



Greening Performance Through Innovation: The Mediating Role of Innovation Orientation in Supply Chain Management

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ABSTRACT

This research aims to offer evidence-based assumptions to enhance sustainable practices and innovation orientation, thereby improving organizational performance. The research further offers comprehensive understanding and valuable comparative analysis concerning green supply chain management within the specific context of IT industry. Quantitative approach is applied to address a specific industry issue; whereby, data is collected through an online survey, distributed to 230 middle and upper-level supply chain managers from 167 Information Technology organizations. By using stratified random sampling technique, realist philosophy and objectivism, this research emphasizes on hypothesis testing, with statistical methodologies to achieve practical relevance. Besides, structured questionnaire is designed and collected from literature review insights which helped measure responses on a 5-point Likert scale. The three variables; green supply chain management, organizational performance and innovation orientation are moderately present in IT industry. Assessment of the research structural model specifies significance to all the tested hypotheses. The research discovered that green supply chain management helps organizations gain a competitive advantage by lowering costs, increasing national and international business opportunities, improving operational efficiency, improving product quality, and increasing employee productivity.

1. INTRODUCTION

In today's competitive business environment, Supply Chain Management is crucial for organizational success (Tarigan *et al.*, 2021). SCM involves strategically coordinated business processes such as the procurement of raw material, sourcing of information, delivery of final product, optimizing flow of goods as well as finances. Supply chain management is the strategic coordination of business functions within a organization and across businesses within the supply chain, aimed at improving long-term performance (Shukor *et al.*, 2021) (Hugos, 2024). Effective SCM involves optimizing the flow of goods, information, and

finances from suppliers to manufacturers to retailers and ultimately to consumers. By integrating key processes, SCM enhances operational efficiency, reduces costs, and improves customer satisfaction. The rise of digital technologies and sustainability concerns has further evolved SCM, emphasizing the importance of agility, transparency, and environmental responsibility in creating resilient and competitive supply chains (Lee *et al.*, 2022). Increasing global concern over environmental sustainability has prompted organizations across various industries to adopt Green Supply Chain Management practices.

Green Supply Chain Management integrates environmental contemplations into every aspect of Supply Chain Management (Gawusu *et al.*, 2022), from product design to product end-of-life management. GSCM is an eco-friendly product design which ensures that the products are recyclable, energy-efficient with minimal environmental footprints. It involves the selection of sustainable materials, often opting for renewable resources. The eco-centric approach further extends to the process of manufacturing, where organizations reduce waste, lower emissions as well as implement cleaner production techniques (Bashar *et al.*, 2023). Besides, machinery, energy-efficient, resource optimization and waste recycling are few other common practices of GSCM (Rasool & Zuberi, 2023). In procurement, this approach emphasizes the sourcing from suppliers which adheres to environmental standards. This may include, the evaluation of suppliers' environmental policies to encourage them to adopt sustainable practices. Moreover, GSCM helps organizations meet the growing customers' demand for sustainable products which contributes to their long-term sustainability goals. By integrating Green Supply Chain, organizations not only reduce environmental impact but also gain competitive edge, ensure compliance with regulatory requirements and foster innovation, which ultimately contributes to a more sustainable future (Jawaad *et al.*, 2022).

The impact of GSCM on organizational performance is profound (Ahmad *et al.*, 2022), as it can lead to cost savings, enhanced corporate image, and compliance with regulations. However, the relationship between GSCM and organizational performance is complex and influenced by various factors. One critical factor is Innovation Orientation, which refers to a organization's propensity to adopt new ideas, processes, and technologies. Innovation Orientation can mediate the effects of Green Supply Chain Management, enabling organizations to implement green practices more effectively and achieve superior performance outcomes (Khan *et al.*, 2022). Understanding this mediating role is essential for leveraging GSCM to enhance organizational performance (Gawusu *et al.*, 2022). GSCM involves the integration of environmental thinking into encompassing product design, supply chain management, material selection and sourcing,

delivery of the final product, manufacturing processes as well as end-of-life management. As businesses strive to meet the demands of eco-conscious consumers and adhere to stringent environmental regulations, the implementation of GSCM has become imperative.

The recent emphasis on sustainability has led to the rise of Green Supply Chain Management. Whereby, organizations that foster a culture of innovation are better equipped to develop and implement green practices effectively, thereby enhancing their overall performance (Bag *et al.*, 2022). Thus, this research posits that innovation orientation plays a mediating role in the relationship between GSCM and organizational performance. Also, as a result of rising demand from consumers and government agencies, environmental protection has risen as a top priority of enterprises worldwide. Due to competitive and regulatory considerations, every organization is attempting to fulfil its social duties by eliminating waste (Streimikiene *et al.*, 2022). The pressure on businesses to implement measures to mitigate the negative environmental effect of their products and services is increasing progressively. Due to globalization, green policies are now becoming traditional organizational procedures (Tiwari, 2022).

1.1. Problem Statement

The intended research aims to bridge existing research gap by investigating the mediating role of innovation orientation in the impact of GSCM on organizational performance. By examining this relationship, the research seeks to provide valuable insights for managers and policymakers on how to leverage innovation to maximize the benefits of GSCM initiatives. Ultimately, this research contributes to the growing body of literature on sustainable supply chain management and offers practical recommendations for enhancing organizational performance through green practices and innovation. Organizations are becoming better at balancing the economic and environmental performance.

As global ecological concerns escalate, organizations are increasingly adopting Green Supply Chain Management practices to enhance sustainability (Alzubi & Akkerman, 2022). Despite extensive research on the benefits of GSCM, the precise mechanisms through which GSCM

influences Organizational Performance remain underexplored. One potential mechanism is Innovation Orientation, which may act as a mediator in this relationship. However, there is a lack of empirical evidence elucidating how Innovation Orientation impacts the effectiveness of GSCM practices on Organizational Performance. This gap in the literature underscores the need for a comprehensive investigation into the mediating role of Innovation Orientation in the GSCM-performance nexus. Understanding this relationship is crucial for organizations seeking to optimize their environmental initiatives while achieving superior performance outcomes. Therefore, this research aims to address this gap by examining the mediating impacts of Innovation Orientation on the relationship between GSCM practices and Organizational Performance, providing valuable insights for both academics and practitioners.

1.2. Research Questions

The main research questions of this research are:

1. To what extent does the “Green Supply Chain Management” impacts Innovation Orientation?
2. To what extent does the “Green Supply Chain Management” impacts the Organizational Performance?
3. To what extent does the Innovation Orientation impacts the Organizational Performance?
4. To what extent does the Innovation Orientation mediates between “Green Supply Chain Management” and Organizational Performance?

1.3. Research Objectives

The main research objectives of this research are:

- To analyze the impact of “Green Supply Chain Management” on Innovation Orientation
- To analyze the impact of “Green Supply Chain Management” on Organizational Performance
- To analyze the impact of Innovation Orientation on Organizational Performance
- To analyze the mediating role of Innovation Orientation on “Green Supply Chain Management” and Organizational Performance

2. THEORETICAL FRAMEWORK

2.1. Green Supply Chain Management

Green Supply Chain Management integrates environmental considerations into supply chain activities, which aims to reduce ecological footprints while maintaining economic efficiency (Jawaad *et al.*, 2022). GSCM encompasses several dimensions, including environmental performance, economic performance, and sustainable sourcing. Green Supply Chain Management (GSCM) blends environmental awareness with traditional supply chain processes, changing each step from product creation to disposal. This modern approach supports sustainability by adding eco-friendly practices to design, sourcing, production, and delivery. GSCM aims to reduce environmental impact through waste reduction, energy saving, and controlling emissions (Edunjobi, 2024). By focusing on renewable resources, recycling, and green technologies, GSCM encourages a sustainable economy and extends the life of materials. This change not only helps businesses follow environmental laws but also meets the growing consumer demand for eco-friendly products, giving organizations a competitive advantage and promoting global environmental care.

- Environmental performance in GSCM involves adopting practices that minimize waste, reduce emissions, and conserve resources (Opoku-Mensah *et al.*, 2024). Organizations may use cleaner production technologies, optimize logistics to lower carbon footprints, and implement end-of-life product management through recycling and remanufacturing. These initiatives help reduce the overall environmental impact of supply chain operations.
- Economic performance is enhanced through GSCM by lowering operational costs and increasing efficiency. Sustainable practices, such as energy-efficient manufacturing and waste reduction, lead to significant cost savings (Masharipov, 2023). Additionally, GSCM opens up new revenue streams by attracting environmentally conscious consumers and meeting regulatory requirements, thereby improving profit margins and long-term financial stability.
- Sustainable sourcing focuses on procuring materials from suppliers who adhere to

environmental standards. This ensures the use of renewable or recyclable resources, reducing the environmental impact of the supply chain (Letunovska *et al.*, 2023). Organizations evaluate suppliers based on their environmental performance and encourage them to adopt sustainable practices, mitigating risks associated with resource scarcity and supply chain disruptions.

By integrating above mentioned dimensions, GSCM not only enhances sustainability but also contributes to better organizational performance. Innovation orientation plays a crucial role in this process, driving the adoption of advanced technologies and practices that improve environmental and economic outcomes, thereby mediating the relationship between GSCM and organizational performance.

2.2. Innovation Orientations

Innovation orientation is the commitment of an organization to support and implement new ideas, processes, products, and technologies (Iqbal *et al.*, 2021). In the context of Green Supply Chain Management, it focuses on product innovation, process innovation, and organizational innovation to drive sustainability and efficiency (Rubio-Andrés & Abril, 2024). A high level of innovative orientation improves organization's ability to recognize and generate possibilities through its activities and behavior. It is noted that in order to take advantage of several opportunities, organizations compose capacities that alter their structures and processes and convert these resources. With response to changes in the environment, it is claimed that innovative organizations reshape their resources for the sake of replacing unusable and invalid resources (Medrano *et al.*, 2020). Also, this happens in terms of innovation when the resources are recombined to develop new markets and capabilities in innovative ways. Innovation orientation acts as a mediator in the relationship between GSCM and organizational performance (Khan *et al.*, 2022). By fostering a culture of innovation, organizations can effectively implement sustainable practices, leading to superior environmental and economic outcomes. This comprehensive approach not only enhances sustainability but also drives long-term business success and resilience.

- Product innovation involves developing

eco-friendly products that meet consumer demands for sustainability. This includes designing products that are energy-efficient, recyclable, and made from sustainable materials (Suherlan, 2023). By investing in research and development, organizations create products with minimal environmental impact, attracting eco-conscious consumers and gaining a competitive edge.

- Process innovation focuses on enhancing supply chain processes to improve efficiency and reduce environmental impact (Larios-Francia & Ferasso, 2023). Organizations adopt cleaner production techniques, optimize logistics, and implement waste reduction strategies. Technologies such as IoT and AI play a significant role in monitoring and optimizing energy use, reducing emissions, and improving resource utilization. These innovations lead to significant cost savings and operational improvements.
- Organizational innovation involves adopting new business models, structures, and practices that support sustainability goals. This includes establishing green procurement policies, creating sustainability-focused departments, and fostering a culture of environmental responsibility (Bataneh *et al.*, 2023). By aligning organizational structures and practices with GSCM objectives, organizations ensure a cohesive approach to sustainability and continuous improvement.

2.3. Organizational Performance

Organizational performance involves the evaluation of how well an organization meets its strategic goals (Al Aina & Atan, 2020). High performance signifies effective operations and competitive advantage. It is influenced by leadership, strategy, resources, and culture, and regular assessments help identify strengths and areas for improvement. Organizational performance, in the context of Green Supply Chain Management, is evaluated through financial performance, operational performance, and human resource performance (El Fallahi *et al.*, 2023). Implementing GSCM practices enhances these dimensions, leading to overall improved

organizational outcomes. An organization is a social structure that brings together a group of people to achieve a common goal (Römgens *et al.*, 2020). As a result, a organization engages in activities that are targeted toward its objectives and whose outcomes may be used to assess the organization's effectiveness. The creation and deployment of environmentally friendly commodities that are acceptable for environmental sustainability are required by an organization's green supply chain management plans.

- Financial performance benefits from GSCM through cost savings and new revenue opportunities. Sustainable practices such as energy-efficient manufacturing and waste reduction lower operational expenses, while eco-friendly products attract environmentally conscious consumers, increasing sales and market share (Vibhakar *et al.*, 2023). These practices also help meet regulatory requirements, avoiding fines and benefiting from incentives, thereby improving profit margins and financial stability.
- Operational performance is significantly

improved by GSCM through enhanced efficiency and reduced environmental impact. Sustainable practices optimize resource use, improve logistics, and minimize waste (Popoola *et al.*, 2024). Technologies like IoT and AI enhance supply chain transparency and efficiency, leading to better product quality, faster delivery times, and increased overall productivity. Sustainable sourcing ensures a reliable supply of materials, reducing the risk of disruptions and enhancing supply chain resilience.

- Human resource performance is influenced by GSCM as it fosters a culture of sustainability and innovation. Employees are more engaged and motivated when working for environmentally responsible organizations (Abu-Mahfouz *et al.*, 2023). GSCM involves training programs that equip employees with new skills in sustainable practices and innovative technologies, enhancing their capabilities and job satisfaction. This commitment to sustainability attracts top talent and promotes employee retention.

2.5. Research Model

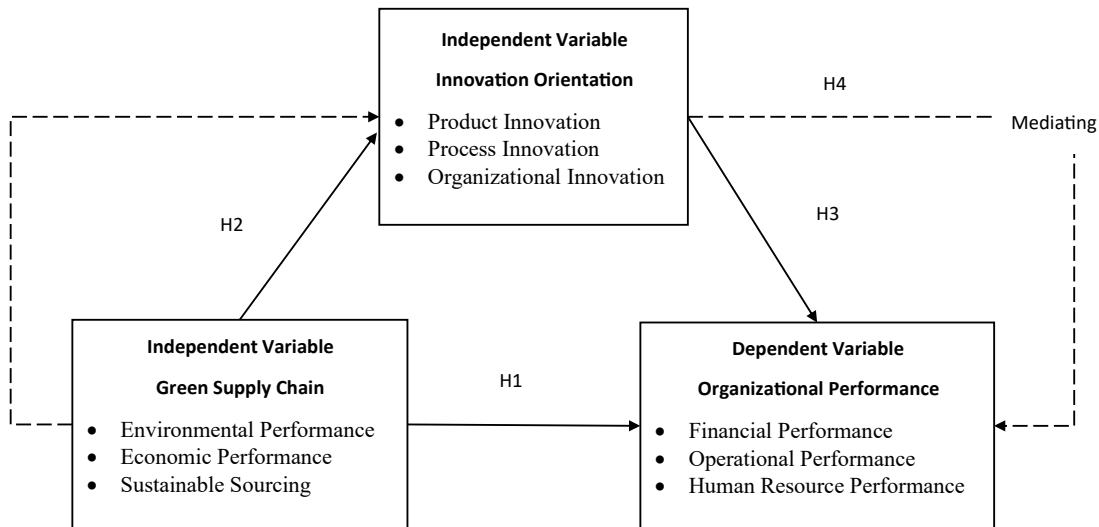


Figure 1: Research Model

3. LITERATURE REVIEW

3.1. The Impact of Green Supply Chain Management on Innovation Orientation

The relationship between Green Supply Chain Management and Innovation Orientation is a growing area of interest in contemporary research.

GSCM involves integrating environmental considerations into supply chain operations to reduce environmental impacts and enhance sustainability (Kalyar *et al.*, 2020) (Rupa & Saif, 2022). This integration necessitates adopting innovative practices, fostering an environment

conducive to organizational innovation. Implementing GSCM practices encourages organizations to innovate in their processes and products to meet environmental standards (Hashmi & Akram, 2021). The need for compliance drives technological advancements and process improvements, contributing to overall innovation. Additionally, GSCM practices often require collaboration with suppliers and customers, leading to the co-creation of innovative solutions (Shi *et al.*, 2020).

Proactively adopting GSCM can enhance a organization's competitive advantage by differentiating its products and processes through green innovations (Waqas *et al.*, 2022). Organizations that invest in green technologies and sustainable practices are often seen as market leaders, attracting environmentally conscious consumers and investors (Khalil & Nimmanunta, 2023). This positioning not only improves market performance but also encourages continuous innovation to maintain the green image. Furthermore, unique capabilities developed through GSCM, such as sustainable resource utilization and waste reduction, can be leveraged to foster innovation (Jo & Kwon, 2021). These capabilities act as a catalyst for developing new products and processes that align with environmental goals. Thus, the literature supports the hypothesis that Green Supply Chain Management positively impacts Innovation Orientation, driving compliance, operational efficiencies, and fostering an innovative culture that promotes market leadership.

Therefore, we propose the following hypothesis;
H1: Green Supply Chain has a positive impact on Innovation Orientation

3.2. The Impact of Green Supply Chain Management on Organizational Performance

The nexus between Green Supply Chain Management and Organizational Performance has attracted substantial scholarly attention (Gawusu *et al.*, 2022). GSCM involves the incorporation of environmental considerations into supply chain operations, aiming to minimize environmental impacts and enhance sustainability (Rupa & Saif, 2022). This strategic approach not only fulfills regulatory requirements but also drives significant improvements in organizational performance. By integrating eco-friendly practices, organizations can achieve cost reductions through efficient

resource utilization, waste minimization, and energy savings (Almalki *et al.*, 2023) (Gao *et al.*, 2023). These operational efficiencies contribute directly to improved financial performance, enhancing profitability and competitive positioning.

Moreover, GSCM fosters better stakeholder relationships, as organizations that prioritize sustainability are often viewed more favorably by customers, investors, and regulatory bodies (Assumpção *et al.*, 2022). This positive perception can lead to increased market share, customer loyalty, and investor confidence. Additionally, GSCM can enhance employee morale and engagement by promoting a culture of sustainability and corporate responsibility (Malik *et al.*, 2021). Engaged employees are more productive and innovative, contributing further to organizational success (Ahmed *et al.*, 2020). The holistic benefits of GSCM, from cost savings and revenue growth to enhanced reputation and employee engagement, underscore its positive impact on overall organizational performance.

Therefore, the following hypothesis is proposed;
H2: Green Supply Chain has a positive impact on Organizational Performance

3.3. The Impact of Innovation Orientation on Organizational Performance

The relationship between Innovation Orientation and Organizational Performance has garnered significant attention in recent research. Innovation Orientation refers to a organization's commitment to fostering and implementing new products, and services (Dukeov *et al.*, 2020) (Didonet & Diaz-Villavicencio, 2020). This strategic focus on innovation is critical for maintaining competitive advantage and achieving long-term success. Organizations that prioritize innovation are better equipped to adapt to market changes, meet evolving customer needs, and capitalize on new opportunities (Bayhan & Korkmaz, 2021). By continuously developing and refining their offerings, these organizations can improve their market position, enhance customer satisfaction, and drive revenue growth.

Furthermore, Innovation Orientation contributes to operational efficiency by streamlining processes and adopting advanced technologies (Casciani *et al.*, 2022). Innovative practices can lead to cost reductions, improved product quality, and faster time-to-market, all of which positively impact the

bottom line (Gao *et al.*, 2021). Additionally, a strong focus on innovation fosters a culture of creativity and collaboration within the organization, boosting employee engagement and productivity (Liu *et al.*, 2022). Engaged and motivated employees are more likely to contribute innovative ideas and solutions, further enhancing organizational performance (Van Zyl *et al.*, 2021). The cumulative effect of these benefits underscores the critical role of Innovation Orientation in driving overall organizational success.

Therefore, following hypothesis is proposed;

H3: Innovation Orientation has a positive impact on Organizational Performance

3.4. The Mediating Effect of Innovation Orientation on Green Supply Chain Management and Organizational Performance'

The interplay between Green Supply Chain Management, Innovation Orientation, and Organizational Performance has extensively been examined in recent literature. GSCM involves integrating environmental considerations into supply chain operations to reduce environmental impacts and enhance sustainability (Han & Huo, 2020) (Rupa & Saif, 2022). This strategic approach not only meets regulatory requirements but also drives significant improvements in organizational performance through cost savings, efficient resource utilization, waste reduction, and energy conservation (Ahmad *et al.*, 2022). These operational efficiencies directly enhance financial performance, thereby improving profitability and competitive positioning.

Innovation Orientation, defined as a organization's commitment to implement new ideas and processes, plays a crucial mediating role in this relationship. Organizations that adopt GSCM practices often find themselves compelled to innovate in order to meet environmental standards and leverage sustainable practices (Nazir *et al.*, 2024). This focus on innovation leads to the development of new technologies and products that not only enhance sustainability but also improve overall operational efficiency (Tu & Wu, 2021). For instance, by implementing green technologies and processes, organizations can streamline operations, reduce costs, and improve product quality, thus contributing to better organizational performance.

Furthermore, the adoption of GSCM practices can enhance stakeholder relationships, as

environmentally responsible organizations are viewed more favorably by customers, investors, and regulatory bodies (Yang *et al.*, 2023). This positive perception can increase market share, customer loyalty, and investor confidence, further enhancing organizational performance (Islam *et al.*, 2021). Additionally, a strong Innovation Orientation promotes a culture of creativity and collaboration, leading to higher employee engagement and productivity (Lam *et al.*, 2021). Engaged employees are more likely to contribute innovative ideas and solutions, amplifying the benefits of GSCM (Visamitanan & Assarut, 2021). This approach drives operational efficiencies and improves financial outcomes, while Innovation Orientation amplifies these benefits through enhanced innovation and stakeholder relationships.

Thus, previous literature supports the following hypothesis, which states that;

H4: Green Supply Chain Management has a positive impact on Organizational Performance with a significant mediating role of Innovation Orientation.

4. METHODOLOGY AND RESEARCH DESIGN

4.1. Methodology

Methodology is a general technique based on a series of interconnected acts that must be completed in order to conclude the research. Due to the establishment of hypotheses that serve as the foundation for examining literature and theories, deductive research method is employed which ultimately guide the research model. Besides, variables in a system may be connected together as a result of conceptual modelling.

4.2. Research Design

This research employs an applied research design to explore the impact of green supply chain management on organizational performance with the mediating role of innovation orientation in the IT organizations. Because, it emphasize on real-world solutions, addresses industry challenges and provides context-specific insights; while, targeting a particular issue within the domain of Information Technology.

A quantitative approach is adopted for this research, aiming to gather numerical data to identify patterns. To explore the relationships among the designated variables and derive conclusions, we rely on data analysis. To facilitate

data collection, survey method is employed. It enables quantitative analysis of empirical data which helps test hypotheses formulated during the research.

4.3. Research Philosophy

This research emphasis on hypothesis testing using statistical methodologies, by applying Realist research philosophy. Our research aligns with Objectivism, as it hypothesizes social phenomena and ensures an objective understanding regarding the impact of green supply chain management on organizational performance. Realism underscores practical relevance, which helps provide actionable insights for IT organizations.

Conversely, we are using objectivism as it supports an unbiased analysis and observation. It ensures generalizable and replicable findings which enhances empirical validation and scientific rigor to produce evidence-based conclusions. Both these approaches together provide a framework for comprehensive understanding to improve organizational performance through sustainable practices and innovation orientation in the IT industry.

Thus, allowing for analysis of relationships and external observation among variables accurately. Furthermore, we adopted a deductive approach, initiating from theoretical framework to test hypotheses for empirical data by understanding the impact of Green Supply Chain Management on organizational performance. It is based on quantitative analysis, structured methodology and existing theories, leading to generalizable findings, while providing valuable comparative analysis and insights within specific context.

4.4. Sampling

The sample consists of middle and upper level supply chain managers from Information Technology organizations, relevant to the research focus. The research population includes 167 organizations within this industry. A stratified random sampling method is used to ensure the sample accurately represents the population, with strata based on key demographic factors relevant to the research questions, such as age, role within the organization, and years of experience. The target sample size, determined through statistical power analysis, aims for at least 230 participants to ensure robust statistical conclusions.

4.5. Data Collection Instrument

Data is collected using a structured questionnaire,

designed from literature review insights and validated tools. The questionnaire is divided into sections for each variable: independent, dependent, mediator, and moderator. Responses are measured on a 5-point Likert scale (1 for strongly disagree to 5 for strongly agree) to assess participants' perceptions and experiences.

4.6. Data Collection Procedure

Data is collected through an online questionnaire to ensure easy access and broad reach. Participants received email invitations explaining the research purpose, voluntary participation, confidentiality, and data use solely for research. Reminders are sent two weeks later to maintain response rates.

4.7. Population and Sample

The population of this research is Information Technology/Software organizations. 230 middle and upper-level supply chain managers from IT organizations are selected to conduct this research because of their expertise in the particular sector. Primary data collection instrument for this research is an empirical survey.

4.8. The Unit of Analysis (Respondents):

The questionnaire is distributed to middle and upper level supply chain managers in IT organizations. This group is chosen for their understanding of the research variables, ensuring informed responses.

5. ANALYSIS

This part of our research deliberated on the outcomes of data gathered. The obtained data is stored into Statistical Package for the Social Sciences (SPSS) for data analysis. After screening for missing values, we proceeded on to the calculation of variable averages as our data had zero missing values. These variable averages are then utilized throughout test runs to generate various results. Data normality analysis and reliability analysis is among the tests that are conducted. The outcomes of these tests reveals, whether our data is trustworthy or not. In a descriptive research, the mean and standard deviation of our variables is exposed, which may then be utilized in future research.

The analysis of demographic factors is essential as it helps determine whichever population is supposed to be analyzed in the research. For this research, we performed a correlation analysis for variables after completing each of these stages, and then we also analyzed our entire research

hypothesis. Besides, linear regression is also used to test the entire research hypothesis.

Preliminary analysis

Employees working in organizations provided the responses gathered. The received responses are from employees of various ages. Aside from the demographic factors, we collected all responses to research the variables on a Likert scale from 1 to 5. The scale ranges from 1 to 5, with 1 denoting strongly disagree and 5 denoting strongly agree. The demographical factors are entered as follows: age (1 equals less than 20 years), age (2 equals 20-30 years), age (3 equals 30-40 years), (4 is equal to above 40 years). While Gender is recoded as; 1 being male, 2 being female, and 3 being prefer not to say. The following work experience is recorded: (1 is equal to less than 6 months, 2 is equal to 6-12 months, 3 is equal to 1-3 years, 4 is equal to 3-5 years and 5 is equal to above 5 years.

Missing values

Missing values in the obtained data have a tendency to influence the analysis, but the magnitude of this effect is dependent on the structure and amount of missing values. Furthermore, missing data in the range of 15% (or less) in a questionnaire is avoidable and can be rectified. In this research, all responses are mandatory, ensuring that there are no missing values in the data.

Reliability Analysis

Accuracy and consistency of the measures utilized in the research are referred to as reliability. From our data's output file, reliability is accurately determined. If the alpha value lies under the bracket 0.5 and 0.6, then the data is considered to be acceptable; however, if it is over 8, then it is considered to be very good (see Table 1).

Table 1: Cronbach alpha value for reliability analysis

Variables	Cronbach Alpha	No. of items
GSCM	.802	7
INO	.634	3
OP	.823	8

The value in the Cronbach Alpha of GSCM is 0.802; whereby, the total items for this variable is 7. Thus, the established value of GSCM is excellent and highly acceptable. The Cronbach alpha value of INO is 0.634 and it has 3 items in its variable. So, the value of Cronbach alpha indicates that atmosphere has an acceptable reliability. Furthermore, the

Cronbach alpha value of OP 0.23 and it has 8 items in its variable. So, the Cronbach alpha value of OP indicates that it has a very good reliability.

Descriptive Analysis

The mean and the standard deviation are evaluated in the analysis, as all assessed data is based on a five-point Likert scale. In this 1 is considered as "Strongly Disagree" while 5 is considered as "Strongly Agree". In terms of responses, the analysis evaluated the respondent weightage (see Table 2).

Table 2: Descriptive Statistics

Variable	Mean	Std. Deviation
Avg_GSCM	3.5610	.94298
Avg_INO	3.5844	1.05475
Avg_OP	3.6650	.89348

As, it can be seen in the table, the majority of respondents have given weightage to agree options, as shown by the values of mean, which range from 3.5610 to 3.6650. The standard deviation is in the range of 0.94298 to 0.89348.

Table 3: Demographical Analysis

	Demographics	N	%
Age	Below 20	36	24%
	20-30	86	57.3%
	30-40	14	9.3%
	40-50	7	4.7%
	Above 50	7	4.7%
Gender	Male	55	36.7%
	Female	87	58.0%
	Prefer not to say	8	5.3%
Work Experience	Less than 6 months	38	25.3%
	6-12 months	52	34.7%
	1-3 years	14	9.3%
	3-5 years	18	12%
	Above 5 years	28	18.7%

The percentage calculated for the demographic feature "gender" indicates that 55 (36.7%) males

and 87 (58.0%) females are involved. As a consequence of the gender distribution of the sample, the male gender had a much higher participation rate. Individuals in the sample ranged in age from below 20 to above 50 years old. The largest portion of the 230 respondents are between the ages of 20 and 30 (n = 86, 57.3%) and below 20 (n = 36, 24%), followed by the age categories of 30-40 (n = 14, 9.3%) and above 50 (n = 7, 4.7 percent). As a result, it can be determined that middle-aged people aged 20-30 had the highest degree of involvement. According to the research of their work experience, the vast majority of respondents had 6-12 months experience (n = 48, 32 percent) and less than 6 months (n = 37, 24.6 percent), followed by respondents with 1-3 years' experience (n = 25, 16.6 percent). Only a few of them had less experience (n = 21, 14%) and (n = 19, 12.6%).

Table 4: Correlation Analysis

Correlational Analysis			
Variables	1	2	3
GSCM	1		
INO	0.715**	1	
OP	0.774**	0.563**	1

A bivariate research method called correlation analyzes the degree and direction of the relationship between two quantitative variables. The following correlation matrix of variables from the current research is generated using Pearson's correlation coefficient, designated by 'r.' a r value between 0.10 and 0.30 suggests a weak link, a r value between 0.40 and 0.60 indicates a moderate relationship, and a r value of over 0.7 implies a high relationship between two variables. Furthermore, correlation analysis shows whether or not there is a statistically meaningful relationship between two variables.

Table 5: Regression/ Hypothesis testing

Hypothesis	B	R square	P	Result
GSCM → INO	0.80	0.51	0.00	ACCEPTED
GSCM → OP	0.73	0.60	0.00	ACCEPTED
INO → OP	0.48	0.32	0.00	ACCEPTED

Green Supply Chain Management and Innovation Orientation

As the value of R square is 0.51, so GSCM is considered to have a positive impact on INO (“β=

0.80, P<0.00”). However, the values indicate that a change of 1 percent in GSCM can change INO with a percent of 51 and INO can be affected by 80 per cent through a change in the value of beta by 1%. Thus, our hypothesis 1 can be considered acceptable.

Green Supply Chain Management and Organizational Performance

According to the presented hypothesis, the table revealed that a positive influence is observed on the performance of organization by GSCM. Moreover, the value of R square is quoted as 0.60. 73% organizational performance is altered by one percent change in GSCM and OP is affected by 73%, if the value of beta is changed by 1%. Thus, our second hypothesis is considered to be true as well.

Innovation Orientation and Organizational Performance

On organizational performance, INO showed significant positive impact as shown in the above table. The value of 0.32 is noted as the value of r square. However, a change of 32 per cent is observed in organizational performance by the change in innovation orientation. Moreover, 48 per cent change is observed in organizational performance by the change in the value of beta. This, this hypothesis is accepted to be true.

Table 6: Mediation Analysis

Variables	M1 (β)	M2 (β)	M3 (β)
Control Variables			
Age	0.42*	0.04*	0.56*
Gender	0.54*	-0.23*	0.66*
Work Experience	0.45*	-0.67	-0.63
R square	0.06		
Independent Variable			
GSCM		0.73**	0.56**
R square	0.56		
ΔR square	0.5		
Mediating Variable			
INO			0.44**
R square	0.68		
ΔR square	0.12		

In order to evaluate the mediation hypothesis of our research, the output file that comprised of findings based on demographics as controlled variables is used. The hypothesis is accepted as it is found that Innovation orientation mediates between “Green supply chain management” and

organizational performance. Moreover, in this analysis, Demographic characteristics involves age, gender and work experience. In terms of beta value or 2nd model, our value is noted as 0.73 that is considered to be significant and 0.56 as model 3 value which is significant too. However, it is noted that full mediation existed between these two variables. As a result, we may conclude that INO mediates the relationship between “GSCM and OP” in this research, and our hypothesis can be accepted.

6. DISCUSSION

The purpose of this research is to evaluate the impact of green supply chain management on organizational performance in the setting of IT organizations. SPSS software is used to examine the statistical significance of the research's presented hypotheses. The analytical approach is primarily used to generate, present, and evaluate the findings of measurement and structural models.

In the present research, all four hypotheses are examined, and all of them are approved because of their substantial relationship with other factors. We go through the findings of all the tests done to check the hypotheses. The following are several hypotheses and their descriptions:

Table 7: Hypothesis Check

Hypothesis	β	R square	P	Result
GSCM → INO	0.80	0.51	0.00	ACCEPTED
GSCM → OP	0.73	0.60	0.00	ACCEPTED
INO → OP	0.48	0.32	0.00	ACCEPTED

H1: “Green Supply Chain Management has a positive impact on Innovation Orientation”

The relationship between Green Supply Chain Management and Innovation Orientation (INO) is supported by empirical analysis as well as literature. Previous literature indicates that GSCM integrates environmental considerations into supply chain operations, driving organizations to adopt innovative practices. This proactive adoption fosters organizational innovation, leading to technological advancements and process improvements necessary for compliance and sustainability. Additionally, GSCM practices enhance a organization's competitive advantage, attracting environmentally conscious consumers

and investors, and promoting continuous innovation to maintain a green image.

Empirical analysis further supports these findings. With an R square value of 0.51, the data suggests a positive impact of GSCM on INO, as indicated by a significant beta value ($\beta= 0.80, P<0.00$). This signifies that a 1% change in GSCM can result in a 51% change in INO, with INO being affected by 80% through changes in beta. These results of organization our hypothesis that GSCM significantly influences INO, driving compliance, operational efficiencies, and fostering an innovative culture that enhances market leadership.

This research hypothesis states that as GSCM improves, the value of INO improves as well, and vice versa. If GSCM declines, the value of INO declines as well. With the aid of linear regression in SPSS, this research's hypothesis is examined in the current research and it is suggested by the findings that there should be acceptance in terms of all hypothesis. There is an observation that GSCM seems to have a great influence on INO as the value of P is significant i.e., 0.000. By seventy per cent, the value of INO is increased by a per cent change in GSCM as it is revealed by the value of beta. The value of INO is increased by a percentage of 80%. The hypothesis is accepted as there is an observation that GSCM has a positive impact on INO as value of R square is observed to be 0.51.

H2: “Green Supply Chain Management has a positive impact on Organizational Performance”

The relationship between Green Supply Chain Management and Organizational Performance is well-supported by both literature and empirical evidence. The literature review highlights that GSCM, by incorporating environmental considerations into supply chain operations, not only meets regulatory requirements but also drives substantial improvements in organizational performance. This strategic integration leads to cost reductions through efficient resource utilization, waste minimization, and energy savings, directly enhancing financial performance and competitive positioning. Furthermore, GSCM fosters better relationships with stakeholders, including customers, investors, and regulatory bodies, thereby increasing market share, customer loyalty, and investor confidence. Additionally, promoting a culture of sustainability boosts employee morale and engagement, which further

contributes to organizational success. Empirical analysis validates these findings, showing a positive influence of GSCM on organizational performance with an R square value of 0.60. The data indicates that a 1% change in GSCM results in a 73% alteration in OP, as evidenced by the significant beta value. These results affirm the hypothesis that GSCM positively impacts organizational performance by driving operational efficiencies, improving financial outcomes, enhancing stakeholder relationships, and fostering a sustainable and innovative organizational culture. The holistic benefits of GSCM underscore its vital role in enhancing overall organizational performance.

There is a representation of the relationship between GSCM and OP as stated in hypothesis 2 and a percent change of 72 is observed. However, 76% change is observed in OP value, if the value of GSCM is altered by 1%. The relationship between GSCM and OP is very strong as the value of P is considered to be less than 0.000 so it can be said that the hypothesis is true.

H3: "Innovation Orientation has a positive impact on Organizational Performance"

The relationship between Innovation Orientation and Organizational Performance is confirmed by empirical analysis and previous literature. Literature indicates that a focus on innovation is fundamental for maintaining a competitive advantage and achieving long-term success. Organizations prioritizing innovation adapt better to market changes, meet evolving customer needs, and capitalize on new opportunities. This results in improved market position, enhanced customer satisfaction, and increased revenue.

Empirical analysis shows that INO significantly impacts OP, with a P value less than 0.001 and an R square value indicating that changes in INO lead to a 32% change in OP. Additionally, a 1% change in INO results in a corresponding 1% change in OP, as shown by the beta value. These findings validate the hypothesis that INO positively influences OP. Innovation enhances operational efficiency by streamlining processes and adopting advanced technologies, leading to cost reductions, improved product quality, and faster time-to-market. It also fosters a culture of creativity and collaboration, boosting employee engagement and productivity. Thus, Innovation Orientation significantly impacts Organizational Performance.

Innovation Orientation have a significant positive impact on organizational performance, as the "value of P is less than 0.001" and the value of R square shows that if we change the value of innovation orientation, the value of organizational performance changes by 32 percent. Moreover, the value of beta shows that a 1% change in innovation orientation results in a 1 percent change in the value of organizational performance. Thus, this hypothesis is accepted based on the findings of the investigation.

H4: "Innovation Orientation acts as a mediator between Green Supply Chain Management and Organizational Performance"

The hypothesis that Green Supply Chain Management positively impacts Organizational Performance with Innovation Orientation as a significant mediator is well-supported by both the literature review as well as empirical analysis. Literature reveals that GSCM involves integrating environmental considerations into supply chain operations, leading to cost savings, efficient resource use, waste reduction, and energy conservation, thereby enhancing profitability and competitive positioning. INO, defined as a organization's commitment to fostering new products, and services, mediates this relationship by driving further improvements.

Empirical analysis using regression confirm this, showing significant beta values of 0.73 in model 2 and 0.56 in model 3, indicating full mediation between GSCM and OP. This means that organizations adopting GSCM practices innovate to meet environmental standards, developing new technologies and processes that enhance sustainability and operational efficiency. Additionally, GSCM improves stakeholder relationships, increasing market share and customer loyalty. INO fosters a culture of creativity, boosting employee engagement and productivity, thus amplifying the benefits of GSCM. In summary, GSCM positively impacts OP, significantly mediated by INO.

The mediating function of innovation orientation in the link between green supply chain management and organizational performance is investigated using regression analysis, with demographics as the controlled variable. In this test, all demographic variables are involved i.e., age, gender and working experience. In model 2, the value of beta is said to be 0.73 and the value is 0.56 in model 3 and they

are significant. This also indicated that there exists full mediation between “GSCM and OP”. Thus, it can be said in a nutshell, that INO acts as a mediator between GSCM and OP.

7. CONCLUSION & RECOMMENDATIONS

The research on the impact of Green Supply Chain Management (GSCM) on Organizational Performance (OP) in IT organizations reveals significant insights, particularly highlighting the mediating role of Innovation Orientation (INO). As environmental protection becomes a global priority, IT organizations are increasingly integrating green standards throughout their supply chain operations. This includes raw material procurement, manufacturing, social welfare, and product development, all aimed at sustainability.

The research establishes a clear relationship between GSCM, INO, and OP. Empirical analysis using statistical methods such as Spearman correlation and regression confirms that GSCM practices significantly enhance organizational performance. Specifically, IT organizations that adopt GSCM are found to innovate more, leading to improved operational efficiency, cost reductions, waste minimization, and energy conservation. These improvements directly enhance financial performance, profitability, and competitive positioning.

Moreover, the research underscores that INO plays a crucial mediating role in this relationship. Organizations that implement GSCM are compelled to innovate to meet environmental standards and leverage sustainable practices. This innovation drive leads to the development of new technologies, processes, and products, further boosting operational efficiency and product quality. The research affirms that a positive change in INO significantly impacts OP, validating the hypothesis that GSCM positively affects OP through INO.

The findings recommend that stakeholders and government agencies collaborate to develop policy frameworks encouraging proactive adoption of GSCM practices. Such frameworks should address barriers to GSCM implementation, such as high investment, operational, and training costs, and

suggest solutions to mitigate these challenges. Waiving environmental certification costs could further incentivize organizations to adopt GSCM practices.

In conclusion, the adoption of GSCM in IT organizations leads to substantial competitive advantages. These practices not only improve economic performance and contribute to the country's GDP but also enhance environmental sustainability and community well-being. Therefore, fostering a culture of innovation within GSCM frameworks is crucial for achieving long-term organizational success and environmental stewardship.

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