

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm

Quality of information sharing as a moderator: An investigation of the relationship between supply chain management strategies and competitive advantage in Saudi Arabian manufacturing companies

Zaher Abusaq^{a*}

^a*Industrial Engineering Department, College of Engineering, University of Business and Technology, Jeddah, 21448, Saudi Arabia*

ABSTRACT

Article history:

Received March 12, 2023
 Received in revised format June 18, 2023
 Accepted July 17 2023
 Available online July 17 2023

Keywords:

*Competitive advantage
 Customer connections
 Information sharing level
 Information sharing quality
 Strategic supplier partnerships*

The purpose of this research is to investigate the influence of supply chain management methods on competitive advantage in Saudi Arabian manufacturing firms, with a particular emphasis on the function of information sharing quality as a moderating variable. The data received from a sample of Saudi manufacturing enterprises were analyzed using a structural equation modelling technique. According to the findings, customer relationships, the level of information sharing, and strategic supplier partnerships all have strong beneficial impacts on competitive advantage. However, the influence of information sharing quality alone on competitive advantage was shown to be statistically negligible. These results emphasize the necessity of developing strong customer relationships, encouraging effective information exchange procedures, and creating strategic collaborations with suppliers to gain a competitive edge. The research adds to the current literature by providing insights unique to Saudi Arabian industrial firms. The results are important for managers and decision-makers developing competitive supply chain management strategies. Future studies may investigate other factors and dimensions, as well as perform longitudinal studies, to better understand the structures of supply chain management and competitive advantage in the Saudi context.

© 2023 Growing Science Ltd. All rights reserved.

1. Introduction

Organizations, especially manufacturing businesses, have been using supply chain management (SCM) for over a decade. Global competition among companies is now largely determined by the quality of their supply chains (Ali, 2022; Kanan et al., 2022). As a result of SCM's ability to facilitate cost and service trade-offs, businesses may boost their economic performance and the quality of the services they provide significantly simultaneously (Harb & Trad, 2023; Karimi & Rafiee, 2014). To put it simply, SCM includes everything a firm does to create, distribute, and make use of its products or services. Logistics is often seen as a value-adding activity in the supply chain and is thus an essential aspect of supply chain management (Karim, Tahera, & Nasrin, 2020). Logistics, in general, aids businesses in enhancing their client services by increasing their efficacy, efficiency, and/or competitive advantage. Deducing from this that SCM's primary goal is to generate, develop, or increase customer value (Al-Rawashdeh, Jawabreh, & Ali, 2023; Ali, 2022; Nandi, Nandi, Moya, & Kaynak, 2020) is a reasonable assumption. But SCM is more than just logistics under a different name. It includes things like coordinating planning and control operations and integrating information systems (Tien, Anh, & Thuc, 2019), which are not normally part of the definition of logistics. Additionally, businesses work hard to provide and fulfil orders free of flaws while also meeting all of the customers' wants and needs (Kanan et al., 2022; Mohammad Kanan et al., 2023). To do this, businesses must work in tandem with their supply chain partners and current members (Ali, 2022; Kartika et al., 2020).

* Corresponding author
 E-mail address zaher@ubt.edu.sa (Z. Abusaq)

Supply chain management (SCM) was described by (Maina & Mwangangi, 2020) as a system that links raw material suppliers, manufacturing facilities, and distribution hubs to consumers. Supply chain management, or the value chain, is the order in which goods and services are created and distributed. In addition to the manufacturer and its suppliers, the supply chain also includes logistics providers, storage facilities, wholesalers, retailers, and ultimately, the end consumers (Mostafa, Hamdy, & Alawady, 2019). According to the aforementioned definitions (Akam, Sunday, Etuk, Ejikeme, & Arikpo, 2023; Al-Rawashdeh et al., 2023; Ali, 2022), integration is an essential part of supply chain management. As a result, integration is now a key part of most modern definitions of SCM (Ivanov, 2021). Specifically, Copacino defined “the new vision of supply chain management” (Ali, 2022; Harb & Trad, 2023), and connects all the parties involved in converting raw materials into products and offering them to consumers at the right time and at the right place in the most efficient manner, thereby illustrating the importance of integration.

Furthermore, a company may have more than one source of competitive advantage (CA), which may include things like product quality, pricing, operations, and connections with customers (Atnafu & Balda, 2018). Companies compete fiercely to meet consumers' demands for ever-improving goods and services at ever-lower rates. This has resulted in improved customer interactions relationships (Al-Rawashdeh et al., 2023; Shukla & Pattnaik, 2019). as businesses work harder to listen to and meet the needs of their clients. In order to better serve the end customers and consumers, as well as to improve the performance of the individual supply chain members, these supply chain strategies emphasize the integration and coordination of internal and external business processes throughout the supply chain (Al-Rawashdeh et al., 2023). However, there are two gaps that should be pointed up in the current research. The first is the paucity of studies on supply chain management (SCM) and customer relationship management (CRM) in Jordanian manufacturing firms. This includes studies of manufacturing, outsourcing, channel, and customer service strategies, as well as the performance of the supply chain as a whole.

The second shortcoming concerns the analysis of the links between SCM and CA. Indeed, many studies link SCM strategies and CA development, but they remain, more often than not, scattered and incomplete (Shukla & Pattnaik, 2019). First, few make the effort to clarify or explain the relationship between these two variables, most often treating this phenomenon as a black box. In addition, these studies often focus on certain local aspects of SCM and, for example, on a company's relationships with its suppliers (Atnafu & Balda, 2018), the integration of logistics systems within a company (Rudberg & Olhager, 2003) or a company's relations with its distributors (Shukla & Pattnaik, 2019). Therefore, it is essential to carry out an evaluation of the impact of SCM strategies on CA and the role of the quality of information sharing as a moderating variable.

2. Literature Review and Hypotheses Development

This study's hypotheses include the ideas of CA, strategic supplier partnerships, customer relationships, the level of information sharing, and the quality of information sharing.

2.1 Competitive Advantage

When looking at supply networks from a resource viewpoint, the most important issue to ask is whether or not their characteristics are uncommon, valuable, and easy to replicate. Only one firm in the market may have a competitive advantage (CA) if it has access to these strategic resources (Barney, 2015).. A corporation may get a CA if its operations are better coordinated. Optimising a process is another route to CA achievement. One function's optimisation shouldn't come at the price of others, however (Porter, 1985).

A CA may be obtained by being the least expensive rival or by distinguishing oneself. (Porter, 1985). Cost savings and improved agility (response time) to changing client demands are what really count for a CA in the supply chain industry (Taghipour, Barzegar, Mahboobi, & Mohammadi, 2020). If a firm is striving to significantly reduce costs, more effort is needed in terms of cooperation, coordination, collaboration and integration between firms (Diehlmann et al., 2021). A global SCM must include the service requirements of customers in different regions since the supply chain's ultimate purpose is to meet the requirements of the end customers. When market circumstances change, supply chain strategy must be readjusted accordingly. It has been stated . (Piprani, Jaafar, & Mohezar Ali, 2020) that worldwide expansion of rapidly expanding businesses need innovative approaches to supply chain management.

2.2 Strategic Supplier Partnerships

The firms of the future will be those that work together with their suppliers (Alshourah, Alassaf, & Altawalbeh, 2018). The ramifications of this are clear today. Long-term contracts with suppliers, increased supplier diversity, and streamlined operations are all direct outcomes of this trend (Doblinger, Surana, Li, Hultman, & Anadón, 2022). To better manage cash flow, businesses are cutting down on the number of suppliers they work with and forming strategic partnerships with a chosen few (Moosivand, Ghatari, & Rasekh, 2019). According to (Ye & Lau, 2022), businesses may get a sustainable CA via the synergistic use of in-house resources and those of external vendors. The creation of unique goods could benefit from combined

talents. Also, research from (Handfield & Nichols Jr, 2004) shows that firms still need to keep up with their suppliers even if they're struggling economically. Risks may be shared and synergies realised via strategic partnerships with vendors (Bonamigo, Dettmann, Frech, & Werner, 2020). Strategic and operational competencies of supply chain members are typically leveraged in long-term interactions between a firm and its suppliers (Al-Hussein, Alabdallat, Abu, Rumman, & Ali, 2023; Alanazeh et al., 2023; Alhaj et al., 2023). Through strategic collaboration, businesses try to assist each other achieve substantial and enduring advantages (Alzoubi, Ahmed, Al-Gasaymeh, & Kurdi, 2020). Strategic supplier management may boost operational efficiency in terms of dependability, flexibility, cost, and quality. (Tarigan & Siagian, 2021). Thus, we propose the following hypotheses:

H₁: *Strategic supplier partnerships influence CA.*

2.3 Customer Relationships

The concept of customer relationship management (CRM) emerged in the 1980s, and the phrase "relationship marketing" (RM) was used in 1983 by Berry, who described it as "efforts in sustaining and increasing loyal relationships with customers" (Bordallo, 2022). Relationship management (RM) aims to establish and sustain productive partnerships with clients, whether they are consumers, dealers, or distributors (Bordallo, 2022). Based on RM theory, Bashir's 2017 quantitative research and evaluation of CRM's effect on customer retention in the banking industry in Punjab, India discovered positive results. According to Bashir, a well-implemented CRM system may boost customer retention rates and satisfaction by facilitating the efficient management of data and the enhancement of retention-promoting offerings. Research has also been done on the topic of customer relationship management (CRM) and its use in a variety of sectors, including the food and grocery retail sector.

In the context of professional marketing publications providing a comprehensive view of contemporary marketing or specialised publications centred solely on CRM and RM (Starzyczna, Pellešová, & Stoklasa, 2017), many marketing professionals likely derive and gain knowledge of CRM and RM. (Al tarawneh, Alqaraleh, Ali, & Bani Atta, 2023; Nawaiseh et al., 2022; Shan et al., 2022; Shniekat, AL_Abdallat, Al-Hussein, & Ali, 2022) conducted a quantitative study to analyse and contrast the outcomes of customer relationship management (CRM) in small and medium-sized Czech businesses in 2015, 2010, and 2005. RM encompasses CRM and developed from transactional shifts in company marketing (Starzyczna et al., 2017). Based on their research, Starzyczna et al. (2017) found that organisations which prioritise customers via strategic marketing management are more likely to have positive financial outcomes, whereas only a small percentage of enterprises fail at CRM because their focus on customers was insufficient. So, we'd like to suggest the following:

H₂: *Customer relationships influence CA.*

2.4 Level of Information Sharing

There are two elements to information dissemination: quantity and quality. Both are important for SCM procedures and have been the subject of prior study as distinct concepts (Karimi & Rafiee, 2014). The level (quantity aspect) of information sharing refers to how much private and crucial data is shared with one's supply chain partner (Gamini & Rajapaksa, 2020). Information exchanged between businesses may be both strategic and tactical in character, from details on logistical operations to data about the market at large and individual customers (Afande, Ratemo, & Nyaribo, 2015),

According to Chileshe and Phiri (2022), a robust supply chain link is made up of five components, one of which is the exchange of information. By gathering publicly accessible data and sharing it with other stakeholders throughout the supply chain, information may be used as a source of CA (Saber, Bahraami, & Haery, 2014).. Researchers agree that having up-to-date marketing information available at all points in the supply chain is crucial to running well (Karimi & Rafiee, 2014). In addition, Lemma (2021) highlighted the need of accurate and timely information utilisation by all supply chain functional components as a critical competitive and differentiating aspect. According to research (Rudyanto, Soemarni, Pramono, & Purwanto, 2020), companies in a supply chain may more effectively work together when they share information regularly. They can adapt to market shifts more rapidly and better meet the demands of the final consumer if they work together. According to empirical research (Chileshe, 2022), a streamlined material flow, which includes making widely visible all information travelling throughout the chain, is crucial to a well-functioning supply chain. As a result, we suggest the following:

H₃: *The level of information sharing influences CA.*

2.5 Information Sharing Quality

Typically, information sharing is seen in terms of quantity and quality. Numerous research have been conducted to investigate how information sharing influences supply chain members' methods and profitability (Gamini & Rajapaksa, 2020). Businesses share demand-related information with their upstream and downstream partners to better plan and coordinate logistics and production-related operations (Al-Rawashdeh et al., 2023; Quynh & Huy, 2018). Information sharing helps both suppliers and

manufacturers because suppliers may modify their wholesale and acquisition pricing to establish equilibrium between forward and backward flows (Kanan et al., 2023; Mohammad Kanan et al., 2023). As a result, information sharing is expected to improve corporate operations. The number and quality of information sharing are both critical (Alqaraleh, Almari, Ali, & Oudat, 2022; Alrabei, Al-Othman, Al-Dalabih, Taber, & Ali, 2022; Gharaibeh, Saleh, Jawabreh, & Ali, 2022; Hassan, Aldoseri, Saeed, Khder, & Ali, 2022). Massive amounts of low-quality information shared across supply chain participants might hinder the usefulness of general information sharing. (Marinagi, Trivellas, & Reklitis, 2015) suggested that information sharing among supply chain partners promotes higher overall performance through the enforcement of SCMPs. This, in turn, improves the reliability and quality of the information shared. Information sharing may be enhanced via effective and user-friendly information technology solutions (Yang & Maxwell, 2011). However, the expansion of information sharing is hindered by the high price and high complexity of technological solutions, especially for small and medium-sized businesses. (Quynh & Huy, 2018). Therefore, the following possibilities are offered:

H4: *Quality information sharing moderates the relationship between strategic supplier partnerships and CA.*

H5: *Quality information sharing moderates the relationship between customer relationships and CA.*

H6: *Quality information sharing moderates the relationship between the level of information sharing and CA.*

3. Research Methodology

This study used a quantitative research methodology to investigate the structural relationships between customer relationships, level of information sharing, strategic supplier partnerships, and CA of Saudi Arabian manufacturing enterprises, with the quality of information sharing serving as a moderator. Figure 1 shows the theoretical framework of the impact of SCM strategies on CA and the role of the quality of information sharing as a moderating variable.

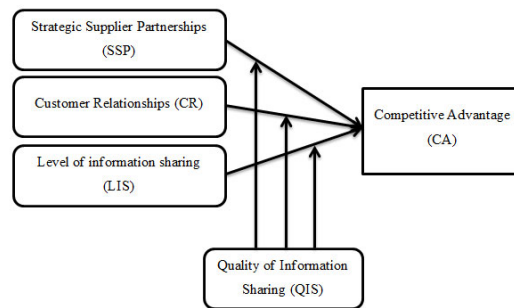


Fig. 1. Theoretical framework

A survey questionnaire was prepared and delivered to a convenience sample of 550 supply chain personnel. 331 genuine replies were obtained from the 550 distributed questionnaires, yielding a response rate of 60.2%.

The questionnaire had five dimensions that were measured: customer relationships, the level of information sharing, strategic supplier partnerships, CA, and the quality of information sharing. The questions were taken from prior research (Al-Rawashdeh et al., 2023; Ali, 2022). and were scored on a Likert scale with points with scores ranging from one (strongly disapproving) to seven (which is strongly agree). The data was analysed using the partial least squares structural equation modelling (PLS-SEM4) approach. The research included measurement model validity and reliability, hypothesis testing, and structural model assessment. In summary, a survey questionnaire was used to collect data from 333 Saudi Arabian employees, and the findings were evaluated using the PLS-SEM approach.

Table 1

Questionnaire items

No.	Variable	No. of items	Reference
1	Strategic supplier partnerships	6	(Al-Rawashdeh et al., 2023)
2	Customer relationships	7	(Al-Rawashdeh et al., 2023)
3	Level of information sharing	6	(Al-Rawashdeh et al., 2023)
4	Competitive advantage	7	(Saber et al., 2014)
5	Quality of information sharing	7	(Ellitan & Muljani, 2017)

4. Analysis and Discussion

The PLS structural equation may be deconstructed into two component elements known as the method of measurement and the structure approach. The measurement model describes the conceptual model's reliability and validity, while the structural

model specifies the latent component path coefficients. Both models capture the interactions between and among the latent variables. Fig. 2 depicts the measuring model used in this investigation.

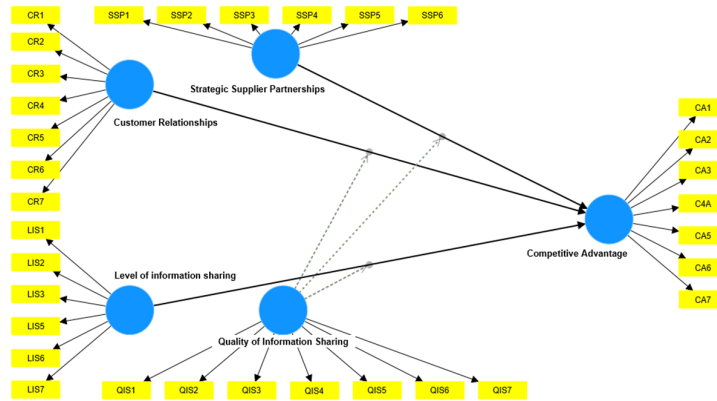


Fig. 2. Measurement model

Outer Loadings

According to (Hair Jr, Howard, & Nitzl, 2020), the link between the latent concept and its measurable indicators is represented by the outer loadings in PLS-SEM. The route diagram in the SmartPLS software shows the factor loadings of each indicator on its related build. The indicator’s construct’s strength may be inferred from its outer loading value, which should be more than 0.7, ideally. Standard error estimates and significance tests for the outer loadings may be conducted with the use of bootstrapping methods, with a p-value below 0.05 suggesting a strong association between the indicator and its construct. As a whole, assessing outside loadings in SmartPLS may strengthen confidence in the indicators being monitored (Hair Jr et al., 2020). All were more than 0.7 in this study, as seen in Table 2; thus, they were accepted.

Table 2

Outer loadings

	Competitive advantage	Customer relationships	Level of information sharing	Quality of information sharing	Strategic supplier partnerships
CA1	0.796				
CA2	0.739				
CA3	0.722				
CA5	0.774				
CA4	0.811				
CA6	0.733				
CA7	0.799				
CR1		0.795			
CR2		0.806			
CR3		0.746			
CR4		0.782			
CR5		0.762			
CR6		0.793			
CR7		0.777			
LIS1			0.784		
LIS2			0.817		
LIS3			0.816		
LIS5			0.869		
LIS6			0.814		
LIS7			0.805		
QIS				0.723	
QIS				0.867	
QIS				0.900	
QIS				0.876	
QIS				0.847	
QIS				0.868	
QIS				0.853	
SSP					0.812
SSP					0.844
SSP					0.825
SSP					0.655
SSP					0.823
SSP					0.798

Construct Reliability and Validity

As seen in Table 3, reliability analysis was performed to evaluate the steadiness and precision of the measuring instruments. Composite reliability, average variance extracted (AVE) and Cronbach's alpha were used to assess consistency. All constructions showed high levels of dependability in the findings. Over and above the minimally acceptable level of 0.7 (Hair Jr et al., 2020), Cronbach's alpha values varied from 0.882 to 0.935. This indicated strong coherence between the various components of the framework. Furthermore, the combined reliability coefficients fell within a 0.888–0.938 range (Hair Jr et al., 2020). When compared with the cutoff of 0.7, these results showed high dependability and consistency among the constructions. The AVE values were between 0.59 and 0.72 (Fornell & Larcker, 1981), far higher than the threshold of 0.5 typically used to indicate adequate representation of the latent variables.

Overall, the construct measuring scales showed high reliability [43]: CA, customer relationships, level of information sharing, quality of information sharing and strategic supplier partnerships. The reliability of the measuring tools was therefore confirmed.

Table 3

Cronbach's alpha and composite reliability

	Cronbach's alpha	Composite reliability (rho a)	Composite reliability (rho c)	Average variance extracted
Competitive advantage	0.884	0.888	0.910	0.590
Customer relationships	0.893	0.896	0.916	0.609
Level of information sharing	0.901	0.904	0.924	0.669
Quality of information sharing	0.935	0.938	0.947	0.721
Strategic supplier partnerships	0.882	0.890	0.911	0.633

Structural Model

PLS-SEM enables the investigation of complicated model-level connections between variables. In this investigation, a structural equation model (also known as S analysis) was built using the SmartPLS 4 program (Hair Jr et al., 2020). The latest version of SmartPLS (Hair Jr et al., 2020) has powerful analytic features for assessing and understanding models. While customer relationships, level of information sharing and strategic supplier partnerships were the independent factors, CA was the dependent factor. Moreover, the quality of information sharing was a moderator.

The complicated causal linkages between the latent variables and their observable indicators could be evaluated using SmartPLS 4. Both the measurement model, which determined how the latent variables were linked to their observable indicators, and the structural model, which investigated how the latent variables affected the dependent variable, were assessed in tandem.

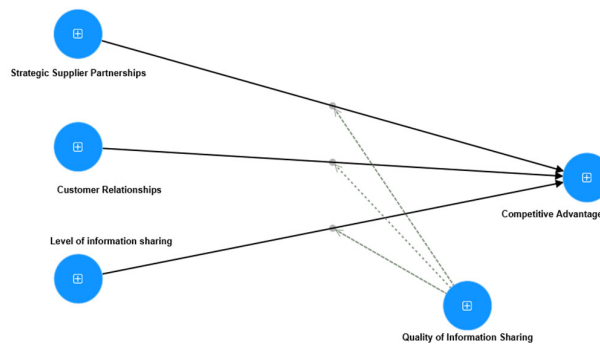


Fig. 3. Structural model

Discriminant Validity

Discriminant validity is a statistical notion that verifies the uniqueness of each construct tested in research. Using the square root of the AVE for each construct and the correlations between the constructs, we evaluated the measures' discriminant validity. Table 4 shows that the AVEs for the constructs were higher than the correlations between them, indicating acceptable levels of discriminant validity (Hair Jr et al., 2020). For example, the AVE for CA was higher than its correlations with customer relationships, level of information sharing, quality of information sharing and strategic supplier partnerships, indicating that the AVE for CA was more predictive of performance than any of the other constructs. This demonstrated that CA was distinctive and useful in ways that the other concepts described here were not. Similarly, customer relationships, information sharing level, information sharing quality and strategic supplier partnerships all had greater AVE values than their correlations with other variables, highlighting their uniqueness. Furthermore, the AVE values for the interactions between quality of information sharing and the other constructs (level of information sharing, customer relationships and strategic supplier partnerships) were higher than the correlations with other constructs, indicating acceptable discriminant validity. In general, the constructs had sufficient discriminant validity based on a correlation matrix.

Table 4
Discriminant validity

	Competitive advantage	Customer relationships	Level of information sharing	Quality of information sharing	Strategic supplier partnerships	Quality of information sharing x level of information sharing	Quality of information sharing x customer relationships	Quality of information sharing x strategic supplier partnerships
Competitive advantage								
Customer relationships	0.871							
Level of information sharing	0.709	0.644						
Quality of information sharing	0.604	0.601	0.705					
Strategic supplier partnerships	0.710	0.613	0.801	0.703				
Quality of information sharing x level of information sharing	0.346	0.346	0.437	0.373	0.411			
Quality of information sharing x customer relationships	0.168	0.218	0.340	0.298	0.293	0.773		
Quality of information sharing x strategic supplier partnerships	0.387	0.304	0.421	0.354	0.398	0.865	0.748	

Path Coefficients

In a structural equation model, the intensity and direction of the associations between the independent variables and the dependent variable are represented by path coefficients. The influence of each independent variable on the dependent variable is represented by its coefficient. The path coefficients between the independent variables and CA of Saudi Arabian manufacturing firms were analysed in this research. An initial 0.583 route coefficient was identified between customer relationships and CA. This suggested a positive correlation ($p=0.001$) between the two, with better customer relationships leading to a higher CA. Additionally, a 0.152 correlation between the degree to which information was shared and a company's competitive advantage was found. The correlation between supply chain transparency and CA was strong ($p=0.01$), showing that more open communication between firms improved performance. However, between quality of information sharing and CA, the path coefficient was calculated as 0.014, which was not significant ($p=0.789$), suggesting that the quality of information sharing may not be sufficient to provide manufacturers with a major edge in the marketplace. In addition, a statistically significant relationship ($p=0.01$) between strategic supplier partnerships and CA was revealed, which indicated that establishing solid bonds with key suppliers might help provide a business with an edge in the market. We also looked at the ways in which information sharing quality, customer relationships and strategic supplier partnerships interacted with one another and with the level of information sharing. The calculated values for the path coefficients were 0.063, 0.146 and -0.215 , respectively. The sole significant interaction was quality of information sharing x customer relationships ($p=0.01$), demonstrating a positive effect on CA. These results emphasised the significance of customer relationships, information exchange and strategic supplier partnerships in generating CA for Saudi Arabian manufacturing firms.

Table 5
Coefficients

	Path coefficient	Mean	Standard Deviation	t-statistic	p-value
Customer relationships → competitive advantage	0.583	0.577	0.056	10.421	0.000
Level of information sharing → competitive advantage	0.152	0.160	0.058	2.640	0.008
Quality of information sharing → competitive advantage	0.014	0.018	0.053	0.268	0.789
Strategic supplier partnerships → competitive advantage	0.170	0.164	0.055	3.101	0.002
Quality of information sharing x level of information sharing → competitive advantage	0.063	0.071	0.056	1.119	0.263
Quality of information sharing x customer relationships → competitive advantage	0.146	0.137	0.048	3.048	0.002
Quality of information sharing x strategic supplier partnerships → competitive advantage	-0.215	-0.213	0.050	4.286	0.000

R-squared

The R-squared statistic calculates the amount of variation in the dependent factor (i.e. CA) that can be explained by the model's independent variables. The R-squared value for CA was 0.717, as seen in Table 6, suggesting that the independent factors evaluated could explain roughly 71.7% of the variation in CA. Meanwhile, the adjusted R-squared statistic is a variant of the R-squared statistic that accounts for the number of independent variables and sample size. The modified R-squared value for CA was 0.709 in Table 6. Given the number of variables and data points in the research, this adjusted value compensated for the model's complexity and offered a more accurate estimate of the proportion of variation explained by the independent variables.

Overall, these R-squared figures showed that the model's independent variables could explain a significant percentage of the variance in CA, thus implying that the independent factors considered were significant predictors of CA in the context of the research.

Table 6
R-squared

	R-squared	R-squared adjusted
Competitive advantage	0.717	0.709

5. Discussion and Conclusion

The purpose of this research was to determine the influence of SCM methods on the CA of Saudi Arabian manufacturing firms, with a particular emphasis on the function of information sharing quality as a moderating variable. The study's results shed light on the links between numerous characteristics and CA and provided significant insights for both academic researchers and SCM practitioners. According to the findings, customer relationships, the information sharing level and strategic supplier partnerships all had beneficial impacts on CA. These results were consistent with earlier research that emphasised the significance of strong customer relationships, effective information exchange and robust collaborations with suppliers in gaining a CA (Li et al., 2018; Wang et al., 2019). Hence, Saudi manufacturing firms may improve their competitiveness by developing customer-centric practices, encouraging information exchange throughout the supply chain and building strategic collaborations with suppliers. Furthermore, we looked at the impact of information sharing quality as a moderator in the link between SCM techniques and CA. The influence of information sharing quality alone on CA was determined to be statistically negligible. This implies that although information exchange is vital, information quality by itself may not have a significant influence on CA. To obtain more thorough knowledge of the impact of information sharing quality on CA, future studies might dive further into the precise dimensions and processes of information sharing quality. We also presented empirical evidence of the influence of customer relationships, the information sharing level and strategic supplier partnerships on the CA of Saudi Arabian manufacturing firms. A company may improve its competitive position in the changing business climate by cultivating strong customer relationships, supporting effective information sharing methods and creating collaborative collaborations with key suppliers, and practitioners must realise the strategic value of these characteristics and apply them to their SCM plans. Notably, however, the quality of information exchange may not immediately contribute to CA. Thus, companies should concentrate not only on the quantity but also on the quality and relevance of shared information to achieve their full potential for increasing CA.

This research adds to the current literature on SCM strategies and CA by providing significant insights relevant to Saudi Arabian manufacturing firms. The results have practical consequences for these organisations' managers and decision-makers, allowing them to develop successful strategies that harness customer relationships, information exchange and supplier alliances to obtain a competitive advantage in the marketplace. Other studies may be conducted to expand these results by investigating other factors and dimensions that impact CA in the Saudi industrial sector. Longitudinal studies may also be carried out to evaluate the long-term effect and durability of SCM methods on CA.

In sum, this research underlines the strategic importance of SCM techniques and the role of customer relationships, information exchange and supplier partnerships in generating CA for Saudi Arabian manufacturing firms.

References

- Afande, F. O., Ratemo, B. M., & Nyaribo, F. N. (2015). Adoption of supply chain management practices: Review of determining factors. *Innovative Systems Design and Engineering*, 6(5), 72-77.
- Akam, M. J., Sunday, E. G., Etuk, I. U., Ejikeme, O. B., & Arikpo, N. N. (2023). The role of integrated coordination in supply chain performance of firms in the manufacturing industry. *International Journal of Integrated Supply Management*, 16(1), 26-51.
- Al-Hussein, M. A.-H. A., Alabdallat, W. I. M., Abu, M. A., Rumman, O. J., & Ali, B. J. (2023). Impact of E-Government Applications on Reducing Administrative Burden in Delivering Public Service. *Information Sciences Letters*, 12(3), 1663-1671 doi:<http://dx.doi.org/10.18576/isl/120350>
- Al-Rawashdeh, O. M., Jawabreh, O., & Ali, B. J. (2023). Supply Chain Management and Organizational Performance: The Moderating Effect of Supply Chain Complexity. *Information Sciences Letters*, 12(3), 1673-1684. doi:<http://dx.doi.org/10.18576/isl/120351>
- Al tarawneh, E., Alqaraleh, M. H., Ali, B., & Bani Atta, A. (2023). The Impact of the Efficiency and Effectiveness of Electronic Accounting Information Systems on the Quality of Accounting Information. *Information Sciences Letters*, 12(3), 1685-1692. doi:<http://dx.doi.org/10.18576/isl/120352>
- Alananzeh, O. A., Almuhausen, F., Jawabreh, O., Fahmawee, E. A. D. A., Ali, B. J., & Ali, A. (2023). The Impact of Job Stability, Work Environment, Administration, Salary and Incentives, Functional Justice, and Employee Expectation on the Security Staff's Desire to Continue Working at the Hotel. *Journal of Statistics Applications & Probability*, 12(2), 425-439. doi:<http://dx.doi.org/10.18576/jsap/120209>
- Alhaj, A., Zanoon, N., Alrabea, A., Alnatsheh, H., Jawabreh, O., Abu-Faraj, M., & Ali, B. J. (2023). Improving the Smart Cities Traffic Management Systems using VANETs and IoT Features. *Journal of Statistics Applications & Probability*, 12(2), 405-414. doi:<http://dx.doi.org/10.18576/jsap/120207>
- Ali, B. J. (2022). Integration of Supply Chains and Operational Performance: The Moderating Effects of Knowledge. *Information Sciences Letters*, 11(04), 1069-1076. doi:10.18576/isl/110407

- Alqaraleh, M. H., Almari, M. O. S., Ali, B., & Oudat, M. S. (2022). The mediating role of organizational culture on the relationship between information technology and internal audit effectiveness. *Corporate Governance and Organizational Behavior Review*, 6(1), 8-18. doi:<https://doi.org/10.22495/cgobrv6i1p1>
- Alrabei, A. M., Al-Othman, L. N., Al-Dalabih, F., Taber, T. A., & Ali, B. (2022). The Impact of Mobile Payment on the Financial Inclusion Rates. *Information Sciences Letters*, 11(4), 1033-1044. doi:10.18576/isl/110404
- Alshourah, S., Alassaf, H., & Altawalbeh, M. (2018). Roles of top management and customer orientation in enhancing the performance of customer relationship management (CRM) in hotel industry. *International Journal of Advance Research and Innovation*, 6(3), 233-239.
- Alzoubi, H., Ahmed, G., Al-Gasaymeh, A., & Kurdi, B. (2020). Empirical study on sustainable supply chain strategies and its impact on competitive priorities: The mediating role of supply chain collaboration. *Management Science Letters*, 10(3), 703-708.
- Atnafu, D., & Balda, A. (2018). The impact of inventory management practice on firms' competitiveness and organizational performance: Empirical evidence from micro and small enterprises in Ethiopia. *Cogent Business & Management*, 5(1), 1503219.
- Barney, J. (2015). 5. Firm resources and sustained competitive advantage. *Journal of Mana.*
- Bonamigo, A., Dettmann, B., Frech, C. G., & Werner, S. M. (2020). Facilitators and inhibitors of value co-creation in the industrial services environment. *Journal of Service Theory and Practice*, 30(6), 609-642.
- Bordallo, D. C. (2022). *Exploration of Successful Customer Relationship Management Strategies in Guam Supermarkets*. Walden University.
- Chileshe, M. J. (2022). *The impact of supply chain management practices on performance of small and medium enterprises. a case of agro-dealers in Lusaka.*
- Chileshe, M. J., & Phiri, J. (2022). The impact of supply chain management practices on performance of small and medium enterprises in developing countries: a case of agro-dealers in Zambia. *Open Journal of Business and Management*, 10(2), 591-605.
- Diehlmann, F., Lüttenberg, M., Verdonck, L., Wiens, M., Zienau, A., & Schultmann, F. (2021). Public-private collaborations in emergency logistics: A framework based on logistical and game-theoretical concepts. *Safety science*, 141, 105301.
- Doblinger, C., Surana, K., Li, D., Hultman, N., & Anadón, L. D. (2022). How do global manufacturing shifts affect long-term clean energy innovation? A study of wind energy suppliers. *Research Policy*, 51(7), 104558.
- Ellitan, L., & Muljani, N. (2017). The effect of information sharing and quality of information on the performance of supply chain: the case of east java manufacturing smes. *International Journal of Advanced Research (IJAR)*, 593-5407.
- Fornell, C., & Larcker, D. F. (1981). *Structural equation models with unobservable variables and measurement error: Algebra and statistics*: Sage Publications Sage CA: Los Angeles, CA.
- Gamini, L., & Rajapaksa, P. (2020). Impact of Supply Chain Management Practices on Competitive Advantage and Organization Performance: Evidence from the Manufacturing Industry in Sri Lanka.
- Gharaibeh, A. T., Saleh, M. H., Jawabreh, O., & Ali, B. (2022). An empirical study of the relationship between earnings per share, net income, and stock price. *Applied Mathematics*, 16(5), 673-679. doi: <http://dx.doi.org/10.18576/amis/160502>
- Hair Jr, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 109, 101-110.
- Handfield, R. B., & Nichols Jr, E. L. (2004). Key issues in global supply base management. *Industrial marketing management*, 33(1), 29-35.
- Harb, A., & Trad, M. (2023). Assessing the Impact of Supply Chain Management Processes on the Lebanese Industry of Goods and Services During Times of Uncertainty. *Arab Economic and Business Journal*, 15(1), 7.
- Hassan, W. M., Aldoseri, D. T., Saeed, M. M., Khder, M. A., & Ali, B. J. (2022). *Utilization of Artificial Intelligence and Robotics Technology in Business*. Paper presented at the 2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS).
- Ivanov, D. (2021). Lean resilience: AURA (Active Usage of Resilience Assets) framework for post-COVID-19 supply chain management. *The International Journal of Logistics Management*.
- Kanan, M., Al-Khalili, R., Alshaibani, E., Saleh, Y., Assaf, R., Al-Mimi, A., & Bakir, A. (2023). Assessing Service Quality at Optical Centers in Palestine Using SERVQUAL: Measuring Ambiguity.
- Kanan, M., Habib, M. S., Habib, T., Zahoor, S., Gulzar, A., Raza, H., & Abusaq, Z. (2022). A Flexible Robust Possibilistic Programming Approach for Sustainable Second-Generation Biogas Supply Chain Design under Multiple Uncertainties. *Sustainability*, 14(18), 11597.
- Kanan, M., Zahoor, S., Habib, M. S., Ehsan, S., Rehman, M., Shahzaib, M., . . . Hamdan, A. (2023). Analysis of Carbon Footprints and Surface Quality in Green Cutting Environments for the Milling of AZ31 Magnesium Alloy. *Sustainability*, 15(7), 6301.
- Karim, M., Tahera, U., & Nasrin, S. (2020). Supply Chain Management: Materialization of Process Management to Attain Greater Accomplishment in Business Function. *Fareast International University Journal*, 104.
- Karimi, E., & Rafiee, M. (2014). Analyzing the impact of supply chain management practices on organizational performance through competitive priorities (case study: Iran pumps company). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 4(1), 1-15.

- Kartika, H., Norita, D., Triana, N. E., Roswandi, I., Rahim, A., Naro, A., . . . Suprihatiningsih, W. (2020). Six sigma benefit for Indonesian pharmaceutical industries performance: a quantitative methods approach. *Systematic Reviews in Pharmacy*, *11*(9), 466-473.
- Lemma, T. B. (2021). *The effect of supply chain management practices on competitive advantage: the case of dangote cement company/ethiopia plc*.
- Maina, J., & Mwangangi, P. (2020). A critical review of simulation applications in supply chain management. *Journal of Logistics Management*, *9*(1), 1-6.
- Marinagi, C., Trivellas, P., & Reklitis, P. (2015). Information quality and supply chain performance: The mediating role of information sharing. *Procedia-Social and Behavioral Sciences*, *175*, 473-479.
- Moosivand, A., Ghatari, A. R., & Rasekh, H. R. (2019). Supply chain challenges in pharmaceutical manufacturing companies: using qualitative system dynamics methodology. *Iranian journal of pharmaceutical research: IJPR*, *18*(2), 1103.
- Mostafa, N., Hamdy, W., & Alawady, H. (2019). Impacts of internet of things on supply chains: a framework for warehousing. *Social sciences*, *8*(3), 84.
- Nandi, M. L., Nandi, S., Moya, H., & Kaynak, H. (2020). Blockchain technology-enabled supply chain systems and supply chain performance: a resource-based view. *Supply Chain Management: An International Journal*, *25*(6), 841-862.
- Nawaiseh, K. H. A., Alawamleh, H., Al Shibly, M., Almari, M., Orabi, T. A., Jerisat, R., . . . Badadwa, A. (2022). The Relationship Between the Enterprise Resource Planning System and Maintenance Planning System: An Empirical Study. *Information Sciences Letters*, *11*(5), 1-11. doi:<https://digitalcommons.aaru.edu.jo/isl/vol11/iss5/2>
- Piprani, A. Z., Jaafar, N. I., & Mohezar Ali, S. (2020). Prioritizing resilient capability factors of dealing with supply chain disruptions: an analytical hierarchy process (AHP) application in the textile industry. *Benchmarking: An International Journal*, *27*(9), 2537-2563.
- Porter, M. E. (1985). Technology and competitive advantage. *Journal of business strategy*, *5*(3), 60-78.
- Quynh, D. V. X., & Huy, N. H. (2018). Supply chain management practices, competitive advantages and firm performance: A case of small and medium enterprises (SMEs) in Vietnam. *Journal of modern accounting and auditing*, *14*(3), 136-146.
- Rudberg, M., & Olhager, J. (2003). Manufacturing networks and supply chains: an operations strategy perspective. *Omega*, *31*(1), 29-39.
- Rudyanto, R., Soemarni, L., Pramono, R., & Purwanto, A. (2020). The influence of antecedents of supply chain integration on company performance. *Uncertain Supply Chain Management*, *8*(4), 865-874.
- Saber, Z., Bahraami, H. R., & Haery, F. A. (2014). Analysis of the impact of supply chain management techniques: A competitive advantage in the market. *International Journal of Academic Research in Economics and Management Sciences*, *3*(1), 75.
- Shan, R., Xiao, X., Dong, G., Zhang, Z., Wen, Q., & Ali, B. (2022). The influence of accounting computer information processing technology on enterprise internal control under panel data simultaneous equation. *Applied Mathematics and Nonlinear Sciences*, *aop*(aop), 1-9. doi:10.2478/amns.2022.2.0157
- Shniekat, N., AL Abdallat, W., Al-Hussein, M., & Ali, B. (2022). Influence of Management Information System Dimensions on Institutional Performance. *Information Sciences Letters*, *11*(5), 435-1443. doi:10.18576/isl/110512
- Shukla, M. K., & Pattnaik, P. N. (2019). Managing customer relations in a modern business environment: towards an ecosystem-based sustainable CRM model. *Journal of Relationship Marketing*, *18*(1), 17-33.
- Starzyczná, H., Pellešová, P., & Stoklasa, M. (2017). The comparison of customer relationship management (CRM) in Czech small and medium enterprises according to selected characteristics in the years 2015, 2010 and 2005. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *65*(5), 1767-1777.
- Taghipour, M., Barzegar, P., Mahboobi, M., & Mohammadi, S. (2020). Investigating the relationship between competitive strategies and corporate performance (case study: Parsian banks of Tehran). *Management*, *3*(4), 13-28.
- Tarigan, Z. J. H., & Siagian, H. (2021). *The effects of strategic planning, purchasing strategy and strategic partnership on operational performance*. Petra Christian University.
- Tien, N. H., Anh, D. B. H., & Thuc, T. D. (2019). Global supply chain and logistics management. *Dehli: Academic Publications*.
- Yang, T.-M., & Maxwell, T. A. (2011). Information-sharing in public organizations: A literature review of interpersonal, intra-organizational and inter-organizational success factors. *Government information quarterly*, *28*(2), 164-175.
- Ye, Y., & Lau, K. H. (2022). Competitive green supply chain transformation with dynamic capabilities—an exploratory case study of Chinese electronics industry. *Sustainability*, *14*(14), 8640.

