Does supplier management matter for supply chain performance? Evidence from the textile industry

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ABSTRACT – REZUMAT

Does supplier management matter for supply chain performance? Evidence from the textile industry

This study examines the impact of long-term relationships and vendor-managed inventory on supply chain performance and the mediating role of information sharing in Pakistan's textile industry. For testing the proposed hypotheses of the present study, the primary data was gathered with the help of a questionnaire from past studies via a convenience sampling strategy. Three hundred fifty questionnaires were distributed among the textile industry through the HR department of the concerned firm. However, only 330 cases were considered for data analysis after data clearing in SPSS version 25. Hence, the response rate is 94%. The data were analysed using SEM in Smart-PLS version 3. The results of hypothesis testing indicated the direct effect of long-term relationships and vendor-managed inventory, which was found to have a positive and significant impact on information sharing and supply chain performance in Pakistan's textile industry. Furthermore, the mediating effect of information technology between long-term relationships and vendor-managed inventory revealed a partial mediation effect on supply chain performance. The policymakers and top management of concerned firms should consider these variables for future strategies to get better supply chain performance.

Keywords: *supply chain performance, long-term relationship, information sharing, vendor-managed inventory, textile industry*

Impactul managementului furnizorilor asupra performanței lanțului de aprovizionare. Dovezi din industria textilă

Acest studiu își propune să examineze impactul relațiilor pe termen lung și al inventarului gestionat de furnizori asupra performanței lanțului de aprovizionare și al rolului de mediere al schimbului de informații în industria textilă din Pakistan. Pentru testarea ipotezelor propuse în studiul de față, datele primare au fost colectate cu ajutorul unui chestionar din studiile anterioare, printr-o strategie de eșantionare. Trei sute cincizeci de chestionare au fost distribuite industriei textile prin intermediul departamentului de resurse umane al firmei în cauză. Cu toate acestea, doar 330 de cazuri au fost luate în considerare pentru analiza datelor după ștergerea datelor în SPSS versiunea 25. Prin urmare, rata de răspuns este de 94%. Datele au fost analizate folosind SEM în Smart-PLS versiunea 3. Rezultatele testării ipotezelor au indicat efectul direct al relațiilor pe termen lung și al inventarului gestionat de furnizor, care s-a dovedit a avea un impact pozitiv și semnificativ asupra schimbului de informații și a performanței lanțului de aprovizionare, în industria textilă din Pakistan. În plus, efectul de mediere al tehnologiei informației între relațiile pe termen lung și inventarul gestionat de furnizor a evidențiat un efect parțial de mediere asupra performanței lanțului de aprovizionare. Factorii de decizie și managementul firmelor în cauză ar trebui să ia în considerare aceste variabile pentru strategiile viitoare, pentru a obține performanțe superioare în lanțul de aprovizionare.

Cuvinte-cheie*: performanța lanțului de aprovizionare, relație pe termen lung, schimb de informații, inventar gestionat de furnizor, industria textilă*

INTRODUCTION

A business model that supports the entire supply chain, such as vendor-managed inventory, maintains and manages inventory following retailer point-of-sale data [1]. Therefore, the suppliers ensure they have replacements in response to market demand and consumer purchasing patterns. Improving inventory utilisation by maximising its frequency by the supplier is an essential factor for the success of firms. In this context, enterprise resource planning is a crucial system that facilitates the management of critical resources to support business operations and enhance functionality. There are many benefits of enterprise resource planning (ERP). It is a financially efficient system that integrates diverse supply chain operations, including distribution, customer service, marketing and sales, production, and overall quality as perceived by the customer [2]. In this regard, by integrating fundamental business operations into a technology-driven system, one can guarantee the

effective planning and allocation of resources at their designated locations [3].

The long-term relationship has the potential to generate community subsidies for supply chain partners, which cannot be ignored in today's competitive business environment [4]. For this, improving revenue through revenue competitiveness in the market can be achieved by implementing timely processes. Furthermore, this would promote operational efficiency through cost reduction, strategic collaboration and planning, joint ventures for innovative approaches, and sound decision-making to foster a positive relationship cycle for supply chain activities. Therefore, information sharing is the foundation of inter-business coordination, facilitating the seamless operation of technological developments [5]. To increase the supply chain's responsiveness, information sharing is utilized to render tactical data extremely valuable through technical expertise and strategic planning [6]. The textile industry is among the most ancient sectors of the global economy [7]. Pakistan's fashion and textile industry thrives due to the constant evolution of apparel and fashion trends [8]. This sector increased exports and contributed to the expansion of the Pakistani economy. In this connection, businesses must strengthen their supply chains by implementing contemporary, diverse planning, outsourcing, and distribution network strategies to gain a competitive edge. Additionally, it contributes to expanding a company's market share, customer satisfaction, and profits. The effect of effective supply chain management on the delivery of goods from factories is that it reduces both costs and delivery times while ensuring that final consumers receive high-quality products [9]. Within the textile industry of Pakistan, supply chain management is a concept that has been introduced previously. Regional rivals, including Vietnam, Bangladesh, China, Bangladesh, and Turkey, present serious competition in this industry. Compared to other regional competitors, conducting business in Pakistan entails a higher expenditure on the supply chain [10]. Due to the factors above, the textile industry in Pakistan is undergoing a critical period.

Many organizations have come to recognize the criticality of SCM in establishing a sustainable competitive edge for their products in fiercely competitive markets [11]. They have suggested that utilizing supply chain performance measurement as a foundation for enhancing overall supply chain efficiency could be beneficial in the long run. Previously, cost and visibility were identified as the primary challenges facing the textile industry in developing countries like Pakistan [12]. Therefore, various past studies reported comparable results, indicating that firm characteristics can influence the performance and practices of SCM [13, 14]. Similarly, one can infer from this that a single operational strategy must be revised to accommodate every feature of the supply chain. Within the contemporary supply chain environment, competition is increasingly emphasized.

Organizations strive to optimize performance by deploying accessible resources to enhance the supply chain process and gain a competitive advantage in the marketplace. Over recent decades, the textile industry in Pakistan has experienced a persistent decline that is attributable to a multitude of factors [15]. Industry performance will improve if the four tools are utilized effectively and accountability is maintained throughout the process. The characteristics mentioned above that impact the effectiveness and utility of SCM should have been considered in the present study.

The present study makes a few contributions to the field of knowledge. First, in the past, the direct effect of long-term relationships and vendor-managed inventory on supply chain performance was tested [16, 17]. However, in the present study, mediating role information sharing was introduced to validate research scholars' existing findings. Second, past studies mainly worked on the service sector [18], but the textile industry was studied using the variables stated in this study. Lastly, the textile industry managers responded to this study because the authors believe they provide a better understanding of studied variables compared to lower-level employees of firms [19].

Therefore, the objectives of the present study were to determine the direct impact of the direct effect of a long-term relationship and vendor-managed inventory on information sharing and supply chain performance and to examine the mediating role of information sharing regarding supply chain performance in the textile industry of Pakistan.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Theoretical framework

Resource-based view (RBV) is a theoretical framework that emphasizes an organization's internal resources and capabilities as sources of competitive advantage and superior performance [20]. The RBV model is considered a crucial resource for the supply chain. Regarding long-term relationships, these connections make building trust, commitment, and shared values-resources unique to each relationship-possible [21]. Furthermore, strategic planning increases the likelihood that partners will put effort into creating and sustaining relationship-specific resources, improving communication, cooperation, and data sharing. In addition, inventory that the vendors manage can be examined using RBV because a supplier's or vendor's capacity to keep track of their customers' inventory is an essential skill for a firm's success [22]. With this skill, the inventory is delivered more efficiently, there is better coordination throughout the supply chain process, and there are no chances of inventory stock-outs. The RBV model elaborates on the effects of information sharing on performance, an essential component of supply chain management [23].

Therefore, it can be said that the exchange of information is the most beneficial resource that could improve the process and performance of the supply

chain. Coordination, responsiveness, and decision-making are all enhanced when parties in the supply chain share information and expertise [24].

Hypothesis development

Long term relationship

After extensive, long-term collaboration, cooperative and trusting relationships develop between companies and suppliers [25]. A recent study suggested that trust in the supply chain can improve efficiency and decision-making by encouraging open dialogue, exchanging relevant information, and pooling resources to address issues [26]. Another study revealed that suppliers maintain consistent and dependable business practices when parties commit to long-term partnerships [27]. Therefore, they are driven to meet quality standards consistently, deliver on time, and keep the agreed-upon service levels. However, a recent study concluded that because of this dependability, the supply chain operates more efficiently and faces fewer interruptions, and establishing long-term relationships could be a way to save costs. Positive outcomes cannot be ignored. Effective relations between suppliers and customers result in reduced costs, operational efficiency, and increased logistics [28].

Moreover, this effective relationship reduces procurement costs, increases the efficiency of the supply chain, and reduces the cost of holding inventory [29]. This is a win-win situation to mitigate supply chain risks, and it is beneficial for both parties to commit to a long-term partnership and combine their resources. Lastly, a study suggested that it is advisable to collaborate and share information in advance to reduce the impact of potential disruptions such as natural disasters, geopolitical events, or supplier capacity constraints on supply chain performance [30].

H1: Long-term relationships have a positive effect on supply chain performance.

H2: Long-term relationships have a positive effect on information sharing

Vendor Managed Inventory

A recent study confirmed that in the Vendor Managed Inventory (VMI), suppliers can assume control of their customers' inventory as part of their role in supply chain management [30]. In addition, in vendor management, the vendor represents the client by monitoring inventory, restocking as needed and making decisions. However, another study suggested that the bullwhip effect describes how shifts in demand are amplified as they make their way through the supply chain [31]. The key benefit would be VMI, where the supplier can directly access the customer's inventory or point-of-sale data, allowing them to acquire a more accurate picture of demand. In this regard, VMI mitigates the bullwhip effect, supply chains are more stable, and demand is less volatile, leading to improved efficiency and reduced costs. A study recommended that it is the responsibility of the vendor to keep an eye on inventory level and restock VIM as needed, and being able to anticipate changes

in demand or supply disruptions allows for quicker responses [32]. Lastly, suppliers can modify the production and delivery schedules to ensure prompt replenishment of the customer inventory, and an increase in responsiveness can reduce lead times and improve customer service [33].

H3: Vendor-managed inventory has a positive effect on the supply chain performance.

H4: Vendor-managed inventory has a positive effect on information sharing.

Mediating role of information sharing

Complex and interdependent relationships characterize many supply chain activities. When partners effectively share information, it improves coordination and provides access to relevant, up-to-date data [34]. Improving supply chain performance is made possible through this coordination's ability to synchronize actions, streamline procedures, and avoid misalignments [35]. Sales projections, production schedules, and inventory levels are all easier to communicate in a partnership that lasts a long time. Effective planning and better forecasting improved the performance of the supply chain; consequently, the mismatch between demand and supply was eradicated [36]. In committed partnerships, asking each other how they are doing is customary. Both sides can monitor the other's evolution by using key performance indicators (KPIs) like product quality metrics, lead times, and on-time delivery rates. Each link in the supply chain is more likely to step up and do its part if everything is being tracked, which improves efficiency. Information exchange between suppliers and customers is crucial to Vendor Managed Inventory (VMI) [37]. The efficient flow of information enables a supplier to restock their inventory. Suppliers react faster to meet the demand level, removing supply hurdles, which is only possible with the effective exchange of information [38]. If suppliers are aware of trends in sales or when products are running low, they can proactively replenish their customers' inventory. There are fewer stockouts, shorter lead times, and better supply chain performance due to this replenishment responsiveness [39].

H5: Information sharing mediates the relationship between long-term relationships and supply chain performance.

H6: Information sharing mediates the relationship between vendor-managed inventory and supply chain performance.

METHODOLOGY

Data and procedure

A 'Primary' source provides the data for the study. Primary research consists of collecting data directly from respondents employed in the textile industry and to whom direct inquiries have been directed. The primary data is an information source from which the researcher gathers primary sources of information. It indicates that the researcher has collected data to pursue a particular study subject or objective. The

information will be gathered from textile industry employees residing in Pakistan.

A convenience sampling strategy was utilized for this investigation. Non-probability sampling, which involves the random selection of individuals, is employed by researchers as a practical means of acquiring data. The sample size is determined from the entire population under study, as it is impracticable to include every employee in these industries (e.g., each factory has more than 1,500 workers). The participants in this research were personnel employed in the textile industry. Conducting studies with a sample size ranging from 30 to 500 respondents is deemed adequate and acceptable. Hence, 330 constitute our sample size in this study.

Scale development

Long term relationship was adopted from the study of Abbas and Kamal [40]. Four research items are "Last long-time relationship with a key supplier, Collaboration with a key supplier to improve quality in the long run, Long term alliance & Supplier as an extension". Vendor Managed Inventory was taken from the research of Lee [17]. In this variable four items were considered "Your firm has built a VMI system infrastructure for continuous maintenance, your firm has improved work efficiency by using the VMI system, our firm has increased productivity by using the VMI system & Your firm has built an ERP system infrastructure for continuous maintenance".

Information sharing variable was considered from the study of Firmansyah and Siagian [41]. Research items were also four "Have an integrated information system with partners, Have an internally integrated information system, The relationship of information systems with suppliers & Communication systems with adequate suppliers".

Supply chain performance adopted from the study of Firmansyah and Siagian [41]. Four research items were "Delivery of orders as promised, Responsiveness in changing customer demand, Adjusting to the requested product specifications & The flexibility of product variety types".

Statistical procedure

In the present study, partial least squares structural equation modelling (PLS-SEM) is applied to test the proposed hypothesis using Smart-PLS software (version 3.3.2). This technique is acceptable when research scholars' objectives to test the proposed research model using existing theories and mediation effects are tested, as in the present study. We analysed the gathered data and reported as per recent guidelines.

RESULTS

Reliability and validity analysis

The purpose of reliability analysis is to determine whether or not the data was collected accurately [42]. Reliability is the degree to which random errors are absent; therefore, it measures dependable outcomes. It delineates the precision and validity of the experimental methodologies. In this instance, the reliability analysis determines Cronbach's alpha value, which is evident to yield significant results for the entire set of data. By applying the criterion established by: > 9 – Excellent, > 8 – Good, > 7 – Acceptable, > 6 – Questionable, > 5 – Poor, and < 5 – Unacceptable, the Cronbach's alpha values and composite reliability can be utilized to classify the reliability.

Table 1

| RELIABILITY AND VALIDITY ANALYSIS					
Name of variable	Item	Items loading	Cronbach's Alpha Value	Composite reliability	Variance Inflation Factor (VIF)
Long-Term Relationship	LTR1	0.786	0.854	0.902	0.697
	LTR2	0.809			
	LTR3	0.861			
	LTR4	0.880			
Information Sharing	IS1	0.857	0.880	0.918	0.736
	IS2	0.821			
	IS3	0.854			
	IS4	0.899			
Vendor Managed Inventory	VMI1	0.925	0.914	0.940	0.795
	VMI2	0.873			
	VMI3	0.887			
	VMI4	0.882			
Supply Chain Performance	SCP1	0.877	0.815	0.879	0.646
	SCP2	0.790			
	SCP3	0.727			
	SCP4	0.813			
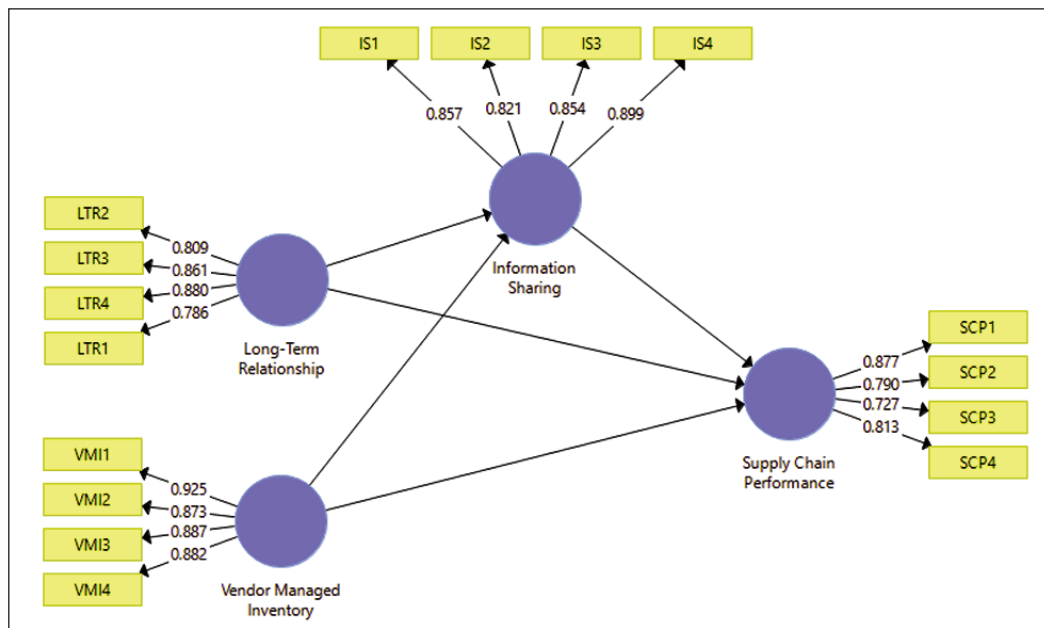
Fig. 1. Model fitness

A reliability rating of 0.70 or higher for Cronbach's Alpha and composite reliability indicates that the variable is trustworthy [43]. Based on the survey results indicating values exceeding the specified limit, it can be concluded that the data should be consistent. As demonstrated in table 1, our variables exhibit a high degree of dependability. Validity requires that the VIF value be equal to or greater than 0.50 [44]. It is evident that the VIF for all variables is equal to or greater than 0.50 (figure 1).

Hypothesis testing

Regression analysis aims to predict the value of the dependent variable by examining the values and impacts of the independent variables. Our research has involved the utilization of multiple independent variables; consequently, multiple regression analysis was employed in SmartPLS version 3. The beta values and t values are presented in table 2.

Therefore, the findings indicate that three factors (direct effects) – long-term relationship ($\beta = 0.137$, t-value = 2.007), information sharing ($\beta = 0.260$, t-value = 4.240), and vendor-managed inventory ($\beta = 0.348$, t-value = 0.348 – have a significant influence on the performance of the supply chain. Similarly, two factors – long-term relationship ($\beta = 0.379$, t-value = 7.657), and vendor-managed inventory ($\beta = 0.427$, t-value = 8.581) – have a significant influence on the performance of the supply chain in textile of Pakistan. Furthermore, the mediating

|			
			Table 2
PATH DIRECTIONS			
Direct effects			
Path directions	**Value of Beta (Standard Coefficient)**	**Significance t-value**	**Results**
Long-Term Relationship → Information Sharing	0.379	7.657	Supported
Long-Term Relationship → Supply Chain Performance	0.137	2.007	Supported
Vendor Managed Inventory → Information Sharing	0.427	8.581	Supported
Vendor Managed Inventory → Supply Chain Performance	0.348	5.708	Supported
Information Sharing → Supply Chain Performance	0.260	4.240	Supported
Indirect effects			
Long-Term Relationship → Information Sharing → Supply Chain Performance	0.099	3.603	Supported
Vendor Managed Inventory → Information Sharing → Supply Chain Performance	0.111	3.814	Supported
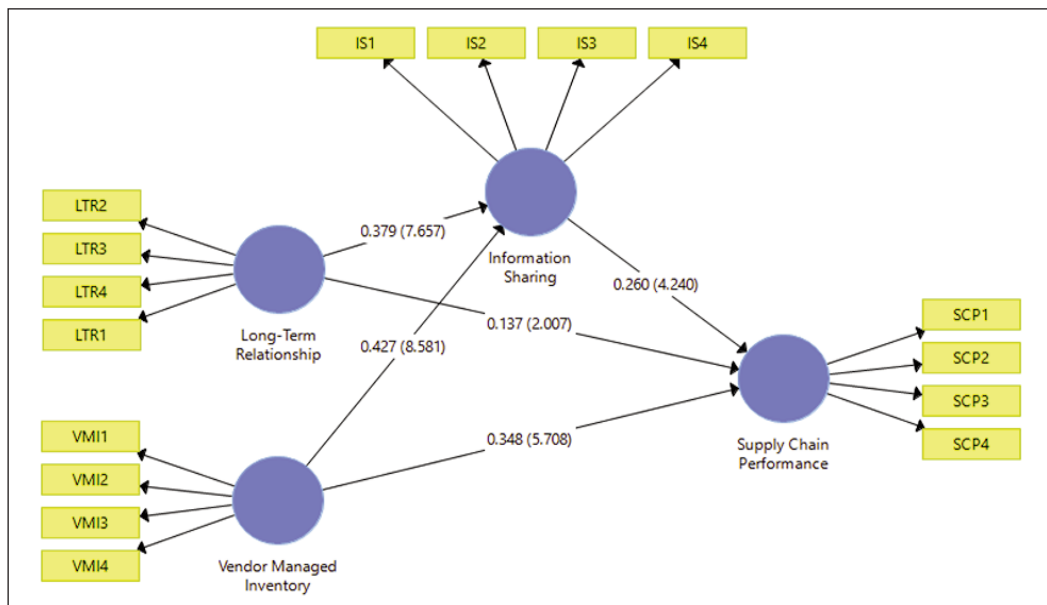
Fig. 2. Structural equation modelling

effect of information technology on the long-term relationship (β = 0.099, t-value = 3.603), and vendor-managed inventory (β = 0.111, t-value = 3.814) have a significant influence on the performance of the supply chain in textile of Pakistan. Hence, the partial mediation effect was confirmed (table 2 and figure 2).

DISCUSSION

In the present study, vendor-managed inventory has a more significant impact on supply chain performance in Pakistan's textile industry due to higher beta values for other variables. If the firm manages its inventory level better with the help of suppliers, then customers' needs can be fulfilled with greater profitability. In addition, various benefits can be driven, such as better inventory management, supplier coordination, and supply chain performance. Furthermore, the mediating effect of information sharing for the variable's long-term relationship and vendor-managed inventory confirmed better supply chain performance. These findings confirmed that better outcomes, such as trust level, resource support and commitment, can be achieved through long-term relationships. Lastly, the role of information sharing for vendor-managed inventory also recommended better and improved relationships for enhanced supply chain performance in the textile industry of Pakistan. Therefore, real-time decisions can be made, and improved supply chain performance must be addressed.

Prior researchers suggested that the influence of long-term relationships on supply chain performance is an essential factor that can be ignored [41]. Based on their findings, long-term relationships have a significant impact. Past study indicates that vendor-managed inventory significantly impacts the supply chain's performance [45]. Similarly, as market competition intensifies, industries must continue to hone their capabilities and monitor inventory, demand, and stock management to satisfy customer requirements. Therefore, prior scholars have reached the same conclusions as the present study, suggesting that VMI positively and significantly impacts supply chain performance in the long run. A previous study has demonstrated that information sharing had a substantial effect on supply chain performance [46]. They further stated that it is essential for the industry to maintain communication and information sharing with all stakeholders, such as suppliers, customers, and other partners involved in the supply chain process.

CONCLUSION

This study aims to examine the impact of long-term relationships and vendor-managed inventory on supply chain performance and the mediating role of information sharing in Pakistan's textile industry. The results revealed that all direct effects, including long-term relationships, vendor-managed inventory, and information sharing, positively and significantly impact information sharing and supply chain performance in Pakistan's textile industry. However, the unique finding of this study is that vendor-managed inventory has a more significant impact on supply chain performance for other variables. Furthermore, the mediating effect of information technology between long-term relationships and vendor-managed inventory revealed a partial mediation effect on supply chain performance. Lastly, vendors manage inventory with higher beta values as mediators concerning long-term relationships.

Theoretical contribution

The present study adopted the RBV resource-based view theory, which supported the conceptual framework. Long-term relationship findings suggested that commitment, timely information, resource support and shared values can be achieved. This theory is

considered an external factor. In addition, RBV also confirmed in this study that managing inventory is significant in n many positive benefits, such as better inventory level, better customer satisfaction, and an improved position in the industry compared to competitors. Lastly, information sharing would help the textile industry in Pakistan with real-time information and timely decisions. This would also contribute to better visibility in the supply chain for better partners' performance as an internal factor in the long run.

Managerial implications

This research was considered significant for individuals employed in the textile industry and top management of the textile industry of Pakistan. Findings of this suggested that factors including vendor-managed inventory, information sharing, and long-term relationships significantly impact Pakistan's supply chain performance. Therefore, it is crucial for long-term relationships to sustain customers and cultivate positive relationships with them by ensuring the supply chain operates at peak efficiency.

Limitations and future research direction

Along with a few contributions, there are certain limitations as well. The research was limited to a sample size of 330 respondents. The sample size can be increased in the future to validate the present findings. This study was limited to only four factors. Still, other factors such as process integration, trust, collaborative planning, forecasting and replenishment, and warehouse management systems may be considered in the future. Due to time and resource constraints, our study employed non-probability convenience sampling. In contrast, prospective researchers may collect data through probability sampling.

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