

Impact of Network Factors on Supply Chain Performance: The Mediating Role of Internal Integration (A case of Textile sector of Pakistan)

Mohsin Javaid¹ & Dr. Sheikh M. Fakhre Alam Siddiqui²

¹Research Scholar Karachi University Business School, University of Karachi, Pakistan,

Email: mohsinjawed645@gmail.com , ORCID: <https://orcid.org/0009-0005-4203-2945>

²Assistant professor Karachi University Business School, University of Karachi, Pakistan,

ORCID: <https://orcid.org/0009-0000-1073-5623> , Email: fakhrealam@uok.edu.pk

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Corresponding Author:

Mohsin Javaid

Email:

mohsinjawed645@gmail.com

ABSTRACT

In complex and highly divided industries such as textiles the supply chain performance progressively depends on how firms manage inter-organizational networks and inner coordination. Drawing on Industrial Network Theory, Supply Chain Integration Theory and the Actor-Resource-Activity (A-R-A) system this study analyzes the impact of network performing artists, arrange assets and network activities on supply chain performance in Pakistan textile segment with internal integration investigated as a mediating component. Utilizing quantitative research design, essential data were collected from 180 managers in textile manufacturing firms and analyzed through Partial Slightest Squares Structural Equation Modeling (PLS-SEM). The measurement model demonstrated satisfactory unwavering quality and validity. The results uncover that network factors don't have a critical coordinate impact on supply chain performance. However, they altogether influence internal integration which in turn incorporates a strong positive impact on performance. Mediation examination confirms that internal integration completely mediates the relationship between network variables and supply chain execution. The discoveries extend network theory by demonstrating that the performance benefits of supply chain systems are realized as it were through strong inner coordination. For all intents and purposes the study highlights the significance of cross-functional integration in translating external collaboration into progressed supply chain performance.



Introduction

Background of the Study

In the contemporary global business environment the organizations are operating beneath unprecedented levels of competition, instability and complexity. Quick technological advancements, globalization of markets and shortened product life cycles and expanding customer desires have in a general sense altered how firms create and maintain competitive advantage. In this advancing landscape the competition has moved from individual firms to entire supply chains where the success depends on the collective performance of interconnected organizations instead of separated operational excellence (Christopher, 2016; Ketchen & Hult, 2007; Mentzer et al., 2001)

Supply chain management (SCM) has hence emerged as a key imperative for firms looking for proficiency, the responsiveness and long-term supportability. Instead of focusing exclusively on inner processes, cutting edge SCM emphasizes coordination, the collaboration and integration among different supply chain partners, including providers, producers, wholesalers and customers. This shift has driven researchers to conceptualize supply chains not as linear groupings of transactions but as complex networks of interdependent organizations (Harland, 1996; Håkansson & Snehota, 1995; Borgatti & Li, 2009)."

Within this point of view the network view of supply chains has picked up critical consideration. The network perspective argues that supply chain performance is molded by the interaction of three essential components: the actors, resources and activities. Actors allude to the firms and institutions participating within the supply chain; resources include tangible and intangible resources shared or utilized inside the network; and activities represent the coordinated activities that change assets into value (Håkansson and Johanson 1992; Ritter and Gemunden 2004). The arrangement and integration of these elements are considered critical for achieving predominant supply chain performance.

The relevance of the network point of view is especially evident in textile supply chains which are among the most complex and divided industrial supply chains globally. Textile supply chains include different stages including fiber generation, spinning, weaving or sewing, coloring and wrapping up, garment manufacturing, distribution and retailing often spread over distinctive geological regions. These chains are characterized by high demand variability, seasonality, natural sensitivity, brief fashion cycles and strongly fetched pressures (Majumdar & Sinha, 2019; Verma et al., 2020; Choi et al., 2001; Gereffi & Frederick, 2010).

In developing economies the textile industries play a crucial role in financial development, employment generation, trade profit and industrial development. However in spite of their economic significance the material supply chains regularly suffer from basic wasteful aspects, frail coordination, restricted information sharing and poor integration across supply chain actors (Khan & Qianli, 2017; Dubey et al., 2018). These challenges have become even more pronounced in recent years due to global disturbances such as pandemics, the exchange limitations and supply shocks.

In spite of the fact that earlier research has established that network factors such as connections among actors shared resources and coordinated activities positively influence supply chain performance much of the existing literature has focused on direct relationships without enough explaining the basic mechanisms through which these effects occur. In practice the outside collaboration and network arrangement regularly fail to interpret into performance enhancements

due to inner organizational misalignment, functional silos and the need of cross-departmental coordination.

Recognizing this gap the present study receives a network-based theoretical lens and introduces internal integration as a mediating mechanism between network variables and supply chain performance. Internal integration refers to the extent to which different functional units inside an organization such as procurement, production, logistics and marketing are aligned, coordinated and collaboratively working toward common supply chain objectives (Flynn et al 2010; Wong et al 2011).

Methodologically this research adopts a quantitative research plan utilizing an organized survey to gather primary data from managers working in textile supply chains. The proposed relationships are experimentally tested utilizing structural equation modeling (SEM) which allows for concurrent examination of direct and indirect (mediated) connections among latent constructs. By integrating the network point of view with internal integration theory this consider aims to provide a more comprehensive explanation of supply chain performance within the textile sector.

Research Problem

In spite of the developing recognition of supply chain networks as a source of competitive advantage the textile supply chains continue to experience determined performance challenges. These challenges include delayed deliveries, tall inventory levels, conflicting product quality, lack of responsiveness to market changes and wasteful utilization of resources (Majumdar and Sinha 2019). Such issues are particularly intense in developing economies where organization limitations, infrastructural limitations and the managerial wasteful aspects encourage complicate supply chain operations.

Existing supply chain literature suggests that network factors such as strong inter-firm relationships, successful resource sharing and coordinated activities can significantly enhance supply chain performance (Harland 1996; Ritter and Gemunden 2004). However observational evidence indicates that the simple presence of external collaboration does not naturally lead to improved performance results. In many cases the firms struggle to convert external network relationships into operational and performance benefits due to weak inner coordination and functional misalignment (Flynn et al 2010).

Most earlier studies in textile and manufacturing supply chains have examined coordinate relationships between network factors and performance results offering limited insight into how and why these relationships work. There's a lack of experimental research that clarifies the mechanism through which organize actors, resources and the activities influence supply chain performance. In specific the mediating role of internal integration remains underexplored within the textile supply chain setting. Accordingly the central research issue of this study is articulated as follows:

How do network factors (actors and resources and activities) impact supply chain performance within the textile industry and what role does internal integration play in mediating this relationship?

Need For The Research

The need for this research emerges from both practical (applied) and theoretical (scientific) considerations.

From a viable point of view the textile firms work in highly competitive and cost-sensitive markets where effectiveness, responsiveness and reliability are basic success variables. Managers are

beneath constant pressure to reduce costs, improve delivery performance and react rapidly to changing customer demands. Understanding how network connections with suppliers and partners interpret into performance outcomes through inner organizational alignment can help managers design more viable supply chain strategies.

The discoveries of this study can benefit:

- **Textile manufacturers** by recognizing mechanisms to move forward operational efficiency
- **Supply chain managers** by highlighting the significance of internal integration
- **Policymakers and industry affiliations** by informing policies that promote collaboration and integration
- **Export-oriented textile firms** by improving competitiveness in global markets

From a scientific point of view this research contributes to supply chain management literature by coordinating the network point of view with internal integration theory. Whereas previous studies have examined these concepts independently limited research has experimentally tested internal integration as a mediating mechanism inside a network-based framework particularly in textile supply chains.

By tending to this gap the study amplifies the Actor-Resource-Activity (A-R-A) system and provides experimental evidence on how external network connections are translated into performance through inner organizational processes. This contributes to theoretical advancement and offers a more nuanced understanding of supply chain performance drivers.

To address this overarching research issue the following sub-questions are formulated:

1. What is the effect of network actors on supply chain performance in textile supply chains?
2. How do network assets influence supply chain performance within the textile industries?
3. What role do network activities play in improving textile supply chain performance?
4. Does internal integration significantly mediate the relationship between network actors and supply chain performance?
5. Does internal integration intervene the relationship between network resources and supply chain performance?
6. Does inside integration mediate the relationship between network activities and supply chain performances?

By tending to these questions the study seeks to grow the existing body of knowledge by moving past coordinate relationships and explaining the inside organizational components through which network-based collaboration impacts supply chain performance.

Nominal Definitions

For clarity and consistency, the following key terms are characterized as they are used in this study:

- **Supply Chain:** A network of organizations included within the upstream and downstream flows of products, services, data and accounts from crude material suppliers to final customers (Mentzer et al 2001).
- **Supply Chain Performance:** The degree to which a supply chain accomplishes proficiency and viability in meeting customer requirements, including cost reduction and delivery reliability, adaptability, quality and responsiveness (Flynn et al 2010).

- **Network Point of view:** A theoretical approach that conceptualizes supply chains as interconnected networks of actors and resources and activities instead of linear chains of transactions (Harland 1996).
- **Network Actors:** Firms and organizations taking part within the supply chain network that interact and collaborate to attain shared destinations (Ritter and Gemunden 2004).
- **Network Resources:** Tangible and intangible resources such as physical foundation, budgetary capital, human abilities and data that are shared or utilized inside the supply chain network (Li et al 2006).
- **Network Activities:** Coordinated activities attempted by network actors, including planning, data trade, logistics coordination and control mechanisms (Hakansson and Johanson 1992).
- **Internal Integration:** The degree of coordination, collaboration and data sharing among useful divisions within a firm to attain supply chain objectives (Flynn et al 2010).
- **Textile Industry:** An industrial sector included within the production, handling and distribution of strands, yarns, fabrics and garments.

Context of the Study

This study is conducted inside the textile industry which is one of the foremost critical manufacturing divisions in many developing economies. Textile supply chains are characterized by multi-tier structures, high labor intensity, regular demand patterns and strong dependence on global markets. These characteristics make textile supply chains particularly powerless to disturbances and wasteful aspects.

In developing countries the textile firms regularly work with restricted innovative capabilities, powerless framework and divided supply chain relationships. Despite expanding engagement in global value chains many textile firms battle to attain steady supply chain performance due to poor inner coordination and lack of integration across supply chain partners (Khan and Qianli 2017).

By focusing on the textile industry this study gives a relevantly grounded examination of how network factors and internal integration together impact supply chain performance. The findings are anticipated to be relevant not as it were to textile firms but moreover to other manufacturing industries with comparable structural characteristics.

Literature Review

Overview: Theoretical Foundations

The primary objective of this chapter is to set up a comprehensive theoretical and experimental establishment for analyzing the impact of network factors namely network actors and resources and activities on supply chain execution with internal integration conceptualized as a mediating mechanism inside the textile industry. By synthesizing set up theories and earlier experimental discoveries this chapter creates a coherent conceptual system and a set of testable theories that guide the experimental examination of the study.

This study is fundamentally grounded in Industrial Network Theory especially the Actors-Resources-Activity (A-R-A) system developed by Hakansson and Johanson (1992) and advance explained by Hakansson and Snehota (1995). The A-R-A system conceptualizes industrial frameworks as systems of interacting actors who control, combine and adjust resources through facilitated activities. Unlike traditional linear or dyadic supply chain models this point of view emphasizes relational embeddedness, common dependence and long-term interaction among firms. Esteem creation is viewed as a collective outcome of coordinated relationships instead of the result of isolated firm-level decisions.

Complementing the industrial network point of view the study draws upon Supply Chain Integration Theory which argues that predominant supply chain performance is accomplished when firms align both their external connections and inner functional processes (Flynn et al 2010; Wong et al 2011). Inside this theoretical lens internal integration represents a critical organizational capability that enables firms to absorb and prepare and operationalize externally generated data, resources, and collaborative activities. Without compelling internal integration the potential benefits of external collaboration stay underutilized.

In addition chosen elements of the Resource-Based View (RBV) are joined to clarify why access to shared and relationally implanted resources can contribute to supported competitive advantage (Barney 1991). RBV recommends that resources and capabilities that are profitable, uncommon, troublesome to mimic and organizationally embedded can improve firm performance. When network resources are successfully integrated into inner processes they can evolve into such strategic capabilities.

Taken together these three theoretical points of view give a strong and complementary foundation for clarifying how network-based relationships impact supply chain performance and why internal integration serves as a critical mediating mechanism especially in complex and divided textile supply chains.

Textile Supply Chains as Complex Networks

Textile supply chains are broadly recognized as among the foremost complex manufacturing supply chains due to their multi-tiered structure, broad geographic dispersion and high sensitivity to market, design and environmental conditions (Majumdar and Sinha 2019). Unlike discrete manufacturing sectors the textile supply chains include various successive and interdependent processes, including fiber production, spinning, weaving, handling, coloring, wrapping up, garment manufacturing and retail distribution. Each stage is often managed by different firms increasing coordination necessities and dependency among actors.

Earlier research emphasizes that textile firms once in a while work in isolation; instead they function within thick and interconnected networks of suppliers, subcontractors, logistics providers, buying houses and international buyers (Verma et al 2020). These network relationships significantly impact key performance results such as lead time reduction, cost proficiency, product quality, flexibility and responsiveness. However the literature moreover highlights persistent challenges related to fracture, weak coordination and control asymmetries, especially in textile supply chains found in developing economies (Khan and Qianli 2017).

Given these characteristics researchers progressively argue that textile supply chains should be analyzed as complex networks instead of as linear chains or isolated dyadic connections. A network-based explanatory lens permits for a more accurate understanding of interdependencies, coordination mechanisms and collective value creation.

Network Actors and Supply Chain Performance

Network actors allude to the organizations and institutional substances taking part in a supply chain network, including suppliers, producers, wholesalers, logistics providers and supporting offices (Ritter & Gemünden, 2004; Nyaga et al., 2010; Lavie et al., 2012). The literature reliably demonstrates that the quality of connections among these actors manifested through believe, commitment, communication quality, reputation and leadership plays a definitive role in forming supply chain performance.

Studies grounded in industrial network theory recommend that deliberately positioned actors can apply significant impact over resource flows and activity coordination and relationship solidness inside the network (Håkansson and Snehota 1995). Within the context of textile supply chains strong and collaborative actor relationships empower improved demand forecasting, superior quality affirmation, quicker problem determination and improved responsiveness to volatile market conditions.

Experimental research advance demonstrates that collaborative relationships among supply chain actors are positively related with performance pointers such as delivery reliability, adaptability, inventory productivity and cost reduction (Cao and Zhang 2011). Nevertheless several ponders caution that strong external relationships alone don't naturally translate into superior performance results. When inner organizational processes are misaligned the benefits of actor-level collaboration may stay unrealized (Flynn et al 2010).

Network Resources and Supply Chain Performance

Network resources include both tangible and intangible resources that are accessed, shared or mutually developed through supply chain connections. These include physical framework, production technology, financial resources, human ability, relational capital and data systems (Li et al 2006). From an RBV point of view such resources can strengthen a firm competitive position when they are effectively coordinates and utilized.

In textile supply chains access to shared resources such as advanced machinery, logistics foundation, skilled labor and convenient market information enables firms to improve operational proficiency, reduce costs and improve product quality. Among these data sharing has received specific attention within the literature, because it decreases uncertainty, improves coordination and facilitates joint decision-making over supply chain partners (Simatupang & Sridharan, 2005; Zhao et al., 2011; Dubey et al., 2018).

However prior studies moreover emphasize that the simple accessibility of network resources does not ensure performance improvements. Without satisfactory inner arrangement and cross-functional coordination firms may fail to misuse these resources effectively, resulting in problematic performance outcomes (Wong et al 2011). This highlights the significance of internal integration as a mechanism that enables firms to change over network resources into operational and strategic benefits.

Network Activities and Supply Chain Performance

Network activities refer to the coordinated activities attempted by supply chain actors to oversee and synchronize streams of materials, data and funds. These activities incorporate joint planning, production planning, data exchange, logistics coordination, quality management and performance monitoring (Håkansson and Johanson 1992). Network activities represent the operational measurement of supply chain networks and are central to esteem creation. (Håkansson & Johanson, 1992; Schoenherr & Swink, 2012; Simchi-Levi et al., 2018).

The literature demonstrates that synchronized and well-coordinated activities improve supply chain proficiency by decreasing duplication of exertion, minimizing delays, lowering exchange costs and progressing responsiveness (Frohlich and Westbrook 2001). In textile supply chains the facilitated activities are especially critical due to regularity, short product life cycles, demand volatility and strict delivery due dates imposed by global buyers.

In spite of these points of interest the viability of externally facilitated activities depends heavily on the inner capabilities of firms. Divided inner structures, poor communication and functional

silos regularly weakens the execution of mutually planned activities and restricting their affect on overall performance (Flynn et al 2010).

Internal Integration as an Organizational Capability

Internal integration refers to the degree to which useful units inside an organization such as procurement, production, logistics, promoting and finance coordinate, collaborate and share information to attain common supply chain objectives (Flynn et al., 2010; Koufteros et al., 2005; Pagell, 2004). It reflects the degree to which inner processes are adjusted and synchronized instead of operating in isolation.

The literature consistently identifies internal integration as a critical antecedent of supply chain performance. Inside integrated firms benefit from improved communication, quicker decision-making and decreased struggle and way better arrangement between strategic objectives and operational execution (Wong et al 2011). Such firms are better situated to reply to external demands and disruptions.

In textile firms the internal integration is especially vital due to the high level of interdependency among production planning, stock management, quality control and delivery planning. Without inner alignment even well-designed external collaborations may fail to create important performance advancements.

Internal Integration as a Mediating Mechanism

A rising stream of supply chain literature argues that internal integration plays a mediating part between external collaboration and performance results (Flynn et al., 2010; Wiengarten et al., 2019; Baron & Kenny, 1986; Preacher & Hayes, 2008). According to this view the outside network relationships impact performance in an indirect way by forming inner coordination processes.

This mediation logic is particularly significant in textile supply chains where firms often engage in extensive external collaboration but lack the inner capabilities required to operationalize shared data, resources and plans. Internal integration functions as a bridge mechanism that interprets network-based.

Conceptual Model Development

Based on the reviewed literature the conceptual model proposes that network actors and network resources and network activities impact supply chain performance both directly and indirectly through internal integration.

The model reflects a process-based logic:

1. Network variables shape the external social and operational environment
2. Internal integration interprets these external inputs into facilitated inner activities
3. Coordinated activities lead to progressed supply chain performance

The incorporation of both direct and mediated paths allows for testing whether internal integration somewhat or fully explains the relationship between network variables and performance

Shared resources especially data frameworks, data visibility and mechanical platforms, empower smoother information flows and support cross-functional coordination subsequently reinforcing internal integration.

Internal Integration and Supply Chain Performance

H7: Internal integration (ITGR) positively impacts supply chain performance (SCP).

High levels of internal integration permit firms to adjust strategies, processes and decision-making over capacities and progressing operational effectiveness, responsiveness and the successful execution of supply chain activities.

Mediating Effects

H8a: Internal integration mediates the relationship between network actors and supply chain performance.

Relationships with network actors improve supply chain performance indirectly by reinforcing internal integration which then empowers firms to better leverage external relationships for progressed results.

H8b: Internal integration mediates the relationship between organize activities and supply chain performance.

The positive affect of coordinated network activities on supply chain performance works through internal integration as synchronized inner processes interpret external coordination into performance improvements.

H8c: Internal integration mediates the relationship between network resources and supply chain performance.

Network resources enhance supply chain performance through internal integration as integrated inner processes are superior situated to absorb and utilize shared resources successfully.

Rival Hypotheses

A plausible equal explanation is that network variables directly influence performance without the need for internal integration. Another equal explanation recommends that firm estimate or market power instead of integration drives performance results. These options are tended to by unequivocally modeling mediation and controlling for organizational characteristics.

Scope Of The Study And Theoretical Assumptions

Each experimental study is conducted inside a defined theoretical and relevant boundary. Clearly articulating the scope of the study and its basic presumptions is basic to delimit the interpretation of discoveries and to recognize the conditions beneath which the proposed theoretical relationships are expected to hold. This study is no exemption and is grounded in a set of theoretical presumptions while being intentionally restricted to a particular industrial context.

Theoretical Assumptions

First this study assumes that textile firms work inside identifiable and structured supply chain networks instead of as separated entities. Steady with the industrial network point of view the firms are seen as inserted in forbid connections including suppliers, manufacturers, logistics providers and buyers. These relationships shape the flow of materials, data and resources over the

supply chain. The study in this manner expect that network actors, assets and activities can be meaningfully conceptualized and experimentally examined inside the textile supply chain context.

Second the study assumes that managers possess adequate information and cognitive ability to reliably assess supply chain integration and performance results. The research depends on perceptual measures collected through survey instruments which are widely utilized and approved in supply chain management research. It is assumed that respondents being directly involved in supply chain and operations or logistics functions are capable of giving precise and informed assessments of internal integration practices, network relationships and performance results inside their organizations.

Third the study assumes that internal integration temporally and logically goes before supply chain performance results. Drawing on supply chain integration theory the inner coordination among functional units is treated as an organizational capability that enables firms to effectively implement decisions, utilize resources and react to external demands. In spite of the fact that execution feedback may further influence integration over time this study assumes a directional relationship in which internal integration acts as an antecedent mechanism through which network variables impact performance.

Fourth it is assumed that the proposed relationships are relatively stable over the period of observation. Given the cross-sectional nature of the study the research does not expressly demonstrate dynamic changes over time. Instead it assumes that the structural relationships among network variables, internal integration and supply chain performance reflect an balance state within the textile firms beneath investigation.

Scope of the Study

The scope of this study is purposely restricted to the textile industry which represents one of the foremost complex and strategically critical manufacturing divisions in developing economies. Textile supply chains are characterized by multi-tier production processes, labor-intensive operations, regular demand patterns and strong dependence on global markets. These characteristics make the textile industry an especially suitable setting for analyzing network-based supply chain associations and inward integration components.

By focusing solely on textile firms the study aims to achieve relevant depth and theoretical clarity. In any case this industry-specific focus may restrain the coordinate generalizability of the disclosures to other divisions. Industries with on a very basic level assorted operational characteristics such as high-tech manufacturing or service-based industries may show different designs of network interaction and integration.

Nevertheless the study maintains that its discoveries possess theoretical transferability. The underlying constructs and relationships examined network actors, assets, activities, internal integration and supply chain performance are not unique to the textile industry. Manufacturing industries that share comparable characteristics such as process complexity, supply chain fragmentation and reliance on inter-firm collaboration may reasonably draw experiences from the results of this study.

Moreover, the scope of the study is restricted to examining internal integration as the primary mediating mechanism. Other potential mediators or moderators such as external integration, environmental instability and technological capability or organizational culture are acknowledged but remain outside the scope of the show research. These prohibitions are intentional and aim to protect model stinginess and analytical focus.

Methodology

Overview

This chapter clarifies the methodological procedures utilized to examine the impact of network factors on supply chain performance within the textile segment of Pakistan. It traces the research approach, design and population and reviewing methods and the estimation of variables, data examination procedures and validity considerations and methodological presumptions. The purpose of this chapter is to ensure methodological transparency and to legitimize the suitability of the chosen methodologies for addressing the research objectives and testing the proposed theories. Reliable with prior supply chain and network studies this research adopts a quantitative approach based on primary information collected through a structured survey (Creswell and Creswell 2018).

Research Approach

Quantitative Research Approach

The study embraces a quantitative research approach which is appropriate for testing theoretical relationships and analyzing the strength and direction of associations among variables. Quantitative methods permit for objective measurement, statistical examination and generalization of findings to a broader population. This approach is broadly utilized in supply chain and network research where relationships among idle develops are experimentally tested (Hair et al 2019).

Research Design

Cross-Sectional Survey Design

A cross-sectional survey design is utilized in this study whereby data are collected from respondents at a single point in time. This design is reasonable for capturing prevailing network practices and their influence on supply chain performance within the textile industry. The cross-sectional nature of this study enabled the productive data collection and comparison across firms working under comparable natural conditions.

Explanatory Research Design

The study is illustrative in nature because it looks for to clarify how network factors influence supply chain performance instead of portraying these variables. Experimental and quasi-experimental designs are not feasible because network relationships between firms cannot be manipulated or controlled by the researcher. Subsequently the study depends on normally happening variations in network structures and practices which is steady with established research in supply chain management (Flynn et al 2010).

Population and Sampling

Population of The Study

The population of the study comprises of textile manufacturing firms operating in Pakistan including firms engaged in spinning, merging, processing, coloring and garment manufacturing. These firms maintain extensive supply chain networks involving wholesalers, distributors and customers at both domestic and international levels.

Unit of Analysis and Sampling Element

The unit of analysis in this study is the firm while the sampling element are the individual respondent occupying a manager position related to supply chain management, procurement and

logistics or operations. Such respondents are selected because they possess relevant knowledge regarding inter-organizational relationship and supply chain performances outcomes.

Sampling Technique

This study employs a probability sampling technique specifically stratified random sampling to ensure adequate and proportionate representation of respondents across crucial organizational characteristics within the textile and clothes industry. Given the heterogeneous nature of textile firms particularly in terms of organizational size the firms were firstly classified into distinctly divisions based on the number of employees (i.e. less than 100, 100–300 and 300–499 and 500 and above employees).

Following stratification respondents were randomly selected from each division ensuring that both the medium-sized and large organizations are sufficiently represented in the sample. As reflected in the demographic profiles a substantial proportions of respondents was drawn from large organizations with 500 or more than 500 employees while firms from smaller and medium-sized categories were also included allowing for balanced representation across organizational sizes.

To further enhance the relevance and reliability of the data the respondents was selected from key functional areas directly involved in supply chain activities including procurement, production/operation and supply chain/logistics. Furthermore respondents across different employment levels ranging from entry-level officers to seniors and top level managements and was included to capture both operational and strategic perceptions. The majority of respondents possess considerable work experience and ensuring informed and contextually grounded responses.

The practice of stratified random sampling helps reduce sampling preference improving the precision of estimates and enhances the external validity and generalizability of the study finding inside the textile and clothes sectors.

Sample Size Determination

Sample Size Adequacy for SEM

The final data set comprises of 180 usable responses which is generally adequate for survey-based SEM under common applied guidelines and power considerations. First from a PLS-SEM perspective the sampling size exceeds the widely used “10-times rule” which recommends a minimum sample size equal to 10 times the largest numbers of structural paths pointing at any endogenous construct. In the suggested model internal integration receives three incoming paths (network actors and resources and activities) while supply chain performance receives up to 4 incoming paths (network actors and resources and activities and internal integration). Therefore the minimum sample size requirement ranges from over 30 to 40 cases and the achieved sample size (N=180) securely exceeds this threshold supporting stable estimation of path numbers.

Secondly from a statistical power standpoint (often evaluated using multiple regression logic for SEM structural paths) a sample of 180 data is typically sufficient to detect medium effects in models with a small number of predictors. For example for an endogenous construct with four predictors (as in the supply chain performance equation) conventional power guidelines indicate that approximately 80–100 cases is sufficient to detect a medium effect size (e.g. $f^2 = 0.15$) at $\alpha = 0.05$ with power ≥ 0.80 . Therefore the present sample size offers adequate power for detecting practically meaningful relationships in the structural model. Nevertheless detecting very small effects (e.g. $f^2 = 0.02$) would typically require a much larger sample; thus the study is primarily powered to identify small to moderate and moderate effects which is steady with most behavioral and operations management SEM research.

Finally in terms of model difficulty the proposed conceptual framework contains a limited number of latent constructs and structural paths and the sample includes respondents from relevant functional domains and experience levels. This supports the reliability of measurement model estimation and the stability of structural parameter estimates which then strengthening the robustness of SEM-based Theoretical testing.

Measurement of Variables

Operationalization of Network Factors

Network factors is operationalized as multidimensional constructs reflecting key aspects of inter-organizational relationship inside the supply chain. These include information sharing, collaboration intensity and inter-firm trust and coordination mechanisms. Each dimension captures a specific facet of network interaction that are theoretically linked to the improved supply chain performance.

Measurement of Supply Chain Performance

Supply chain performance is measured through managerial perceptions of the operational proficiency, delivery consistency and cost effectiveness and responsiveness. These dimensions collectively represent the firm's ability to effectively manage supply chain activities and achieve competitive outcomes from it.

Measurement Scale

All constructs are measured using multiple items on a 5 points Likert scale ranging from strongly disagreeing to strongly agreeing. Likert-type scales are widely accepted in the organizational research due to their reliability and ability to capture perceptual data in a standardized format (Likert 1932).

Reliability And Validity Of Measurement

Content Validity

Content validity is confirmed by adjusting measurement items from the established studies and by seeking expert's opinions from researchers and specialists in supply chain management. This process ensures that the items effectively represents the theories under investigation.

Construct Validity

Construct validity is assessed through factor analysis to confirm that the measurement items load considerably on their intended constructs. That then ensured that the overall observed variables are correctly reflecting the underlying theoretical concepts.

Reliability

Reliability is evaluated using Cronbach's alpha coefficients to assess the internal consistency of the measurement items. Alpha values of 0.70 or above 0.70 are considered acceptable indicating reliable measurement scales (Nunnally and Bernstein 1994).

Data Analysis Techniques

Preliminary Data Analysis

Descriptive statistics are used to summarize the respondent's characteristics and examine the distribution of study variables. Correlation analysis is conducted to consider the strengths and directions of relationships among network variables and supply chain performance.

Structural Equation Modeling

To test the proposed hypotheses structural equation modeling (SEM) is employed using relevant software such as AMOS or Smart-PLS. SEM is suitable for this type of study because it allows simultaneous estimation of multiple relationships among latent constructs while accounting for measurement error. The hypothesized relationships are asymmetrical and linear with network factors acting as independent variables and supply chain performance as the dependent variable (Hair et al., 2019; Preacher & Hayes, 2008).

Validity Considerations

Internal Validity

Internal validity can be addressed by minimizing common method bias through procedural remedies such as assuring respondent's inconspicuousness and using clear and unambiguous questionnaire items. Statistical testing is also applied to assess the presence of common method variance.

External Validity

External validity is enhanced through probability sampling and the inclusion of firms from multiple segments of the textile industries. This then improves the generalizability of the findings to the broader textile sectors in Pakistan.

Methodological Assumptions and Limitations

The study further assumes that respondents provide accurate and honest responses and that managerial perceptions reflect actual network practices and supply chain performance. It is also assumed that the relationships among variables remain stable during the period of data collection.

Data Analysis and Results

Overview

This chapter presented the empirical analysis and result of the study entitled "Impact of Network Factors on Supply Chain Performance: The Mediating Role of Internal Integration". The chapter aimed to analyze the collected data that assess the reliability and validity of the measurement instruments and to test the hypothesized relationships using Partial Least Squares Structural Equation Modeling (PLS SEM) through Smart-PLS software.

PLS-SEM is appropriate for my study due to its suitability for prediction oriented research and its ability to handle complex models with mediating relationships and its robustness when normality assumptions are violated (Hair et al., 2019). The chapter is organized into demographic analysis, measurement model assessment, structural model evaluation and hypothesis testing.

Demographic Profile Of Respondents

A total of **180 questionnaires** was used for the final analysis. The demographic characteristics of the respondents are summarized in **Table 1**.

Table 1: Demographic Profile of Respondents (n = 180)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age	20–29 years	25	14
	30–39 years	115	64
	40–49 years	30	17
	Above 50 years	10	6
Gender	Male	151	84
	Female	29	16
Industry	Textile & Apparel	158	88
	Food & Beverages	22	12
Employment Level	Entry-level / Junior Officer	26	14
	Middle Management / Supervisor	120	67
	Senior Management / Director	20	11
	Executive / Top Management	14	8
Functional Area	Procurement	79	44
	Production / Operations	51	28
	Supply Chain / Logistics	49	27
Job Experience	Less than 3 years	20	11
	3–7 years	25	14
	8–12 years	99	55
	More than 12 years	36	20
Organization Size	Less than 100 employees	25	14
	100–300 employees	16	9
	300–499 employees	42	23
	500 and above	97	54

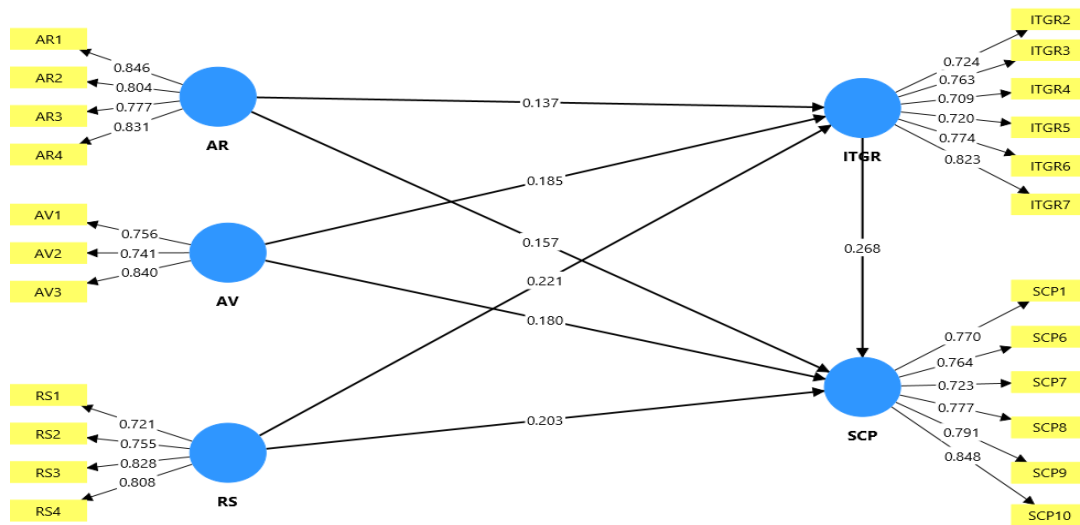
Table 1 showed that the majority of respondent are between 30 to 39 years of age that indicating a mature and professionally active workforce. The sample are dominated by male respondents which reflecting the gender composition commonly observed in Pakistan textile industry. Most respondents belong to middle management which is particularly relevant because individuals at this level are directly involved in supply chain coordination, operational decision making and inter organizational interactions.

Furthermore over 75% of respondents possess more than eight years of professional experience that ensuring that responses are informed by substantial industry exposure. The dominance of large organizations (500 or more employees) suggested that respondents operate within structured supply chains where network relationships and integration mechanisms are critical. Overall the demographic profile confirms that the sample is appropriate for investigating supply chain performance in the textile sector.

Measurement Model Assessment

The measurement model was evaluated that confirmed that the constructs were measured reliably and validly before examining the structural relationships. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability to ensure that the indicator consistently measure the same construct. Convergent validity had examined through factor loadings and average variance extracted (AVE) to verify that the indicators adequately represent their underlying constructs. Discriminant validity was assessed using the Fornell Larcker criterion and the heterotrait–monotrait ratio (HTMT) to confirm that each construct is empirically distinct from

the others. Establishing reliability and validity at this stage ensured that the subsequent structural model result are accurate and meaningful.



PLS-SEM Algorithm Graphical Representations

Figure 2: PLS-SEM Measurement Model

Outer Loadings

Table 1

	AR	AV	ITGR	RS	SCP
AR1	0.846				
AR2	0.804				
AR3	0.777				
AR4	0.831				
AV1		0.756			
AV2		0.741			
AV3		0.840			
ITGR2			0.724		
ITGR3			0.763		
ITGR4			0.709		
ITGR5			0.720		
ITGR6			0.774		
ITGR7			0.823		
RS1				0.721	
RS2				0.755	
RS3				0.828	
RS4				0.808	
SCP1					0.770
SCP10					0.848
SCP6					0.764
SCP7					0.723
SCP8					0.777
SCP9					0.791

Interpretation:

- Most measurement items for AR, AV, ITGR, RS and SCP displayed outer loadings at or above the recommended threshold of 0.70 which confirming satisfactory indicator reliability and supporting the adequacy of the reflective measurement model.
- Actors (AR) indicators (AR1-AR4) shows strong outer loadings ranging from 0.781 to 0.848 which indicating consistent and reliable measurement of the construct.
- Activities (AV) indicator such as (AV1-AV3) demonstrated satisfactory loading in between 0.742 and 0.841 so confirming their ability to capture the intended latent variable.
- Internal Integration (ITGR) indicators largely exceed the threshold with loadings ranging from 0.701 to 0.820. While ITGR1 0.690 was removed because of loading below the minimum acceptable threshold as their inclusion could have weakened construct reliability and convergent validity.
- Resources (RS) indicators (RS1-RS4) exhibited strong loadings between 0.727 and 0.826 that indicating robust indicator reliability for the construct.
- The majority of Supply Chain Performance (SCP) indicators demonstrate acceptable loadings ranging from 0.706 to 0.837 thus supporting their contribution to measuring operational performance outcomes.
- Five SCP indicators such as (SCP2 0.695, SCP3 0.675, SCP4 0.60, SCP5 0.61 and SCP11 0.674) were removed because of loading below the minimum acceptable threshold as their inclusion could have weakened construct reliability and convergent validity.
- Several SCP indicators (SCP2, SCP3 and SCP11) shows marginal loadings slightly below 0.70 , however they were retained because their values are close to the threshold as they contribute to content validity and their removal did not significantly improve reliability measures.
- Overall the retained indicators meaningfully contribute to their respective latent constructs and the measurement model demonstrates adequate indicator reliability following the removal of poorly performing items.

Internal Consistency Reliability and Convergent Validity

Table 2: Reliability and Convergent Validity

CONSTRUCT	Cronbach's Alpha	Composite Reliability (CR)	AVE
Network Actors (AR)	0.832	0.888	0.664
Network Activities (AV)	0.700	0.823	0.609
Network Resources (RS)	0.787	0.860	0.607
Internal Integration (ITGR)	0.848	0.887	0.567
Supply Chain Performance (SCP)	0.871	0.903	0.608

Interpretation:

Table 2 indicates that all constructs establish acceptable internal consistency reliability as Composite Reliability values exceed the recommended threshold of 0.70. Though the Cronbach's Alpha value for Network Activities is slightly below 0.70 its Composite Reliability exceeds 0.80 which is acceptable in PLS-SEM research due to the method emphasis on CR rather than Alpha (Hair et al., 2019).

Convergent validity is also recognized as all AVE values exceed 0.50 that indicating that each construct explains more than half of the variance in its indicators. These results confirmed that the measurement items reliably and validly represent their respective constructs

Discriminant Validity

Table 3: Fornell–Larcker Criterion

Construct	AR	AV	ITGR	RS	SCP
Network Actors (AR)	0.815				
Network Activities (AV)	0.284	0.780			
Internal Integration (ITGR)	0.256	0.305	0.753		
Network Resources (RS)	0.301	0.366	0.330	0.779	
Supply Chain Performance (SCP)	0.269	0.299	0.386	0.317	0.780

Interpretation:

Table 3 present the Fornell Larcker criterion result for assessing discriminant validity. The diagonal values for each construct are greater than the corresponding inter construct correlations. This indicated that each construct shared more variance with its own indicators than with other constructs in the model so thereby confirming **adequate discriminant validity**.

Heterotrait-Monotrait Ratio (HTMT)

Table 4:

	Heterotrait-monotrait ratio (HTMT)
AV → AR	0.378
ITGR → AR	0.295
ITGR → AV	0.379
RS → AR	0.355
RS → AV	0.502
RS → ITGR	0.376
SCP → AR	0.311
SCP → AV	0.375
SCP → ITGR	0.437
SCP → RS	0.374

Interpretation:

- Discriminant validity was measured using the Heterotrait Monotrait ratio (HTMT) criterion as recommended for PLS-SEM analysis.
- All HTMT values among the construct (AR, AV, ITGR, RS and SCP) are well below the conservative threshold of 0.85 that indicating adequate discriminant validity.
- The HTMT values range from 0.299 to 0.502 so suggesting that each construct is empirically distinct from the others.
- The highest HTMT value is observed between RS and AV (0.502) which remains substantially below the recommended cutoff that confirming that these constructs are conceptually related yet statistically distinct.

- The relatively low HTMT values across all construct pairs indicate minimal overlap between latent variables which supporting the uniqueness of each construct within the measurement model.
- Overall the HTMT results confirmed that discriminant validity is established for all constructs included in the model.

Collinearity Assessment (VIF)

Table 5: Variance Inflation Factor (VIF)

Structural Path	VIF
AR → ITGR	1.143
AR → SCP	1.166
AV → ITGR	1.201
AV → SCP	1.242
ITGR → SCP	1.197
RS → ITGR	1.214
RS → SCP	1.273

All VIF values are well below the recommended thresholds, which indicating **no multicollinearity issues**. This confirmed that each predictor contributed exclusively to the model and that the estimated path coefficients are consistent.

Coefficient of Determination (R²)

Table 7:

	R-square	R-square adjusted
ITGR	0.164	0.150
SCP	0.220	0.203

Coefficient of Determination (R²)

Table 7 shows the R-square values, which indicate the proportion of variance in the dependent variable explained by each model. The ITGR model explains about 16.4% of the variation (adjusted R-square 15%), reflecting a relatively weak explanatory power. In comparison, the SCP model performs better, explaining 22% of the variation (adjusted R-square 20.3%).

These values indicated weak explanatory power, which is considered substantial in organizational and behavioral research, where SCP showed a better fit than ITGR.

Effect Size (F²)

Table 8: Effect Size (F²)

Structural Path	f-square
AR -> ITGR	0.020
AR -> SCP	0.016
AV -> ITGR	0.034
AV -> SCP	0.018
ITGR -> SCP	0.077
RS -> ITGR	0.048
RS -> SCP	0.021

Table 8 indicates that the internal integration has a major effect size on supply chain performance, highlighting its central role in the model. Network factors exhibit a small direct effect on performance but meaningful effects on internal integration that reinforcing the mediating mechanism identified earlier.

Model Fit

Table 9: Model Fit

	Saturated model	Estimated model
SRMR	0.067	0.067
d_ULS	1.248	1.248
d_G	0.369	0.369
Chi-square	379.307	379.307
NFI	0.923	0.923

Considering together, the overall model fit indices indicate that the proposed model establishes a good overall fit. All the measures are above the minimum threshold criteria. Standardized Root Mean Square Residual (SRMR) where the recommended threshold value is 0.08 on comparison to the result it is well under threshold value showing a good model fit. The saturated and estimated models both show satisfactory and acceptable values across all key fit measures, which are showing the support the adequacy of the pre-defined measurement and structural models.

Discussion of Results

The results support Industrial Network Theory and Supply Chain Integration Theory by demonstrating that network relations create value only when firms possess strong internal integration capabilities. In Pakistan textile sector and internal integration serves as a strategic mechanism that converts external network resources into improved supply chain performance.

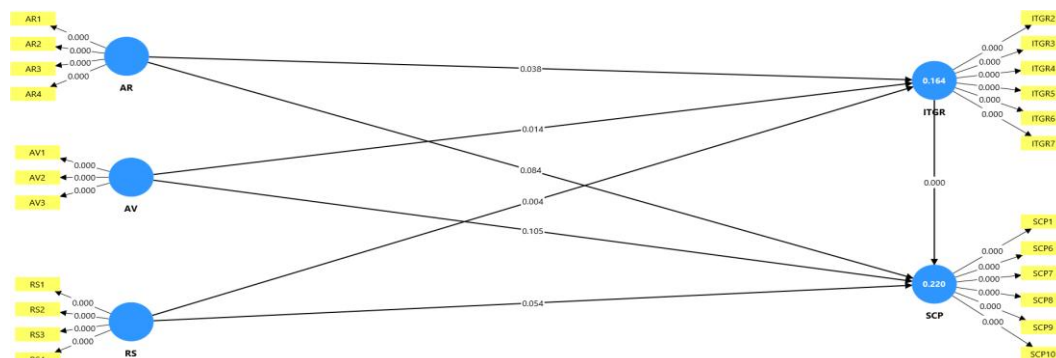
Summary

The above results confirmed the reliability and validity of the measurement model and establish the mediating role of internal integration between network factors and supply chain performance. The finding provided a strong empirical foundation for the managerial implications and further conclusion are discussed in the subsequent chapter.

Bootstrapping Path Coefficients

The structural model was assessed by bootstrapping with 5,000 resamples to assess the significance of the hypothesized relationships.

Bootstrapping Graphical Representations



Figure(s) 3 PLS-SEM Bootstrapping Results

Direct Effects

Table 5: Direct Effects

Hypothesis	Path	B	t-value	p-value	Decision
H1	AR → SCP	0.120	1.730	0.084	Not Supported
H2	AV → SCP	0.131	1.619	0.105	Not Supported
H3	RS → SCP	0.144	1.926	0.054	Not Supported
H4	AR → ITGR	0.137	2.076	0.038	Supported
H5	AV → ITGR	0.185	2.451	0.014	Supported
H6	RS → ITGR	0.221	2.865	0.004	Supported
H7	ITGR → SCP	0.268	3.634	0.0002	Supported

Table 5 based on path coefficients reflecting the results to the direct effects of the variables showed that network actors, network activities and network resources positively impact the internal integration supporting hypothesis related to direct effects H4, H5 and H6. Similarly internal integration has also a statistically significant positive effect on supply chain performance thus supporting Hypothesis H7. In contrast the network actors, network activities and network resources do not exhibit significant direct effects at the 5% significance level. Even though their path coefficients are positive and their effects are insufficient to directly influence supply chain performance.

Mediating Effects of Internal Integration

Table 6: Mediating Effects

Hypothesis	Path	β	t-value	p-value	Mediation
H8a	AR → ITGR → SCP	0.037	1.978	0.048	Supported
H8b	AV → ITGR → SCP	0.050	1.823	0.068	Not Supported
H8c	RS → ITGR → SCP	0.059	2.192	0.028	Supported

Table 6 demonstrated that two of the indirect paths (network actors and network resources) through internal integration were statistically significant. However, network activities do not show significant impact on supply chain performance through mediation. Since the direct effects of network factors on supply chain performance are insignificant and the indirect effects are significant except network actors, full mediation is established for network actors and network resources. This confirmed that certain network factors influence supply chain performance through internal integration mechanisms while other network factor may be impact through alternative path.

Discussion

This chapter interprets the empirical finding of the study on the impact of network factors on supply chain performance in the textile sector of Pakistan. Consistent with academic conventions the discussion is confine to interpretations of the results rather than personal opinion. Both theoretical and practical implications is addressed in each subsection. The discussion are structured according to the prescribe format.

Brief Overview

The objective of this study was to examine how network actors, network resources and network activities influence supply chain performance and to determine whether internal integration mediate these relationship. Grounded in Industrial Network Theory and Supply Chain Integration

Theory the study proposed that external network relationships contribute to performance outcomes only when they are effectively adopted through coordinated internal processes.

The empirical analysis exposed three vital findings. First the network factors do not exert a statistically significant direct effect on supply chain performance. Second the internal integration has a significant and positive effect on supply chain performance. Third the internal integration fully mediates the relationships between network actors, resources, activities and supply chain performance. These findings together indicated that the performance benefits of supply chain networks are realized through internal organizational integration slightly than through external relationships alone.

Discussion of Results of Application of Method and Implications

The application of Partial Least Squares Structural Equation Modeling (PLS-SEM) generated reliable and valid result for testing the proposed conceptual model. The measurement model confirmed satisfactory internal consistency reliability and convergent validity with composite reliability and AVE values exceeding recommended threshold (Hair et al., 2019). Discriminant validity was also established which confirming that the constructs captured distinct theoretical dimensions.

From a theoretical perspective the successful application of PLS-SEM supported its appropriateness for testing mediation based models in supply chain and network research. The method allowed simultaneous estimation of direct and indirect effects and it is essential when examining internal integration as an explanatory mechanism. The findings strengthen calls in the literature to move beyond simple direct effect models when studying complex inter organizational phenomena (Flynn et al., 2010).

From a practical standpoint the methodological results imply that practitioners and researchers should adopt analytical approaches skilled of uncovering indirect mechanisms. Evaluations of supply chain performance that focus solely on direct effects may overlook critical internal processes that determine whether external collaborations yield tangible outcomes. Thus the method employed in this study aligned with the complexity of textile supply chains and enhances the credibility of the findings.

Discussion of Descriptive Analysis and Implications

The descriptive analysis revealed that most respondents were experienced middle level managers working in the large textile organizations. This profile is significant because such managers are directly involve in coordinating supply chain activities and translating strategic association into operational actions. As a result the data provide a credible basis for assessing network relationships, internal integration and performance outcomes.

Theoretically the descriptive findings suggested that the observed results reflect establish organizational structures rather than nascent or informal supply chain arrangements. This strengthen the interpretation that internal integration are necessary organizational capability even in relatively mature firms. The finding align with prior research indicating that experience and scale do not automatically ensure effective internal coordination (Wong et al., 2011).

Practically the descriptive result suggest that despite the presence of experienced managerial personnel the textile firms may quiet face challenges in aligning internal functions. This highlighted the need for formal mechanisms such as integrated information systems and cross functional coordination structures to support managerial decision making and improve supply chain performance.

Discussion of Tests of Hypotheses and Implications

The hypothesis testing results provide important insights into the dynamics of network -based supply chains. The non-significant direct effects of network actors, resources and activities on supply chain performance indicate that external associations alone are insufficient to enhanced performance. This finding refined existing network and collaboration literature by demonstrating that relational embeddedness does not automatically translate into operational consequences (Håkansson & Snehota, 1995).

In contrast the significant positive effect of internal integration on supply chain performance confirmed it role as a central organizational capability. This result is consistent with Supply Chain Integration Theory which emphasizes the importance of cross functional coordination in achieving superior performance (Flynn et al., 2010).

The full mediation effects observe in this study extend Industrial Network Theory by empirically demonstrating that the value of network actors, resources and activities is realized only when firm possess strong internal integration. Theoretically this finding positions internal integration as a critical link between external networks and performance outcome. Practically it implies that managers shall prioritize internal alignment initiatives to fully benefit from external collaborations.

Analysis and Implications

Post-hoc analyses including effect size, coefficient of determination, predictive relevance and collinearity valuations have additional reinforced the robustness of the model. The moderated R^2 values indicated that model explained a meaningful proportion of variance in internal integration and supply chain performance which is consistent with hope in organizational research (Hair et al., 2019).

The effect size results demonstrated that the internal integration has a substantially larger impact on supply chain performance than direct network factor. The positive Q^2 values confirmed that the predictive relevance of the model indicating its applicability to similar textile supply chain contexts.

Theoretically these results reinforced the argument that internal organizational capabilities are primary drivers of performance. Practically they suggest that investment in internal integration are probable to produce greater performance improvement than isolated efforts to strengthen external network ties.

Conclusion

This study examined how network factors actors, resources and activities affect supply chain performance in Pakistan textile sector that highlighting internal integration as a key mediator. The finding showed that network factors alone do not directly improve performance because their effect is realize only when firm possess strong internal alignment through cross functional collaboration, shared information systems and coordinated decision making. Theoretically the study extends Industrial Network Theory and the ARA framework by emphasizing internal integration as a mechanism that convert network potential into actual outcomes while also integrating insights from the Resource Based View. Practically the textile firm shall prioritize strengthening internal capabilities alongside external partnerships and industry policies that foster organizational capability development can enhance competitiveness. Overall the research underscores that value lies not just in networks but in a firm ability to integrate and leverage them effectively that providing both academic and managerial insights for sustainable supply chain performance.

Summary of the Entire Thesis

This thesis examines the impact of network factors on supply chain performance in the textile sector of Pakistan with internal integration abstract as a mediating mechanism. Drawing on Industrial Network Theory, Supply Chain Integration Theory and the Resource Based View the study develops a conceptual framework linking network actors, resources and activities to supply chain performance through internal integration.

A quantitative research design was adopted and primary data were collected from managers working in textile supply chains. Using PLS-SEM the study assesses the reliability and validity of measurement instrument and to test both direct and indirect relations among the constructs. The result revealed that while network factors do not directly influence supply chain performance they significantly affect performance indirectly through internal integration.

Conclusions in Relation to the Literature

The findings of this study are largely consistent with previous research emphasizing the importance of internal integration in achieving the supply chain performance (Flynn et al 2010; Wong et al 2011). While prior studies often reported positive direct effects of collaboration and network relationships the present study refines these conclusions by demonstrating that such effects are dependent upon internal organizational arrangement.

In relation to Industrial Network Theory the result suggests that actors and resources and activities create potential value rather than comprehended value. This potential is converted into performance outcomes only when firms possess adequate internal integration capabilities thereby extending the A–R–A structure.

Implications

The following implications involve informed speculation based on study findings.

Theoretically, the study may encourage future researchers to treat internal integration as a foundational capability rather than a peripheral construct in network-based supply chain models. It also suggests that performance advantages recognized to networks may be overelaborated if internal mechanisms are not explicitly considered.

Practically the findings suggest that textile firms that invest in cross-functional integration shared and information systems and coordinated decision-making structures may achieve more sustainable performance improvements than firms focusing merely on external partnerships. At a broader level industry policies promoting organizational capability development may enhance the competitiveness of the textile sector.

Limitations

This study has several limitations. From a hypothetical point of view the model focuses only on internal integration as a mediating mechanism barring other potential mediators or moderators such as outside integration or ecological instability. Methodologically the cross-sectional design limits causal induction and the reliance on self-reported information may introduce response predisposition.

Moreover the study is kept to the Pakistani material division which may restrain the generalizability of the discoveries to other businesses or national settings.

Suggestions for Future Inquire About

Future research may receive longitudinal plans to look at how network relationships and internal integration advances over time. Researchers may also explore additional mediating or moderating variables such as technological capability and organizational culture or environmental turbulence.

Comparative studies across industries can would further enhance the generalizability of the proposed framework. Finally, the qualitative approaches could complement quantitative findings by providing deeper visions into the internal processes through which network relationships are operationalized.

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APPENDIX A

Survey Questionnaire

Response Scale:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Section A: Network Actors

AR1: My organization has a good image and a leadership position in the supply chain.

AR2: My organization continuously engages in social events and maintains friendships with other actors in the supply chain.

AR3: My organization is considered a pioneer and a family business recognized within the supply chain.

AR4: My organization actively creates relationships with new actors in the supply chain.

Section B: Network Activities

AV1: My organization facilitates information exchange within the firm and between supply chain partners.

AV2: Top management in my organization provides financial support for staff training and new development initiatives.

AV3: Employees in my organization are trained by local and/or international experts.

Section C: Network Resources

RS1: There are exchanges of goods, services, money, information, and personnel between my organization and its partners.

RS2: My organization conducts analyses of network quality, network resources, and the network environment.

RS3: There are formal and/or informal agreements between my organization and its supply chain partners.

RS4: My organization exercises control over network outputs.

Section D: Internal Integration

ITGR1: Data integration exists among internal functions within my organization.

ITGR2: Enterprise application systems are integrated across internal functions.

ITGR3: Inventory management is integrated across departments.

ITGR4: The level of inventory can be monitored in real time.

ITGR5: Logistics-related operational data can be accessed in real time.

ITGR6: Cross-functional teams are used in new product development.

ITGR7: There is real-time integration and coordination among all internal functions, from raw material management through production, shipping, and sales.

Section E: Supply Chain Performance

SCP1: My organization's primary supply chain can deliver zero-defect products to final customers.

SCP2: My organization's primary supply chain can deliver value-added services to end customers.

SCP3: My organization's primary supply chain can eliminate late, damaged, and incomplete orders.

SCP4: My organization's primary supply chain can quickly respond to and solve customer problems.

SCP5: My organization's primary supply chain can deliver products precisely on time.

SCP6: My organization's primary supply chain can deliver precise quantities.

SCP7: My organization's primary supply chain can deliver shipments of variable sizes frequently.

SCP8: My organization's primary supply chain can minimize total product cost.

SCP9: My organization's primary supply chain can minimize all types of waste.

SCP10: My organization's primary supply chain can effectively manage safety stock.

SCP11: My organization's primary supply chain can deliver smaller lot sizes and shipping case sizes.