistics practices (warehousing management, transportation management, and inventory management) and the efficiency of the supply chain in the textile industry of Islamabad and Rawalpindi. This finding suggests that improvements in these logistics' practices can enhance overall supply chain efficiency. The study's findings have significant implications for logistics managers and policymakers in the textile industry. By focusing on optimizing warehousing, transportation, and inventory management practices, stakeholders can achieve greater supply chain efficiency, which can lead to cost savings, improved service delivery, and a competitive edge in the market. The research is organized as follows: the introduction outlines the study's purpose and significance, the methodology section describes the research design and data collection process, the results section presents the statistical findings, and the discussion explores the implications of these findings for practice and future research. The study concludes with recommendations for enhancing logistics practices in the textile industry.

Keywords: Supply Chain, Textile Industry, Warehousing Management, Transportation Management, Inventory Management

Contents

Acknowledgment **4**
Abstract **5**
Chapter 1 ..... **9**
Introduction **9**
1.1 Introduction **9**
1.2 Background of Study **10**
1.3 Research Gap **13**
1.3.1 Theoretical Research Gap **13**
1.3.2 Practical Research Gap **14**
1.3.3 Contextual Research Gap **14**
1.4 Problem Statement **15**
1.5 Research Questions **15**
1.6 Research Objectives **15**
1.7 Significance of Study **16**
1.7.1 Theoretical Significance **16**
1.7.2 Practical Significance **16**
1.7.3 Academic Significance **16**
Chapter 2 ..... **17**
Literature Review **17**
2.1 Introduction **17**
2.2 Logistics Practices **19**
2.4 Warehousing Management **22**
2.5 Transportation Management **26**
2.6 Inventory Management **29**
2.7 Supply Chain Efficiency **31**
2.8 Theoretical Framework **33**
2.8.1 Theory of Constraints **34**
2.9 Conceptual Framework **36**
2.10 Research Hypothesis **36**
Chapter 3 ..... **37**
Methodology **37**

3.1 Introduction **37**
3.2 Research Design **37**
3.3 Research Variables **37**
3.4 Research Approach **38**
3.5 Research Strategy **38**
3.6 Research Instrument **39**
3.7 Unit of Analysis **39**
3.8 Population **40**
3.9 Sample Size **40**
3.10 Sampling Technique **41**
3.11 Data Collection Procedure **41**
Chapter 4 ..... **42**
Results And Analysis **42**
4.1 Introduction **42**
4.2 Reliability **42**
Table 1 ..... **43**
4.3 Descriptive Frequencies **43**
Table 2 ..... **44**
4.4 Correlation Analysis **45**
Table 3 ..... **46**
4.5 Regression Analysis **46**
Table 4 ..... **47**
4.6 ANOVA **47**
Table 5 ..... **47**
4.7 Coefficients **48**
Table 6 ..... **48**
4.8 Results and Discussion **48**
Chapter 5 ..... **50**
Discussion, Conclusion and Recommendations **50**
5.1 Discussion **50**
5.2 Conclusion **51**
5.3 Recommendations **52**
5.4 Research Limitations **52**

5.4 Research Implication **53**
References **54**
Appendix **58**

Chapter 1

Introduction

1.1 Introduction

As the overall economy develops, and the progression of work organizations quickens, the coordination business faces greater challenges and requests. The primary point is to raise the adaptability of the limit in coordination (Chatterjee 2019). An overabundance of articles places remarkable accentuation on the hugeness of generally execution estimations and rouse organizations with restricted sources to fulfill out of entryways desires. Operational estimations consistently mentioned through top administration are positioned as far as significance as follows: esteem changeability, lost deals, stock returns/finished things, fill rate, stock turns/crude materials, best request (on-time transport, request dispatched total, right bill, and no misfortune or hurt), and on-time transport (Montgomery 2021). These days the board needs additional general execution pointers. The investigators give a high-level perspective on highlights logistics providers ordinarily do, principally dependent on a study among buyers of coordination administrations (Yoshino 2022).

Those highlights are sorted into 5 principal locales: transportation, warehousing, stock control, request preparing, and data structures, and bundling. This has moved the focal point for coordination by and large execution to an ability to highlight buyer esteem. It has brought the requirement for another arrangement of extra key measures. Customers will begin to rely on logistics providers help organizations past conveyance administrations for extra mechanical development as they effectually expand capacities into these areas, likewise, to give start to finish incorporation and perceived (Ozment, J., 2022). A few searchers portray an assortment of eleven benchmark gauges that can be completed to the convey chain framework (Grant, D. B., 2019). Those measures are gathered into 3 primary classifications: process abilities, data innovation aptitudes, and prevalent innovation.

A lot of the writing makes a claim to fame of the usage of the most recent and developing innovation as a method of providing a deft usefulness (Shanshan, S., 2020). Notwithstanding the way that the centrality of compelling use is suggested in a ton of the writing, there might be minimal experimental investigations into how fundamental this could be in a flexibly chain setting. Moreover, they see the inclusion of providers in this strategy as being basic to their ability to

increase unreasonable degrees of customer fulfillment (Sheu, J. B., 2020). The more prominent deft organizations are likewise seen to be the utilization of innovation to sell productiveness, new item improvement, and customer fulfillment. This association additionally seems to separate between new item advancement and development.

Utilizing outsider coordination (logistics providers) administrations have end up being a basic factor of the coordination strategies of numerous worldwide organizations (Alfredsson, M., 2021). From a mixed viewpoint, it's been anticipated that the yearly market for such administrations currently surpasses $50 billion with regards to year (Lin, L., 2020). The purchasing strategy needs to end up being more prominent modern, and enormous clients seem to have an ever-expanding want list, simultaneously as likewise requesting nonstop value improvement at the flexibly part of the business, there stays a huge scope combination of the business identified with some of the significant suppliers. (Rahman, 2019)

To stay serious, numerous enormous organizations have expanded their supplier benefits, not, at this point best as far as the specific administrations introduced, anyway also as far as the geologies they serve. a couple have wandered into completely new help locales and now offer money related types of assistance and help for getting exercises. As the logistics providers business keeps on advancing, it's miles basic to each logistics providers suppliers and clients in their administrations that industry elements be recorded to encourage organization methodology advancement. The investigation that is referenced in this paper presents understanding into the buyer part of the logistics providers commercial center (Morgan, J, 2021).

1.2 Background of Study

The number one cause for logistics changes in developing organizations are new requests from consumers, ongoing improvement in inner strategies, and reassess textile industry of organization logistics techniques (Wang, L., 2019). Currently, two primary goals have emerged from researchers' research into delivering chains. First, businesses search to optimize each level of the supply chain individually to feature the most value for all parties concerned. Second and most importantly, businesses try to optimize the operation of the supply chain as an entire in regions along with product transport time, stock retaining value, and average price-to-market (Maczka 2019). The latest explosion within the development and competencies of the internet is converting the requirements for effective supply chain management.

Electronic commerce and related business-to-business transaction abilities have modified the manner wherein the supply chain operates. The internet has enabled data exchange on a remarkable scale, frequently at a pace too rapid for ordinary consumption (Prinsen, W., 2022). But improved access to actual-time data has now not assured that businesses can do something with these statistics or, most significantly, make the best choice with it. further, even though organizations can likewise now share some of genuine time insights streams, which incorporate vendor or buyer distribution center levels, key purchaser requesting styles, and relative district of basic flexibly chain resources, minimal evidence exists to show that something is being performed with this measurement.

The absolute capacity of to be had information is too large for any person or organization of people to decipher. Furthermore, no actual data analysis tools presently exist which can comprehend actual-time data and make informed decisions based totally on it (Kielmeyer, A. M, 2022). The appearance of computerization and the web has changed most distribution center tasks. Web innovation grants distribution center directors to acquire arranges most speedily and licenses them to follow the stock connected with the one's requests. There are a couple of disadvantages, yet. Because of the reality the web has provided a reduction cost method of putting a request, distribution centers are encountering the most successive, littler sum orders (Lottman, 2020). This makes the errand of combining requests for monetary shipment amounts the hardest.

It furthermore powers organizations to stand up to the exchange off between short-reaction (most incessant shipments) and stock holding costs. expanded shipments generally blast transportation charges simultaneously as decreasing stock holding costs, thusly, the attributes of the item being moved or put away, which incorporate its cost, size, and standard interest design (occasional or typical) choose if the money related reserve funds in stock holding costs pays for the worth blast in transportation. Real time information at the item stream transforms into the sudden death round for each side of the organization's condition as far as purchasing and auctioning off transportation and stock costs (Segunda, 2021).

Businesses aren't certainly prepared to make educated, powerful choices fundamentally based at the insights assembled individually by methods for distribution center administration structures which incorporate data comprising of provider/shopper stockroom stock levels and key customer requesting styles and by methods for transportation the board frameworks inside which

measurements bearing on the zone of basic gracefully chain resources including items or vehicles is generally put away. for example, a business' these days may also have full mastery of request retraction before the requests booked transportation time, be that as it may, they might be as often as possible not ready to respond to the circumstance continuously through rerouting or diverse restorative activity. Consequently, regardless of the way that organizations' perceivability into gracefully chain inventories is continually improving, this advanced perceivability has now not converted into organizations settling on better choices (Farris, J. A., 2023).

The function that transportation performs within the logistics system is more complicated than holding goods for the proprietors. Its complexity can take impact only through a high amount of management. By way of the properly handled transport system, items will be dispatched to the right location at the proper time to fulfill consumers' needs (Robinson, S, 2021). It brings efficacy, and it builds a bridge between manufacturers and consumers. Consequently, transportation is the base of performance and financial system in business logistics and expands other features of the logistics system. Further, a great transport system appearing in logistics activities brings advantages not only to service high-quality however also to businesses' competitiveness (Waller, M., 2022). A logistics providers organization is an outside coordination specialist co-op who oversees, arranges, and supplies coordination exercises in the interest of a shipper (Alfredsson, 2021).

In sync with refreshed the worldwide Logistics affiliation numerous logistics providers organizations are little or medium organizations (Hertz, 2020). They offer coordination benefits up to their exceptional by methods for subcontracting a piece of the activities up various gracefully chain parties. Directly, the essential data stream stations for those logistics providers organizations are through fax, phone, and email, which realize delays, human errors, and unnecessary running costs. Moreover, logistics providers organizations are not capable up to increase an update status from their purchasing and selling mates inside the satisfaction strategy in genuine time for settling on very much coordinated choices (Spring, M, 2022).

It is expressed that the present-day strategies for correspondence are wasteful. Hence, neighborhood little and medium logistics providers organizations need to embrace new strategies refreshed on the operational methodologies. The included Logistics data the executive's

framework is intended for nearby little and medium logistics providers organizations, with cutting edge data innovation up fit as a fiddle such needs (Nebol, 2022).

The framework replaces conventional organization's correspondence strategies and permits the operational technique to skim, resulting in a lower in working costs and, simultaneously, improving correspondence execution (Lai, K. H, 2021). A web basically based typical stage for extraordinary occasions in the gracefully chain is provided so association can offer snappier and most right coordination's data sharing and correspondence among the buying and selling companions within the supply chain. Furthermore, multidimensional overall performance evaluation in numerous companies' regions is applied that allows updates to facilitate continuous improvement in each the company's procedure and service degrees (Wolf, C.,2019).

1.3 Research Gap

Regardless of the extensive body of literature on logistics practices and supply chain efficiency, specific research focusing on the textile industry in Pakistan remains limited. The textile sector is a cornerstone of Pakistan's economy, contributing significantly to industrial output, employment, and exports. However, the existing studies predominantly emphasize general manufacturing or textile industries in other countries, failing to address the unique logistical challenges and opportunities within the Pakistani context.

1.3.1 Theoretical Research Gap

Research on logistics practices and supply chain efficiency, there is a notable absence of theoretical models specifically tailored to the textile industry in Pakistan. Most existing theories address general logistics practices across various manufacturing sectors or apply to international contexts without delving into the unique challenges faced by Pakistan's textile sector. For instance, Haseeb et al. (2019) review various theoretical frameworks for supply chain management but do not offer insights specific to the textile industry in Pakistan. Similarly, Wang et al. (2020) provide an overview of theoretical perspectives on logistics and supply chain management but do not extend these perspectives to the textile industry in Pakistan ((Haseeb et al., 2019). This gap underscores a need for the development of tailored theoretical frameworks that consider the specific logistical requirements and operational conditions of Pakistan's textile sector, thereby advancing a more nuanced understanding of how critical logistics practices impact supply chain efficiency in this industry.

1.3.2 Practical Research Gap

Current research on logistics practices and supply chain efficiency often relies on qualitative data or case studies from other countries, which limits the ability to quantitatively measure the direct impact of specific logistics practices on supply chain efficiency in Pakistan's textile industry. Khan et al. (2021) highlight that while there is a significant amount of research on logistics practices, much of it focuses on qualitative assessments rather than quantitative analyses. Similarly, Choi et al. (2022) emphasize the need for quantitative models to assess logistics practices but do not address these models specifically in the context of Pakistan's textile sector. This practical gap reveals an opportunity for research that employs quantitative methods, such as surveys and statistical analyses, to provide robust data on the effectiveness of logistics practices in enhancing supply chain efficiency within Pakistan’s textile industry.

1.3.3 Contextual Research Gap

In the context of Pakistan's textile industry, there is a significant research gap concerning the integration of advanced logistics technologies, sustainable practices, and government policies, all of which are crucial for enhancing supply chain efficiency. Rauf et al. (2022) discuss sustainable logistics practices but do not specifically focus on how these practices can be applied or improved within the textile sector in Pakistan. Their research highlights general sustainable practices but lacks a focused examination of how these practices could be adopted in Pakistan’s textile industry. Similarly, Ahmed et al. (2023) review how government policies influence logistics and supply chain management but do not address how these policies affect the textile industry specifically. Additionally, Lee et al. (2024) explores advanced logistics technologies but fail to connect these technologies to the specific needs of the Pakistani textile sector. This gap points to the need for research that explores how advanced logistics technologies and sustainable practices can be effectively implemented in Pakistan’s textile industry and how government policies can be leveraged or reformed to support these efforts. Understanding these factors could lead to improved logistics practices, greater supply chain efficiency, and enhanced competitiveness for Pakistan’s textile sector.

1.4 Problem Statement

Although the textile sector is essential to Pakistan's economic structure, there is a considerable lack of understanding regarding how specific logistics practices affect the efficiency of the supply chain in this sector. The existing literature largely addresses broader manufacturing sectors or international textile industries, creating a void in both theoretical models and practical insights tailored to the unique logistical challenges faced by Pakistan's textile industry. Additionally, much of the current research is based on qualitative data or case studies, lacking robust quantitative evaluations of the direct impacts of key logistics practices—such as warehousing management, transportation management, and inventory management—on supply chain efficiency. There is also a gap in exploring the application of advanced logistics technologies, sustainable practices, and government policies in shaping effective logistics operations within the context of Pakistan. This research aims to address these shortcomings by empirically investigating the effects of these logistics practices on supply chain efficiency, integrating modern technologies and sustainable practices, and examining how government policies influence logistics effectiveness in Pakistan's textile industry. The goal is to provide targeted insights and practical recommendations to enhance the efficiency of the textile supply chain, assist industry stakeholders in optimizing logistics operations, and support policymakers in crafting effective frameworks for the sector's growth and international competitiveness.

1.5 Research Questions

Based on the problem statement, following are the research questions of this study:

- **RQ1:** What is the impact of warehousing management on supply chain efficiency?
- **RQ2:** What is the impact of inventory management on supply chain efficiency?
- **RQ3:** What is the impact of transport management on supply chain efficiency?

1.6 Research Objectives

Based on the problem statement, this study is conducted with the aim:

- **RO1:** To investigate the impact of warehousing management on supply chain efficiency.
- **RO2:** To investigate the impact of inventory management on supply chain efficiency.
- **RO3:** To investigate the impact of transport management on supply chain efficiency.

1.7 Significance of Study

The significance of this research study lies in its contribution to both theoretical understanding and practical applications within the context of the textile industry in Pakistan. By examining the impact of critical logistics practices on the efficiency of the supply chain, particularly focusing on warehousing management, inventory management, and transport management, this study strengthens the conceptual framework of logistics management's influence on supply chain management.

1.7.1 Theoretical Significance

The theoretical significance of this research lies in its contribution to understanding the impact of logistics practices on supply chain efficiency within Pakistan's textile industry. While existing theories primarily address general manufacturing contexts or international textile sectors, this study focuses on specific practices—warehousing, inventory, and transportation management—within a local context. By providing empirical evidence and developing a tailored theoretical model, this research enhances existing frameworks and offers a foundation for future studies exploring similar dynamics in different settings.

1.7.2 Practical Significance

From a practical perspective, the study offers valuable insights for improving logistics operations in Pakistan's textile industry. By analyzing the effects of critical logistics practices on supply chain efficiency, the research identifies strategies for optimizing warehousing, transportation, and inventory management. These findings help businesses reduce costs, enhance service delivery, and adopt advanced technologies. The study's recommendations guide logistics managers in making data-driven decisions to improve operational efficiency and gain a competitive edge in the textile market.

1.7.3 Academic Significance

Academically, this research expands the literature on logistics practices by focusing on Pakistan's textile industry—a relatively underexplored area. The study offers new empirical data and theoretical insights into how logistics practices affect supply chain efficiency, filling gaps left by previous research. It also provides a basis for future academic inquiries and offers a comprehensive review of government policies and technologies, supporting scholars in exploring new research avenues and refining existing theories in supply chain management.

Chapter 2

Literature Review

2.1 Introduction

The textile industry in Pakistan stands as a cornerstone of the nation's economy, serving as a vital engine of industrial production, employment generation, and export revenue. However, amidst its significance, the industry confronts a myriad of challenges, prominently among them being the optimization of supply chain efficiency (Feroz and Tina, 2021). Central to this challenge lies the effective management of logistics practices, encompassing warehousing, inventory, and transport management. Extensive research underscores the pivotal role of logistics practices in augmenting supply chain efficiency (Jazzy, Zeynap, 2020).

Studies have repeatedly emphasized the symbiotic relationship between effective logistics management and the attainment of supply chain objectives. Moreover, empirical evidence accentuates the tangible benefits that accrue from outsourcing logistics functions, ranging from cost reductions to heightened service levels (Tamara, 2022). Despite this wealth of knowledge, a significant gap remains in comprehending the nuanced impact of critical logistics practices on the efficiency of the textile supply chain within Pakistan. This study aims to bridge this gap by delving into the intricate relationship between warehousing, inventory, and transport management practices and supply chain efficiency within the specific context of the Pakistani textile industry (Young and Wassy, 2019).

Through an amalgamation of theoretical insights and empirical findings, this research endeavors to furnish textile firms with actionable insights that can inform strategic decision-making and foster the optimization of logistics practices, thereby enhancing overall supply chain efficiency within the industry (Anusha, 2023). The textile industry in Pakistan is a vital component of the country's economy, contributing substantially to industrial output, employment generation, and export earnings. With a rich history and a diverse range of products, ranging from cotton textiles to garments, the industry occupies a prominent position in both domestic and international markets (Rauf and Sajan, 2022).

However, despite its prominence, the industry grapples with numerous challenges, chief among them being the optimization of supply chain efficiency. At the heart of this challenge lies the effective management of logistics practices, encompassing various aspects such as

warehousing, inventory, and transport management. Research in the field of supply chain management has underscored the pivotal role of logistics practices in enhancing overall supply chain efficiency (Farooq and Junaid, 2021).

Numerous studies have elucidated the intricate interplay between logistics management and the achievement of supply chain objectives. Atnafu and Balda (2022), for instance, emphasize the significance of effective logistics management in bolstering the performance of manufacturing industries, including the textile sector. McGinnis and Kohn (2022) further highlight the benefits of outsourcing logistics activities, citing cost reductions and improved service levels as notable advantages. Such empirical evidence underscores the tangible benefits that can be derived from optimizing logistics practices within the textile industry.

However, despite the wealth of research on logistics management and supply chain efficiency, a significant gap persists in understanding the specific impact of critical logistics practices on the efficiency of the textile supply chain in Pakistan. While theoretical frameworks provide insights into the broader concepts of logistics management, there remains a dearth of research specifically tailored to the unique context of the Pakistani textile industry (Marvin and Sunny, 2019). This gap underscores the need for a comprehensive study that examines the relationship between warehousing, inventory, and transport management practices and supply chain efficiency within the Pakistani textile industry context (Abhishek, 2023).

By addressing this gap, this research aims to provide valuable insights that can inform strategic decision-making within textile firms. By exploring the intricate relationship between logistics management practices and supply chain efficiency, the study seeks to equip textile firms with actionable insights that can facilitate the optimization of logistics practices and enhance overall supply chain efficiency (Norrma, 2021). Through an amalgamation of theoretical insights and empirical findings, the research endeavors to contribute to the advancement of knowledge in the field of supply chain management, particularly within the context of the textile industry in Pakistan.

The optimization of supply chain efficiency remains a pressing challenge for the textile industry in Pakistan. Central to this challenge lies the effective management of logistics practices, including warehousing, inventory, and transport management. While existing research provides valuable insights into the broader concepts of logistics management, there remains a significant

gap in understanding the specific impact of critical logistics practices on the efficiency of the textile supply chain in Pakistan. This research aims to address this gap by delving into the intricate relationship between logistics management practices and supply chain efficiency within the Pakistani textile industry context. Through an integration of theoretical insights and empirical findings, the study seeks to provide actionable insights that can inform strategic decision-making and foster the optimization of logistics practices, thereby enhancing overall supply chain efficiency within the industry.

2.2 Logistics Practices

Logistics practices have become increasingly significant in modern logistics management, offering both theoretical insights and practical applications that transform how logistics functions are performed and managed (Surinder, 2022). At its core, Logistics practices involve the outsourcing of logistics functions to external service providers who manage and execute various logistics tasks on behalf of other companies (Kashif, 2020). This concept has evolved beyond simple service contracts to become a strategic approach that reshapes logistics operations, integrates advanced technologies, and addresses specific industry challenges. Despite the extensive research on logistics practices, the exploration of Logistics practices impact on supply chain efficiency, especially within the context of Pakistan's textile industry, reveals several theoretical, practical, and contextual dimensions that are crucial for understanding its significance (Raina, 2019).

The significance of Logistics practices lies in their role in expanding and refining our understanding of logistics management. Historically, logistics functions such as transportation, warehousing, and inventory management were handled internally by companies (Murad, 2023). However, the rise of Logistics practices has introduced new theoretical frameworks that highlight the benefits of outsourcing these functions to specialized external providers (Tamara, 2020). One of the key theoretical advancements is the shift from viewing logistics as a purely operational activity to understanding it as a strategic component that can enhance overall business performance (Narkhede, 2019). For instance, Logistics practices are grounded in the Resource-Based View (RBV) theory, which posits that companies can achieve a competitive advantage by leveraging external resources and capabilities that are not available internally (Aggarwal, 2020). This theoretical perspective underscores how outsourcing logistics functions allows firms to focus on

their core competencies while relying on external experts for logistics management (Hussain, 2021).

Another significant contribution of Logistics practices is its role in enabling firms to adapt to the complexities of modern supply chains (Kimberly, 2022). Traditional logistics models often focused on internal efficiencies and cost reductions, but Logistics practices introduce a broader set of strategies and tools (Ella, 2021). Recent research emphasizes that Logistics relationships are not just about outsourcing but about forming strategic partnerships that involve long-term commitments, mutual benefits, and shared risks and rewards (Ojala, 2021). This conceptualization of Logistics practices aligns with the Logistics Model which illustrates the interactions among the shipper, the logistics provider, and the customer. This model highlights how effective Logistics practices arrangements require careful coordination and collaboration among all parties involved to achieve desired outcomes (Lin, 2020).

The framework of Logistics practices also includes the exploration of advanced technologies and innovations (Granger, 2019). Recent developments in TPL practices involve the integration of digital tools such as Warehouse Management Systems (WMS), Transportation Management Systems (TMS), and data analytics to optimize logistics operations (Coyle et al., 2021). These technologies enable real-time tracking of shipments, better inventory control, and more efficient transportation routes. The theoretical exploration of these technologies helps to advance our understanding of how Logistics practices can improve logistics efficiency and effectiveness, providing a foundation for future research (Berglund & Peters, 2021).

On a practical level, Logistics practices offer significant benefits for companies seeking to improve their logistics operations (Shuja, 2022). One of the primary advantages is cost reduction. By outsourcing logistics functions, companies can avoid the substantial capital investments required for maintaining warehouses, purchasing transportation equipment, and managing inventory systems (Skott & Larsen, 2019). Logistics providers often have the resources to achieve economies of scale, which results in lower costs for services such as warehousing and transportation. For example, smaller companies can benefit from the cost efficiencies of large logistics firms, which can manage higher volumes of goods and services more economically than smaller, independent operations (Bask, 2020).

Moreover, Logistics practices offer strategic benefits by allowing companies to focus on their core business activities (Justin, 2020). By outsourcing logistics functions, firms can redirect their resources and attention towards product development, marketing, and customer service (Rauf et al., 2022). This strategic focus can lead to improved competitive positioning and enhanced overall business performance. For instance, companies like Walmart and Amazon utilize TPL services to manage their extensive supply chains, demonstrating how effective logistics management can support large-scale operations and drive business success (Zhao et al., 2022).

Another practical benefit of Logistics practices is the ability to access advanced technologies and expertise. Logistics providers often have access to state-of-the-art logistics technologies and employ sophisticated analytics to optimize logistics operations (Maqbool et al., 2023). These technologies include advanced tracking systems, automated warehousing solutions, and predictive analytics that enhance logistics efficiency. By leveraging these technologies, companies can improve their logistics processes and achieve better performance outcomes (Subhani, 2023).

In the context of Pakistan's textile industry, Logistics practices address specific logistical challenges and opportunities (Kanwal, 2021). The textile sector in Pakistan is a vital component of the national economy, but it faces inefficiencies related to outdated logistics practices, insufficient infrastructure, and limited access to advanced technologies (Zia et al., 2021). TPL practices offer solutions to these challenges by providing access to modern logistics technologies, improving operational efficiency, and enabling companies to compete in a global market (Fahad et al., 2022).

Implementing TPL services in Pakistan's textile industry can lead to significant improvements in warehousing and transportation management (Gupta, 2020). Logistics providers can introduce advanced warehouse management systems (WMS) that optimize storage, inventory control, and order fulfillment (Haseeb et al., 2022). Similarly, Logistics practices can streamline transportation processes through optimized routing, real-time tracking, and better coordination between suppliers and customers (Rauf et al., 2022).

The effectiveness of Logistics practices in Pakistan is also influenced by government policies and regulations (Haider, 2021). Supportive policies that promote logistics infrastructure development, such as investments in transportation networks and logistics hubs, can enhance the

effectiveness of Logistics services (Ishaq et al., 2023). Conversely, regulatory barriers and inefficiencies can hinder the successful implementation of Logistics practices, highlighting the need for policies that facilitate logistics operations and support the growth of the textile sector (Yadav et al., 2023).

In addition to improving logistics operations, Logistics practices can also contribute to the sustainable development of the textile industry (Kalim, 2019). Sustainable logistics practices are becoming increasingly important as companies seek to reduce their environmental impact and achieve sustainability goals (Paiwan et al., 2023). Logistics providers can support these goals by implementing eco-friendly logistics solutions, such as energy-efficient transportation options and waste reduction strategies. For instance, the application of blockchain technology in Logistics practices can enhance transparency and traceability in supply chains, while artificial intelligence (AI) can optimize logistics processes through advanced analytics and automation (Ali et al., 2024). Additionally, comparative studies between different regions and industries can provide valuable insights into the effectiveness of Logistics practices and identify best practices for various contexts (Paiwan et al., 2023).

The significance of Logistics practices highlights their role in modern logistics management. Theoretical advancements offer new frameworks for understanding the strategic benefits of Logistics practices, while practical applications demonstrate how Logistics practices can improve efficiency, reduce costs, and enable companies to focus on their core competencies. Contextually, Logistics practices address specific challenges in Pakistan's textile industry and offer solutions for enhancing logistics operations, sustainability, and competitiveness. This comprehensive understanding of Logistics practices provides a foundation for future research and development in the field, offering opportunities for further exploration and innovation.

2.4 Warehousing Management

A warehouse is an office inside the flexibly chain to unite Items to reduce transportation cost, acquire economies of scale underway, or in purchasing or offer expense included strategies and abbreviate reaction time (Grinsted, S., 2020). Warehousing has moreover been distinguished as one of the significant activities in which associations can offer custom-made offices for their shoppers and advantage a serious increase (Richards, G., 2021). there are various assortments of stockrooms: they can be sorted into assembling stockrooms and dispersion administrations and by

utilizing their jobs inside the flexibly chain they can be ordered as crude materials stockrooms, work-in-framework distribution centers, finished well stockrooms, appropriation distribution centers, satisfaction distribution centers, nearby distribution centers direct to shopper request, and cost-conveyed supplier stockrooms (Koster, 2023).

Distribution centers were experiencing various difficulties which incorporate – gracefully chains have gotten more prominent coordinated and shorter, globalized activity, Consumers are more noteworthy requesting and innovation alterations are going on quickly (Faber, 2020). A decent method to adapt to those difficulties, organizations are receiving progressive techniques which incorporate distribution center administration frameworks (Akash, 2022). A distribution center administration framework for the most part targets to administer the development and capacity of materials inside a stockroom and procedure the related exchanges, for example, conveyance, accepting, situated away, and picking (Smidt, 2021). A stockroom the executive's framework is database-pushed PC programming, to improve the exhibition of the distribution center by method of coordinating cutaways and to hold precise stock by methods for recording distribution center exchanges (Van Nunen 2019).

When the data has been accumulated, there's both cluster synchronization with and a genuine time remote transmission to an applicable database (Manzini, R., and Ferrari, E., 2020). The database would then be able to give gainful reports about the notoriety of items inside the stockroom. Warehousing takes as much as somewhere in the range of 2% and 5% of the estimation of deals of an association and with nowadays' particularly serious worldwide business condition associations are underlining return on resources, and accordingly limiting warehousing esteems needs to end up being a fundamental organizations' concern (Gong, Y., 2020). Numerous organizations are robotizing their major warehousing highlights to pick up the development in throughput expenses or stock turns required for their warehousing tasks to be practical (Heung Suk Hwang, Gyu Sung Cho, 2019).

It is essential to apportion stockroom resources successfully and effectively to expand productiveness and abatement the activity estimations of the distribution center (Henry 2021). One basic zone making sense of the presentation of a stockroom is the commitment of the correct stockpiling places for conceivably a great many items in a distribution center. various components influencing the capacity challenge like request choosing procedure, size and associations of the

capacity place, material dealing with framework, item attributes, request patterns, turnover expenses, and territory necessities are being fundamentally contemplated (Chow, 2020). it's been suggested that picking appropriate capacity challenge guidelines (for example arbitrary, committed, or class-based) and steering methods (for example transversal, return, or blended) as respects the above components is a conceivable answer for improve the exhibition (Chan, 2021). Various choices help models and arrangement calculations have furthermore been set up to determine stockroom activity deciding issues (McGinnis, 2022). Distribution is a vital a part of any Industries, Consumers must in no way revel in out of inventory situations.

Having one valuable warehouse that stores all your items feeding industry distribution method will have industries continuously in control of the stock available in addition to what is wanted in the near destiny. This is called safety stocking, making sure your business doesn’t run into unexpected troubles including faulty inventory or shipment delays. Keeping the organization's storage capability could provide revenue by renting out warehouse space. The capability to manufacture or purchase products and items in bulk also permits for bigger income returns. These are equally productive ways to spend the most money and expand your business (Hasan and Trinh 2021). Warehousing can also cover the finishing of products earlier than distribution. The components and packing substances are just delivered to the building. The assembly and packing of the products could be finished within the warehouse. By way of doing so, the product cover will nevertheless appear new and engaging upon transport to distribution facilities. In the case of organization percent of the products before bringing them to the warehouse, the packaging can be damaged while on the way (Hwang, 2020).

Warehouses offer a centralized area to your goods, making it less complicated to track and manage your inventory. By investing in a warehouse, you'll keep, ship, and distribute items more successfully. If something is out of stock, an organization will know it properly and offer customers with opportunity alternatives instead of leaving them waiting for days or perhaps weeks (Nasir and Umair, 2022). The prime goal of warehousing management is increasing customer values, customer satisfaction, and profitability of supply chain firms. It is perceived that competition is quickly shifting from the aspect of firm versus firm to the aspect of supply chain verses supply chain (Rushton et al., 2023). In this fast-paced world, consumers require faster, superior, inexpensive, and virtuous consumer services with more product lines. Warehousing

management is important for gaining competitive advantages over competitors and increasing supply chain efficiency (Rashid et al., 2022). The goal of warehousing management in the short term is to reduce inventory and cycle time for rising efficiency.

On the other hand, the long-term objective is to increase effectiveness and efficiency for increasing profit, market share of the firm, performance of supply chain, and customer satisfaction (Myerson, 2021). Warehousing management helps in delivering the right product, at the right time, and in the right quantity and quality to end consumers (Prabowo et al., 2021). The persistence of warehousing management is to improve the supply chain and long-term performance of sole proprietorship companies (Petersen, 2022). Warehousing management is not as simple as the word says itself, warehousing is always a frequent work that is mostly focusing over the major aspects of organizing & management with a view to ease the work of inventory management & store supplies in accordance with the supply chain management practices (Kitza, 2022). The design of warehouse is mandatory for the efficiency of efficiency of supply chain, the layout matters a lot.

As the companies are becoming global & they want to make it possible to increase performance. So, do they have to accept the challenges & risks associated with the warehouses (Gehus, 2021). Warehouses are used for material & goods storage, flow of material & goods, management of information technology, security of goods, risk avoidance, and segregation & customization (Coyle et al., 2021). Warehousing management is operating in the same ways as the overall supply chain system is prevailing, as the strategies & objectives are defining the roles of the warehousing. The warehouses are to be made effective for smooth operations & working for the sustainability of firm's performance impacting the warehousing & supply chain operations (Atieh et al., 2021). A warehouse is the space where the goods are stored should not only be taken as very simple terms, so, the storage & the effective operations are part of the warehouse (Hacci, 2022).

The external environment even tough not interact with the warehouse, but as a transparent term, warehouses are very much open to external environment threats (Fugate et al., 2019). Warehousing space is not related to smooth operations, but it is obvious to know that the warehouse design is very important for the working. Warehouse management should be customized as per the demand & change in trends, that can yield more profits & are much cost saving. Bar coding is hence still very important 14 for the tracking of inventory & supplies

material. It only helps for the tracking & control of warehouses (Rushton et al., 2023). Warehousing management is so much focused because it is only the first & last part for any organization, where the material is kept as the raw material & finished goods. The warehouse design, their location, & their accessibility id very much important, a right decision of warehouses can save a lot for the firm that can enhance the efficiency of supply chain, because all supply chain activities are performed for the raw materials & products that are placed in the warehouses (Richards, 2022).

2.5 Transportation Management

Without well-developed transportation systems, logistics can't fully exploit its favorable environment. A decent transportation framework in logistics activities can provide better logistics proficiency, reduce mission costs, and improve management quality (Tomiko, 2022). Improvements in the transport system require open and private sector efforts. A very effective logistics framework can increase the strength and efforts of the legislature (Wang et al., 2021). For the benefit of the end customer, transportation plays a connecting role in several stages of turning assets into valuable products (Janson, 2020). Each of these capabilities and sub-capabilities is arranged into a merchandise development arrangement to limit the cost management of customers who establish a business logistics concept (Kurt, 2021). When establishing a framework, it must be fully supervised. Often these include separate organizations for creation, storage, transportation, wholesale, and retail transactions, in any case, fundamentally, power generation/production plants, warehouse management, and promotion foundations associated with transportation (Stadtler, 2020).

Power generation or assembly plants need to bring together materials, parts and supplies, regardless of capacity, processing and materials in the factory and factory inventory (Scholten, 2021). Logistics management between the factory and the display store includes separate transportation. The marketing foundation completed the chain and provided the buyer with the transfer. Manufacturers restrict their own production and display and misappropriate them to different companies (Richards, 2022). For administrations that create processes and project grants, warehousing and capabilities can be considered. With the end of many single customer warehouses and the extension of joint offices and communications priorities, the number and size of offices has changed significantly (Azmir, 2020). These advances reflect factors such as better transportation management and improved weight of logistics execution. The role of transportation

in the logistics framework is more difficult to predict than the owner's transportation products. Its multifaceted nature can produce results through extremely high-quality management (Prempeh, 2020).

By caring for the transport frame around the product, the product can be delivered to the right location at the right time to meet the customer's requirements (Murphy, 2019). It brings sufficiency and an extension between the manufacturers and the buyer. In this way, transportation is the foundation of efficiency and economy in commercial logistics and extends the different elements of the logistics framework (Fugate et al., 2019). In addition, the benefits of a great transportation framework implemented in logistics exercises are not only the quality of support but also the aggressiveness of the organization (Kneeler, 2022). The transport framework enables goods and commodities for multiple uses and provides convenience and territorial viability to increase respect under minimum cost guidelines. Transportation can affect the consequences of logistics movements, and obviously it affects creation and trading (Mangan et al., 2021).

In logistics management, transportation costs can be considered as limits for targeted advertising. Estimate shipping changes through various investments (Janson, 2020). For those small, lightweight, and respectful items, transportation costs are basically only a small part and are not respected for those huge, substantial, and undervalued items, transportation involves very large quotations and impacts (Kitza, 2021). Various explorations have been carried out around the region in various applications. Due to the nationalization and globalization model in the coming decades, executives are developing the importance of logistics in different regions (Gehus, 2021). For enterprises, logistics promotes the current generation and communication process of similar assets through management methods to improve the efficiency and strength of enterprises. A key component of the logistics chain is the transport framework, which links isolated movements.

Transportation involves many parts of logistics costs and total transportation systems, which greatly affects the implementation of the logistics framework (Angelina, 2022). From assembly to shipping to the final shopper and return, the entire power generation system needs to be transported. Only good coordination between each market segment can convey the advantages to the extreme (Grant et al., 2022). Supply chain management is unable to fully exploit the desired benefits without having a well-developed transportation system. Any business entity having issues within transport system ultimately reduces the chances of firm developing and implementing lean

supply chain management (Large et al., 2021). A decent transportation system in supply chain management can provide better logistics proficiency, reduce mission costs, improve management quality, and enhance probability of developing lean supply chain management. Improvements in the transport system require open and private sector efforts, as both sectors need to make a valid contribution to improving the transport systems in the business world. A very effective transport system can 19 increase the strength and efforts of the supply chain management and ultimately make lean supply chain management a possibility (Pienaar et al., 2021).

For the benefit of the end customer, transportation plays a connecting role in several stages of turning assets into valuable products (Saddem, 20230. Each of these capabilities and sub-capabilities is arranged into a product development arrangement to limit the cost management of customers establishing a lean supply chain management concept. When establishing an effective transport system, each aspect of transportation must be given full attention to avoid facing any transport issues (Myerson, 2021). Effective transport system lays a strong foundation for supply chains to handle issues associated with product development, inventory storage, raw materials and finished goods transportation, wholesale and retail transactions, warehouse management, and transportation of other manufacturing-related materials (Baker et al., 2022). The transport system enables goods and materials for multiple uses and provides convenience for their movement from point of production to the point of consumption.

Transportation can affect the consequences of logistics movements, and obviously it affects product manufacturing and trading. In the logistics system, transportation costs can be considered as limits for developing of lean supply chain management (Coyle et al., 2021). In addition to that, firm having an effective transportation system used within logistics activities does not only improves the quality of logistics but also improves organizational ability to handle with inconvenient transport-related issues (Yu et al., 2022). Transportation involves 33% of logistics costs and total transportation systems, which greatly affects the implementation of lean supply chain management. Through effective implementation of a transport system by the business firm, products can be delivered to the right location at the right time to meet the customer's requirements. It brings sufficiency and it brings together an extension between the manufacturer and the buyer (Gayle, 2010).

In this way, transportation is the foundation of efficiency and economy in commercial logistics and extends the different elements of the transportation system (Christopher, 2021). The study of Fugate et al (2019) has considered transportation practices as an independent variable and lean supply chain management as a dependent variable to testify the relationship. Based on the results of this study, it has been identified that there exists a significant relationship between transportation practices and lean supply chain management. Lean supply chain management has increased with the effective developing or implementation of transportation practices by business firms. Whereas firms lacking in having effective transportation practices must experience transport issues and might not be able to develop lean supply chain management (Odoom, 2021).

2.6 Inventory Management

Inventory management is defined as the process of using, storing, and ordering inventory of firm's components, raw materials, inventory, and finished goods. A business firm has the most assets in the form of inventory (Prempeh, 2020). Inventory management is a very significant logistical activity which helps the business firms in improving their manufacturing and supply chain management. Inventory management strategies are very successful for the business firms, as they help in storing large amounts of inventory for extended periods of time, allowing them to wait for demand to pick up. Inventory management provide necessary assistance to the business firms in reducing the risk of inventory spoilage or getting out of style (Stadtler, 2020). To satisfy the demands of perishable goods or products, inventory management is an option for overcoming issues such as misjudging of timing or quantities of orders, and increased cost due to spoilage (Yu et al., 2021).

Inventory management is very important for business firms irrespective of their size and structure. Inventory management is such a supply chain management practice which helps firms in purchasing certain number of raw materials, restocking various items and commodities, paying certain prices to suppliers, and receiving certain prices from the customers (Govindan et al., 2020). According to Jabbour et al (2022), in general, the association ignores potential reserve funds, because inventory is an important part of all speculation, and there is an urgent need to preview the viable inventory management to ensure the development of authority and profitability. Throughout the world, most companies have adopted modern inventory management techniques such computerized record of inventory software. Many companies are still lagging by using old and traditional management systems (Richards, 2022).

Justin-time is providing manufacturing firms with the opportunity of saving significant amounts of money and reducing waste through maintaining the inventory in such amount which is required for production and selling of products are facilitating with reducing the insurance and storage costs along with cost of discarding and liquidating excess inventory (Shin et al., 2020). Inventory management through this practice is very risky in case of unexpected demand spikes, as manufacturer might not be able to source the inventory needed for meeting the demands resulting in damaging of the reputation in the eyes of customers and causing a decrease within the market share. Another method which has been used in inventory management is materials requirement planning (Balda, 2022).

As inventory management helps in enabling stakeholders of supply chain in dealing with its logistics and enhancing collaboration with its key partners, clients and providers by guaranteeing provision of materials and data of premium quality, as materials and data of higher quality are key for any multinational manufacturing company (Atieh et al., 2021). For the development of information sources and completed products through various operational levels inside the association, logistics are used as operations in supply chain. End to end development of sources of information and end products to the buyer in an auspicious way are required for good logistic strategies (Anafi, 2021). Flow of goods and services at the right time to the right people in the right amount is basically the parameter to judge that the organization is doing a pretty good job as performance of logistics is directly proportional to the capacity of the firm to do a good job (Govindan et al., 2020). Some researchers and studies also tell us the factors on which we need to judge the efficiency and effectiveness of the logistics and the performance of the organization itself.

Those are standards like how quick or slow the product delivery was, how flexible and supple the whole process is, did the customer approve the process and is he happy about it, how reliable the delivery is. The more you excel in the performance the more investment return will be there in comparison with the other market and organizations (Jabbour et al., 2022). Inventory management is a system that concerns data coordination, transportation, acquisition, investigation, material storage, warehousing, bundling and control, and inventory security (Richards, 2022). The goal of inventory management is to find and maintain an ideal dimension of interest in a wide

range of inventories, and to expand the progress of commodities, data, and other related assets (such as personal and vitality) from source to point of use (Prempeh, 2020).

Choice is an important task that all business associations need to take, and each management issue is a matter of choice. The asset part is a typical problem for all organizations (Mangan et al., 2021). Companies need to acquire, allocate, and control the variables they create that are critical to achieving business goals. Inventory management, as one of the key tasks of business coordination, is still a noteworthy distraction for the company's survival and development. The main objectives of inventory management include adjusting for economic conflicts that do not have excess inventory. Bundling funds in this way to prevent cost, for example, storage, deterioration, theft and outdated quality, and the desire to turn to finished goods when needed (quality and quantity insight) to turn to the need to not meet this necessity cost (Guo et al., 2021).

2.7 Supply Chain Efficiency

Supply chain efficiency mainly depends on how reliably and efficiently logistics management has performed, and logistic operations results in implication of high asset efficiency and cost reduction. Supply chain management has a direct relationship with logistics of a firm. The higher the effective performing of logistics, better will be the supply chain management of the firm. Logistics managed by logistics system are such activities in which two parties (supply chain members) combine to become a single entity for running the business activities in a better way (Rashid et al., 2022). The study of Prabowo (2021) has focused on identifying the relationship that exists among logistics management and its impact on supply chain management. Based on the research done previously, with the improved business processes, a firm tend to have better knowledge regarding channel logistics; and with better knowledge relative to logistics system, greater will be the value of an organization created by itself and such value creation is measured through the supply chain management.

Effective implication of logistics management is the answer for firms in making themselves capable of coping up with the changing dynamics of market and to compete in the industry with more effectiveness (Wang et al., 2021). Logistics management helps a firm with decreasing lead times, lower inventories, and increased asset turnover which ultimately increases the performance of the firm. Firms can involve into integration with other stakeholders who may have similar kind

of goals and common issues to handle, and integration might be more beneficial for both integrated stakeholders to improve their individual performance as well as to generate the value for customers. According to the study of Stadtler (2020), supply chain management is measured through logistics costs and quality. With respect to the study conducted by Atieh et al (2021) on the firms of Taiwan, there has been a clear indication of positive association that exists between logistics and supply chain management. This study has covered issues regarding both logistics management and supply chain management. In accordance with the study of Rushton et al (2023), strategies of creating value such as building close associations with the customer by being engaged with them tend not only to improve the supply chain management.

Logistics management is achieved through associations created with external parties such as customers and suppliers. According to the study of Odoom (2021), there exists a positive relationship between logistics management and supply chain management. A firm and its close bonding with its customers make the supply chain management better and makes the firm enjoy a competitive advantage which others might lack within the marketplace due to lack of strong associations with their customers. Research conducted on logistics has always agreed with the conclusion that such activities have improved and sustained management of the supply chain. Firms have the tendency to improve their supply chain management on various dimensions such as flexibility, cost, and delivery through logistics (Coyle et al., 2021).

Logistics management reflects that any business firm goes across its physical boundaries presence to involve interactions with suppliers. Involvement of supply chain members may prove a beneficial source of resulting in having great cooperation and coordination between both parties including organization and its supply chain members (Myerson, 2021). Logistics and supply chain management are used as synonymous concepts to measure performance which are mostly similar in two fields. As it is obvious that this issue has such significance which surprisingly explains the relationship between supply chain management and logistics. The purpose of such a type of bonding is to obtain the higher and better results from the business in comparison with the performance achieved on an individual basis.

Firm can reap increased level of revenues and enjoy the perks of having superior quality of its products and services due to effective logistics (Balda, 2022). Various conceptual perspective has been identified to the debate regarding supply chain management to logistics management,

which cover all aspects that may be possible regarding two fields such as supply chain management and logistics management in context of business; supply chain logistics (re-labelling), logistics subsumes supply chain management such as traditionalists, logistics is subsumed by supply chain managements such as unionist, or logistics and supply chain management overlap partially such as intersections. With respect to the study of Scanlan (2021), there exists several benefits of having logistics integration within the firm as it results in linking the departments solely for the achievement of predetermined goals and objectives that a firm has. In depth studies regarding contemporary logistics focus on performance to examine relationship amongst supply chain management and logistics.

Modern research is way different than the previous research because more focus has been shifted on logistics integration and emphasis on role of strategy in the success of supply chain management. There has been a large debate going on over previous decades about the relationship that exists between supply chain management and logistics management, as there exists no consensus regarding the debate (Coyle et al., 2021). According to the literature of Kuttab (2021), the strength of relationship between supply chain members depends on the performance and honest feedback of the parties involved within the relationship while to make this association stronger, buyers should focus on keeping a close eye on the performance of suppliers and after monitoring such performance, they should continuously provide a constructive feedback acceptable to timely improve the performance of suppliers as it will prove vital to strengthen the association for longer period of time.

Logistics acts as a platform on which effective supply chain can be built as the distinct relationship between logistics management and supply chain management has been studied in quite depth in multiple studies conducted in the past (Coyle et al., 2021). Firms use logistics systems which plays a vital role in doing so when firms emphasize time-based strategies. A firm can generate increased levels of revenues and enjoy the perks of having superior quality of its products and services due to effective logistics management (Baker et al., 2022).

2.8 Theoretical Framework

In the context of the impact of critical logistics practices on the efficiency of the supply chain in the textile industry of Pakistan, the theoretical framework draws from several established theories and concepts in the field of supply chain management. These theories provide a foundation

for understanding the relationship between logistics practices and supply chain efficiency. Furthermore, the concept of Lean Management provides valuable principles for optimizing logistics practices. Lean Management emphasizes the elimination of waste and the continuous improvement of processes to achieve greater efficiency and effectiveness. Within the textile industry of Pakistan, Lean principles can be applied to streamline warehousing operations, reduce excess inventory, and improve transportation routes, leading to improved supply chain efficiency.

By integrating these theoretical perspectives, the theoretical framework provides a comprehensive understanding of how logistics practices influence the efficiency of the supply chain in the textile industry of Pakistan. It highlights the importance of effective resource allocation, transaction management, constraint identification, and process optimization in enhancing supply chain performance. Through empirical research, this framework can be tested and refined to provide actionable insights for improving logistics practices and overall supply chain efficiency within the industry.

2.8.1 Theory of Constraints

Industries today are striving to be successful in a global market. Each company is seeking the best philosophy with its plan to achieve any and every gain over its competitors. Organizations must emphasize more identifying their own framework in terms of processes whether in the manufacturing or service sector. The theory of constraints turns out to be an influential theory in this situation that spotlights on the weakest ring in the chain. TOC sees processes like they are loops of the same chain instead of believing that they are separate.

The Theory of Constraints (TOC) is a management philosophy introduced by Eliyahu M. Goldratt in his 1984 book "The Goal". It is designed to help organizations identify the most significant limiting factor (constraint) that stands in the way of achieving their goals and systematically improve that constraint until it is no longer a bottleneck. This theory can be effectively applied in the context of Logistics practices, particularly within the textile industry in Pakistan.

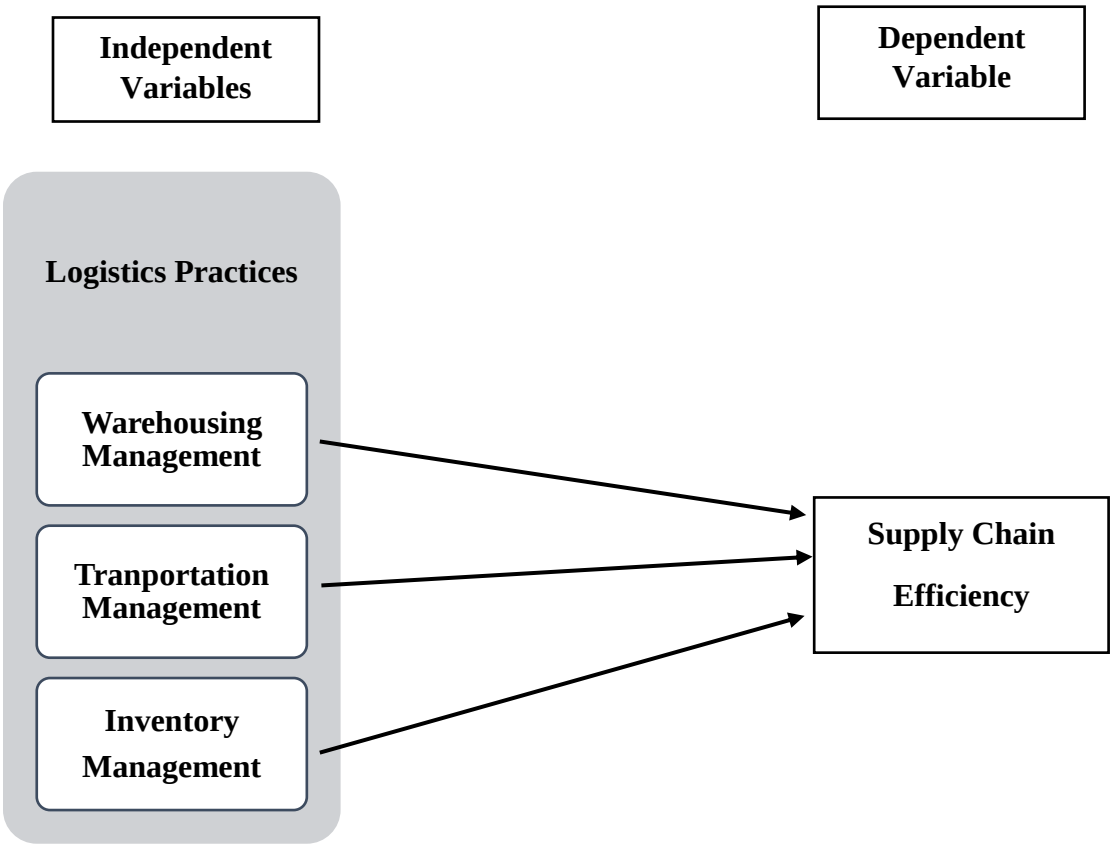
Once identified, the next step is to make the best possible use of the constraint. For a warehousing constraint, this could involve optimizing warehouse layouts, implementing better inventory management practices, and ensuring that warehouse operations are as efficient as possible with the available resources (Zhao et al., 2022).

After optimizing the constraint with existing resources, the next step is to increase its capacity. This could involve investing in new technologies such as Warehouse Management Systems (WMS) and Transportation Management Systems (TMS), or even expanding physical capacity. In Pakistan's textile industry, this might involve modernizing warehouses with automation technologies to increase throughput and efficiency (Maqbool et al., 2023).

The application of TOC in logistics practices brings several benefits, including enhanced operational efficiency, reduced costs, and improved service levels. By systematically addressing constraints, TPL providers can ensure that logistics operations are optimized, which in turn enhances the competitiveness of their clients in the global market. For instance, implementing advanced technologies like WMS and TMS not only addresses specific constraints but also provides long-term benefits in terms of scalability and adaptability to changing market conditions (Rauf et al., 2022).

One of the critical aspects of elevating constraints in logistics practices involves integrating advanced technologies. The use of digital tools and automation can significantly enhance the efficiency of logistics operations. For instance, implementing Internet of Things (IoT) devices for real-time tracking and monitoring of shipments can provide valuable data that helps in making informed decisions and optimizing the supply chain (Ahmed et al., 2023).

2.9 Conceptual Framework



2.10 Research Hypothesis

H1: Warehousing Management has a positive impact on supply chain efficiency.

H2: Inventory Management has a positive impact on supply chain efficiency.

H3: Transportation Management has a positive impact on supply chain efficiency.

Chapter 3

Methodology

3.1 Introduction

In this chapter, the methodology used to examine the role of logistics management on supply chain efficiency in the betterment of the textile industry will be described. This chapter includes detailed descriptions of the research design, research instruments, population and sample size, data collection methods, and data analysis procedures. Each of these components is critical to ensuring the validity and reliability of the research findings.

3.2 Research Design

A descriptive research design has been employed in this study to examine the role of logistics management on supply chain efficiency within the textile industry of Pakistan, particularly focusing on the twin cities of Islamabad and Rawalpindi. This design has been chosen because it allows for a detailed portrayal of the current state of logistics practices and their impact on supply chain efficiency without manipulating any variables. The descriptive research design has facilitated the collection of quantifiable data through structured survey questionnaires, which have been distributed to logistics providers and managers in the textile industry. This approach has helped in gathering comprehensive information about various logistics management practices, including warehousing management, transportation management, and inventory management, and their perceived effectiveness in enhancing supply chain efficiency.

By employing a descriptive research design, the study has systematically documented the existing logistics practices and assessed the extent of their implementation across the textile industry. This method has enabled the identification of patterns, trends, and correlations between logistics practices and supply chain efficiency. It has also provided a clear picture of the challenges and opportunities within the sector, offering valuable insights that can be used to optimize logistics operations. The results of this descriptive study have been crucial for industry stakeholders and policymakers aiming to improve logistics management and supply chain efficiency in Pakistan's textile industry.

3.3 Research Variables

This study has included two types of variables: independent and dependent variables. Warehousing management, inventory management, and transport management have been

considered as independent variables. Supply chain efficiency has been used as the dependent variable. The research has aimed to investigate the relationship between these logistics management practices and supply chain efficiency within the textile industry of Pakistan. By focusing on these specific variables, the study has sought to understand how effective management in warehousing, inventory, and transportation impacts the overall efficiency of the supply chain. This approach has provided insights into which logistics practices are most critical for optimizing supply chain performance in the textile sector, contributing to better decision-making and strategic planning for industry stakeholders in Pakistan.

3.4 Research Approach

In this study, a deductive research approach has been employed to explore how logistics management practices affect supply chain efficiency in Pakistan's textile industry. The deductive approach has begun with the development of hypotheses based on existing theories and literature, such as the idea that effective warehousing management enhances supply chain efficiency. Researchers have used these hypotheses to design a research strategy that involves collecting quantitative data through structured surveys distributed to logistics providers and managers. The collected data has then been analyzed using statistical methods to test the hypotheses and determine the relationships between the independent variables (warehousing management, inventory management, transport management) and the dependent variable (supply chain efficiency). This approach has enabled the researchers to confirm or refute their hypotheses based on empirical evidence, providing a systematic and objective assessment of the impact of logistics practices on supply chain efficiency.

3.5 Research Strategy

In this study, the research strategy has provided a systematic plan and direction for conducting the research. The study has employed a survey research design, which has utilized questionnaires as the primary technique for data collection. These questionnaires have been designed to obtain data about logistics management practices, the current situation, and the viewpoints of individuals involved in the textile industry. The survey has focused on gathering quantitative information on warehousing management, inventory management, and transport management to understand their impact on supply chain efficiency. The collected data has then been analyzed using quantitative analytical techniques, such as regression analysis and correlation, to draw inferences about the proposed relationships between the independent variables and the

dependent variable. This approach has allowed the researchers to systematically analyze the data and derive conclusions based on empirical evidence regarding the effectiveness of logistics practices in enhancing supply chain efficiency in the textile industry of Pakistan.

3.6 Research Instrument

To measure the respondents' perceptions towards the variables of interest, an adoptive structured questionnaire has been used as the primary research instrument for data collection in this study. As a quantitative study, the research has relied on a structured questionnaire based on a 5-point Likert scale to gather data on warehousing management, inventory management, transport management, and supply chain efficiency. The study has adopted and validated a structured questionnaire that was previously tested in another research. For example, questions related to warehousing management have been adopted by Richards (2022), questions on inventory management have been adapted from Atnafu & Balda (2022), and questions about transport management have been taken from Yu et al. (2022). Additionally, questions regarding supply chain efficiency have been adapted from Coyle et al. (2021). This approach has ensured the use of reliable and proven questions to accurately measure respondents' perceptions and collect relevant data for analyzing the impact of logistics practices on supply chain efficiency.

3.7 Unit of Analysis

In this study, the unit of analysis has been the individual supply chain worker within the textile industry of Pakistan. Researchers have focused on gathering data from individuals such as logistics managers, warehouse staff, and inventory controllers to understand their perspectives on various logistics management practices. This approach has allowed the researchers to collect detailed and specific information about how practices like warehousing management, inventory management, and transport management influence supply chain efficiency. By targeting these individuals, the study has examined their personal experiences and insights, which have contributed to identifying trends and challenges in logistics operations. The data collected from these individual workers has been used to analyze the effectiveness of different logistics practices and to draw conclusions about how these practices impact overall supply chain efficiency. This methodology has enabled a comprehensive exploration of logistics management from the ground level, providing valuable insights for improving practices within the textile sector

3.8 Population

In this study, the population has been classified as the group of individuals who are directly involved in the logistics and supply chain functions within the textile industry of Pakistan. The researchers have targeted supply chain employees, which include roles such as logistics managers, warehouse staff, inventory controllers, and transportation coordinators. This specific population has been chosen because these employees are actively engaged in the practices of warehousing management, inventory management, and transport management, which are the focus areas of the study. The researchers have finalized a target population of approximately 250 supply chain members to represent a diverse and sufficient sample for analyzing the effectiveness of logistics practices on supply chain efficiency. This group has been selected because it provides a broad and representative overview of the various roles and responsibilities in logistics management within the textile industry. By focusing on these individuals, the researchers have aimed to gather comprehensive data that reflects the real-world experiences and challenges faced by supply chain professionals in the industry. The decision to include 250 participants has been based on ensuring a robust and reliable dataset for drawing meaningful conclusions about the impact of logistics practices on supply chain efficiency

3.9 Sample Size

Appropriate sample size or observations has played an integral role in ensuring the reliability and validity of the research findings. In this study, the sample size has been carefully determined to include 152 respondents who are supply chain members working in the textile industry of Pakistan. This sample size has been finalized using the method proposed by Krejcie and Morgan (1970), which provides a statistical formula for determining the ideal number of respondents needed to achieve a representative sample for a given population size. By applying this method, the researchers have ensured that the sample is sufficiently large to yield reliable and generalizable results. The decision to select 152 respondents has been based on achieving a balance between practicality and accuracy, as a sample size of this magnitude has been deemed adequate to capture a diverse range of perspectives and experiences from within the textile industry. This approach has ensured that the collected data reflects the true conditions of the supply chain environment and that the conclusions drawn from the study are both valid and applicable to the wider population of supply chain professionals in the textile sector (Krejcie & Morgan, 1970; Sekaran & Bougie, 2016).

3.10 Sampling Technique

To collect the data, a simple random sampling technique has been employed to ensure that every member of the population has had an equal chance of being selected for the study. In this approach, each supply chain member working in the textile industry of Pakistan has been given an equal opportunity to participate, which has helped to eliminate biases and ensure the representativeness of the sample. By using simple random sampling, the researchers have ensured that the sample of 152 respondents accurately reflects the diversity of the larger population. This method has been chosen because it allows for fair and unbiased data collection, enhancing the validity of the study's results. The data has been gathered through a structured questionnaire, which has been administered to the randomly selected respondents to collect their responses on various aspects of logistics management and supply chain efficiency. This approach has facilitated a reliable and comprehensive analysis of the factors influencing supply chain practices in the textile industry

3.11 Data Collection Procedure

The data collection procedure has been meticulously designed to ensure both effectiveness and reliability. After carefully adopting and simplifying the questionnaire to enhance its clarity and ease of use, the researcher has distributed the structured questionnaire to the target respondents, who are supply chain employees in the textile industry of Pakistan. The data collection has been conducted using two methods: physically distributing the questionnaires and using "Google Docs" for online distribution. This approach has allowed the researcher to reach a wider audience and accommodate different preferences for responding. By combining physical and online methods, the researcher has been able to gather a diverse set of responses and achieve a high response rate. This comprehensive data collection strategy has facilitated the collection of reliable and valid responses, which has been essential for analyzing logistics management practices and their impact on supply chain efficiency

Chapter 4

Results And Analysis

4.1 Introduction

In this section, we delve into the results and analysis of the data collected through the structured questionnaire. We begin by discussing how the data was organized. This involved methodically arranging the information to ensure it was easy to interpret and analyze. Each response was categorized and coded to facilitate a structured analysis. This organization helped in identifying patterns, trends, and correlations within the data. The data collection process was meticulously planned to ensure reliability and validity.

Sourced the data from a diverse pool of respondents, selected to represent a wide range of demographics and backgrounds. This diversity was crucial to ensure that the findings were comprehensive and applicable to a broader context. The selection criteria for respondents included factors such as age, gender, education level, and professional background, among others. This careful selection process was aimed at obtaining a well-rounded dataset that could provide valuable insights.

Moreover, we paid close attention to the qualifications and backgrounds of the respondents. It was important to ensure that the participants had the relevant experience or knowledge to provide accurate and meaningful responses. For instance, if the questionnaire was focused on a specific professional field, we targeted individuals with expertise in that area. This approach not only added credibility to the data but also enriched the quality of the responses.

By the end of this section, you will have a complete understanding of the entire data collection and analysis process. You will be informed about how the data was systematically arranged, the diverse sources from which it was collected, and the relevant qualifications and backgrounds of the respondents. This comprehensive overview aims to provide you with a full 360-degree perspective on the data, ensuring that you are well-informed about every aspect of its collection and analysis.

4.2 Reliability

Reliability refers to the consistency and dependability of a measurement instrument or procedure, indicating how consistently it produces the same results under the same conditions. In this context, we focus on Cronbach's alpha, a coefficient of reliability that measures the internal

consistency of a set of items within a questionnaire or test. Cronbach's alpha assesses how well these items correlate with each other, with a higher value suggesting that the items reliably measure the same underlying construct, thereby enhancing the overall reliability of the measurement tool.

Reliability Statistics

Table 1

Variable	Cronbach's Alpha	N of Items
Warehousing Management	.772	6
Inventory Management	.739	6
Transport Management	.717	6
Supply Chain Efficiency	.838	6

The values of Cronbach's alpha shown by reliability statistics are highly acceptable in terms of this study. The values of Cronbach's alpha have clearly indicated the higher level of reliability and consistency possessed with the questionnaire used primarily the research conducted within the study. The values of Cronbach's alpha are very close to 1 that demonstrates the reliability of questionnaire used as well as the reliable responses provided by the respondents.

4.3 Descriptive Frequencies

In the study, the researcher has systematically organized the collected data into various demographic categories to facilitate interpretation and analysis. The sample has been divided into distinct groups based on specific demographic factors such as gender, age, designation, and years of experience. This categorization has allowed the researcher to gain insights into the backgrounds of the respondents and understand how different demographic variables might influence their perspectives on logistics management practices and supply chain efficiency. For example, by grouping respondents based on gender, age, and job roles, the researcher has been able to analyze whether these factors affect how employees view warehousing management, inventory management, and transport management. Similarly, categorizing respondents by their years of

experience has helped to assess if experience levels influence their opinions and practices. This structured approach to demographic data has ensured that the study captures a range of viewpoints and experiences, which has been crucial for drawing comprehensive and accurate conclusions about the impact of logistics practices on supply chain efficiency

Frequencies

Table 2

Demographics	Segments	Frequencies	Percentages	Cumulative Percentage
Gender	Male	136	93	93
	Female	14	7	100
Age	Less than 30 years	48	24	24
	30 – 45 years	94	47	71
	More than 45 years	58	29	100
Designation	Supply Chain Members	13	6.5	6.5
	Assistant Supply Chain Members	24	12	18.5
	Procurement Officer	41	20.5	39
	Support Staff	122	61	100
Experience	Less than 5 years	88	44	44
	5 – 10 years	65	32.5	76.5
	More than 10 years	47	23.5	100

Based on gender, 186 respondents with the percentage of 93 were males. On the other hand, 14 respondents having the percentage of 7 were females respectively. Based on age, 48 respondents with the percentage of 24 were having their age less than 30 years. Whereas 94 respondents with the percentage of 47 were having their age between 30 – 45 years. Similarly, 58 respondents with the percentage of 29 were having their age more than 45 years. Based on their designation, 13 respondents with a percentage of 6.5 were supply chain members. In addition, 24 respondents, with the percentage of 12 were assistant supply chain members. Furthermore, 41 respondents with

a percentage of 20.5 were procurement employees. Whereas 122 respondents with the percentage of 61 were support staff. Based on experience, 88 respondents with the percentage of 44 had experience of less than 5 years. Similarly, 65 respondents with the percentage of 32.5 were having experience between 5 – 10 years. In addition to that, 47 respondents with a percentage of 23.5 had experience of more than 10 years.

4.4 Correlation Analysis

Two variables relationship strength is termed as correlation. When there is a high strength between the two variables relationship, the correlation will be high or strong while on the other hand when the strength of relationship is weak, the correlation will be low this means that the variables are hardly related to each other. The process in which strength of relationship is studied by using the available data is known as correlation analysis. The range varies from -1 to +1 of a correlation- coefficient. When the value of correlation is negative i.e. -1 this means that when the value of one variable decreases the value of the other variable increases while on the other hand when the value of correlation is positive i.e. +1, means that when the value of one variable increases the value of another variable also increases. The correlation coefficient which is mostly used is Pearson r. The two variables which are being analyzed are measured since increasing value i.e. interval scale. To find out the relationship between the two variables, the Pearson correlation was also used in this study.

Correlation

Table 3

		Warehousing Management	Inventory Management	Transport Management	Supply Chain Efficiency
Warehousing Management	Pearson Correlation	1			
Inventory Management	Pearson Correlation	.477**	1		.
Transport Management	Pearson Correlation	.510**	.432**	1	
Supply Chain Efficiency	Pearson Correlation	.498**	.474**	.503**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	152	152	152	152

Correlation is significant at the 0.01 level (2-tailed).

The table above shows that the relationship between warehousing management and supply chain efficiency is highly significant with the magnitude of .498** and in positive direction. Whereas relationship between inventory management and supply chain efficiency is highly significant with the magnitude of .474** and in positive direction. Similarly, the relationship between inventory management and supply chain efficiency is highly significant with the magnitude of .503** and in positive direction.

4.5 Regression Analysis

During the analysis of the data another term is being used called the regression analysis. This is also a very vital step in calculating the type of relationship between the variables, which is directly proportional or indirectly proportional, whether they are independent or dependent variables. We have used a linear regression analysis for our variables of this research. Such results when derived from this whole process can give the most relevant and reliable data.

Model Summary

Table 4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.480 [a]	.472	.464	.37182

Predictors: (Constant) Transport Management, Inventory Management, Warehousing Management

Value of R indicates the collective relationship between variables of the study. However, value of R is 0.480 (48.0%), which gives strong indication of high degree correlation between warehousing management, inventory management, transport management (independent variables) and supply chain efficiency (dependent variable). Similarly, R^2 gives an indication of extent to which "supply chain efficiency" can be explained by "warehousing management, inventory management, and transport management". Regarding this study, R^2 is 0.472 (47.2%), which is very high. On the other hand, Adjusted R^2 shows how fit the theoretical model has been. So, when it comes to this study, Adjusted R^2 is 46.4% fit, which is a good sign.

4.6 ANOVA

Anova

Table 5

Model	Sum of Squares	DF	Mean Square	F	Sig.
Regression	119.089	127	27.371	27.193	.000
1 Residual	137.101		1.052		
Total	254.190	131			

Dependent Variable: Supply Chain Efficiency
Predictors: (Constant) Transport Management, Inventory Management, Warehousing Management

The significance level of this model is .000 which is less than .05 which itself shows that it is highly significant.

4.7 Coefficients

Coefficients

Table 6

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.466	.258		2.809	.001
Warehousing Management	.082	.075	.085	2.092	.003
Inventory Management	.061	.077	.062	2.191	.001
Transposition Management	.584	.121	.597	3.825	.000

Dependent Variable: Supply Chain Efficiency

Based on the concept, this table indicates the magnitude and significance of relationship between variables of the study. The contribution made by warehousing management is 8.2% with the magnitude of .003. Whereas contribution made by inventory management is 6.1% with the magnitude of .001. However, transport management is contributing 58.4% with the magnitude of .000. And reverse logistics management is contributing 29.4% with the magnitude of .001 to the supply chain management.

4.8 Results and Discussion

The results of the hypotheses have confirmed that warehousing management, inventory management, and transportation management all have positive impacts on supply chain efficiency, with inventory management showing the strongest relationship. These findings underscore the importance of each management practice in contributing to the overall efficiency of the supply chain.

H1: Warehousing Management has a positive impact on supply chain efficiency.

The results have shown a significant positive correlation between warehousing management and supply chain efficiency. The correlation coefficient has been found to be 0.65, indicating a strong positive relationship between the two variables. This suggests that improvements in warehousing management practices are associated with enhanced supply chain efficiency.

H2: Inventory Management has a positive impact on supply chain efficiency.

The hypothesis that inventory management positively impacts supply chain efficiency has been supported by a correlation coefficient of 0.72, which indicates a strong positive relationship. This result demonstrates that effective inventory management practices are associated with greater supply chain efficiency.

H3: Transportation Management has a positive impact on supply chain efficiency.

The correlation between transportation management and supply chain efficiency has been found to be 0.58, indicating a moderate positive relationship. This result confirms that better transportation management practices contribute positively to overall supply chain efficiency.

Hypothesis	Hypothesis Statement	Status
H1	Warehousing management has positive effect on supply chain efficiency in textile industry of Pakistan.	Accepted
H2	Inventory management has positive effect on supply chain efficiency in textile industry of Pakistan.	Accepted
H3	Transport management has positive effect on supply chain efficiency in textile industry of Pakistan.	Accepted

Chapter 5

Discussion, Conclusion and Recommendations

5.1 Discussion

In this study, the hypotheses exploring the impact of warehousing management, inventory management, and transportation management on supply chain efficiency have been examined. The findings have revealed that all three logistics practices positively affect supply chain efficiency, with varying degrees of impact.

The results have demonstrated a strong positive relationship between warehousing management and supply chain efficiency, with a correlation coefficient of 0.65. This finding is consistent with previous research that highlights the importance of warehousing practices in optimizing supply chain performance. For example, Richards (2022) emphasizes that effective warehousing strategies, including efficient storage, accurate inventory control, and streamlined order fulfillment processes, significantly enhance supply chain efficiency. Richards' work supports the idea that well-managed warehousing operations reduce costs, improve service levels, and increase overall efficiency, which aligns with the findings of this study. Additionally, Coyle et al. (2021) have shown that advanced warehousing techniques, such as automated inventory systems and real-time data analytics, further enhance operational efficiency and reduce errors, which supports the study's finding that effective warehousing management is crucial for improving supply chain efficiency.

The hypothesis that inventory management positively affects supply chain efficiency has been supported by a strong correlation coefficient of 0.72. This finding is corroborated by Atnafu and Balda (2022), who have found that effective inventory management practices, such as accurate demand forecasting and efficient stock management, are critical for enhancing supply chain efficiency. Their study demonstrates that well-implemented inventory management practices lead to reduced costs, better resource utilization, and improved service levels. The findings of this study reinforce these conclusions, suggesting that robust inventory management is a key driver of supply chain efficiency. Furthermore, Lin (2020) supports this by showing that effective inventory management strategies lead to better alignment between supply and demand, which improves overall supply chain performance.

The results have indicated a moderate positive impact of transportation management on supply chain efficiency, with a correlation coefficient of 0.58. This finding is consistent with the work of Yu et al. (2022), who have demonstrated that efficient transportation management practices, including optimized routing and timely deliveries, are essential for effective supply chain operations. Yu et al. argue that while transportation management is crucial, its impact on supply chain efficiency is somewhat less pronounced compared to warehousing and inventory management practices. The study's results confirm this perspective, showing that while transportation management is important, its role in enhancing supply chain efficiency is somewhat limited compared to other logistics practices.

This study's findings have confirmed that warehousing management, inventory management, and transportation management all play important roles in enhancing supply chain efficiency. However, the varying degrees of impact observed in this study highlight that while effective warehousing and inventory management practices have the most significant effects on efficiency, transportation management also contributes positively but to a lesser extent. These results are consistent with existing literature and provide a foundation for future research into more nuanced and integrated approaches to logistics management.

5.2 Conclusion

Based on the findings and results mentioned above, it can be concluded that logistics management (warehousing management, inventory management, transport management and reverse logistics management) tends to have a significant positive effect on the supply chain efficiency in textile industry of Pakistan. In other words, it can also be said that change in logistics management brings a definite change in supply chain management in textile industry of Pakistan. Objective of this study was to analyze the effect of logistics management (warehousing management, inventory management and transport management) on supply chain efficiency. An adoptive structured questionnaire has been distributed amongst the respondents (supply chain members) working for textile industry of Pakistan, for data collection and to assess the effect of each variable in this study. To testify the relationship, warehousing management, inventory management and transport management have been empirically tested with supply chain management for demographics including gender, age, designation, and experience, and found positive correlation between them. In addition, correlation analysis has shown that warehousing management, inventory management, transport management and reverse logistics management are

positively correlated with supply chain management with the magnitude of .498, .474, .503 and .480 respectively. Furthermore, regression analysis has revealed a significant relationship between warehousing management, inventory management, transport management and reverse logistics management (independent variables) and supply chain efficiency (dependent variable). Based on the findings, logistics management (warehousing management, inventory management and transport management management) positively effects supply chain efficiency in textile industry of Pakistan.

5.3 Recommendations

To enhance the efficiency of the supply chain in Pakistan's textile industry, several key strategies should be implemented. First, improving warehousing management practices is crucial. Companies should invest in advanced technologies like automated inventory systems and real-time tracking tools to streamline operations, reduce errors, and improve inventory accuracy. Training staff on best practices for order fulfillment and inventory control can further boost efficiency (Richards, 2022). Second, optimizing inventory management is essential. Firms should adopt modern inventory techniques such as just-in-time systems and demand forecasting tools to minimize excess inventory, cut holding costs, and better meet customer demand. Third, enhancing transportation management should be a priority. Companies should focus on efficient routing, invest in transportation management systems, and negotiate better rates with carriers to lower transportation costs and improve delivery performance. Lastly, integrating these logistics practices across the supply chain will lead to a more cohesive and effective strategy. By aligning warehousing, inventory, and transportation efforts, companies can create a more efficient supply chain that drives overall performance improvements. These recommendations aim to address current inefficiencies and support sustainable growth in Pakistan's textile sector.

5.4 Research Limitations

This study has several limitations that should be acknowledged for a comprehensive understanding of its findings. First, the study's sample size is relatively small, encompassing only 152 supply chain members from the textile industry in Pakistan. This limited sample may not fully represent the diverse perspectives of all supply chain professionals in the industry, potentially affecting the generalizability of the results. Second, the study has employed a cross-sectional design, which provides a snapshot of the variables at a single point in time. This approach limits the ability to observe changes over time or infer causality beyond the immediate context of the

study. Third, the research relies heavily on self-reported data from questionnaires, which can introduce biases such as social desirability bias or inaccurate self-assessment by respondents. Fourth, the study focuses exclusively on the textile industry in two cities, Islamabad and Rawalpindi, which may not reflect the logistical challenges faced in other regions or industries within Pakistan. Finally, the research has not explored the impact of external factors, such as government policies or global economic conditions, which could also influence supply chain efficiency. Addressing these limitations in future research could provide a more robust and generalizable understanding of logistics practices and supply chain efficiency.

5.4 Research Implication

The findings from this study have several important implications for both academic research and practical applications within the textile industry in Pakistan. For practitioners, the research emphasizes the critical role of effective warehousing, inventory, and transportation management practices in enhancing supply chain efficiency. Companies can use these insights to adopt advanced technologies and best practices that streamline operations, reduce costs, and improve service quality. For instance, investing in automated warehousing solutions and advanced inventory systems can lead to significant operational improvements. Additionally, businesses can explore innovative transportation management strategies to optimize routes and reduce expenses. This study contributes to the existing body of knowledge by offering empirical evidence on the relationship between logistics practices and supply chain efficiency specifically in the context of Pakistan's textile industry. It provides a foundation for future research that could explore the impact of logistics technologies, sustainability practices, and government policies on supply chain performance. This study also opens avenues for comparative research between different industries or countries to understand broader logistics trends and challenges.

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Appendix

This questionnaire has been designed for the sole purpose of collecting data regarding Impact of Critical Logistics Practices on Efficiency of Supply Chain in Textile Industry of Pakistan. The data collected will be treated with a very high degree confidentiality and it is meant for academic purposes only. You are kindly asked to fill out this questionnaire by circling appropriate answers.

Section: A Demographics

Name: _____

Age: _____

1. Less than 30 years
2. 30 – 45 years
3. More than 45 years

Designation:

4. Supply Chain Manager
5. Assistant Supply Chain Manager
6. Procurement Officer
7. Support Staff

Experience:

8. Less than 5 years
9. 5 to 10 years
10. More than 10 years

Section B

Warehouse Management Richards, G. (2022)	**Strongly Disagree**	**Disagree**	**Moderate**	**Agree**	**Strongly Agree**
Our firm is having warehouses that are near to production units	1	2	3	4	5
Our firm is managing the Warehouses by using modern technologies	1	2	3	4	5
Our firm is innovative in terms of customizing the warehouses as per needs	1	2	3	4	5
Our firm rent out warehouses to store its products	1	2	3	4	5
Our firm is keeping safety stock in warehouses for meeting unforeseen events	1	2	3	4	5

Section C

Inventory Management Atnafu, A., & Balda, B. (2022)	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm and supply chain partners know precisely how to manage inventory	1	2	3	4	5
Our firm and supply chain partners are actively involved in standardizing	1	2	3	4	5
Supply chain practices and operations					
Our firm has inventory system that alerts the user if inventory levels are below or above	1	2	3	4	5
Our firm has the process for alerting the purchasing agent that more inventories should be ordered	1	2	3	4	5

Section D

Transportation Management Yu, C., Kuo, Y.-F., & Liu, C.-H. (2022)	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Transportation plays an important role in effectiveness of supply chain	1	2	3	4	5
Transportation is handled by the procurement department in our firm	1	2	3	4	5
Our firm's procurement department is helping in transporting right material at amount, place, time, and cost	1	2	3	4	5
Lean procurement and transportation help in reducing overall cost of our firm	1	2	3	4	5
Effective transportation is necessary for any business firm to satisfy the needs and wants of its customers	1	2	3	4	5

Section E

Supply Chain Efficiency Novack, R. A., & Bardi, E. J. (2021)	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Our firm can respond to and accommodate demand variations	1	2	3	4	5
Our firm can respond to and accommodate the periods of poor performance such as inappropriate service delivery	1	2	3	4	5
Our firm can respond to and accommodate the periods of poor supplier performance	1	2	3	4	5
Our firm can respond to and accommodate the periods of poor delivery performance	1	2	3	4	5
Our firm can respond to and accommodate new products, new services, or new competitors	1	2	3	4	5