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Data-Driven Green Decision-Making and Digital Supply Chain Agility: Implications for Organizational Success

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A R T I C L E I N F O

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A B S T R A C T

This research aims to examine the interplay between green decision making, supply chain agility, and organizational performance in the healthcare industry. Experimental quantitative research design is used for conducting this research with a sample of 230 supply chain managers from healthcare organizations. By applying realist philosophy and deductive approach, existing hypothesis are tested empirically. Whereby, stratified random sampling and statistical power analysis enhanced the accuracy of research findings. Also, structured questionnaire using 5-point Likert scale led to the measuring of volunteered participants' perception. Findings illustrates that green decision making positively and significantly impacts organizational performance especially when mediated by supply chain agility. By exploring the relationships between green decision making, supply chain agility, and organizational performance, this research provided valuable insights into how healthcare organizations can effectively integrate sustainability into their operations and achieve enhanced performance outcomes.

1. INTRODUCTION

The present era is marked by heightened sustainability concerns and intensified environmental awareness. Organizations from numerous sectors are recognizing the importance of integrating green decision making in their operational strategies (Appolloni *et al.,* 2021). In particular, healthcare industry is facing unique challenges in embracing environmentally sustainable practices (Pereno & Eriksson, 2020). Green decision making incorporates environmental considerations into business strategies, operations and decisions that aims at reducing environmental impact to enhance organization's overall sustainability (Colapinto *et al.,* 2020). In context of healthcare industry, green decision making involves wide range of practices, such as reducing waste, sourcing environmentally friendly materials and products as well as improving energy efficiency (Abaku & Odimarha, 2024). Adoption of aforementioned practices is driven by growing recognition of social and environmental responsibilities of the healthcare providers, with the prospective for operational efficiencies and cost savings.

Organizational performance predominantly in the healthcare industry is multifaceted (Levesque & Sutherland, 2020), encompassing operational efficiency, financial performance, compliance with regulatory standards and patient satisfaction (Carini *et al.,* 2020). Integration of green decision making into the healthcare operations is theorized to positively impact these recital scopes by promoting efficient use of resources, reducing emissions, as well as enhancing organization's stakeholder trust and reputation (Al Amosh, & Khatib, 2024).

Another central aspect of this research is the role of supply chain agility in relationship of green

decision making and organizational performance. Supply chain agility is organizations' ability to respond and quickly adapt to the changes in external environment (Shukor *et al.,* 2021), such as regulatory requirements, environmental challenges as well as market demands (Patel & Sambasivan, 2022). To consider the healthcare industry, supply chain agility is pivotal for ensuring efficient and timely delivery of medical equipment, services and supplies. By improving supply chain agility through green decision making, healthcare organizations can enhance responsiveness, achieve greater overall performance as well as reduce operational disruptions.

1.1. Problem Statement and Research Gap

Healthcare industry is under growing pressure to implement sustainable practices in response to increased regulatory requirements and environmental apprehensions (Olalekan *et al.,* 2021; Shahzad *et al.,* 2023). Despite the recognized advantages of green decision making, numerous healthcare organizations are struggling to integrate these practices effectively into their operations and procedures. Mainly, due to the challenges and complexities associated with managing operational and environmental demands. Simultaneously, role of supply chain agility as mediator between organizational performance and green decision making remains under-explored.

The gap in knowledge, observation and evidence hinders healthcare organizations from realizing the full potential of sustainable practices leading to poor organizational performance. Therefore, it is critical to consider how green decision making impacts organizational performance in healthcare industry. It is also important to cognize the mediating role of supply chain agility in this correlation. By addressing the aforesaid problem, healthcare managers and providers with be able to embrace actionable insights and strategies so as to improve performance and sustainability, eventually contributing to more efficient and resilient healthcare systems.

1.2. Research Contribution

The present research helps organizations competing in the healthcare industry to understand the importance of Green decision making in improving performance of organizations. In addition, the healthcare organizations will get important insights on how supply chain agility can further improve the organizational performance while employing Green decision making approach.

1.3. Research Questions

- What is the relationship and between green decision making and supply chain agility?
- What is the relationship between green decision making and organizational performance?
- What is the relationship between supply chain agility and organizational performance?
- What is the relationship and statistical impact of green decision making on organizational performance with mediating role of supply chain agility specifically in the healthcare industry?

1.4. Research Objectives

- Determining the impact of Green decision making on organizational performance in the healthcare industry.
- Finding out the relationship between Green decision making and supply chain agility in the healthcare industry.
- Determining the refereeing role that supply chain agility in the relationship between Green decision making and organizational performance in the healthcare industry.

2. THEORETICAL FRAMEWORK

2.1. Green Decision Making

Green decision making is the strategic process of integrating environmental contemplations into business practices and decisions (Wong *et al.,* 2020). This approach minimizes ecological footprints of organizations while improving long-term viability and sustainability (Nketiah *et al.,* 2024). In context of healthcare industry, green decision making involves holistic view of operations, from procurement to aligned environmental goals and even waste management (Bentahar *et al.,* 2023). Environmental compliance, eco-friendly product design and sustainable procurement are imperative components of green decision making which contribute to organizations' overall sustainability strategy.

2.2. Sustainable Procurement

Sustainable procurement is the sourcing of services as well as goods in a way that considers environmental impact throughout organization's life cycle (Singh & Chan, 2022). This approach

involves the selection of suppliers and products which meet stringent environmental criteria, including minimal waste production, use of renewable resources and reduced carbon emissions (Sönnichsen & Clement, 2020). It encourages suppliers to adopt greener practices which is crucial in the healthcare industry. Sustainable procurement of equipment, pharmaceuticals and medical supplies impacts environmental sustainability significantly (Asif, 2022; Abaku & Odimarha, 2024). Basically, procurement influences the entire supply chain of an organization, stimulating comprehensive adoption of globally responsive practices.

2.3. Environmental Compliance

Environmental compliance adheres to environmental standards and laws set by the regulatory bodies (Sendawula *et al.,* 2021). This dimension includes the management of hazardous materials, reduction of emissions as well as assurance of waste disposal methods that do not harm the environment (Jha *et al.,* 2022). Compliance with the environmental regulations is a legal obligation and a critical component of green decision making. Because, it helps organizations reduce operational risks, enhance reputation and avoid legal penalties (Ding *et al.,* 2022). Besides, sustaining high standards of environmental compliance also saves cost and improves operational efficiency, which helps organizations to adopt more efficient practices (Javaid *et al.,* 2022; Gupta & Gupta, 2021).

2.4. Eco-friendly Product Design

Eco-friendly product design is the creation of product with minimal environmental impact (Nguyen *et al.,* 2020). It involves the designing of equipment and devices which are energy-efficient, biodegradable, and easily disassemble (Cenci *et al.,* 2022). This approach includes reduced use of toxic substances and reusable products which do not harm the environment (Nguyen *et al.,* 2020). Incorporation of environmentally friendly principles into product design improves patient safety, contributes to sustainable system and reduces environmental footprint.

2.5. Organizational Performance

Organizational performance is the efficiency with which organizations meets their objectives (Anwar & Abdullah, 2021). It encompasses a wide range of outcomes, such as financial performance, market position, overall competitiveness and operational efficiency (Gupta *et al.,* 2020). Organizational performance is a multifaceted variable which involves delivery of high-quality patient care with ethical and sustainability considerations of organizations' operations (Levesque & Sutherland, 2020). To completely understand and improve performance of organizational, it is crucial to consider numerous dimensions, such as innovation performance, stakeholder value creation and sustainability metrics.

2.6. Sustainability Metrics

Sustainability metrics are measures of an organization's social, economic and environmental performance (Rehman *et al.,* 2021). These metrics include waste reduction, energy consumption, carbon footprint, compliance and water usage with environmental regulations (Murshed *et al.,* 2021). By reporting and tracking the sustainability metrics, organizations assess their environmental impact (Amaral *et al.,* 2020). Organizations also determine their commitment to sustainable practices by identifying areas for improvement. Use of effective sustainability metrics helps organizations in mitigating environmental risks, reducing operational costs as well as enhances reputation of organization (Quintana-García *et al.,* 2022). To align with increased expectations of regulators, broader community and patients for responsible services, it is crucial to consider sustainable metrics.

2.7. Innovation Performance

Innovation performance is the ability of an organization to develop new processes, products, technologies as well as services that enhance competitive advantage (Distanont, 2020). In addition, innovation assist organizations in the implementation of innovative operational practices and adoption of advanced technologies. Measurement of innovation performance involves assessment of research outcomes and development activities; as well as adoption of new and unique technologies and operational efficiency (Migdadi, 2022). Basically, high innovation performance leads to reduced costs, strong market position and improved outcomes contributing to overall organizational performance.

2.8. Stakeholder Value Creation

Stakeholder value creation is the practice of generating benefits for involved parties, such as suppliers, community, employees and investors (Freudenreich *et al.,* 2020). The benefits may

include delivery of high-quality service, employee development, strong supplier relationships, financial returns to investors and community well-being. By focusing on this variable, organizations build loyalty and trust, experience enhanced reputation with long-term sustainability. Measuring stakeholder value involves the assessment of employee engagement, customer satisfaction, financial performance, community impact and supplier collaboration (Ahmed *et al.,* 2020).

2.9. Supply Chain Agility

Supply chain agility is the ability of organization supply chain to respond to environment and market changes rapidly (Shukor *et al.,* 2021). It involves speed, adaptability, flexibility which enables an organization to meet customer demands, capitalize emerging opportunities and manage disruptions (Tarigan *et al.,* 2021). Basically, achieving supply chain agility requires organizations to focus on dimensions; such as, agile manufacturing processes, adaptability to market changes and responsive supply chain networks.

2.10. Agile Manufacturing Processes

Agile manufacturing processes are designed to proficiently adjust and regulate according to the change in production schedules, supply availability and product demand (Malviya, 2021). In addition, agile manufacturing is pivotal for producing technical devices, and other related products. This variable involves the use of modular production lines, advanced technologies like automation and additive manufacturing as well as flexible manufacturing systems (Javaid *et al.,* 2022; Alogla *et al.,* 2021; ElMaraghy *et al.,* 2021). Implementation of agile manufacturing processes within organizations improves product quality, respond to unexpected changes swiftly in the demand and supply chain disruptions and reduces lead times (Alzoubi *et al.,* 2022). The flexibility in processes ensures that critical products are made available when required by customers, impacting the overall performance and resilience of organization's supply chain.

2.11. Responsive Supply Chain Networks

Responsive supply chain networks are categorized by their capability to acclimate according to the changes observed in demand and supply quickly (Nayeri *et al.,* 2021). This variable involves collaboration with real-time data sharing, advanced analytics and suppliers to anticipate market fluctuations and respond consequently (Tamym *et al.,* 2021). This approach helps organization ensure timely delivery of essential supplies, reduce the risk of overstocking and manages efficient inventory levels (Okeagu *et al.,* 2021). By promoting strong relationships with leveraging technologies and suppliers, organizations create a responsive and more resilient supply chain network. Basically, this responsiveness is pivotal to meet the needs of customers and maintain continuity of care.

2.12. Adaptability to Market Changes

Adaptability to market changes is organizations' supply chain capability to adjust its operations and strategies in response to ever evolving market conditions (Aslam *et al.,* 2020). It implicates understanding emerging trends, preparedness to pivot strategies and constantly monitoring market as needed. Additionally, adaptability is significant for managing the influence of technological advancements, shifts in customers' demand and regulatory changes (Leong *et al.,* 2020). Organizations excelling in this particular area swiftly adopt innovative technologies, and implement new regulations. It can be assumed that adaptability ensures that organizations maintain operational efficiency and quality of service even during significant market disruptions.

2.13. Operational Definitions

Variables & Dimensions	**Definitions**	**References**
Green Decision Making	The integration of environmental considerations into business strategies and operations.	Wong *et al.,* 2020.
Sustainable Procurement	The practice of sourcing goods and services in an environmentally responsible manner.	Lăzăroiu et al. 2020.
Environmental Compliance	Adherence to environmental laws, regulations, and standards.	Hu et al. 2022.
Eco-friendly	Creating	Khanna *et*

Product Design	products with minimal environmental impact throughout their lifecycle.	*al.,* 2022.
Organizational Performance	The effectiveness and efficiency with which an organization meets its goals and objectives.	Al Aina *et al.,* 2020.
Sustainability Metrics	Indicators used to measure an organization's environmental, social, and economic performance.	Mio *et al.,* 2022.
Innovation Performance	An organization's ability to develop and implement new products, services, and processes.	Hameed *et al.,* 2021.
Stakeholder Value Creation	Generating benefits for all parties involved with the organization, including customers, employees, and the community.	Freudenreich *et al.,* 2020.
Supply Chain Agility	The capability of a supply chain to rapidly respond to changes in the market and environment.	Jabarzadeh *et al.,* 2022.
Agile Manufacturing Processes	Flexible and efficient production methods that can quickly adapt to changes in demand and supply.	Malviya, 2021.
Responsive Supply Chain Networks	Supply chain systems that can quickly adapt to changes in demand and supply conditions.	Richey *et al.,* 2022.
Adaptability to Market Changes	The ability of an organization to adjust its strategies and operations in response to evolving market conditions.	Hunt & Madhavaram, 2020.

3. REVIEW OF LITERATURE

3.1. Relationship between Green Decision Making and Supply Chain Agility

Adopting green decision making within an organization has recently garnered increased attention due to its potential to improve supply chain agility. Green decision making aims at minimizing the ecological impacts by considering environmental considerations into business operations (Heydari *et al.,* 2021). Sustainable procurement is a facet of green decision making which emphasize on reducing organization's environmental footprint as well as incentivize suppliers to implement greener practices (Ayarkwa *et al.,* 2020; Sönnichsen & Clement, 2020).

Environmental compliance, another aspect of green decision making, entails the adherence to environmental regulations (Aragòn *et al.,* 2020). It helps manage hazardous materials, ensures environmentally safe waste disposal and reduces emission (Xiang & van Gevelt, 2020). Compliance with environmental regulations mitigates operational risks and promotes adoption of eco-friendly processes (Do *et al.,* 2022). The incorporation of lean practices and advanced technologies through aforesaid processes inherently enhances supply chain agility (Patel & Sambasivan, 2022). For instance, waste reduction techniques and renewable energy sources can

reorganize and modernize production processes, building a more flexible and adaptable system to cope with sudden supply or demand changes.

Eco-friendly product design further reinforces supply chain agility by designing energy-efficient medical equipment, produced from recyclable materials (Javaid *et al.,* 2024). Sustainable products principally utilize flexible and modular production techniques which reconfigures swiftly to meet changing requirements (Roy & Abdul-Nour, 2024; Milisavljevic-Syed *et al.,* 2024). This type of flexibility is critical in healthcare sector, where rapid response to regulatory changes and emergent health crises is pivotal for enhancing organizational performance as well as preserving patient care.

Consequently, the following hypothesis is proposed;

H1: Embracing Green Decision Making positively impacts Supply Chain Agility of an organization.

3.2. Relationship between Green Decision Making and Organizational Performance

The incorporation of green decision making in organizations has gained significant attention due to its potential to improve the overall organizational performance. It involves the integration of environmental concerns into business approaches so as to minimize the ecological impact (Wong *et al.,* 2020). Focusing on sustainable procurement, eco-friendly product design and environmental compliance within healthcare industry impacts performance of organizations positively (Ahmad *et al.,* 2020). Prioritizing sustainable procurement within the healthcare industry significantly impact environmental sustainability of an organization by impacting the entire supply chain (Balon, 2020). Such practice improves the overall sustainability performance of an organization; as well as, promotes broader adoption of environmentally friendly practices (Singh & Chan, 2022). Environmental compliance encompasses adherence to environmental standards, laws and regulations. It mitigates the operational and legal risks while adopting eco-friendly processes to maintain high standards of environmental compliance leading to enhanced cost savings and operational efficiencies (Morgera, 2020). Particularly, in the healthcare business, environmental compliance encompasses the management of hazardous materials, reduction of emissions as well as ensuring environmentally safe waste disposal. Such practices assist healthcare organizations enhance their reputation as well as avoid legal penalties.

On the other side, eco-friendly product design emphases on producing products with nominal environmental impact which promotes and reinforces positive impact of Green decision making on performance of organization (Boopathi, 2024). In the healthcare organization, it involves the designing of medical equipment and devices which are fuel-efficient with enhanced patient safety, smaller environmental footprint and reduced production costs (Mittal *et al.,* 2020). By slotting in eco-friendly principles into the product design, healthcare organizations can contribute to a sustainable healthcare system and improved sustainability (Arthi *et al.,* 22020). Sustainability metrics in the healthcare industry include waste reduction, energy consumption, carbon footprint, compliance and water usage with environmental regulations (Lenzen *et al.,* 2020). By reporting on the sustainability metrics, healthcare organizations identify areas for improvement, demonstrate commitment to sustainable practices and assess environmental impact (Sherman *et al.,* 2019). Effective and operative utilization of sustainability metrics helps in mitigating environmental risks, reducing operational costs as well as improves organization's reputation which aligns with increasing potentials of patients, broader community as well as regulators for sustainable healthcare services (Alshqaqeeq *et al.,* 2020).

Innovation performance in healthcare industry take several forms, such as advanced healthcare technologies implementation and employment of innovative operative practices (Ilangakoon *et al.,* 2022). Determining innovation performance embroils measuring new technologies adoption rate, consequences of research and development accomplishments, impact of innovations on operational efficiency and patient care (Berry, 2019). Basically, high innovation performance leads to enhanced patient outcomes, and a strong market position, contributing to overall organizational performance (Russo Spena *et al.,* 2020). Stakeholder value creation generates advantages for parties involved within the organization, including employees, patients, suppliers, community and investors (Mazzucato,

2024). It involves high-quality patient care delivering, employee well-being, strong supplier relationships, and financial returns to investors as well as community health (Dembek *et al.,* 2018). Healthcare organizations builds loyalty, ensures long-term sustainability and enhances reputation through stakeholder value creation.

Previous literature underscores the significance of green decision making as a premeditated approach to achieve sustainable growth and superior organizational performance.

As a consequence, the following hypothesis is proposed;

H2: Embracing Green Decision Making positively impacts Performance of an organization.

3.3. Relationship between Supply Chain Agility and Organizational Performance

Supply chain agility helps organizations to rapidly respond to market fluctuations as well as environment changes (Shukor *et al.,* 2021). Agility is considered critical in healthcare industry because of its regulatory changes, and dynamic nature (Patri & Suresh, 2019). Besides, timely delivery of medical services and supplies can also be achieved through agile manufacturing processes (Alzoubi *et al.,* 2022). Because, they are designed to efficiently and quickly adjust to product demand changes, supply availability and production schedules. Agile manufacturing is helps produce pharmaceuticals and medical devices by utilizing flexible manufacturing systems, advanced technologies like automation or additive manufacturing and modular production lines (Algorri *et al.,* 2022). Implementation of agile manufacturing practices permits healthcare organizations to enhance product quality and reduce lead times (Stavropoulos *et al.,* 2020). It also helps respond to unanticipated changes in demand and supply chain disruptions swiftly. It helps healthcare organizations ensure availability of critical medical products when needed. It enhances the performance and overall resilience of healthcare supply chain (Rehman & Ali, 2022).

Receptive supply chain networks quickly adapts to demand changes and supply conditions (Falcone *et al.,* 2022). These networks implicate collaboration with real time data sharing and suppliers by using advanced analytics to not only anticipate but also respond to market fluctuations. The networks ensure timely delivery of needed medical supplies in healthcare industry. By leveraging advanced technologies such as AI and building strong relationships with suppliers (Sharma *et al.,* 2020), healthcare organizations develop responsive and resilient supply chain networks (Kumar *et al.,* 2023; Bentahar *et al.,* 2023). Adaptability to changes in market is organization's supply chain capability to adjust its operations and strategies in response to ever evolving market conditions (Aslam *et al.,* 2018). It involves continuous market monitoring, understanding of emerging market trends, and pivot strategies preparedness. Adaptability assists healthcare organizations manage the impact of technological advancements, shifts in patient demand as well as regulatory changes (Pettit *et al.,* 2019). To implement new protocols in healthcare, respond to public health crises, develop innovative treatments and embrace unique technologies, adaptability is crucial. Adaptability helps ensure healthcare organizations maintain high levels of operational efficiency, even during significant market disruptions.

Organizational performance efficiently meets organizational goals by encompassing financial performance, market position, competitiveness and operational efficiency (Osazefua, 2019). In healthcare industry, the multifaceted approach involves delivery of superior patient care and ethical considerations (Nassani *et al.,* 2023). Basically, adoption of supply chain agility positively impacts organizational performance in multiple dimensions (Zhu & Gao, 2021). Agile manufacturing processes, adaptability and responsive supply chain networks are key components of supply chain agility which enhances sustainability metrics, improves innovation performance and creates greater stakeholder value.

Previous literature explores ways in which embracing supply chain agility impacts organizational performance positively, while emphasizing on agile manufacturing processes, adaptability and responsive supply chain networks.

Nonetheless, the following hypothesis has been proposed;

H3: Embracing Supply Chain Agility positively impacts Performance of an Organization.

3.4. Relationship between Green Decision Making, Supply Chain Agility, and Organizational Performance

Integration of green decision making in healthcare

organizations is essential to balance operating goals with environmental sustainability (Sherman *et al.,* 2020). Sustainable procurement is considered a key feature of green decision making which involves selection of services and goods that minimizes environmental impact (Calabrese *et al.,* 2019). Implementation of this approach helps reduce organization's environmental footmarks and encourages suppliers to implement eco-friendly practices (Mousa & Othman, 2020). In healthcare diligence, prioritizing and embracing sustainable procurement significantly impacts the entire supply chain, stimulating the adoption of greener processes. This practice enhances environmental sustainability, leads to cost savings with enhanced operational efficiency (Sherman *et al.,* 2020). By setting standards for suppliers and healthcare providers, organizations can adopt sustainable supply chain.

Environmental compliance ensures that healthcare providers adheres to the regulatory standards set by authorities (Benzidia *et al.,* 2021). It helps mitigate operational and legal risks while nurturing the adoption of eco-friendly processes (Abdul *et al.,* 2018). In healthcare industry, compliance involves the management of hazardous materials and reduction of emissions (Abaku & Odimarha, 2024). These practices helps healthcare providers avoid legal penalties with improved reputation amongst interested parties and improved operational efficiency (Kenny & Priyadarshini, 2021). It is assumed that high environmental compliance standards lead to operational improvements and cost savings, ultimately contributing positively to the performance of organization.

Eco-friendly product design drive the confines of innovation and advancement by encouraging and developing safe, environmentally friendly and efficient medical products (Ko, 2020). In the healthcare field, it involves the designs of medical equipment and devices which are energy efficient and recyclable/biodegradable (MacNeill *et al.,* 2020). Besides, the material used to design the products are required to be easily disassembly as well as recycling. Agile manufacturing methods support healthcare organizations to develop and deliver medical goods efficiently and speedily so as to ensure that patients' care is not conceded by supply chain disruptions (Ziaee, 2019; Shankar, 2022). Responsive supply chain networks in contrast is characterized by real-time collaboration and communication with the suppliers (Giannakis *et al.,* 2019; Helo & Shamsuzzoha, 2020). It enhances the ability of organization to manage inventory effectually and meet patient needs promptly (Oliveira & Handfield, 2019). While, adaptability to changes in market helps healthcare organizations in staying ahead of technological and regulatory demand shifts, which ensures continuous enhancement in service delivery (Johnston, 2018).

Considering the previous literature, following hypothesis has been proposed;

H4: Green Decision Making positive impact on Organizational Performance with Mediating Role of Supply Chain Agility.

The review of literature revealed that no reliable studies have been conducted to discover the impact of green decision making on organizational performance and the refereeing role of supply chain agility in this association in regards to the healthcare industry.

Accordingly, the present research goals to fill the research gap and has developed the following research model:

3.5. Research Model

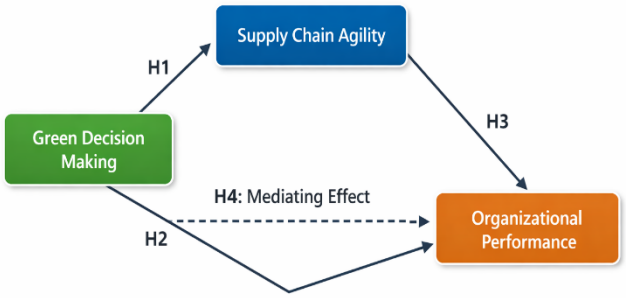

Figure 1: Research Model

4. METHODOLOGY

4.1. Research Design

Our research addresses a practical business issue through an experimental quantitative research design. This approach is employed to describe and correlate variables, explore causal relationships and develop data analysis for conclusions.

Precise measurement on how green decision making influences organizational performance and how supply chain agility mediates this relationship is examined through quantitative research method. For generating valid data, clear insights and robust evidence to refute the hypotheses, quantitative analysis is utilized.

4.2. Research Philosophy

The research adopts a Realist philosophy, emphasizing on hypothesis research testing and objective measurement. It aligns with the objective reality of how the three variables interact in reality. By embracing this stance, true nature and relationships between green decision making, supply chain agility and organizational performance is revealed.

Methodologically, it uses a deductive approach to observe and test existing hypotheses empirically. Starting with established concepts and theories from previous literature on green decision making, organizational performance, and supply chain agility, formulation of precise hypotheses and design research is developed so as to test research hypotheses in an objective manner.

4.3. Sampling

Stratified random sampling is applied for this research as it ensures representativeness, considering key demographics like age, role, and experience. It enhances the robustness, generalizability and accuracy of research findings, making a well-suited method to research the complex interactions between green decision making, supply chain agility, and organizational performance. Whereas, statistical power analysis determined the target sample size of at least 230 participants to ensure robust conclusions.

4.4. Data Collection Instrument & Procedure

Information is collected via structured questionnaire based on validated tools and literature review insights. It is divided into sections for independent, dependent, mediator, and moderator variables. Besides, participants' perceptions are measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Data is collected via online questionnaire for broad reach and easy access. Participants received email invitations explaining confidentiality, exclusive use of data, voluntary participation as well as research's purpose.

- Selected population for this research is supply chain managers from healthcare organizations.
- 230 supply chain managers from healthcare industry have been carefully chosen.
- Supply chain managers are chosen as they are experienced in supply chain management.
- The primary data collection instrument is questionnaire for this research in particular.

4.6. The Unit of Analysis (Respondents):

Questionnaire is sent to supply chain managers in healthcare organizations. These managers are chosen for their expertise and understanding of the research variables including green decision making, organizational performance, and supply chain agility, making them well-equipped to provide informed responses.

5. DATA ANALYSIS

5.1. Demographic Statistics

In the recent survey conducted with 230 supply chain managers from healthcare sector, the difference in the distribution of male and female is quite evident. 196 participants in the study's sample, of which represent 85.2% of the sample affirmed to the male gender of the respondent and 14.8%, identified as female. A more significant number of the respondents was male, and this highlights the importance of gender integration projects to increase the number of females in the sector.

5.2. Reliability and Validity

In assessing the reliability and validity of the measurement model, we employed several key metrics: Cronbach' Alpha, coefficient of Composite reliability, Average Variance Extracted (AVE), Variance Inflation Factor (VIF). The Cronbach's Alpha values were also above the cut off of 0.70 for all constructs, which established internal reliability. Composite reliability too went a notch higher than the recommended 0.70, showing the reliability in the measures. All the AVEs were greater than the minimum acceptable level of 0.50, indicating that all the constructs explained a significant amount of the variances in their respective items, thus, affirming the convergent validity. Moreover, all the VIF values are below 1 and the highest VIF value is only 1.15 which is below the cut-off value of 5 thus ruling out the

threat of multicollinearity and also, made sure that the constructs are not overlapping. Together, all these statistics assert the validity and reliability of the measurement model, as well as their correspondence with comparable studies' norms, enhancing the credibility of the study results. Table 1 demonstrate the measurements.

Table 1: Convergent Validity, VIF, CA, CR, AVE

Construct	Items	VIF	CA	CR	AVE
Green Decision Making	GDM1	2.113	0.863	0.916	0.598
	GDM2	2.502			
	GDM3	2.1175			
	GDM4	1.955			
	GDM5	1.393			
	GDM6	2.447			
Supply Chain Agility	SCA1	1.905	0.824	0.855	0.613
	SCA2	2.835			
	SCA3	1.598			
	SCA4	1.885			
	SCA5	2.633			
	SCA6	2.346			
	SCA7	2.988			
	SCA8	1.655			
	SCA9	2.952			
Organizational Performance	OP1	2.849	0.819	0.941	0.670
	OP2	2.655			
	OP3	1.660			
	OP4	2.678			
	OP5	2.411			
	OP6	2.659			
	OP7	1.065			

5.3. Discriminant Validity

In order to confirm the discriminant validity, the Heterotrait-Monotrait Ratio (HTMT) as well as the Fornell-Larcker criterion was calculated. The values of HTMT ratios of all the respective constructs lay under the benchmark level of 85, which necessitates that the respective constructs are reasonable and not too much similar to each other. This ascertains that all the constructs are in fact tapping into different components of the theoretical framework. Also, the Fornell Larcker criterion was tested, which states the individual construct's AVE should be greater than the square root of the correlations between the construct and other constructs, and this test was also passed. These positive results, close to the benchmark values, enhance the validity of the measurement model to identify diversified and non-overlapping latent factors of the study variables, thus affirming the soundness of the model and the credibility of the study outcomes. Table 2 demonstrate the results.

Table 2: HTMT & Fornell Larcker Criterion

HTMT Ratio			
	Green Decision Making	Supply Chain Agility	Organizational Performance
Green Decision Making	---		
Supply Chain Agility	0.719	---	
Organizational Performance	0.654	0.609	---
Fornell Larcker Criterion			
	Green Decision Making	Supply Chain Agility	Organizational Performance
Green Decision Making	**0.873**		

Supply Chain Agility	0.614	**0.894**	
Organizational Performance	0.594	0.711	**0.851**

5.4. Measurement Model Assessment

This Structural Equation Model (SEM) had undergone the bootstrapping tests utilized to ascertain the stability and the reliability of the model with sufficient rigor. To check the significance of the findings predictive quantities of the model were estimated using a statistical method known as resampling: Bootstrapping. For all the main constituents, the analysis pointed to high R-squared values thereby affirming that sufficient variance in the dependent variables is described by the model. The employed bootstrap approach showed high R-squared values that indicate a high reliability of the model and the relationships between the variables. This method offered more assurance in the model validity and the model's capacity to apply the theoretical assumption outside the sample data thereby vindicating the validity and efficiency of the proposed theoretical framework.

Table 3: Hypothesis relationship

H	Path	β	R2	t-value	p-value
H1	GDM→SCA	0.351	0.542	3.154	0.000
H2	GDM→OP	0.415	0.479	4.265	0.000
H3	SCA→OP	0.248		2.150	0.000
H4	GDM→SCA→OP	0.571		6.251	0.001

In the above table 3 through hypothesis testing, the study established the existence of positive significant correlation between the variables under consideration. Moreover, the regression of GDM to SCA had the highest relevant statistic of 0.351 with an R -squared of 0.542, t-value of 3.154 and p-value of 0.000 signifying a positive relationship at 0. Shakespeare should have emphasized more on the Munday's approach, especially the GDM and towards SCA that was statistically more significant as mentioned before. Similar to that, the variables of GDM and OP had the beta of 0.415, the R-squared was 0.479, and the t-value and p-value were 4.265 and 0.000 respectively proved the positive significant relationship between two of the variables. Likewise, the direct impact of SCA on OP was also significant with beta.0.248, t.2.150, and p.0.000. Moreover, the indirect effect of GDM on OP through SCA emerged with a beta of 0.571, a t-value of 6.251, and p-value of 0.001, which defined SCA's significant mediating role. Collectively, all hypothesized paths are supported by these results, showing that GDM has a direct positive impact on both SCA and OP and that SCA fully mediates GDM's positive impact on OP.

6. DISCUSSION ON THE RESULTS

Hypothesis 1 Discussion

H1: Embracing Green Decision Making positively impacts Supply Chain Agility of an organization

Findings suggest that green decision making incorporates environmental considerations into the business operations, aiming to minimize the ecological impact whereas promoting sustainability. Overall, green decision making drives investment in advanced technologies, sustainable practices ultimately contributing to an efficient supply chain.

Hypothesis 2 Discussion

H2: Embracing Green Decision Making positively impacts Performance of an organization

Research findings suggest that green decision making within healthcare organizations aims to balance operational objectives with environmental sustainability. By incorporating green decision making practices, healthcare organizations improve innovation performance, create greater stakeholder value and enhances sustainability metrics, eventually leading to extraordinary organizational performance.

Hypothesis 3 Discussion

H3: Embracing Supply Chain Agility positively impacts Performance of an Organization

Findings suggest that Supply chain agility is an important factor in the resilience and performance of healthcare organizations. Agile manufacturing processes, adaptability and responsive supply chain networks enhances organizational performance. Healthcare organizations that are investing in agile manufacturing, cultivating adaptability and building responsive supply chain networks are positioned effectively capitalize opportunities, navigate uncertainties and lead to

cost savings, enhanced operational efficiency and high-quality patient care.

Hypothesis 4 Discussion

H4: Green Decision-Making positive impact on Organizational Performance with Mediating Role of Supply Chain Agility

Findings depict a positive impact of Green decision making on organizational performance is significantly enhanced when mediated by supply chain agility. Sustainable procurement, eco-friendly product design and environmental compliance contribute to supply chain agility. It in turn impacts organizational performance positively. Integration of sustainable procurement practices in healthcare organizations helps encourage environmentally conscious suppliers. They are innovative and more flexible allowing quicker adjustments to demand changes and disruptions. Environmental compliance promotes eco-friendly processes, adoption of efficient, leading to reduced operational risks and enhanced supply chain responsiveness. Eco-friendly product design helps organizations meet the changing needs effectively. Consequently, integration of green decision-making practices develops an agile supply chain, which improves the overall organizational performance significantly. The mediating role of supply chain agility highlights significance of strategic approaches to green decision making, driving a sustainable superior performance and long-term growth in the healthcare industry.

Furthermore, mediating role of supply chain agility in the relationship between green decision making and organizational performance is significant. Healthcare organizations that integrate and incorporate green decision-making practices, including sustainable procurement, eco-friendly product design and environmental compliance are expected to cultivate more agile supply chains. Agility enhances an organizations' ability to capitalize and exploit emerging opportunities within the market. Principally, adoption of green decision-making practices certainly influences the organizational performance, with supply chain agility aiding as a key mediator. By integrating environmental compliance, eco-friendly product design and sustainable procurement, healthcare providers improves supply chain agility, leading to cost savings, stakeholder trust as well as improved operational competence.

7. CONCLUSION

In brief, incorporation of green decision making within the healthcare organization as a critical strategy to enhance organizational performance with mediating role of supply chain agility has become substantially significant. Accordingly, healthcare organizations are increasingly embracing green decision making practices. healthcare organizations can benefit significantly by prioritizing viable and sustainable procurement by choosing suppliers that meet rigorous environmental criteria. It can be accomplished by setting clear sustainability standards.

Besides, employing of stringent supplier evaluation processes can also encourage suppliers to embrace greener and eco-friendly practices. In this way, an innovative and flexible supply chain can be achieved, leading to improved sustainability and agility. Adhering to the environmental regulations and laws is important to enhance operational efficiency and mitigate risks. Healthcare organizations are ought to invest in advanced technologies and training programs which ensures compliance with the environmental standards. Besides, regular assessments and audits will also assist in sustaining greater compliance levels, resulting in improved organizational performance and significant cost savings.

- ***Recommendations***

It is highly recommended to invest in research and development programs so as to develop green medical products derived from operational efficiencies and innovation. Healthcare organizations should also focus on designing energy-efficient products to diminish environmental footprint and to enhance product safety. Besides, building strong affiliations with suppliers as well as leveraging and utilizing technologies such as Internet of Thing and Artificial Intelligence for advanced analytics generates efficient real-time data sharing with responsive and resilient supply chain networks. Such responsiveness helps maintain continuity of care for patients by meeting urgent needs, thus improving performance of organization.

Healthcare organizations must understand the emerging market trends, incessantly monitor market and be equipped to pivot schemes. In addition, embracing adaptability will help organizations quickly adopt innovative treatments, respond to health emergencies, implement new

regulations and maintain high quality service with operational efficiency. So, to fully comprehend and improve organizational performance, Healthcare organizations should incorporate innovation performance, stakeholder value creation and sustainability metrics into the performance measurement systems. This type of holistic method will enable healthcare providers to address the interconnected and diverse challenges of delivering sustainable, innovative and high-quality services.

By following the aforesaid recommendations, healthcare organizations can integrate green decision-making practices, achieve exceptional organizational performance, improve supply chain agility, and contribute to a resilient healthcare system with a more sustainable healthcare system effectively.

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