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EXPLORING THE NEXUS AMONG INFORMATION SHARING, INFORMATION TECHNOLOGY AND SUPPLY CHAIN PERFORMANCE: AN EMPIRICAL STUDY

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Research Paper

Abstract: *Supply chain performance is crucial for organizational success and gaining competitive advantage. Information technology plays a pivotal role by enhancing real-time visibility, communication, and coordination among stakeholders. Effective information sharing further accelerates decision-making, reduces lead times, and improves responsiveness to market demands, thereby enhancing overall supply chain performance. This study aims to investigate the impact of informations sharing and information technology on supply chain performance within the manufacturing sector of Saudi Arabia. Data were gathered from 350 employees using a convenient sampling technique. Employing a deductive quantitative approach and cross-sectional research design, data were analysed using SPSS and Smart PLS. The findings from Partial Least Squares Structural Equation Modelling (PLS-SEM) indicate that information technology significantly and positively influences supply chain performance. Similarly, information sharing also demonstrates a positive and significant impact on supply chain performance among manufacturing companies in Saudi Arabia. These results contribute theoretically to the literature on Saudi Arabian manufacturing contexts. Additionally, future research could assist policymakers and investment bodies in prioritizing information technology infrastructure to enhance supply chain performance. The study concludes with a discussion on limitations and proposes directions for future research.*

Keywords: *Information Sharing, Information Technology, Supply Chain Performance, Smart PLS.*

1. Introduction

Supply chain performance (SCP) encompasses the network of firms collaborating to produce and deliver items to clients. Effective SCP is essential for managing a company's network (Fatorachian & Kazemi, 2021). In essence, SCP represents a critical enterprise system's business operations that oversee the supply chain,

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ensuring the provision of goods and services to consumers (Alzoubi & Yanamandra, 2020). Previous studies indicate that information technology (IT) is a vital component for enhancing SCP (Nabila et al., 2022). Similarly, information quality (IQ), which involves the sharing of information among systems, people, or businesses, is crucial. Numerous industries strive to improve the efficiency of their supply networks (Kanan et al., 2023). In such endeavours, IQ becomes a fundamental element that boosts SCP within organizations (Jawabreh et al., 2023).

The strategic integration of IT and IS among supply chain collaborators has proven effective in enhancing overall performance. IT has evolved into a pivotal component of supply chains, contributing significantly to SCP (Sundram et al., 2020). Recognizing the strategic importance of IT for SCP, companies emphasize integrating stakeholders to facilitate the smooth movement of products and services from suppliers to end consumers. This integration encompasses managing the entire production cycle, from raw material procurement to final consumption, and includes processes like returns, reuse, and recycling. Since its inception in the early 1990s, this concept has underscored IT's critical role in optimizing these operational processes. The effective strategic deployment of IT is crucial for supply chains to maintain competitiveness amidst today's dynamic market landscape (Al-Rawashdeh et al., 2023; Hatamlah et al., 2023). Similarly, information sharing plays a vital role in enhancing supply chain performance by improving coordination and responsiveness across the network (Ganbold et al., 2020). Timely and accurate information sharing on inventory levels, demand forecasts, and production schedules among supply chain partners helps reduce uncertainties and minimize disruptions (Ganbold et al., 2020). This collaborative approach facilitates informed decision-making, enhances inventory management practices, and enables rapid response to changes in customer demand driven by market conditions (Karmaker et al., 2023). Furthermore, IQ enhances trust and strengthens relationships among supply chain stakeholders, leading to more efficient operations and potentially improving supply chain performance. Consequently, this study focuses on the impact of information sharing and information technology on SCP.

The impact of IT and IQ on SCP has been a focal point of interest in existing research. Empirically, there remain several gaps that warrant attention to enhance the generalizability of research findings. Primarily, studies investigating the effects of IQ and IT on SCP have typically examined their individual impacts, often overlooking their combined influence (Alshurideh et al., 2023; Frederico et al., 2023; Karmaker et al., 2023; Surucu-Balci et al., 2024; Tajeddini et al., 2024). In other words, previous research has predominantly focused on economies other than Saudi Arabia, highlighting limited generalizability to this context, thereby underscoring the importance of conducting research specific to Saudi Arabia. Furthermore, findings from prior studies demonstrate inconsistencies, with some reporting positive effects while others indicate neutral or negative impacts of IT and IQ on SCP (Alzoubi & Yanamandra, 2020; Di Vaio & Varriale, 2020; Fatorachian & Kazemi, 2021; Gu et al., 2021; Rashid et al., 2024). The existing definitions of IT and IQ remain ambiguous as authors have defined these concepts in varying terms. This inconsistency in definitions also serves as a motivation for researchers to conduct further studies.

Therefore, aiming to address these gaps, this study aims to examine the impact of IQ and IT practices on SCP within manufacturing companies in Saudi Arabia.

The study's objectives contribute both theoretically and practically. Theoretically, integrating studies to investigate the combined effects of information technology and information sharing could yield a deeper understanding of their collective impacts on supply chain performance. This approach might facilitate the development of comprehensive frameworks that account for the intricate relationships between IT infrastructure, information sharing practices, and specific contextual factors relevant to regions such as Saudi Arabia. From a practical standpoint, addressing these gaps could offer guidance to practitioners in Saudi Arabia and similar contexts on implementing robust IT solutions and effective information sharing strategies to enhance supply chain efficiency and responsiveness. By bridging these theoretical and practical divides, future research could provide actionable insights and enrich the strategic management of supply chains across diverse global settings. The remaining sections of this study are organized as follows. First, a framework is developed to explore the interaction between IS and IT on SCP. Second, a brief literature review and two research hypotheses concerning the conceptual model are presented. Subsequently, the research methodology and empirical findings are detailed. The findings are then analysed, discussing their implications for management. Finally, the study concludes with a discussion on its limitations and implications.

2. Theoretical and Empirical Literature Review

2.1 Information Technology and Supply Chain Performance

IT is crucial for enhancing SCP by enabling real-time visibility and optimizing processes within the supply chain network (Rashid et al., 2024). IT empowers organizations to track inventory levels, monitor production schedules, accurately forecast demand, and streamline logistics operations. These technologies facilitate seamless communication and collaboration among manufacturers, suppliers, and customers, thereby reducing lead times, minimizing costs, and improving overall efficiency (Dubey et al., 2024). By implementing IT, companies can respond more swiftly to changes in customer demand, thereby enhancing their SCP (Purwaningsih et al., 2024).

Empirical evidence has shown the influence of IT on SCP. Alghofeli (2023) conducted research using a descriptive technique and collected data via a questionnaire from Saudi logistics experts. The results indicated a positive and significant impact of IT on SCP. Similarly, Sundram et al. (2020) examined the impact of IT on SCP and concluded that IT and information sharing have a considerable favourable influence on performance. Kim (2017) also investigated the relationship between integrative IT and SCP, finding that integrated IT is significantly associated with improved performance. In contrast, Alshurideh et al. (2023) found a negative and significant impact of IT on SCP. They attributed this negative relationship to potential sector-specific factors and recommended further research on different sectors and countries, incorporating other technology-related variables to explore variations in findings. They also suggested that the negative impact might be due to sector overlap, indicating the need for studies focusing on other sectors.

Yu (2015) conducted a study on the impact of IT on SCP, with findings indicating a positive and significant relationship. Yu (2015) further explored the relationship between IT and SCP, suggesting that IT-enabled internal integration positively influences both operational and financial performance. Oh et al. (2019) argued that Information and Communication Technology (ICT) serves as a critical foundation for enhancing supply chain performance, with their findings revealing a positive and significant impact of ICT features on SCP. Ganbold et al. (2020) investigated the role of IT competence in facilitating SCP, finding significant positive effects. Similarly, Awwad and El Khoury (2024) also identified a significant influence of IT on SCP in their study. The literature consistently underscores that IT plays an integral role in SCP across various countries and contexts. Previous studies have predominantly concentrated on other countries and sectors, with limited focus on the manufacturing sector of Saudi Arabia. Thus, based on these previous findings, it is hypothesized that,

Hypothesis 1: *"Information technology influence significantly to supply chain performance of Saudi Arabia manufacturing companies."*

2.2 Information Sharing and Supply Chain Performance:

IQ serves as a critical determinant in enhancing supply chain performance by fostering collaboration and efficiency among stakeholders within organizations (Alzoubi & Yanamandra, 2020). This practice facilitates timely and accurate dissemination of information on inventory levels, production schedules, demand forecasts, and market trends, enabling supply chain partners to make informed decisions and coordinate activities more effectively (Oubrahim et al., 2023). Such transparency reduces uncertainties, minimizes the bullwhip effect, and enhances overall inventory management, thereby lowering costs and optimizing asset utilization (Bag et al., 2023). Furthermore, shared information enables swift responses to disruptions and changes in customer demand, thereby improving agility and responsiveness across the supply chain. This effective IQ fosters trust and strengthens relationships among partners, contributing to enhanced supply chain performance.

Empirical studies have consistently demonstrated the relationship between IQ and SCP. Sutduean et al. (2019) evaluated this link and found a positive and significant influence of IQ on SCP. Similarly, Gebisa (2023) confirmed a positive and significant impact of IQ on SCP, suggesting further exploration in other countries where manufacturing plays a pivotal role in economic and social contexts. Firmansyah and Siagian (2022) also investigated the influence of IQ on SCP, concluding that SCP is directly affected by IQ. They recommended future research in developing nations, particularly in the manufacturing sector. Sundram et al. (2020) further examined the relationship between IQ and SCP, reporting a positive and significant impact. They emphasized that the understanding of Information Systems (IS) and SCP relationships is still in its early stages in developing nations. In contrast, Asamoah et al. (2016) found a positive but insignificant impact of IQ on SCP. They discussed potential reasons for this insignificance and suggested further research in other developing nations, incorporating additional technological variables alongside IQ. Similar arguments were made for conducting further research in Gulf countries to broaden the scope of findings in the IQ and SCP domain (Alzoubi & Yanamandra, 2020).

Ayele and Ram (2020) investigated the effects of IQ practices on SCP. Their research revealed a strong connection between information quality and all facets of

SCP, with information intensity significantly influencing SCP quality. The cumulative impact of IQ policies on SCP was also found to be substantial, indicating that enhanced levels of information exchange in supply chain processes enhance SCP. Conversely, Andiana et al. (2024) conducted a study on how IQ among supply chain partners reduces lead times, improves inventory turnover, and enhances customer satisfaction. Their findings underscored the positive and significant impact of IQ on SCP. They suggested further research in other developing countries to broaden understanding in this area. In another study, Rashid et al. (2024) explored how enhanced information visibility improves demand forecasting accuracy, thereby reducing stock-outs and excess inventory costs, crucial factors in achieving supply chain efficiency. Their study findings indicated a positive and significant impact of IQ on SCP. They further argued that in developing countries, IQ among organizations is still in its initial stages, and they recommended further research in other developing nations. Given that Saudi Arabia is also a developing country with a significant contribution from the manufacturing sector to social and economic development, it is crucial to study this sector. Therefore, the study has formulated the following research hypotheses,

Hypothesis 2: *"Supply chain performance significantly influenced from information sharing of Saudi Arabia manufacturing companies."*

3. Study Framework

To empirically test the hypotheses, a theoretical framework has been constructed based on the literature review. The research framework is conceptualized on the theory of resource-based view (RBV). This theory provides a foundational understanding of how information sharing and information technology can influence supply chain performance (Ahmed et al., 2023). According to RBV theory, competitive advantage within organizations is achieved through unique, intangible resources (Alvarez & Barney, 2017). These intangible resources, such as information technology infrastructure and effective information sharing capabilities within supply chain networks, do not possess tangible existence (Al-Rawashdeh et al., 2023). Investments in information technology enable firms to develop distinctive competencies in areas like data analytics, real-time tracking, and process automation, thereby enhancing operational efficiency and responsiveness. Information sharing facilitated by information technology fosters collaborative relationships among supply chain partners, leading to shared knowledge, reduced transaction costs, and improved decision-making. This collaborative capability can be considered a valuable resource that enhances SCP (Gebisa, 2023). The theoretical variables are depicted in Figure 1.

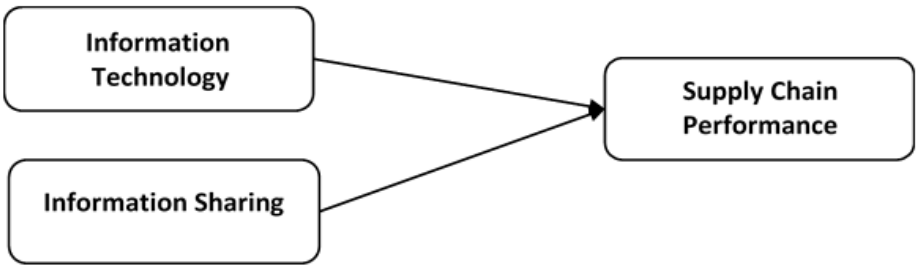

Figure 1: Theoretical Framework

3.1 Research Methodology

The research aimed to assess the impact of information technology and information sharing on supply chain performance in the manufacturing sector of Saudi Arabia. To achieve this objective, the study employed a quantitative research approach, which allows for statistical analysis to investigate phenomena and establish relationships (Holton & Burnett, 2005). This approach was deemed suitable for the study's purposes. Additionally, the study utilized a cross-sectional research design, which captures data from a diverse sample at a single point in time (Pandis, 2014). This design is effective for examining prevalence, correlates, and associations among variables without the complexities of longitudinal data collection (Bryman, 2016). Furthermore, an explanatory research approach was employed to uncover causal relationships and explain the underlying mechanisms behind observed phenomena (Baskerville & Pries-Heje, 2010). This approach extends beyond description to understand why certain outcomes occur, which is particularly valuable for testing existing theories using various statistical methods (Creswell et al., 2014). Thus, the researchers adopted an explanatory research approach to enhance the research framework.

3.2 Data Collection Procedure

The research employed a convenient sampling technique to gather data from employees in the manufacturing sector of Saudi Arabia. This method was chosen over probability sampling due to its practical advantages and feasibility within the study's context (Sedgwick, 2013). Obtaining an exact list of employees from manufacturing companies proved challenging for the authors, necessitating the use of convenient sampling for its accessibility to respondents within limited timeframes and resources. Furthermore, the survey method was selected to collect data, utilizing a structured questionnaire distributed randomly among 400 employees across various manufacturing companies in Saudi Arabia. The questionnaire consisted of closed-ended questions rated on a five-point Likert scale to capture quantitative data on employee satisfaction, job performance, and organizational commitment. The decision to use the survey method was justified by its efficiency in gathering standardized responses from a large sample, enabling statistical analysis to generalize findings to the broader population of manufacturing employees in Saudi Arabia. Out of the 400 respondents, 350 provided valid responses, indicating a favourable response rate (Baruch & Holtom, 2008).

3.3 Variable Instrument Research

In this study, researchers utilized Likert-scale questionnaires with response options ranging from 1 to 5, where 1 represented "strongly disagree" and 5 represented "strongly agree". The questionnaire consisted of two sections: the first section collected personal information, while the second section required respondents to answer statements related to various variables based on their opinions. The choice of a five-point Likert scale was motivated by its ease of comprehension and its ability to provide comprehensive information (Robinson, 2024). Table 1 presents the research instrument designed to assess the impact of IQ and IT on SCP within industrial supply chains.

Table 1: Study Instrument

Variables of the Study	Indicator	Sources
Information Sharing	1- The organization informs trading partners about changing demands. 2. Trading partners share confidential information with your organization. 3. Trading partners keep your organization informed about business challenges. 4. Trading partners provide valuable business process expertise to your corporation. 5. Organizations and trading partners share information to help with business planning. 6. Organizations and trading partners communicate about events or changes that may affect them.	(Sundram et al., 2020).
Information Technology	1- Our company educates customers on using electronic commerce websites. 2- Our company uses a CRM system to gather and evaluate market data. 3- My company's website can integrate supply chain partners. 4- Customers routinely book container space on my company's website. 5. Our company uses online transactions to cut costs.	(Sundram et al., 2020).
Supply Chain Performance	1- Assess how well our supply chain activities reduce waste. 2-Assess our supply chain's ability to respond quickly to demand variations. 3-Assess our supply chain partners' level of cooperation and integration. 4-Assess the degree to which the quality of products delivered through our supply chain meets our specified standards. 5-Assess the effectiveness of our supply chain activities' cost management and control. 6-Assess how consistently our supplier network meets delivery deadlines. 7-Assess how frequently our supply chain uses innovative strategies and technologies to improve performance.	(Al-Rawashdeh et al., 2023)

4. Data Analysis and Findings

The data were analysed using SPSS and Smart PLS. SPSS was utilized for descriptive statistics and initial screening tests, while inferential statistics were conducted using SPSS as well, as discussed in subsequent sections.

4.1 Demographic Profile

Table 2 presents the demographic profile of employees in manufacturing companies in Saudi Arabia. The workforce is predominantly male, comprising 71.4% of the total sample, with female employees accounting for 28.6%. Educationally, the majority hold Master's degrees (48.6%), followed by those with Bachelor's degrees (28.6%), and others (22.9%) holding diplomas or other qualifications. Regarding age

distribution, employees aged 25-30 years constitute the largest group (28.6%), closely followed by those aged 31-35 years (25.7%), indicating a relatively young workforce. These findings illustrate that a significant proportion of employees in Saudi Arabian manufacturing companies are young and well-educated.

Table 2: Demographic Profile

Demographic Category	Number of Employees	Percentage (%)
Total Employees	350	100
Gender		
Male	250	71.4
Female	100	28.6
Education		
Graduation	100	28.6
Masters	170	48.6
Others	80	22.9
Age		
25-30 years	100	28.6
31-35 years	90	25.7
36-40 years	70	20
Above 40 years	90	25.7

4.2 The Measurement (Outer) Model

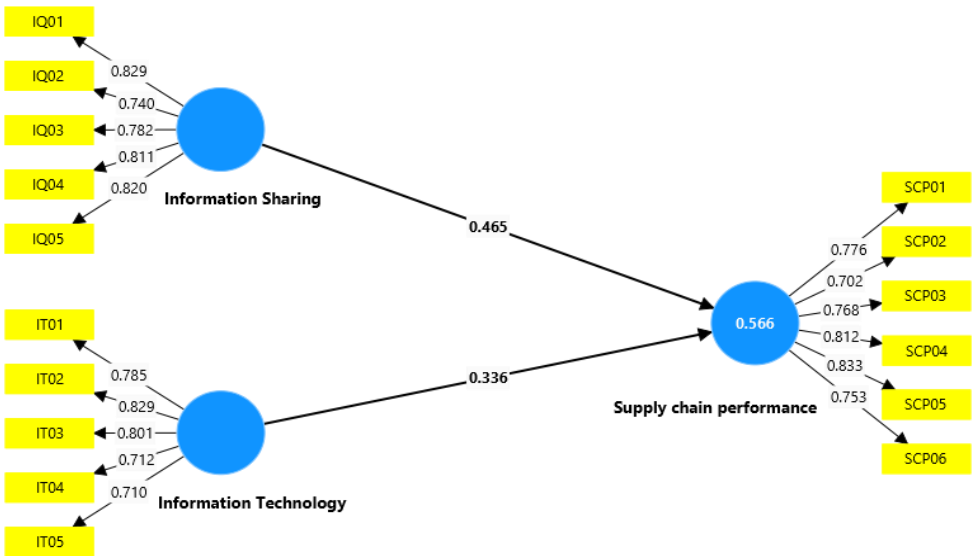

Figure 2: Measurement Model.

The evaluation process in PLS analysis begins with assessing the measurement model, as outlined by (Hair Jr et al., 2021). This involves a systematic four-step procedure to evaluate the measurement model, focusing on two key validity criteria: convergent and discriminant validity. Convergent validity is assessed through factors such as factor loadings, composite reliability, Cronbach's alpha, and average variance extracted (Hair et al., 2017). In evaluating convergent validity, factor loadings of 0.70 or higher are typically used to ensure indicator reliability. As shown in Table 3 and Figure 2, all item values exceed 0.5, meeting the criterion for factor loadings and indicating satisfactory reliability of the indicators.

Table 3: Outer Loadings of Items

Items	Information Sharing	Information Technology	Supply Chain Performance
IQ01	0.829		
IQ02	0.740		
IQ03	0.782		
IQ04	0.811		
IQ05	0.820		
IT01		0.785	
IT02		0.829	
IT03		0.801	
IT04		0.712	
IT05		0.710	
SCP01			0.776
SCP02			0.702
SCP03			0.768
SCP04			0.812
SCP05			0.833
SCP06			0.753

On the other hand, composite reliability, used to assess internal consistency psychometrically, was evaluated by analysing CR with a threshold of 0.70 or above. It specifically measures the extent to which a set of items designed to measure a single construct consistently produces similar results (Hair et al., 2017). Additionally, AVE is a matrix in PLS-SEM that assesses the amount of variance captured from a latent construct relative to variance due to measurement error and other constructs. It is calculated by averaging the squared loadings of indicators on their respective latent variables. A minimum AVE value of 0.50 is considered significant for evaluating convergent validity (Hair et al., 2017). As shown in Table 4, all predicted values meet the requirement for convergent validity.

Table 4: Summary of Findings from the Reflective Measurement Model

	Alpha	CR	AVE
Information Sharing	0.856	0.859	0.636
Information Technology	0.825	0.826	0.591
Supply Chain Performance	0.867	0.870	0.601

According to Fornell and Larcker (1981), assessing discriminant validity requires demonstrating that variations in variables are distinct. There are three approaches available for this: the heterotrait-monotrait (HTMT) ratio, cross-loading approach, and Fornell-Larcker correlation. Hair Jr et al. (2021) argues that according to Fornell and Larcker, the square root of the AVE for each latent construct should be higher than its correlations with other constructs to establish discriminant validity. Table 5 results indicate that each construct exhibits discriminant validity as diagonal values exceed off-diagonal values. Another criterion for discriminant validity, HTMT introduced by Henseler et al. (2015), is widely used and effective in various correlation matrices. It offers high sensitivity and specificity in detecting issues related to discriminant validity. HTMT correlation values should ideally be below 0.85 or 0.90 (Hair et al., 2017). As shown in Table 6, all values are below 0.85, confirming discriminant validity.

Table 5: Matrix of Fornell-Larcker Correlations

	Information Sharing	Information Technology	Supply Chain Performance
Information Sharing	0.797		
Information Technology	0.558	0.769	
Supply Chain Performance	0.420	0.389	0.475

Table 6: The Matrix for the Heterotrait-Monotrait Ratio (HTMT)

	Information Sharing	Information Technology	Supply Chain Performance
Information Sharing			
Information Technology	0.700		
Supply Chain Performance	0.531	0.811	

4.3 Analysing Structural Models

Table 7 presents the predicted results of the coefficient of determination, R-squared (R^2), which illustrates the collective impact of independent variables on the dependent variable. The R^2 statistic quantifies how well IT and IQ in the model explain the overall variance in the dependent variable SCP. With an R^2 value of 0.566, the model adequately explains 56.6% of the variance in supply chain performance in this specific context. Adjusting for predictors, the adjusted R^2 value modifies the R^2 value to account for the number of predictors in the model. It discourages adding unnecessary predictors that do not enhance the model's explanatory power. The adjusted R^2 of 0.562 indicates that approximately 56.2% of the variance in SCP can be attributed to the model after accounting for the number of predictors. These findings suggest that the model, utilizing IT and IQ as predictors, effectively explains a significant portion of the variance in supply chain performance when all relevant factors are considered. The R^2 values are detailed in Table 7.

Table 7: The R^2 Value

	R-Square	R-Square Adjusted
Supply Chain Performance	0.566	0.562

The PLS bootstrapping procedure represents the final step in PLS-SEM for hypothesis testing. Path coefficients play a crucial role in PLS analysis, as highlighted by previous research (Hair et al., 2017). If path coefficients fail to contribute significantly or exhibit contrary directions to expectations, it necessitates rejecting the initial hypotheses. Conversely, significant path coefficients aligned with hypothesized directions provide empirical validation for the proposed causal relationships. In assessing path coefficients through bootstrapping, a minimum of 5,000 bootstrap samples is recommended, matching the original sample size (Hair Jr et al., 2021; Duval., 2022). Therefore, to minimize errors and derive t-values, the current study utilized 5,000 resampling iterations, equivalent to the initial sample size of 350. The hypothesis testing results demonstrate that IQ significantly influences SCP in Saudi Arabia's manufacturing companies. Similarly, information technology also exhibits a significant and positive effect on SCP. These findings are detailed in Table 8 and Figure 3.

Table 8: Findings from the Research

	Beta Coefficients	SD	T statistics	P values	Decision
Information Sharing -> Supply Chain Performance	0.465	0.090	5.190	0.000	Supported
Information Technology -> Supply Chain Performance	0.336	0.088	3.817	0.000	Supported

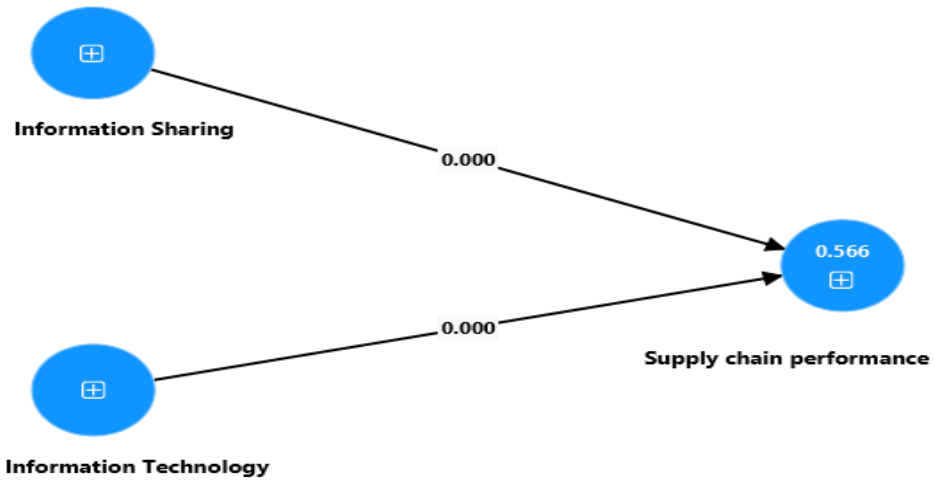

Figure 3: *Analysing Structural Models*

5. Discussion

Supply chain performance stands as a critical determinant of organizational efficiency and cost-effectiveness. Information technology plays a pivotal role by optimizing operations, enabling real-time data access, and facilitating informed decision-making, thereby enhancing supply chain performance. Similarly, effective information sharing enhances stakeholder coordination, reduces delays, and lowers inventory holding costs. Conversely, organizations neglecting investments in IT and information sharing risk inefficiencies, longer lead times, and increased operational expenses, ultimately compromising supply chain performance. Therefore, prioritizing IT investments and cultivating a culture of information sharing are crucial for maximizing supply chain efficiency and sustaining competitive advantage in today's global market. In light of this imperative, the study aimed to empirically investigate the impact of information sharing and information technology on supply chain performance within Saudi Arabia's manufacturing sector. The research collected quantitative data from 350 employees and employed a cross-sectional research design. The study formulated and tested two main hypotheses using PLS-SEM.

The results of the PLS-SEM analysis demonstrate a significant and positive impact of information technology on the supply chain performance of manufacturing companies in Saudi Arabia. These findings suggest that as the technological infrastructure and culture within the Saudi Arabian manufacturing sector improve, so does supply chain performance. This conclusion is consistent with the studies by Alghofeli (2023) and Sundram et al. (2020), which similarly found significant

associations between information technology adoption and enhanced supply chain performance. Additionally, Ganbold et al. (2020) highlighted the pivotal role of information technology in integrating supply chain management practices, further reinforcing its positive impact. These studies collectively underscore that investments in information technology can enhance operational efficiency, facilitate effective communication among supply chain partners, optimize inventory management, and improve responsiveness to market demands. Therefore, it is argued that companies should prioritize IT investments to foster better coordination across their supply chain networks, enhance customer satisfaction, and ultimately increase profitability. Moreover, the ability of IT to enable real-time data sharing and visibility is crucial in navigating the dynamic business environment characteristic of Saudi Arabia's manufacturing sector. Thus, the positive influence of information technology on supply chain performance underscores its strategic importance as a tool for achieving global competitive advantage among manufacturing firms in Saudi Arabia.

Furthermore, additional findings have indicated a positive and significant impact of information sharing on the supply chain performance of manufacturing companies in Saudi Arabia. These results suggest that a robust culture of information sharing among Saudi Arabian manufacturing firms contributes significantly to enhanced supply chain performance. This conclusion is consistent with findings from various studies (Asamoah et al., 2016; Ayele & Ram, 2020; Firmansyah & Siagian, 2022; Sundram et al., 2020), which collectively support the idea that increased information sharing correlates positively with supply chain performance. Previous research has demonstrated that effective information sharing enhances coordination, visibility, and responsiveness across supply chain networks. To capitalize on these benefits, it is recommended that companies leverage technologies such as electronic data interchange (EDI), collaborative platforms, and supply chain management (SCM) systems. These technologies can facilitate better synchronization of activities, reduce lead times, and improve decision-making capabilities. Additionally, they can lead to lower inventory costs, enhanced customer service levels, and ultimately, increased profitability, thereby boosting the economic contributions of organizations. Therefore, the positive impact of information sharing on supply chain performance underscores its strategic importance in enhancing the competitive advantage of organizations and elevating the overall significance of information sharing for supply chain performance in the Saudi Arabian economy.

6. Implications

The study's findings offer significant theoretical and practical implications for the existing literature. Theoretically, the research underscores that integrating robust information sharing practices and adopting information technology solutions can effectively boost supply chain efficiency and responsiveness. It substantiates established theories that highlight the criticality of real-time data exchange, collaborative decision-making, and enhanced visibility within supply chain networks. Moreover, this theoretical framework underscores the broad applicability of these principles while recognizing the necessity for contextual adaptations tailored to accommodate Saudi Arabia's distinct business environment, regulatory framework, and cultural dynamics. Furthermore, the study sets a foundation for future research endeavours by providing a framework that can be extended and strengthened. This

extended model has the potential to enhance the robustness of existing models and increase their applicability across different countries and sectors. This contribution not only enriches the theoretical landscape but also provides practical insights that can inform strategic decision-making and operational improvements in supply chain management globally.

Practically, this study holds transformative implications for Saudi Arabian manufacturing companies. The findings contribute by guiding policymakers towards adopting advanced information technologies such as ERP systems, SCM software, and data analytics tools. These technologies enable companies to optimize inventory management, streamline logistics, and enhance operational agility. Furthermore, the study underscores the significance of information sharing for supply chain performance, illustrating how improved information flow among supply chain partners facilitates effective communication, reduces lead times, and enhances supply chain resilience. This strategic approach not only enhances operational efficiency but also reinforces competitive positioning in global markets. Moreover, in Saudi Arabia's expanding industrial sector, characterized by rapid economic development and diversification priorities, these practical implications underscore the critical role of IT investments and collaborative information sharing. They are pivotal in driving sustainable growth, fostering innovation, and meeting evolving customer expectations. Integrating these insights into strategic frameworks enables Saudi Arabian manufacturers to navigate complexities effectively and achieve sustained success in the global marketplace.

7. Conclusions, Constraints, and Directions for Future Studies

The research aimed to investigate the influence of IQ and IT on SCP within the manufacturing sector of Saudi Arabia. To achieve this objective, a comprehensive review of the existing literature was conducted to identify and define the primary research problem. This included analysing and synthesizing literature related to IT, IQ, and SCP to develop a deeper theoretical understanding. The results from PLS-SEM revealed a significant and positive impact of IT on SCP, indicating its substantial influence. Similarly, IQ was found to significantly influence SCP. These findings extend theoretical insights within the Saudi Arabian context, providing a foundation for future research endeavours. They also offer practical implications for practitioners and corporate executives, aiding in the assessment of how IT and IS can strategically enhance operational efficiencies within organizations.

The study, despite its significant findings, acknowledges several limitations that warrant consideration in future research. Firstly, it focused solely on the direct effects of IQ and IT on SCP, omitting exploration of potential moderating and mediating factors. Therefore, future research could investigate moderating elements such as corporate culture and innovation, which may interact with information sharing, information technology, and SCP. Secondly, the study was confined to the manufacturing sector, limiting the generalizability of its findings. Future research should include organizations from sectors beyond manufacturing to enhance the accuracy and external validity of the study's parameters. While this study effectively illustrates how IT and IS can enhance supply chain efficiency in manufacturing, its applicability to other sectors and countries remains uncertain. Furthermore, the

research is constrained by its exclusive reliance on a quantitative research approach with data collected using Likert scales. Future studies could adopt mixed methods approaches, incorporating interviews, observations, and other techniques to capture a broader range of perspectives and potentially uncover different nuances in the results. In conclusion, addressing these limitations in future research endeavours can contribute to a more comprehensive understanding of the dynamics between IT, IS, and SCP across diverse organizational contexts and geographical settings.

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