

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm**Does digital supply chain flexibility matter? Exploring its impact on smart quality systems and the mediating role of sustainable procurement: A study on five-star hotels in KSA****Ahmad Alamro^{a*}, Abdel-Aziz Ahmad Sharabati^b, Fahad Alofan^c, Mahmoud Allahham^d, Samar Sabra^d and Mohammad khalaf Daoud^e**^aMarketing Department, Faculty of Business, Applied science private university, Amman 11811 Jordan^bBusiness Department, Business Faculty, Middle East University, Amman 11831 Jordan^cDepartment of Business Administration, College of Business & Economics, Qassim University, Buraidah 51431, Saudi Arabia^dDepartment of Supply Chain and Logistics, College of Business, Luminus Technical University College, Jordan^eDigital Marketing Department, Faculty of Business, Jadara University, Irbid, Jordan**ABSTRACT***Article history:*

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This paper aims to explore the influence of digital supply chain flexibility in five-star Hotels on smart quality systems together with its mediating effect through sustainable procurement practices within KSA. The methodology used is quantitative, based on data collected from a sample of five-star Hotels in KSA. Based on the above findings, this study argues about an integral part of DSCF (Digital Supply Chain Flexibility), SP and SQS for adopting theoretical framework. In this study, partial least squares-structural equation modelling (PLS-SEM) was used to validate the hypotheses. Digital supply chain flexibility has a significant positive relationship with sustainable procurement practices and smart quality systems in five-star Hotels. This means that actions such as fostering sustainable procurement practices could act on the ability of digital supply chain flexibility to boost smart quality systems, which play a role in enhancing operational efficiency and service quality. This paper contributes to the examination of various strategies for digital supply chains with sustainable procurement practices and creative quality systems within the hospitality sector; particularly focusing on KSA. Although the research findings are constrained to five-star Hotels from KSA they offer important directions for future research in different hospitality settings. These results provide practical information for hotels managers and policymakers on how digital supply chain flexibility, and sustainable procurement practices combined would contribute to the high-quality service provision as well as operational resilience of five-star Hotels. While these lessons have been drawn from the KSA market, they are also relevant to other hospitality markets with hospitality markets worldwide. This is the first study to examine Mediating Role of Sustainable Procurement and Digital Supply Chain Flexibility Impact on Smart Quality Systems Study in Five-Star Hospitals in KSA.

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1. Introduction

The last few years have marked huge shifts in the business world: scopes of globalization, the increase of global competition; new customers' requirements for quality changes rapidly with developing and growing technology and spreading digital transformation (Shqair & Altarazi, 2022). There have been significant and extraordinary advances in supply chain management, resulting in a critical re-evaluation of how dynamics inherent in supply chains include fundamental intellectual challenges around Supply Chain Management dynamics. This raises a new trend in the sector of supply chain strategy and its importance for increasing business resilience and responsiveness which means digitalizing flexibility from within to manage with cascading changes that this century encounters (Hallikas et al., 2021). For this reason, many studies have addressed

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digital supply chain flexibility as a fundamental part of SC performance, which emphasizes applying Digital Transformations to develop superior capabilities within Supply chain management experience and hence becomes an important factor in their efficiency improvement (Salhieh & Abdallah, 2019). This necessitated a re-evaluation of definitions proposed earlier, regarding the expansion of supply chain management to encompass smart quality systems. Success due to achieving excellence in Innovation, Quality and Flexibility specific to existing or future conditions; needs immediate modification in Business Systems and Governing policies as suggested by a large number of Management scholars. Hence, digital supply chain flexibility is the capability of an organization to quickly adapt (Di Vaio et al., 2023) by incorporating various digital technologies in support thereof; said capability may be characterized as a concept representing everything that contributes towards operationally rendering or improving any aspects of responsiveness, efficiency and resilience within its comprehensive system (Holloway, 2024). Since the researcher's best knowledge, principally among digital supply chain flexibility (DSCF) and smart quality systems (SQS), where no such research has been conducted that highlights a firm's overall contribution to its quality performance specifically related to DSCF (Shehadeh et al., 2024). Our study addresses this important gap. While the DSCF has been dealt with in numerous studies, other issues remain to be resolved. Although some researchers have assessed the impact of DSCF within a 2-dimensional framework (Alkhatib & Momani, 2023), most viewed it as unidimensional and measured using only one indicator (Swafford et al., 2006). It is this gap our study seeks to bridge by establishing two indicators that could better capture SQS: the supply chain flexibility mindset (SCFM) and supply chain flexibility strategy (SCFS). Second, we provide the best of current knowledge and an original empirical examination in this area by using sustainable procurement to mediate DSCF dimensions and SQS (Barhmi et al., 2024). However, SCFM and SCFS on SQS are examined along with the mediating role played by SP in these relationships of manufacturing firms that experience deals about joining supply chains. A recent industry report has flagged this issue whilst also keeping a finger on the pulse of sustainable and flexible supply chain practices; with total industry spend respect to digital supply chain initiatives set for a substantial upward trajectory (Alshawabkeh et al., 2024). This framework allows to distinction of two characteristics of DSCF capabilities and thus contributes towards decomposing the research into various types of forces that may reflect different sources for which companies are capable and sustainable in employing their desired strategic actions. The remainder of the research structure is organized as follows. The next section presents the literature review and describes three hypotheses. In Section 3, we review the quantitative research methodology used and in Section 4 how data screening was done as well as Hypothesis testing results. In Section 5, we detail the contributions of our study and discuss its practical implications and limitations in future research.

Each profession adheres to its own ethical standards, and working in a 5-star Hotels in KSA demands a commitment to integrity to uphold exceptional guest experiences and maintain the establishment's reputation. Hospitality professionals in KSA rigorously apply these ethical principles in their daily operations (De Boeck et al., 2023). The industry follows strict guidelines where ethics take precedence. Guests entrust us with their experiences, seeking superior service, and it is our responsibility to cater to their needs attentively. Hospitality professionals must possess a thorough understanding of guest expectations in travel and tourism, as well as the ability to handle confidential information with discretion (Gray et al., 1992). Ethical considerations are not merely a formality but are pivotal to effective hospitality management, especially amidst industry advancements. Ethical conduct is fundamental across all aspects of hospitality (Saputra et al., 2012). The hospitality sector plays a vital role in enhancing quality of life and promoting tourism, contributing significantly to local economies and societies (Asad et al., 2018). Success in this industry hinges on principles of integrity, values, and professionalism in guest interactions (Bhowmik & Wang, 2020). These ethical standards are integral to training programs for hospitality students, emphasizing ethical conduct alongside hospitality skills (Talib et al., 2013). Each profession adheres to its ethical standards, and in KSA working in a 5-star Hotels that provides top-of-the-line hospitality requires integrity as well to provide an excellent guest experience while preserving the reputation of such long-lived establishments. Hospitality professionals carry out that ethical decision uniquely in their daily operations (Sharabati et al., 2024). This sector is well-regulated and prioritizes ethics. A survey of hospitality professionals revealed that in addition to an understanding of various aspects of travel and tourism, they must also exhibit sensitivity to guest expectations (Zhou et al., 2022). Ethical practices are at the heart of delivering hospitality management success within this sector, so the hospitality industry is a fundamental aspect in improving the living standards and tourism that propels local economies as well as societies (Alkhazaleh et al., 2023). Integrity and values are principles of professional interaction to succeed in this industry (Hatamlah et al., 2023) This valuable trait is harnessed by incorporating ethical training into the hospitality student curricula, mobilizing students to develop alongside learning about professional ethics (Benzidia et al., 2021). Ethics are essential to organizational growth and excellence (Anser et al., 2020); businesses cannot survive without trust between stakeholders as well as honesty. Unethical practices can lead to legal repercussions, thereby forcing the leaders in the industry to make sound ethical decisions (Pilati & Tronconi, 2024). The hospitality sector overall, on a global scale, is facing higher levels of scrutiny and criticism which creates renewed interest in establishing clear ethical groundwork. With a recent increase in the importance of ethical guidelines and policies due to many establishments focus on profits first, and ethics second (Rojas-García et al., 2024), This has placed ethical considerations at the top of the list for most hospitality organizations that are now required to define and implement practices to meet their moral obligations. The government of KSA was also investing in expanding and developing tourism infrastructure to improve hospitality services offered within the National Hospitality Sector by increasing the expenditure budget with 25% additional public sector investment. The increased population growth and demographic changes are contributing to the need for more updated Hotels as well as new Hotels construction, adding facilities and training staff properly. KSA's tourism sector has been resuscitated as the government strives for policy reform while working on attracting foreign investment. KSA has a well-

planned and developed hospitality network (Elijah et al., 2018) but most of the luxurious Hotels are located in urban areas having almost all modern luxury facilities like many public accommodations in KSA (Gruchmann et al., 2027).

Considerable influence of ethical standards on KSA Hotels with legal sanctions against non-compliant behavior underscores the necessity of operating ethically (Kumar et al., 2024). Ethical practices enhance Hotels reputations, locally and internationally, creating a beneficial image of the hospitality industry as well. Global identification and preferences are only possible when the level of ethical standards is maintained at excellence while serving through integrity, trustworthiness, reliance. Compliance with ethical standards contributes to the overall performance of hospitality in KSA and maintains a better quality, establishing a more stable position for tourism Hotels (Daoud et al., 2024). Here, it can be argued that our construct of societal well-being puts into perspective the role played by the hospitality industry when health is paramount as practice (Atieh Ali et al., 2024).

2. Literature Review

2.1 Digital Supply Chain Flexibility

Digital supply chain flexibility has emerged as a critical capability for organizations. It involves digital-enabled supply chain processes agility and responsiveness. It offers the organization with agility, helping to manage supply chain visibility and respond quickly to external disruptions enabling an improved digital capability (Shehadeh et al., 2024). Five-star Hotels need to possess digital logic flexibility if they are willing to enhance the availability of goods and services timely, optimize inventory management as well as overall efficiency in production (Allahham et al., 2024).

2.2 Supply Chain Visibility

It is essential to check the real-time supply chain visibility for better decision-making and response in hospitality. Real-time activity visibility: refers to the capacity to trace and monitor the flow of goods, along with information in the supply chain on a real-time basis (Hatamlah et al., 2023). Hotels, in particular, can benefit from increased supply chain visibility where they can more accurately forecast demand variations and have reduced reliance on inventory shortages that enable wariness against a variety of risks (Salhab et al., 2023). The visibility to reach other stages of the digital supply chain such as a level that supports responding proactively rather than reacting is necessary, it ensures the availability at all times for critical supplies (Hatamlah et al., 2023).

2.3 External Disruptions

External disruptions, like pandemics, natural disasters and geopolitical events are perennial stumbling blocks for hotel supply chains. Such disruptions can undermine supply chain operations, result in critical shortages and affect guest service delivery (Allahham & Ahmad, 2024). Realizable digital supply chain the flexibility of the digital supply chain allows for rapid responses to external disruption including real-time data analytics, scenario planning and more agile practice throughout all sector-related practices (Jawabreh et al., 2023). Hotels can have more resilient supply chains from sustainable procurement practices that help to increase supplier diversity (Hatamlah et al., 2023).

2.4 Digital Capability

There is a concept of digital capability which means organizational capacity to effectively use and manage information across the supply chain (Gupta et al., 2020). The digital capability enables advanced management systems and a guest service platform, as well as data-driven analytics to support greater customer experience and operational efficiency within the hospitality industry (Madhani, 2021). Therefore, Hotels with strong digital culture are best placed to enforce intelligent quality systems which work for operation efficiencies and elevate guest contentment as well as ensure industry standards (Hatamlah et al., 2023).

2.5 Sustainable Procurement

Sustainable procurement is defined as the process of purchasing goods and services that consider their environmental, social, and economic aspects. It focuses on building long-term value by encouraging responsible sourcing practices while minimizing the adverse impact on both the environment and society (de Moor et al., 2024). The five-star Hotels environment implies that the organization has much to benefit from sustainable procurement practices through strengthened brand image, heightened appeal among eco-friendly guests and improved environmental performance (Allahham et al., 2023). Sustainable procurement integrated into digital supply chain strategies can bring both efficiency and sustainability to Hotels (Khalfan & McDermott, 2006).

2.6 Smart Quality Systems

Advanced technologies used in smart quality systems for the monitoring and control of services include IoT, AI, and Data Analytics making them real-time (Anser et al., 2020). Quality systems can deliver the best-performed service level to enhance guest satisfaction and optimize better operation processes in 5 stars-Hotels (Kotorov et al., 2024). These systems can help in finding out the preferences of guests, operational bottlenecks and areas where they need to improve (Chukwuka et al., 2023). Hotels that use digital supply chain flexibility and smart quality systems can adapt quickly when a guest needs change while maintaining a consistently high standard of service (Shahbazi & Byun, 2021).

2.7 Gaps and Hypotheses of the Study

Although existing literature unveils various components of digital supply chain flexibility and sustainable procurement, as well as smart quality systems Hotels in KSA; none the less it lacks to figure out their yet integrated effect on five-star Hotels such as this research. The purpose of this study is to bridge this gap by studying sustainable procurement as a mediator between digital supply chain flexibility and smart quality systems). As a result, this study suggests the hypotheses:

H₁: *Supply chain visibility has a positive effect on sustainable procurement in five-star Hotels in KSA.*

H₂: *External disruptions have a negative impact on sustainable procurement in five-star Hotels in KSA.*

H₃: *Digital capabilities positively influence the effectiveness of sustainable procurement in five-star Hotels in KSA.*

H₄: *Sustainable Procurement mediates the positive effect on Smart Quality Systems in five-star Hotels in KSA.*

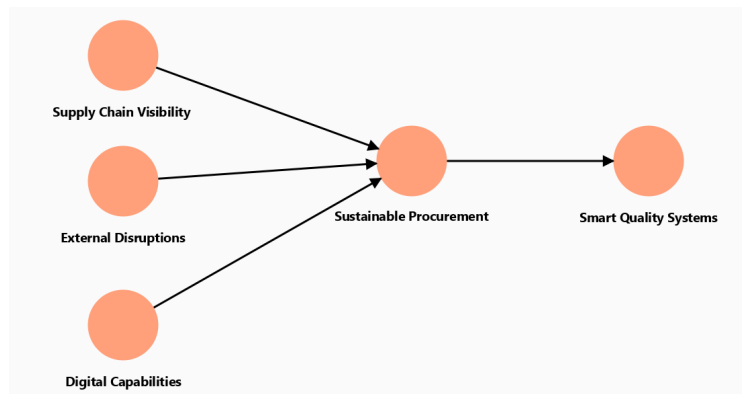


Fig. 1. The proposed study

3. Research Methodology

3.1 Sample and Procedure

Methods Design This study uses a cross-sectional quantitative approach that records the opinions and attitudes of respondents at one point in time. An online survey questionnaire was conducted to generate primary data from general managers of five-star KSA Hotels. Hotels and managers were selected by using a random sampling technique. **155** five-star Hotels in KSA, and the sample size was calculated based on the (Naing et al., 2022). To reach enough responses, 150 questionnaires were sent out. Domain No: Two A total of 120 questionnaires were returned, exclusion 15 incompletely filled. PLS-SEM analysis was performed using 105 valid questionnaires for hypothesis testing. Descriptive statistics calculated using SPSS were used to characterize respondents in terms of age, work experience, education level, and types as well as gender and number of employees.

3.2 Common Method Bias

This study cautiously considered common method bias, in the research into the influence of digital supply chain flexibility on and sustainable procurement as a mediating mechanism-based study conducted at five-star Hotels located in KSA. Single factor analysis was also carried out to check common method variance considering that data collection from one source is a standard procedure in prior literature using PLS-SEM. VIF used to estimate the Variance Inflation Factors by using a full collinearity test in this study. Any value over 3.3 indicates the existence of common method bias. At this value, they were not a concern in the current study Nevertheless, VIF values of all constructs were under such a threshold.

Table 1
Measurement Items and Reliability

Constructs	Items	Factor loadings	Cronbach's Alpha	C.R.	(AVE)
Digital Capabilities	DC1	0.845	0.87	0.911	0.719
	DC2	0.848			
	DC3	0.887			
	DC4	0.81			
External Disruption	ED1	0.824	0.89	0.919	0.695
	ED2	0.808			
	ED3	0.855			
	ED4	0.854			
	ED5	0.825			
Smart Quality System	SQM1	0.843	0.812	0.874	0.635
	SQM2	0.84			
	SQM3	0.75			
	SQM4	0.75			
Supply Chain Visibility	SCV1	0.856	0.87	0.906	0.659
	SCV2	0.79			
	SCV3	0.837			
	SCV4	0.809			
	SCV5	0.764			
Sustainable Performance	SP1	0.845	0.841	0.894	0.68
	SP2	0.874			
	SP3	0.837			
	SP4	0.736			

In Table 1, Average Variance Extracted (AVE) and Composite Reliability were used as criteria of the measurement model while examining relationships among constructs after fitting a confirmatory factor analysis to measure these parameters. The factor loadings of all items reached more than the minimum criterion value 0.708 and range between 0.736 to 0.887, indicating that no item required deletion. All AVE values were higher than 0.50, meaning these captured enough variance compared to error of measurement values. Further, the CR values were between 0.874 and 0.919 suggested by a cut-off of at least 0.70, confirming internal consistency among constructs. Given the above, it is clear that our measurement model of self-perceived competences assessment has been adequately established and represent reliable as well as valid models known these constructs with their manifested indicators in leading to have them secure basis for testing relationships within structural model.

Table 2
HTMT

	Digital Capabilities	External Disruption	Smart Quality System	Supply Chain Visibility	Sustainable Performance
Digital Capabilities					
External Disruption	0.556				
Smart Quality System	0.651	0.484			
Supply Chain Visibility	0.8	0.702	0.697		
Sustainable Performance	0.589	0.51	0.444	0.586	

Table 2 After confirming the convergent validity, the discriminant validity of the model was also assessed within the context of the study. To evaluate discriminant validity, the (HTMT) ratio was employed, as it is considered superior to other methods like the Fornell–Larcker criterion suggests that the HTMT ratio effectively identifies the absence of discriminant validity between variables. In this analysis, the threshold value of 0.90 was used to determine discriminant validity. As shown in Table 2, all HTMT values for the constructs were below the critical value of 0.90, with the highest being 0.8 between Digital Capabilities and Supply Chain Visibility. This indicates that there was sufficient discriminant validity, meaning the constructs were distinct from one another. Therefore, the model demonstrated both adequate convergence and disparity, confirming the measurement model's validity in digital supply chain flexibility, smart quality systems, and sustainable procurement in the studied Hotels.

Table 3
Fornell-Larcker

	Digital Capabilities	External Disruption	Smart Quality System	Supply Chain Visibility	Sustainable Performance
Digital Capabilities	0.848				
External Disruption	0.497	0.833			
Smart Quality System	0.535	0.398	0.797		
Supply Chain Visibility	0.702	0.62	0.562	0.812	
Sustainable Performance	0.51	0.443	0.38	0.504	0.825

According to Table 3, discriminant validity was examined using Fornell-Larcker criterion. Discriminant validity Discriminant was considered with Composite of Averages Variance Extracted (AVE) square root and correlation values among constructs. The square root of the AVE for each construct Digital Capabilities (0.848), External Disruption (0.833), Smart Quality System (0.797), Supply Chain Visibility (0.812) and Sustainable Performance (.825) is greater than CR between these constructs, it shows that all measures are distinct from other/s set of measures as expected by validity results). As an example, AVE of Digital Capabilities (0.848) is higher than correlations between it and External Disruption (0.497), Smart Quality System (0.535), Supply Chain Visibility (0.702). The results thus confirm that the discriminant validity of model constructs is satisfactory and each variable makes a unique contribution towards exploring digital supply chain flexibility, smart quality systems implementation and sustainable procurement in five-star hotels of KSA.

Table 4
R2 Adjusted

Variable	R-square	R-square adjusted
Smart Quality System	0.145	0.142
Sustainable Performance	0.322	0.315

In Table 4, the adjusted R-squared (R²) values from the study were shown to display how much of each dependent variable might be explained by it, using that model. This represents a very modest amount of variance explained by the model 14.2% for Smart Quality System the Sustainable Performance on the other hand r² adjusted is at 0.315, which means that in this case almost a third of its variance can be explained by the identified detractors and thus has higher explanatory power.

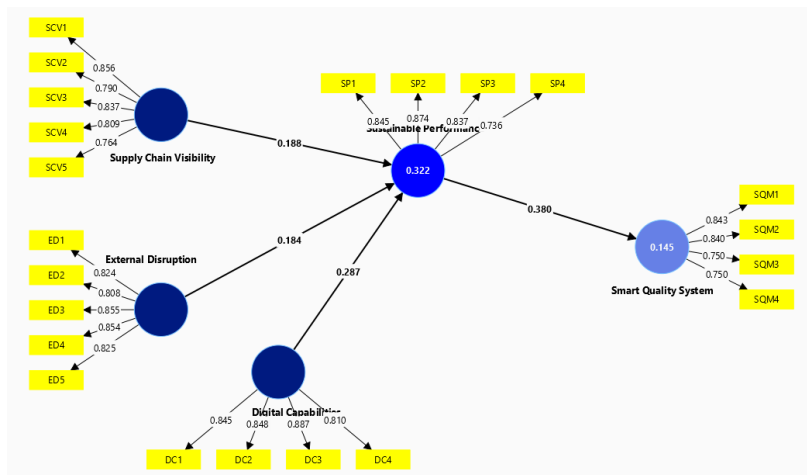


Fig. 2. Research model

3.2 Assessment of the Structural Model

The constructs of the structural model were tested for collinearity by using Variance Inflation Factors (VIF) after confirming the variable's validity and reliability issues. In the PLS-SEM algorithm, our VIF values should be greater than 0.2 and less than 5. This will ensure that collinearity issues do not exist within this model. In such a case, as all VIF values were within an acceptable range, the model was still sound can could be used for further investigation in order to analyze associations between structures and there is no requirement of amalgamating or deleting any structure from research based on this.

Table 7
Collinearity evaluation of the structural model

Construct	DC	ED	SCV	SP	SQM
VIF	2.847	2.745	2.673	2.645	1.903

Note: Digital Capabilities (DC); External Disruption (ED); Supply Chain Visibility (SCV); Sustainable Performance (SP); Smart Quality System (SQM).

3.3 Path Analysis

The measurement model in this study was conducted within constructs of effects for digital supply chain practices and sustainable green innovation on Blue Ocean Strategy fulfillment among the petrochemical sector in KSA. We operationalized our constructs through validated scales using the available literature on eHealth literacy concepts and expert consultation3536 to confirm that the measures used reflect the robustness and reliability of measurement. Advanced statistical techniques such as confirmatory factor analysis CFA were used to validate the measurement model through data collected from managers of

different departments in the KSA petrochemicals sector. Results of the CFA supported discriminant validity and reliability for all constructs, suggesting rigorous tests during the subsequent structural equation modeling (SEM) analysis. This ensures that the relationships tested herein properly mirror the intricate dynamics of digital transformation and sustainable innovation in meeting strategic objectives within Saudi Arabian petrochemical manufacturing, by carefully defining key variables.

4. Result

Table 8
Hypotheses testing estimates

Hypo	Relationships	Standardized Beta	Standard Error	T-Statistic	P-Values	Decision
H1	Digital Capabilities → Smart Quality System	0.109	0.044	2.466	0.014	Supported
H2	Digital Capabilities → Sustainable Performance	0.287	0.085	3.384	0.001	Supported
H3	External Disruption → Smart Quality System	0.07	0.032	2.182	0.029	Supported
H4	External Disruption → Sustainable Performance	0.184	0.075	2.441	0.015	Supported
H5	Supply Chain Visibility → Smart Quality System	0.072	0.04	1.781	0.075	Unsupported
H6	Supply Chain Visibility → Sustainable Performance	0.188	0.088	2.148	0.032	Supported
H7	Sustainable Performance → Smart Quality System	0.38	0.086	4.446	0	Supported

The results of the analysis in Table 6 indicate the relationships observed in the study. Digital Capabilities have a significant positive effect on Smart Quality System, $\beta = 0.109$, $t = 2.466$, $p = 0.014$ and Sustainable performance $\beta = 0.287$, $t = 3.384$, $p = 0.001$ to support H1 and H2 respectively. External disruption is also positively correlated with Smart Quality System $\beta = 0.070$, $t = 2.182$, $p = 0.029$ and with Sustainable performance $\beta = 0.184$, $t = 2.441$, $p = 0.01$ to support H3 and H4. Although Supply Chain Visibility has a positive effect on smart quality systems, it is not significant $\beta = 0.072$, $t = 1.781$, $p = 0.075$, and H5 is not supported. The relationship is, however, significant on sustainable performance $\beta = 0.188$, $t = 2.148$, $p = 0.032$, therefore supporting H6. The strongest correlation observed is between Sustainable performance and smart quality system $\beta = 0.380$, $t = 4.446$, $p < 0.001$, which strongly supports H7. Therefore, in conclusion, Digital Capabilities, External Disruption, and Sustainable performance contribute significantly to the effect on Smart Quality System but Supply Chain Visibility needs to be investigated further.

Table 9
Specific Indirect Effects

Hypo	Relationships	Standardized	Standard	T-Value	P-Values	Decision
H8	Supply Chain Visibility → Sustainable Performance → Smart Quality System	0.072	0.04	1.781	0.075	Unsupported
H9	Digital Capabilities → Sustainable Performance → Smart Quality System	0.109	0.044	2.466	0.014	Supported
H10	External Disruption → Sustainable Performance → Smart Quality System	0.07	0.032	2.182	0.029	Supported

Table 9 presents the results on indirect effect among variables in this study, more precisely a non-significant indirect relation of Supply Chain Visibility with Smart Quality System through Sustainable Performance $\beta = 0.072$; $P 0.075$ that lead to rejection reject H8 Table In addition, Smart Quality System mediates the relationship between Digital Capabilities and Sustainable Performance $\beta = 0.047$, $p < .001$; Moreover, Sustainable Performance mediates the linkage between External Disruption and Smart Quality System positively $\beta = 0.070$, 0.030 , here for H10: The current study, as such, highlights the significant mediating effect of Sustainable Performance in the relationship between Digital Capabilities and External Disruption on Smart Quality Systems specifically among five-star hotels within KSA. H10 is Supported The mediates the relationship between External Disruption and Smart Quality System $\beta = 0.070$, $p = 0.029$ This suggests that Sustainable Performance mediates the effect of Digital Capabilities and External Disruption on Smart Quality Systems in five-star hotels in KSA.

6. Discussion

The levels of digital supply chain flexibility have significantly changed the e-supply chain resilience across KSA five-star Hotels by utilizing smart quality systems and green procurement measures. Our research highlights the importance of digital supply chain operational flexibility for hotels to be able to quickly adapt and respond efficiently, or rapidly recover from dynamic market demand situations vis-a-vis operational challenges (Weisz et al., 2023). Adopting digitized supply chain management practices in five-star Hotels in KSA can make them more agile, robust, and cost-efficient while also delivering superior service quality to guests (Al-Filali et al., 2023). So, sustainable procurement comes out as an important factor that mediates the relationship between digital supply chain flexibility and advanced smart quality systems in five-star Hotels. Green or socially responsible sourcing has ambiguously been contributing to improving operational efficiency and service excellence, in addition sustainable procurement practices have played a pivotal role alongside the hospitality sector. Our study also provides significance by indicating the mediating role of supply chain flexibility in an era where technology reshapes

managing, operations, and sustainability within five-star Hotels through KSA (Salamah et al., 2023). Transformative impact on operation resiliency and sustainability; along changing. Our study contributes to hospitality industry research on how strategic supply chain initiatives lead to sustainable business performance and operational efficiency by investigating the mediating role of sustainable procurement. The empirical findings also offer practical and managerial implications to Hotels managers and other industry stakeholders by highlighting the importance of incorporating innovative digital practices in their supply chain operations while offering sustainable solutions aimed at providing guest satisfaction. Therefore, combining digital supply chain adaptability with sustainable procurement approaches is a strategic must for five-star Hotels in KSA that wish to embed the effectiveness and efficiency of their operations over time in such a way as to maintain their competitive edge while reaching sustainability. Hotels that embrace these strategic initiatives will be able to improve their existing smart quality systems, save operation costs, and contribute to environmental conservation which in turn boost its image for being environment friendly resulting in making it competitive with other Hotels.

7. Theoretical implications

The contribution of our study lies in the enhancement and development of theory using DSCF within 5-star JHI, which provides several implications for both scholars as well as professionals on a larger scale. There is research that sheds light on the role of supply chain management practices in enhancing organizational performance (Almuntfjy et al., 2024), but our work builds upon this body by responding to calls for inquiry into behavior-based actions such as DSCF alongside detangling how they may or may not influence quality through SQS via SP. Our study contributes to the literature by viewing DSCF through a supply chain resilience and agility lens with our conceptual model (Fig. 1) highlighting how improved flexibility in digital supply chains can translate into enhanced operational efficiency and service quality outcomes within luxury Hotels settings. In addition, we tested the direct and mediated relationships of DSCF on SP & SQS in KSA five-star Hotels based on empirical findings. Sustainable procurement practices can bridge the relationship between digital supply chain flexibility and smart quality systems in fostering sustainable performance which contributes to business competitiveness as previously shown within the Hotels industry sector. Introducing this distinctive offer, the study contributes to addressing a notable void in quantitative research concerned with supply chain dynamics and sustainable procurement strategies as well as enhancing service quality within luxury Hotels settings. Furthermore, our study offers an improved understanding of how digital supply chain flexibility works with sustainable procurement to improve smart quality systems in KSA five-star Hotels-specific mechanisms. This study thus contributes theoretically and practically to the literature on the relationship dimensions concerning supply chain management in hospitality, by offering insights into how Hotels managers can enhance operational processes and guest experience through strategic SCM coupled with sustainable procurement.

8. Practical implications

This research presents practical implications that can benefit practitioners and policymakers in the hospitality industry mainly within five-star Hotels of KSA. This research extends prior work on SP, SQS, and DSCF in Hotels by tracing the relationship between the performances of SQS adopting digital technology (DPROC) enabled by the use of sustainable procurement practices (SMI), as a suitable tool to improve Hotels operations. The findings imply that digital technologies can have a positive effect on DSCFs and improve operational efficiencies and service quality in luxury Hotels environments. Hotel operators can use this data to invest in the right places, everything from technology upgrades that might keep a Hotels going after natural disasters, through new channels of digital distribution and efficient supply chain procurement practices enhancing where they spend their capital. Additionally, the research underscores the importance of sustainable procurement as a mediator in DSCF and SQS. Sustainable procurement which is called green, socially responsible, or conscious sourcing, practices for products and services such as environmentally preferable purchasing by Hotels to help them build resilience in their operations while driving more closely toward sustainability goals globally. The opportunity to achieve two goals with a single initiative makes a strong case for policymakers in KSA and the international community as well, that initiatives promoting sustainable practices within hospitality need support. Based on empirical evidence, policymakers could enact regulations and incentives to stimulate DSCF together with sustainable procurement in Hotels as part of corporate sustainability overall strategies for a more sustainable and competitive hospitality sector. Also, our study highlights the strategic role of talent management (TM) practices in fostering human capital (HC), which is crucial for driving sustainable business performance (SBP) within five-star Hotels. A key takeaway for Hotels managers and policy-makers is to invest more in talent development as well as retention mechanisms to improve the skills of their workforce, making them and subsequently the organization itself resilient. This proactive approach helps improve the quality of service and support economic growth, making KSA's Hotels more competitive in line with national development goals and priorities. Hence, our study offers operational implications for Hotels managers and policymakers in KSA by emphasizing digital supply chain flexibility as well as sustainable procurement practices to strengthen smart quality systems driven capabilities that lead toward sustainable business performance within luxury Hotels operations. The scale of transformation needed requires all stakeholders to contribute and take responsibility for sustainability in the hospitality sector.

9. Limitations of Study

Like any research model, this study has some implications that may have an important bearing on future studies focused on DSCF, SP, and SQS in five-star Hotels about using KSA for quantitative analysis. Our study design was a cross-sectional survey which meant that information about every participant was collected only at one point in time and during specific intervals. Future researchers may benefit from utilizing longitudinal studies to track changes over time, allowing for a fuller explanation of the effect DSCF has on SQS and SP dynamics within hotel operations. The sample was limited to the hospitality in five-star Hotels in KSA. Future research is encouraged to broaden the investigation by comparing with other sub-sectors in the hospitality industry or different regions of KSA, which will improve generalization and comparison across heterogeneous organizational settings. Furthermore, the current research sheds light on DSCF and SP strategies within a single sector, exploring TM practices in sectors other than hospitality, tourism, entertainment, or manufacturing which would contribute to extending literature outside the selected field. The findings are only applicable to KSA hospitality settings and extrapolation should be made with caution even outside this setting as other cultural contexts in the Gulf countries may share similar characteristics. Additionally, examining aspects of digital supply chain flexibility that step outside the range considered in the study. Like, the ability to accommodate for new technological implications or rapid response to market volatilities, would develop a richer picture of determinants affecting sustainable procurement practices and intelligent quality systems within hospitality settings. By mitigating these limitations and investigating directions for further research, this study will reinforce empirical results while strengthening the conceptual frameworks as well as practical implications of supply chain strategy development in luxury Hotels within KSA and internationally.

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