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From Sustainability to Performance: The Impact of Green Supply Chain Management on Organizational Outcomes through Innovation and Quality Management

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ABSTRACT

Purpose: This paper investigated the effect of Green Supply Chain Management (GSCM) on organizational performance with reference to innovation and quality management as the mediators.
Design/Methodology/Approach: An approach of quantitative type was used where survey data was used and taken among the managerial employees in the manufacturing companies. The hypothesized relationships and mediation effects were tested with structural equation modeling (SEM).
Findings: The findings indicated that GSCM greatly improves organizational performance. It was also revealed that innovation and quality management have a major

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mediating effect, and GSCM enhances performance directly and indirectly by enhancing internal capabilities.
Practical implications: The results indicate that the managers must incorporate green practices and innovation strategies as well as quality systems in order to deliver high quality performance. GSCM should also be encouraged by policymakers in order to improve sustainability and competitiveness.
Originality/Value: The research is valuable because it forms a dual mediation model that elucidates the role of GSCM in driving organizational performance by means of innovation and quality management, and which can be broadly used in research and practice.

Keywords— Green Supply Chain Management, Organizational Performance, Innovation, Quality Management, Manufacturing Sector

Introduction

Modern businesses significantly increase their profits by adopting and implementing green marketing and supply chain strategies (Islam et al., 2026). The concept of Green Supply Chain Management (GSCM) has been observed as a recent and novel managerial principle. GSCM is an environmental concept that is gaining popularity in the world. For many businesses in the world, adopting GSCM is a way to demonstrate their sincere commitment to Sustainability (Raman et al., 2023). Supply chain managers due to increasing green concepts and government regulations to adopt green supply chain management (GSCM) practices (Feng et al., 2022). Globally, several industries have switched over to GSCM practices since the market competition is very high among its customers and suppliers (Jianguo and Solangi, 2023, Zhang et al., 2026b). It is worth noting that despite the benefits of GSCM, many industries still face economic, environmental, and social barriers that prevent them from transforming their existing supply chains (Raman et al., 2023).

(Omowole et al., 2024) posits that if firms want to achieve sustainable growth, then they must undertake efforts to align their business processes with green marketing principles. This includes adopting a green supply chain management (GSCM) strategy, and the developing of a comprehensive strategic green marketing framework (Alkandi, 2025, Zhang et al., 2026a). Further it's suggested that businesses and policymakers should constantly look towards improving their business practices to enhance their green corporate image (Alkandi, 2025). This will in turn induce the consumers to develop purchase intentions towards that organization (Sardana and Mishra) also advocated that the increased public attention and awareness has caused the manufacturers to shoulder environmental responsibilities.

This suggests the critical role played by green marketing initiatives and strategies in fostering green consumption behavior. Researchers and academicians have tried to establish a comprehensive framework in order to explain the antecedents of green consumption intention (Alkandi, 2025, Raman et al., 2023). The researchers have mainly viewed this framework through the lens of the signaling theory (Schena et al., 2015). This theory provides the necessary framework to explain the impact of strategic green marketing orientation and green supply chain management. According to this

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theory the firms convey information to their customers in the form of signals (i.e., in this case, green supply chain management) which are then received and analyzed by the consumers and based on those signals, the consumers undertake certain actions such as purchase behavior (Amaya et al., 2021).

The Pakistani textile industry has been chosen as a case for the present study because the textile and clothing sector is one of the largest industrial sectors of the country and is directly related to consumer purchases. The policymakers in this industry have been struggling for a long about the development of a comprehensive green and environmentally friendly policy framework (Jianguo and Solangi, 2023, Amin et al., 2026). Being the largest industrial sector in Pakistan, the development of a detailed and comprehensive framework in this regard can significantly advance the understanding of consumer perceptions of organizational performance.

Gap Analysis

Labafi et al. (2019) examined the impact of a facet of internal green marketing orientation i.e., green supply chain management (GSCM) on green consumption intention through the mediating role of green brand equity. Labafi et al. (2019) suggested inculcating strategic green marketing orientation and other variables within the existing conceptual framework to get a broader understanding of the antecedents and precursors of green consumption intention. However, past efforts to integrate eco-innovativeness and environmental add-ons into sustainable strategies in the textile industry have proven ineffective in delivering the intended societal change. This can mainly attributed to the lack of empirical evidence for organizations about the importance of green marketing strategies and their effect on consumer purchase intentions (Amin et al., 2026).Therefore, this study intends to fill this gap by analyzing the impact of strategic green marketing orientation and green supply chain management on green consumption intention through the mediating and moderating roles of green image and brand social responsibility. By analyzing the aforementioned relationships this study intends to add value to the current literature about the antecedents of green consumption intention.

Research Questions:

RQ 1: Does Innovation mediate the relationship between Green Supply Chain Management and Organization performance?

RQ 2: Does Quality management mediate the relationship between Green Supply Chain Management and Organization performance?

Theoretical and Literature Review

Underpinning Theory

The current study intends to examine the aforementioned hypotheses through the lens of the signaling theory. The signaling theory has been widely acknowledged and used in the green marketing literature (Amaya et al., 2021). The signaling theory presents a valuable framework that significantly aids in understanding the various antecedents and precursors that drive the green consumption behavior of consumers. According to the signaling theory the market is characterized by having unequal or imperfect knowledge

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and information (Salem et al., 2026). It means that the consumers do not have adequate information to evaluate the quality of a product or service. Therefore, to ensure the adequate availability of information, the firms attempt to convey information to the consumers with the aid of certain signals. It means that there are two exchanging parties. One is the firm which is the sender of signals and the other is the consumers who are the receivers of the signals (Wen et al., 2026). The signals sent by the firms play a major role in driving the consumers (receivers) to engage in certain behavioral outcomes such as trust, loyalty, and purchase behavior. The behavioral outcomes of the receivers are a direct function of the nature of the signals. It means that positive signals tend to yield positive results and vice versa (Friske et al., 2023). The researchers tend to agree over the fact that the environmentally sustainable practices of the organization are a major signal that is received by the consumers and upon the basis of these signals, the consumers tend to form certain perceptions about the firm.

Green Supply Chain Management (GSCM)

(Raman et al., 2023)describe green supply chain management as the adoption and implementation of environmental thinking processes into the organizations supply chain function. GSCM practices integrate the coordination of the organization segments like production process, inbound and outbound logistics, reverse logistics, internal and external supply chain, customer requirements and responsiveness, and product quality (Feng et al., 2022). This integrated sustainable supply chain operation yields better economic, environmental, and social performance, which results in overall enhanced organizational performance (Duong, 2022). Green supply chain management (GSCM) involves a combination of various facets that include product development and design, procurements of raw materials and their selection criterion, manufacturing procedures, product transportation, and disposal of products after their shelf life has expired (Hariyani et al., 2024). Moreover, according to (Raman et al., 2023) GSCM can be termed as an organization's plan to acknowledge and adopt environmental planning across the supply chain process to significantly boost its environmental footprint.

Over the last few decades GSCM and environmental planning and management have gotten increased attention from all stakeholders and the firms are now aiming to gain a competitive advantage by integrating GSCM into their long-term strategic planning processes (Wiredu et al., 2024).

Nazir et al. (2024) defined green supply chain management as the suppliers' evaluation process focused on the degree of their environmental performance and their efforts in accomplishing and adhering to environmental standards. At the supplier's end, GSCM can be referred to as the capacity and ability of the supplier to effectively address the environmental concerns attached to their operations. Furthermore, green supply chain management (GSCM) has been acknowledged as a vital business management strategy to improve overall environmental sustainability, increase firm profits, and accomplish market share objectives successfully and effectively assimilating the associated environmental threats and impacts (ODIASE and OSIFO, 2025).

Moreover, green supply chain management (GSCM) practices into the business process enables them to develop green competencies that are aimed at developing and producing green products to satisfy and cater to the needs of the customers (Janjhi et

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al., 2025). Through the process of screening, monitoring, evaluating, and collaborating with the respective suppliers, a firm can procure green materials and accessories from its suppliers (Achmad and Asis, 2025). The company can also undertake R&D activities in collaboration with its suppliers to produce goods that are eco-friendly and meet the customer's demands. This practice can considerably enhance the overall performance of the firm (Tay et al., 2026).

The theory of collective reputations explained by the Winfree and McCluskey (2005) entails that overall reputation of an organization is directly affected by the actions of other firms that

form a part of its business process of function. Based on this theory, Winfree (2023) posited that the supplier's inability to effectively tackle the associated environmental management problems can have a serious negative impact on the overall corporate image and performance of an organization. Likewise, the firm's overall image can be positively shaped due to the positive and constructive measures taken by its supplier to adhere to and comply with the environmental standards and greening of the various facets of the supply chain function causes a significant and noticeable improvement in environmental performance (Feng et al., 2022). GSCM leads to a decrease in air emissions, a reduction in effluent waste, and a decrease in the consumption of toxic materials.

Furthermore, it was also posited that supply chain greening can significantly enhance the overall organizational reputation and financial performance due to the reduction

in costs that are linked with energy consumption, treatment of waste material,

and fines imposed as a result of environmental accidents (Janjhi et al., 2025). Raman et al. (2023) analyzed the impact of green supply chain management practices in large-scale manufacturing industries and observed that the adoption of green supply chain practices leads towards an enhancement of the overall corporate image of the firm and also positively affects the customer's perception of the firm.

Green Supply Chain Management Practices (GSCMP) in Manufacturing Firms

In the literature, the concept of green supply chain practices (GSCMP) is commonly used for a variety of activities performed by an organization to minimize their impacts on the natural environment. Supply chains strive to maintain internal health and environmental sustainability using the capability to self-correct based on information from the external environment (Garcia Alcaraz et al., 2022). There is no doubt, that every organization must make effective and efficient use of resources. Hence manufacturing firms in particular play a vital role since those firms have more potential to cause a negative impact on the environment when compared with service-oriented firms. Literature on GSCM, further suggests that manufacturers need to work with their suppliers of raw materials and components to produce environment-friendly products (Zaidi and Lakhal, 2025). Firms could use the power they possess to set environmental standards and criteria for their suppliers so that the best raw material with minimal environmental harm will

be provided for production. As far as the global context is concerned, many of the manufacturing firms have already adapted GSCM practices to ensure sustainability in the long run. How

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international firms adhere to these practices is via proper integration and coordination of all business processes, including purchasing, manufacturing, marketing, logistics, customer focus etc. (Shukla et al., 2023). The following research findings assist in understanding to what extent GSCM practices are being carried out in firms across the globe giving more emphasize to environmental protection and sustainability in the long run.

Green Supply Chain Management and Organization performance

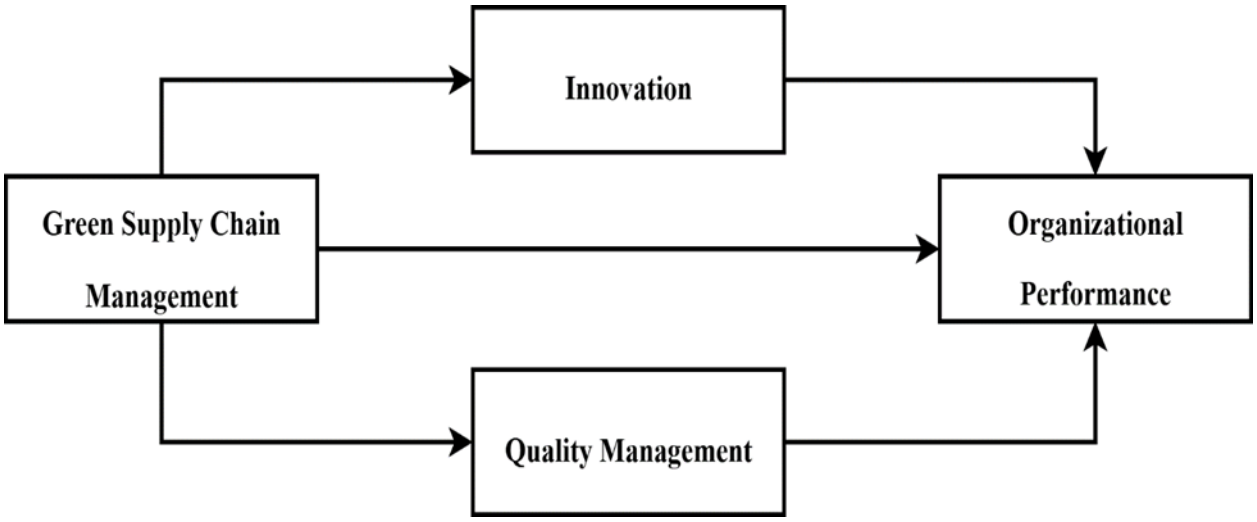
The implementation of green supply chain management as an effort to preserve the environment can help companies reduce raw material costs and use recycled materials, which will increase profits and improve organizational performance (Andaregie and Astatkie, 2022). Munir et al. (2022) suggested that there are five main aspects of green supply chain management and organization performance, including economy, environment, and operations. Additionally, green supply chain management can be beneficial for organizational performance, which is helping green supply chain management has a positive and significant effect on organization performance, which shows that green supply chain management can develop a competitive advantage and improve financial performance in the long term (Al-Khawaldah et al., 2022). There are differences in company perceptions of implementing green supply chain management to improve organization performance because companies need to comprehend the factors in green supply chain management so that they can be implemented in the company and be sustainable (Feng et al., 2022).

Due to this difference in opinion, the researchers proposed the following hypothesis:

Hypothesis 1: Green supply chain management has a positive effect on organization performance

Hypothesis 2: Innovation mediates the relationship between Green supply chain management and organizational performance.

Hypothesis 3: quality management mediate the relationship between Green supply chain management and organizational performance



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Figure 1: Research Model

Methodology

Measures

Green Supply Chain Management : GSCM had 08 items and its scale was adopted from Çankaya and Sezen (2019). ***Innovation:*** A ten-item scale developed by Wang and Wang (2012) was used to measure innovation. ***The Quality Management*** is measured through the 09 items that developed by the Saraph et al. (1989). Moreover the organizational performance is measured by the 07 items scale that developed by the Pokharel and Ok Choi (2015). Moreover, the unit of analysis of this study was individual because the study was centered on the individual consumers of textile apparel brands that are currently the residents of the five cities of Pakistan (Islamabad, Rawalpindi, Lahore, Faisalabad and Karachi). All items were measured on five-point Likert scales (i.e., 1= strongly disagree, 5=strongly agree), which best fit this study for effectively exploring the relationships between the variables.

Sampling Techniques Data Collection

According to Aminu and Shariff (2014) there is still not the pre-established procedure that could be utilized to ascertain a suitable sample size for a study. However, many researchers have come up with certain procedures that can be adopted to ascertain a suitable study sample. The Roscoe's rule of thumb was developed by Albert Roscoe in 1975. This rule of thumb elucidates that a sample size of more than 30 and less than 500 respondents is sufficient and appropriate for carrying out a majority of management and social sciences research. However, one of the major drawbacks of this rule is that it does not tell the exact number required for an effective sample.

Moreover, the data was collected from the participants with the help of a questionnaire. The survey forms were floated to the respondents and they were requested to return it in a specified period. The ethical research standards prescribed by the APA during the phase of data collection. These ethical standards include the right to informed consent, voluntary participation, and the right to the privacy of information that was provided.

Empirical results

4.1 Measurement model assessment

Data cleaning, which involved missing values, outliers, and accuracy and normality of the dataset, was done in SPSS 25. The refined data were exported following preprocessing, and further analyzed. The estimation of the measurement and structural models was then done using SMART PLS which was done with partial least squares structural equation modeling (PLS-SEM). It allowed measuring reliability and validity, convergent and discriminant validity of the constructs. Moreover, the hypothesis testing was conducted using SMART PLS, which analyzed the path coefficients, mediation and moderation effects of the proposed research model.

Table 2 explained the good support to the claim that the measurement model meets the suggested requirements of reliability and convergent validity which means the constructs are measured with a decent level of psychometric quality. Firstly, the standardized factor loadings of all the indicators are between 0.704 and 0.899, which is

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over the recommended factor loading of 0.70 and this proves that all items load significantly on their respective constructs and they add value to the construct measurement. In particular, the Green Supply Chain Management items have quite high loadings (0.769-0.899), indicating a very stable and precise construct. The items of innovation also show satisfactory loadings (0.706-0.785) though lower compared to other constructs, which means that although the construct is reliable, its indicators represent somewhat broader aspects of innovation. Equally, Quality Management and Organizational Performance indicate very high loadings of 0.747 to 0.826 and 0.704 to 0.833 respectively, indicating good item reliability in these constructs.

Cronbachs alpha values are between 0.905 and 0.934 in terms of internal consistency reliability, which is significantly higher than the recommended level of 0.70 and shows good reliability of all the latent constructs. The values of composite reliability (CR), which is a more accurate measure of construct reliability in PLS-SEM, are between 0.906 and 0.935 and again they are above the acceptable mark of 0.70, which further validates the internal consistency of the scales. In terms of convergent validity, the average variance extracted (AVE) of each of the constructs ranges between 0.555 and 0.684, which is greater than the minimum criteria of 0.50 suggested in the literature. This illustrates that both the constructs explain the variance in their respective indicators more than half thus validating that there is sufficient convergent validity. Green Supply Chain Management has the highest AVE (0.684), which means that its indicators explain the most, and the last indicator is Innovation with the lowest AVE (0.555) though it is still within the reasonable range. Altogether, these findings prove that the measurement model has a strong reliability and convergent validity, thus, proving the sufficiency of the measurement tool and the possibility of its further use in the framework of the structural model evaluation.

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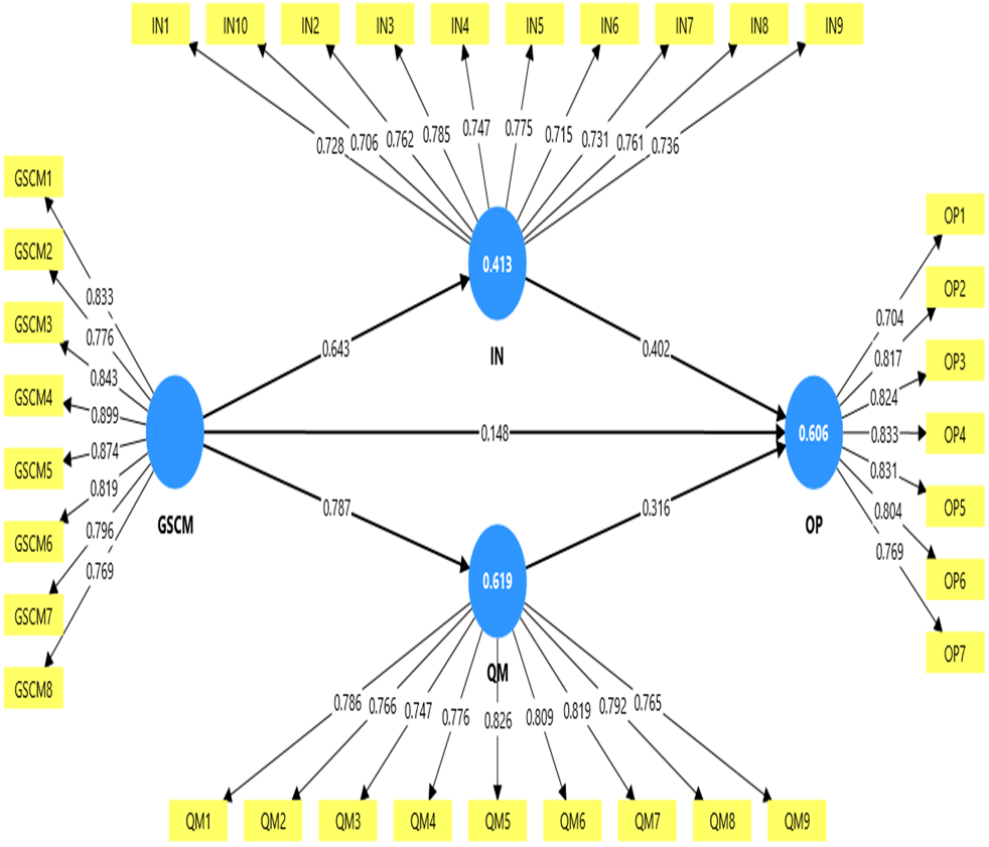


Figure 2. Measurement Model

Table 2. Measurement Result

Constructs	Items	Loadings	Ca	CR	AVE
Green Supply Chain	GSCM1	0.833	0.934	0.935	0.684
	GSCM2	0.776			
	GSCM3	0.843			
	GSCM4	0.899			
	GSCM5	0.874			
	GSCM6	0.819			
	GSCM7	0.796			
	GSCM8	0.769			
Innovation	IN1	0.728	0.911	0.914	0.555
	IN2	0.762			
	IN3	0.785			
	IN4	0.747			
	IN5	0.775			
	IN6	0.715			
	IN7	0.731			

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	IN8	0.761			
	IN9	0.736			
	IN10	0.706			
Quality Management	QM1	0.786	0.923	0.924	0.621
	QM2	0.766			
	QM3	0.747			
	QM4	0.776			
	QM5	0.826			
	QM6	0.809			
	QM7	0.819			
	QM8	0.792			
	QM9	0.765			
Organizational Performance	OP1	0.704	0.905	0.906	0.638
	OP2	0.817			
	OP3	0.824			
	OP4	0.833			
	OP5	0.831			
	OP6	0.804			

These HTMT findings in table 3 on the aspect of discriminant validity indicate that the constructs in the model exhibit good overall discriminant validity. By the heterotrait-monotrait ratio (HTMT) criterion, discriminant validity is determined when the values of HTMT are below a conservative of 0.85 or a more liberal 0.90. All HTMT values in this work are 0.687 to 0.844 that are all less than the proposed cut-off values hence demonstrate that they are all empirically different. In particular, the greatest HTMT value is found between Green Supply Chain Management and Quality Management (HTMT = 0.844), which means that there is a rather strong conceptual relationship between the two constructs, but the figure is not too large and does not pose any threat to discriminant validity. Green Supply Chain Management and Innovation have the highest HTMT (HTMT = 0.687) indicating a more certain difference between the two constructs. Likewise, the relationships between Innovation, Organizational Performance, and Quality Management are not above the mark as well, which also helps to establish construct distinctiveness. In sum, the results of the HTMT analysis reveal that there are significant differences between the latent variables, therefore, validating the existence of the discriminant validity and implying that the measurement model can be further utilized in the structural model analysis.

Table 3. Discriminant Validity through HTMT

	GSCM	IN	OP	QM

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GSCM			
IN	0.687		
OP	0.702	0.774	
QM	0.844	0.735	0.758

Table 4 shows the discriminant validity test of FornellLarcker. Under this criterion, the square root of the average variance extracted (AVE) of each construct, as represented on the diagonal of this matrix is greater than the correlations of the construct with all other constructs in the respective rows and columns. The findings show that the constructs all meet this requirement. In particular, the square root of AVE of Green Supply Chain Management (0.827) is higher than its correlations with Innovation (0.643), Organizational Performance (0.655), and Quality Management (0.787). On the same note, Innovation has sufficient discriminant validity, whereby square root of AVE (0.745) is higher than the correlation with Green Supply Chain Management (0.643), Organizational Performance (0.712) and Quality Management (0.682). The criterion is also fulfilled by Organizational Performance since its square root of AVE (0.799) exceeds its correlations with the other constructs. Similarly, the square root of AVE of Quality Management (0.788) is greater than its relationships with Green Supply Chain Management (0.787), Innovation (0.682) and Organizational Performance (0.706). Though the correlation between Quality Management and Green Supply Chain Management is quite high and just slightly less than the threshold, it is still lower than the diagonal value thus, still supporting the discriminant validity. The Fornell Larcker findings in general support the hypothesis that each construct has a higher percentage of variance with its indicators than with other constructs, which is good discriminant validity and which supports the uniqueness of the latent variables in the measurement model.

Table 4. Discriminant Validity through Fornell-Larcker

	GSCM	**IN**	**OP**	**QM**
GSCM	0.827			
IN	0.643	0.745		
OP	0.655	0.712	0.799	
QM	0.787	0.682	0.706	0.788

The structural model test also reveals a high degree of explanatory power and different degrees of the effect size among the hypothesized relationships. The model as illustrated by the coefficient of determination (R 2) estimates in Table 5 explains 41.3 percent of the Innovation variance (R 2 = 0.413), 60.6 percent of the Organizational Performance variance (R 2 = 0.606), and 61.9 percent of the Quality Management variance (R 2 = 0.619). These values show moderate or high predictive power of the structural model, which is that the exogenous constructs are significant predictors of the endogenous variables in the model. The R 2 values and the adjusted R 2 values are almost similar meaning that it is stable and it is not inflated by the number of predictors. In terms of effect size (f 2) the findings indicate that there are different levels of the contribution of the predictor constructs to the endogenous variables. Using the

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recommendations of Cohen (1988), with 0.02, 0.15 and 0.35 referring to the small, medium and large effects, respectively, the impact of Green Supply Chain Management on Innovation is significant (f 2 = 0.705) which implies that Green Supply Chain Management is a significant predictor of Innovation. Green Supply Chain Management also has a minor impact on Organizational Performance (f 2 = 0.020) indicating a comparatively limited direct impact. Interestingly, the impact of Green Supply Chain Management on Quality Management (f 2 = 1.628) is very large, which indicates that this construct is largely affected by it. Innovation has a medium effect on Organizational Performance (f 2 = 0.207), which shows that innovation has a significant impact on performance results. It is also observed that Quality Management makes a small yet significant impact on Organizational Performance ($f^2 = 0.083$). On the whole, these results suggest that although the Green Supply Chain Management is the strongest predictor of the model, especially in the context of Innovation and Quality Management, the latter has significant explanatory power to improve the Organizational Performance. The combination of the R 2 and f 2 statistics indicate the predictive power and explanatory power of the suggested structural model.

Effect Size F^2				**Coefficient of Determination R^2**		
	GSCM	**IN**	**OP**	**QM**	**R-square**	**R-square adjusted**
GSCM		0.705	0.020	1.628	**IN** 0.413	0.412
IN			0.207		**OP** 0.606	0.603
OP					**QM** 0.619	0.619
QM			0.083			

Table 5. Explanatory Power of Model

4.3 Structure model assessment

PLS-SEM was applied that used 5,000 samples of bootstrapping to determine the significance of direct, mediating, and moderating effects. The findings suggest that all the hypotheses are well supported empirically.

Table 6. Hypothesis results

Hypothesis	**Statistical path**	**Path coefficient**	**STDEV**	**T statistics**	**P values**	**Conclusion**
Direct effects						
Hypothesis 1	GSCM -> IN	0.643	0.034	19.056	0.000	Supported
Hypothesis 2	GSCM -> OP	0.148	0.058	2.566	0.005	Supported
Hypothesis 3	GSCM -> QM	0.787	0.022	35.405	0.000	Supported
Hypothe	IN -> OP	0.402	0.058	6.965	0.000	Supported

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Hypothesis 5	QM -> OP	0.316	0.061	5.183	0.000	Supported

Mediating effects

	Indirect effect					Partial mediation
Hypothesis 6	GSCM -> IN -> OP	0.258	0.036	7.147	0.000	Supported
Hypothesis 7	GSCM -> QM -> OP	0.248	0.048	5.145	0.000	Supported

Direct Effects:

The results of the structural model hypothesis testing with both direct and mediating effects are provided in Table 6 and demonstrate the high level of empirical support of all the hypotheses put forward. In terms of direct impacts, Green Supply Chain Management (GSCM) possesses a strong positive impact on Innovation (= 0.643, t = 19.056, p < 0.001) in support of Hypothesis 1 and reveals that the ability of firms using green supply chain practices to enhance their innovation capabilities is significant. GSCM can also exhibit a strong positive impact on Organizational Performance (2 = 0.148, t = 2.566, p = 0.005), and this is in line with Hypothesis 2, but the effect size is not as strong as other paths. Moreover, the positive impact of GSCM on Quality Management is very high and important (0.787, t = 35.405, p = 0.001), thus, confirming Hypothesis 3 and indicating that green supply chain initiatives have a significant impact on improving quality management practices within the organization. Moreover, Hypothesis 4 is supported by the fact that in addition to Hypothesis 5, Innovation also contributes greatly to Organizational Performance (0.402 t = 6.965 p < 0.001), whereas Quality Management raises Organizational Performance (0.316 t = 5.183 p < 0.001). These results suggest that innovation as well as quality management are significant drivers of organizational performance.

Mediating Effects:

In relation to the mediating effects, the outcomes indicate that there are significant indirect effects of both mediators. Hypothesis 6 is supported by the fact that innovation plays a major role in the connection between GSCM and Organizational Performance (= 0.258, t = 7.147, p< 0.001). Likewise, Quality Management is a significant modulator of the impact of GSCM on Organizational Performance (= 0.248, t = 5.145, p = 0.001), which validates Hypothesis 7. Because the direct impact of GSCM on Organizational Performance is still significant when the mediators are added, both mediation relationships are characterized as a partial mediation. Trying to compare the indirect effects between Innovation and Quality Management implies that the two

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contribute nearly the same as transmission channels by which GSCM improves the Organizational Performance with the former having slightly higher mediating effects. In general, structural model results prove the strategic value of green supply chain practices is multifaceted by enhancing the ability of innovation and quality management, and thus, the significance of the strategic approach of green supply chains.

Discussion and Research Implications

Discussion

This paper has discussed the effects of Green Supply Chain Management (GSCM) on Organizational Performance (OP) and Innovation (INN) and Quality Management (QM) as mediating variables. The empirical findings established that GSCM positively impacts the organizational performance both directly and indirectly by innovation and quality management. The positive correlation of GSCM and organizational performance is direct, which proves that the environmentally responsible supply chain practices can be considered as the means to achieve not only the sustainability objectives but also operations and financial performance. This conclusion aligns with the previous literature that opines that GSCM leads to better efficiency, less waste, and firm competitiveness (ODIASE and OSIFO, 2025). Moreover, the mediating factor of innovation underscores the fact that, companies that embrace green supply chain practices are likely to develop innovative capacities. The outcome of these innovations, be it in processes, products or technology, will yield better performance outcomes. This is in line with the past studies that have indicated that environmental practices trigger innovation and organizational learning (Al-Khawaldah et al., 2022).

In the same way, the mediation effect of quality management substantiates the fact that GSCM enhances internal quality systems. Organizations that engage in green practices tend to have high standards, continuous improvement systems, and efficiency-enhance systems that enhance product quality and reliability in the operations. This finding corroborates previous research that has associated GSCM to quality and operational excellence (Islam et al., 2026). Generally, the paper shows that GSCM functions in two internal processes, the innovation and quality management processes, which forms a synergistic impact on performance. These results support the view that environment management, innovation capability, and quality systems are all catalysts of success in organizations (Yang et al., 2019).

Theoretical Implications

The research adds value to literature in that it will combine GSCM, innovation, and quality management into a single framework. It builds on the existing theories by showing that GSCM is directly correlated with performance as well as indirectly via internal organizational capabilities. The results are consistent with the Resource-Based View (RBV) according to which firm-specific capabilities like innovation and quality management are key to gaining competitive edge (Wiredu et al., 2024). Moreover, the research is consistent with the Natural Resource-Based View that underlines that environmental practices may be the source of the long-lasting competitive advantage (Lau and Wong, 2024). The study fills a gap in the literature because it introduces the

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concept of dual mediation and offers a more comprehensive explanation on how GSCM creates value via various internal processes.

Practical Implications

In terms of management, the results indicate that companies cannot afford to perceive GSCM as an independent environmental project. Rather, companies ought to combine green initiatives with innovation strategies and quality management systems in order to get the optimum performance results. Managers are advised to invest in green technologies and sustainable processes that can promote innovation. Meanwhile, the reinforcement of quality management systems will ensure that such innovations will become the sources of quality and reliable production. All these practices contribute to the increased efficiency of operations and long-term competitiveness.

Limitations and Future Research Directions

There are a number of limitations in this study which leave future research open. Firstly, the cross-sectional design could not be used to capture causal and longitudinal impacts between Green Supply Chain Management (GSCM), Innovation, Quality Management, and Organizational Performance. Secondly, the use of self-reported data can result in common method bias and subjectivity. Thirdly, the importance on manufacturing enterprises in one national setting (one country) limits the extrapolation of the results into various institutional environments. Also, the model has taken into account innovation and quality management as mediators only, and the rest of the factors that could be relevant like digital capability or learning in the organization were excluded. Longitudinal designs and objective measures of performance should be embraced in future studies, and more mediators and moderators of the model need to be added like technological turbulence or environmental uncertainty. Furthermore, cross-country studies, as well as the incorporation of new technologies such as artificial intelligence and big data analytics, could offer more in-depth information on enhancing the GSCM performance relationship.

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