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Optimizing supply chain excellence: Unravelling the synergies between IT proficiencies, smart supply chain practices, and organizational culture

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This study aims to investigate the impact of information technology and supply chain practices on supply chain excellence in the retail sector, with a particular focus on understanding the mediating and moderating effects amidst the challenges posed by COVID-19. This study offers novel insights into the complex interplay between information technology, supply chain practices, and organizational culture in the context of the automotive retail sector. It underscores the pivotal role of this triad in navigating the unprecedented challenges and uncertainties of the modern business environment, providing a blueprint for attaining supply chain resilience and excellence. A survey was conducted involving 203 questionnaires distributed to 12 automotive retail companies in Dubai. The responses were analyzed using Smart PLS software and structural equation modelling to explore the intricate relationships between information technology, supply chain practices, organizational culture, and supply chain excellence. The results confirm that information technology and supply chain practices significantly influence supply chain excellence. Organizational culture was found to have a notable moderating effect, indicating that the alignment of culture with technological and procedural advancements is crucial in achieving superior supply chain performance. The study is confined to the automotive retail sector in Dubai, limiting the generalizability of the findings. Future research can expand to other sectors and geographical areas to provide a more comprehensive insight into the studied relationships. For businesses, especially amidst challenges like COVID-19, aligning information technology and supply chain practices with organizational culture is paramount. The findings suggest that a harmonious integration can lead to enhanced supply chain excellence, offering a competitive edge in the rapidly evolving digital landscape.

1. Introduction

An organization's information technology (IT) competency refers to its capacity to identify the business requirements connected to information technology, to cost-effectively develop its business model, and to offer ongoing support for information technology-based systems. The information technology function inside an organization is often responsible for the organization's information technology proficiencies. Based on the capabilities of its technology and the company's information technology-related competencies, it deals with enhancing supply chain excellence. Each business generates its own information technology value through its information technology department, and this value varies from business to business. As a result, the information technology department of a firm enhances and adds value to the business by supporting and enabling transactions and procedures. However, organizations must negotiate a complicated web of factors, including

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information technology proficiency, supply chain practices, the integration of smart supply chain technologies, and the effect of organizational culture, in order to achieve and maintain supply chain excellence (Cepeda & Arias-Pérez, 2019).

In addition, the research had the objective of generating valuable intuitions to the relationship between IT proficiencies and supply chain excellence within Dubai's retail sector. In the concluding remarks, it is recommended to enhance and expand this research in the context of multiple industries with advanced dimensions to increase its effectiveness.

2. Theoretical Background and Literature Review

2.1 Information Technology Proficiencies

Information technology proficiencies encompass supply chain adaptability and a diverse array of resources, such as people, information, and processes. These proficiencies are integral for meeting multiple business needs. They incorporate the utilization of specific programs and software to alleviate workload, the establishment of infrastructure and associated databases, the deployment of telecom products and services, and the leveraging of a range of online services from both internal and external providers. Furthermore, they involve the strategic application of information and the deployment of management software to ensure the organization achieves its goals and sustains its viability (Yeniyurt et al., 2019).

Companies are under constant pressure to keep themselves abreast of the most recent technology and skills as a result of the quick and increasing cost of technological development. To keep their competitive edge, they must organize, put the new technology into practice, and become accustomed with it. However, these pricey software tools and programs may be necessary because they reduce labor load by streamlining transactions. Databases track consumer behavior and loyalty so that businesses can concentrate on their most profitable clients.

Information technology integration and flexible information technology infrastructure are two components of information technology proficiencies (Al-Gasaymeh et al., 2023). The degree to which an organization's information technology-based resources are connected to its business partners by facilitating communication channels, information exchange, and the development of supportive relationships is referred to as information technology integration. On the other hand, the adaptability of an information technology infrastructure is defined as how much it can be extended.

2.2 Supply Chain Practices

Supply chain practices, as described by Qrunfleh and Tarafdar (2013), encompass a set of strategic and operational actions, procedures, and methodologies that organizations implement to adeptly govern the movement of products, services, information, and finances throughout the entire supply chain network. As reinforced by Hanaysha and Alzoubi (2022), these practices are geared towards enhancing the overall efficiency of the supply chain. The ultimate goals are to reduce costs, shorten lead times, and streamline the procurement, production, distribution, and delivery processes for goods and services. Integral components of supply chain practices include process optimization, logistics and transportation management, inventory control, fostering supplier relationships, precise planning and demand forecasting, open communication and collaboration channels, and effective risk management.

Moreover, organizations wanting to gain a competitive edge through cost savings, higher customer satisfaction, and market situation adaptation must prioritize supply chain practices. These procedures are frequently adjusted to the particular market, corporate strategy, and supply chain complexity, highlighting the necessity of constant development and flexibility in a changing business environment (Yu et al., 2018).

A particular company decides to focus on value and supply chain management in order to provide successful integrated results. Customer service and a proactive supply chain are more important for globally renowned businesses than a focus on costs, productivity, distribution, and speed.

For a competitive edge in the market, normative value congruency and strategic intent are used. Global retail sectors' market-oriented elements have drawn a lot of attention. Beyond these features of market orientation, however, supply chain-oriented practices are crucial for retailers to effectively break into the world's retail market (Haag et al., 2019; Yu et al., 2018).

2.3 Supply Chain Excellence

A supply is made up of a number of suppliers who collaborate to make a single product for a company. The many supply chain operations a business engages in to meet customer expectations and satisfaction are referred to as supply chain performance (Lee et al., 2022). This includes the availability and prompt delivery of the product as well as all the other elements required for the supply chain to function more effectively (Tracey et al., 2005). A retail supply chain primarily consists of all the steps taken by a business to deliver a product to a customer. These steps range from procuring the product's raw materials to delivering it to the customer's doorstep (Frederico et al., 2020). The effectiveness of the supply chain includes all of that. Accessibility, swiftness, decisiveness, adaptability, and attentiveness are the five supply chain dimensions (Modica et al., 2020).

A company must constantly be reachable to both its customers and the supply chain it has to manage (Chen et al., 2020). A business must be prompt and take action as soon as something emerges. Decisiveness is required, particularly in the retail industry. It must also be adaptable, plan out its supply chain beforehand, and be able to act fast to address any issues that may arise (Kurdi et al., 2023). Last but not least, maintaining a good supply chain requires constant vigilance (Chen, 2014). How

well a supply chain is run is shown by the associated dimensions of order reliability, order compliance, and delivery time (Bottani & Bigliardi, 2014). According to Bigliardi and Bottani (2014), supply chain excellence examines the dynamics between producers, suppliers, and consumers. Today's businesses must assess the effectiveness of their supply chains since doing so is essential to maximizing their value and preserving their stability (Pundir et al., 2019)(Kumar, 2016). This assessment, known as "supply chain metrics," includes both functional and end-to-end supply chain indicators. End-to-end supply chain indicators examine how well the various supply chain functions are coordinated with one another, whereas functional indicators assess the effectiveness of the supply chain. The current business climate necessitates proactive supply chains, which includes managing them, formulating plans, and anticipating the future as opposed to only responding when something goes wrong (Yu et al., 2018).

2.4 Smart Supply Chain

A "smart supply chain" is a modern, technologically advanced method of managing the supply chain that makes use of cutting-edge digital innovations and data-driven insights to improve productivity, visibility, responsiveness, and overall performance throughout the entire supply chain ecosystem (Erceg & Sekuloska, 2019). This strategy transforms conventional supply chain operations and processes by using cutting-edge technologies like the Internet of Things (IoT), artificial intelligence (AI), blockchain, sophisticated analytics, and automation (Miller, 2021).

The associated benefits of smart supply chain giving end-to-end visibility into the supply chain by using IoT sensors and linked devices to monitor and collect data on goods, assets, and processes in real-time analyzing previous data and predicting future demand using AI and sophisticated analytics, enabling proactive decision-making and inventory optimization (Korpela et al., 2017). Moreover, creating a unified and comprehensive perspective of the supply chain by combining data from diverse sources, both internal and external, to enable better decision-making (Abdel-Basset et al., 2018). Whereas implementing automation and robots in distribution centers, factories, and warehouses to improve efficiency, lower labor costs, and increase accuracy.

2.5 Organizational Culture

According to Abid Alvi et al. (2014), organizational culture is the collective set of values, beliefs, norms, practices, behaviors, and common assumptions that influence how people interact within an organization and with external stakeholders. It is the foundational structure that affects the identity of the organization and directs its members' decision-making, problem-solving, and daily activities (Mehmood, 2021). The organizational culture acts as a guide for how employees view and react to opportunities, problems, and the overall workplace. AlShehhi et al. (2021) defined, the culture of an organization is not static; rather, it develops through time because of changes in leadership, external forces, and changes in the strategic priorities of the organization. It is crucial in defining the identity of the company, affecting employee satisfaction and engagement, and ultimately affecting how well the company can accomplish its objectives and change with the times. Leadership and organizational development are critically dependent on an understanding of and ability to manage organizational culture.

2.6 Impact of Information Technology Proficiencies on Supply Chain Practices

Each element of the supply chain influences the others. Both supply chain best practices and supply chain excellence are impacted by information technology. Companies rely on information technology to enhance and expand their supply chain operations, according to (Sherer & Alter, 2004). According to Oh et al. (2019), an investment in information technology can have a good impact on supply chain practices. These procedures may be the main driving force behind the transformation of the organization, and these IT-related skills could bring great returns to the business (Wu et al., 2006). Whereas, it has discovered that information technology proficiencies influences both unique technological competences and business performance, as well as new technology creation (Cepeda & Arias-Pérez, 2019). For instance, a corporation can employ IMO on the computer-based system if it has a solid, modern information technology department. It can assist the business in a variety of ways, including by effectively managing its inventory and keeping tabs on its orders. The study by Bigliardi and Bottani (2014), which examined how the adoption of information technology in supply chain management contributed to the company's success, found significant relationship between IT and supply chain performance (Bottani & Bigliardi, 2014). Similar to how the organization cannot leverage specialized supply chain practices like IMO, capacity planning, and order management if the information technology is inadequate (Bottani & Bigliardi, 2014; Rehman et al., 2018). Numerous services for tracking products are offered by information technology (Al-Shboul et al., 2018). In the retail sector, better computer systems aid in determining customer demand and satisfaction.

2.7 Impact of Information Technology Proficiencies on Supply Chain Excellence

According to Brusset and Teller (2017), the use of information technology results in effective logistics management, which improves supply chain excellence. This suggests that information technology is also closely related to supply chain effectiveness. Chen (2014) asserts that information technology is a key component of a company's infrastructure since it serves as the glue that binds supply chains together. Technology that is based online and, on the web, has a significant positive impact on supply chain performance. Web-based technologies offer a quick, essentially cost-free platform for boosting transparency and removing informational delays and distortion. Additionally, they lower transaction costs, which facilitates very fluid corporate coordination. The material, news, and cash movements improve the coordination of the supply chain.

However, according to Brusset and Teller (2017) if a business has an proficient information technology system, they can track a product in real-time and respond swiftly if there is a problem because they are always aware of what is going on. Similar to this, quick, modern computers can reduce staff responsibilities so they can concentrate more on the profitable aspects of the company (Bottani & Bigliardi, 2014). A vital first step towards a flexible supply chain is Web services. A better overall business is built with less room for error when suppliers, manufacturers, and customers are properly connected (Mondol, 2021).

2.8 Impact of Supply Chain Practices on Supply Chain Excellence

Supply chain practices refer to the cooperation and interaction between manufacturers, suppliers, and customers to accomplish a given goal and involve the various capabilities a firm uses to improve its supply chain excellence (Brusset & Teller, 2017). Khan et al. (2022) claim that there is a correlation between supply chain performance and capacities (Khan et al., 2022). However, specific supply chain methods, such as IMO, can be applied to the retail sector. With this technique, the business monitors real-time information about the products from their manufacture to client delivery (Akhtar et al., 2021). Additionally, Hove Sibanda & Pooe (2018) adds that it aids the business in enhancing its entire supply chain performance when defining the link between supply chain capabilities and performance.

2.9 Impact of Smart Supply Chain on Supply Chain Excellence

As highlighted by Gupta et al. (2020), a smart supply chain allows organizations to be more customer-centric. Research by (Sillanpää, 2010) demonstrates that by leveraging data analytics and IoT, companies can personalize customer experiences, offer real-time order tracking, and respond swiftly to changing customer preferences. This customer-centric approach enhances customer satisfaction and loyalty (Federico Del Giorgio, 2022). According to Büyüközkan & Göçer (2018), smart supply chains are better equipped to mitigate risks. Research by Christopher & Towill (2001) indicates that real-time monitoring and data analytics enable organizations to identify potential disruptions, such as supply chain disruptions or supplier issues, in advance. This proactive risk management capability enhances supply chain resilience and reduces vulnerability to unforeseen events (Al Ali, 2021). A research findings highlight that real-time visibility, predictive analytics, automation, and enhanced risk management capabilities contribute to improved efficiency, reduced costs, and increased customer satisfaction (Ivanov & Dolgui, 2021)

2.10The Relationship between Supply Chain Practices, Information Technology Proficiencies, and Supply Chain Excellence

Information technology has a big impact on supply chain excellence since technological advances may make work easier for employees and reduce workloads. By minimizing the amount of time employees spend working, effective information technology skills aid the organization in managing labor expenditures. Without the right technical tools, low-value administrative labor might take a lot of time (Wu et al., 2006; Yu et al., 2018). Although these duties are necessary for the efficient operation of company processes, they take a lot of time and could be used more effectively. The traditional time-consuming business processes of supply chain performance are transformed by new technology. The evolution of the supply chain process, characterized by real-time tracking and pinpoint delivery systems, has been transformative, as noted by Yu et al. (2016). While the initial stages of incorporating new technology might present challenges in terms of time and costs, the long-term benefits are undeniable. These advantages include a heightened emphasis on individual employees, significant efficiency enhancements, augmented transparency, and a more cohesive community with strengthened communication channels.

Supply chain excellence is also assisted by supply chain practices. The link between producers, suppliers, and customers is only one aspect of the supply chain. It deals with the lifetime of the product, from its creation to delivery to the customer, and spans a wide range of topics (Rawat, 2022). Demand management, on the other hand, is a supply chain capacity that deals with preliminary planning to predict and manage the demand for goods or services. It may be used to save money and resources and produce better and more effective supply chain performance.

The management of various complex retail activities is significantly helped by information technology in the retail sector. In order to gain a competitive edge in the retail industry, information technology capabilities are essential (Cruz, 2021). They help govern data, information, and market knowledge. By establishing connections with wholesalers and customers, supply chain practices play a crucial role in a retail organization by focusing on market competitiveness and customer satisfaction levels. The stakes are quite high for retailers because a customer's decision to purchase from a certain retail outlet might be influenced by delivery time and pickup alternatives. As a result, controlling supply chain practices is crucial for the retail sector.

According to Mehmood (2021), information technology proficiencies and supply chain management play a specific role in defining the retail industry. By monitoring several items and services at once, advanced information technology capabilities provide a proper framework for the retail industry (Bottani & Bigliardi, 2014). Many supply chain functions can be modified to simplify employees' lives and lessen their workload. Additionally, as stated by (Pakurár et al., 2019), improved supply chain excellence depends on both information technology and supply chain capabilities, and improved supply chain performance guarantees an improved retail business. For some supply chain practices, like IMO, information technology proficiencies are necessary. No company can implement IMO without an advanced computer system.

2.11 The impact of Smart Supply Chain between the relationship of Information Technology Proficiencies and Supply Chain Excellence

It has stated by an author the advanced level of supply chain assisted to enhance its excellence (Ghadge et al., 2020). It is highlighted by Chacón Vargas et al. (2018), the visibility of supply chain activities is improved through smart supply chains. Real-time monitoring and data analytics in smart supply chains enable organizations to take speedier and more well-informed decisions (Lee et al., 2022). IT expertise and intelligent supply chain practice work together to enable organizations to quickly react to disturbances and optimize resource allocation, which helps to achieve supply chain excellence (Radwan & Farouk, 2021). The impact of IT expertise on supply chain excellence is increased by the adoption of smart supply chain practices. IoT, AI, and real-time data analytics are used by smart supply chains to build a highly responsive and integrated supply chain ecosystem. Smart supply chains enhance the advantages of IT proficiencies by supplying real-time visibility, predictive insights, and automation capabilities (Hosseini et al., 2019).

2.12 The moderating effect of organizational culture on the relationship between Information Technology Proficiencies and Supply Chain Excellence

Many studies emphasize how important IT skills are to supply chain management (Altawaty et al., 2020). Organizations can improve communication, streamline operations, and make data-driven choices because of IT. Research by Melville et al. (2004) highlights the important role that technological investments have in improving performance, reducing costs, and streamlining the supply chain. According to Ramirez et al. (2010) organizational culture, characterized by shared values, beliefs, and norms, plays a vital role in shaping how IT proficiencies are leveraged within a company. A study by Elsbach & Stigliani (2018) emphasize that organizational culture can either facilitate or hinder the effective utilization of IT. A culture that values innovation, adaptability, and collaboration tend to enhance the impact of IT on supply chain processes. Several experts investigated, businesses with innovative and experimental cultures typically get more out of their IT investment. Additionally, cultures that value innovation encourage the creation and adoption of innovative IT solutions, which supports supply chain excellence through ongoing development.

2.13 Retail Industry

Department shops, supermarkets, franchise stores, online retailers, and chain stores are all part of the retail sector. Typically, retail establishments will purchase products from manufacturers, stock them, and then sell them to customers. Retail is the method used by manufacturers to deliver their goods to consumers (Haag et al., 2019). As the middlemen between the manufacturer and the retailer, retailers can also purchase goods or services from wholesalers and then resell the finished goods to the customer. Medication, groceries, and clothing are examples of retail enterprises. Rental businesses and beauty parlors are examples of retail services. A retail company must have modern technology systems. Supply chain capabilities are also crucial to defining its supply chain performance so that the retail industry is not impacted. According to estimates the retail industry in Dubai will grow by an average of 5.2% each year between 2018 and 2023, with e-commerce activity expected to increase by 19%. Strong government support, a high mobile penetration rate, and Dubai's increasing logistical networks are some of the main drivers boosting e-commerce activity. Strong foreign tourist spending, robust demand, and expanding e-commerce activity all boost Dubai's retail sector. Retailers, who act as facilitators, are aware of the value of technology. It benefits the organization financially and enhances the process, sales, and client retention rates. The retail industry is expanding because of the rising popularity of both traditional and app-based delivery services.

3. Research methodology

3.1 Research Problem

The intersection and logical connection between marketing, IT, and supply chain management have been the subject of prior studies. There have, however, been few attempts to investigate how marketing expertise and information technology may affect supply chain integration (SCI).

Table 1
Construct of the Study

Variables	Dimensions	References
IT Proficiencies		(Rehman et al., 2018)
SC Practices	Process Optimization	(Basheer et al., 2016)
	Risk Management	
	Inventory Management	(Wu et al., 2006)
Smart Supply Chain	Supply Chain Digitalization	(Bottani & Bigliardi, 2014)
Organizational Culture	Organizational Values, beliefs and Norms	(Fetais et al., 2022)
SC Excellence		(Adaileh et al., 2022)

The significance of information technology and supply chain capabilities has been examined in the literature, which also demonstrated that these two factors actively influence the performance of the supply chain. Even though some research has already looked at some of the linkages, it is not exhaustive, and it is still not entirely clear how adaptation contributes to progress and ultimately enhancement. The automotive retail industry in Dubai has had tremendous expansion, and it is predicted that in the years to come, the average annual growth rate will rise. Particularly in the current COVID-19 situation, where businesses have been forced to expand online transactions, which requires high levels of information technology and

supply chain practices. A substantial study gap is seen in the supporting literature. It is possible to understand how information technology proficiencies and supply chain practices create value to the retail business. This study is being carried out to close this informational gap while offering reliable and pertinent data. As shown in table 1 and Fig. 1, this study is aimed to understand the connections between information technology (IT) proficiencies, supply chain (SC) practices, smart supply chain (SSC), organizational culture (OC) and supply chain excellence (SCE) of Dubai's retail industry.

3.2 Research Hypothesis and research model

The following hypotheses have been developed in light of the discussion above and are shown in the research model (Figure 1):

H_1: IT Proficiencies has no statistical impact on Supply Chain Excellence in Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

H_2: IT Proficiencies have no statistical impact on Supply Chain Practices in the Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

H_3: IT Proficiencies have no statistical impact on Smart Supply Chain in the Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

H_4: Supply Chain Practices has no statistical impact on Supply Chain Excellence in the Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

H_5: Smart Supply Chain has no statistical impact on Supply Chain Excellence in Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

H_6: IT Proficiencies has no statistical impact on Supply Chain Excellence through Smart Supply Chain in the Automotive retail industry in Dubai at an $\alpha \leq 0.05$ level of significance.

H_7: Organizational Culture has no moderating effect in significant impact of IT Proficiencies on Supply Chain Excellence in Automotive retail industry in Dubai at $\alpha \leq 0.05$ level of significance.

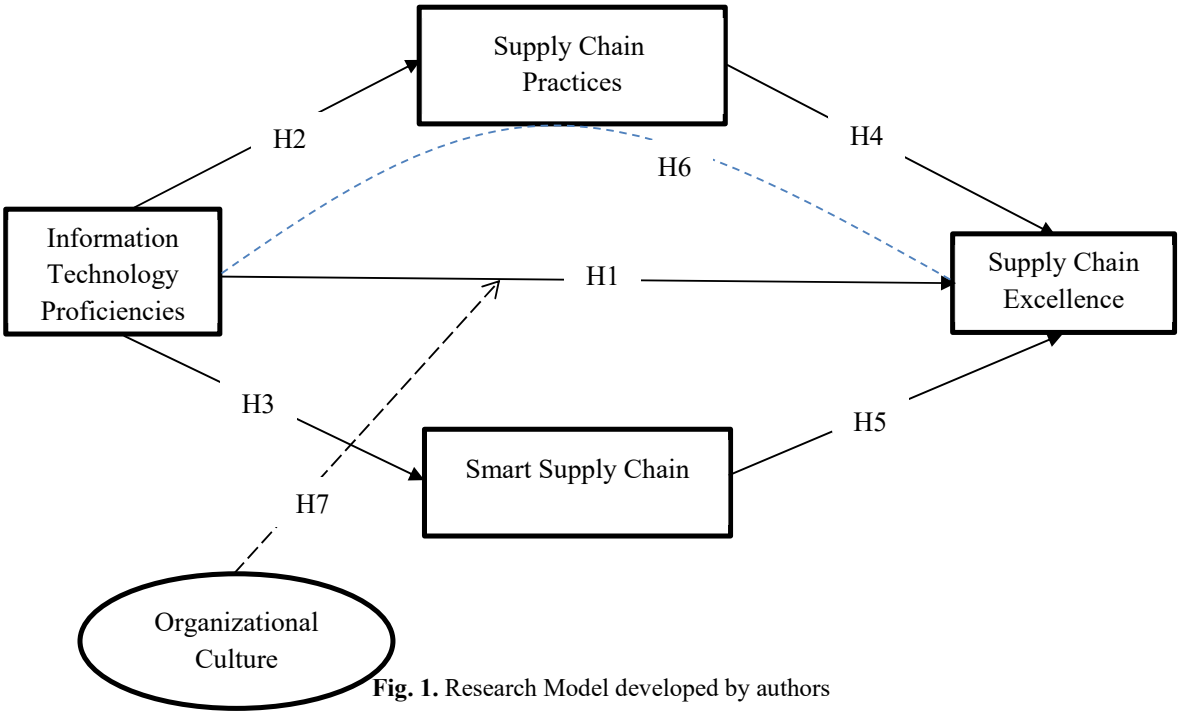

Fig. 1. Research Model developed by authors

3.3 Research Design

This study employs a quantitative, empirical approach, harnessing both primary and secondary data sources. Secondary data provides insights from existing literature and academic journal articles, establishing a foundational understanding of the subject. Concurrently, primary data is collected empirically through a field-based survey. Given the study's quantitative nature, a survey instrument was designed to gather numerical data. The formulation of this instrument drew inspiration from existing literature, ensuring its relevance and accuracy. Special care was taken to ensure the validity and reliability of the survey instrument, thereby safeguarding the legitimacy of the collected data.

The research design is a blend of descriptive and causal/analytical frameworks. The exploratory component delves into comprehending the underlying dynamics of the research topic, its relationships, and ramifications. Meanwhile, the descriptive design distills the essential traits of supply chain performance, IT capabilities, and supply chain practices specifically in the context of Dubai's retail sector. Through this combined approach, the study aims to present a comprehensive understanding of the synergies between IT proficiencies, smart supply chain practices, and organizational culture.

3.4 Population and Sample

The automobile retail sector in Dubai served as the focal point of this study. Cluster sampling was utilized to efficiently reach out to various car retail companies. This sampling technique was chosen due to its relevance to the research model. The units of analysis were individuals working in the supply chain and information technology departments, as well as senior management within the surveyed organizations. Questionnaires were dispatched via email to all potential respondents in the selected companies. Out of these, 248 were returned, with 203 being deemed suitable for inclusion in the study.

4. Data Analysis

The SmartPLS 4.0 statistical software was used to analyze the collected data in order to determine the direct and indirect effects of information technology skills on SC Excellence, as well as the mediating role played by supply chain practices, smart supply chains, and organizational culture. Each component of the construct was evaluated for consistency using Cronbach's Alpha. The measures were described and evaluated using AVE, Composite reliability, convergent validity and discriminant validity to assess the model.

4.1. Validity and Reliability

This section examines the internal consistency for the study model's variables using Cronbach's Alpha coefficient. Table 2 shows acceptable levels of reliability for all model items, where the reliability coefficient ranged between 0.729 to 0.917, and all constructs were above 0.7 (Hair et al., 2010).

Table 2
Cronbach's Alpha, CR, AVE and Discriminant Validity (Fornell Larcker Criterion)

Construct	CR	AVE	Cronbach's Alpha	ITP	SCP	SSC	SCE	OC
Information Technology Proficiencies (ITP)	0.981	0.523	0.886	**0.742**				
SC Practices (SCP)	0.874	0.552	0.735	0.472	**0.743**			
Smart Supply Chain (SSC)	0.866	0.621	0.799	0.519	0.608	**0.709**		
Supply Chain Excellence (SCE)	0.956	0.693	0.887	0.661	0.596	0.678	**0.776**	
Organizational Culture (OC)	0.871	0.579	0.831	0.527	0.480	0.549	0.675	**0.719**

Note: CR=Composite Reliability, AVE=Average Variance Extracted, ITP=Information Technology Proficiencies, SCP=Supply Chain Practices, SSC=Smart Supply Chain, SCE=Supply Chain Excellence, OC=Organizational Culture

Average Variance Extracted (AVE) was also used to assess the validity of the measurement model. The composite reliabilities of the various metrics range from 0.900 to 0.941, exceeding the Fornell and Larcker (1981) cut-off value of 0.700. Results of the validity test are shown in Table 2. The convergent validity of our measures was supported by the average variance extracted (AVE) of each measure meeting Fornell and Larcker's (1981) accepted value of 0.5. Additionally, all of the AVE values' square roots exceeded their inter-correlation counterparts, guaranteeing discriminant validity (Hair et al., 2014). In conclusion, Table 2 findings provide evidence that the measures have adequate validity and reliability.

4.2. Structural Model

Fig. 2 and Table 3 show the outcomes of the PLS analysis for the research model. The standard errors and t-values of the path coefficients were calculated using bootstrapping with 5000 samples (Hair et al., 2014).

Table 3
Structural Model Results

	Construct Path	Path Coefficients	R-square	t-statistics	p-value	Decision
H1	ITP→SCE	0.150	0.589	3.740	0.000	Accepted
H2	ITP→SCP	0.661	0.437	11.64	0.000	Accepted
H3	ITP→SSC	0.527	0.278	5.887	0.000	Accepted
H4	SCP→SCE	0.334		3.448	0.001	Accepted
H5	SSC→SCE	0.089		2.311	0.021	Accepted
	Mediating Effect					
H6	ITP→SCP→SCE	0.279		2.115	0.005	Partial Med
	Moderating Effect					
H7	ITP x OC→SCE	0.166		2.146	0.016	Accepted

Note: ITP=Information Technology Proficiencies, SCP=Supply Chain Practices, SSC=Smart Supply Chain, SCE=Supply Chain Excellence, OC=Organizational Culture, Significant at level p<0.05

According to the findings in Fig. 2 and Table 3, IT proficiencies is directly and statistically significantly correlated with Supply Chain Excellence, Supply Chain practices and Smart Supply Chain (path coefficient β= 0.150, P 0.001, β=0.661, P 0.001, and β=0.527, P 0.001, respectively). The findings support H1, H2 and H3. It has also been evidenced that Supply Chain

Practices and Smart Supply Chain has significant impact on Supply Chain Excellence (Path coefficients β=0.334, P 0.001, β=0.089, P 0.021) the results supporting H4 and H5 of the model. The indirect effect of IT proficiencies on SC Excellence through mediating effect of SC practices and Smart Supply Chain have evidenced as significant, explaining partial mediation (path coefficients β=0.279, t=2.115, P 0.005) supporting the H6. At last, the moderating effect of Organizational culture is depicted as strengthening the relationship between IT proficiencies and SC excellence with positive significant results (β= 0.166, t=2.146, P 0.016) supporting H7. The overall statistical findings are displayed below Table 3 and Fig. 2.

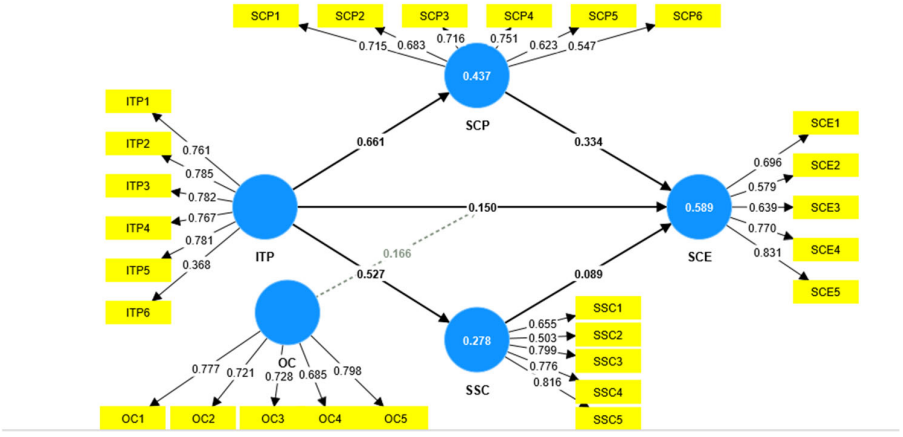

Fig. 2. Structured Equation Model

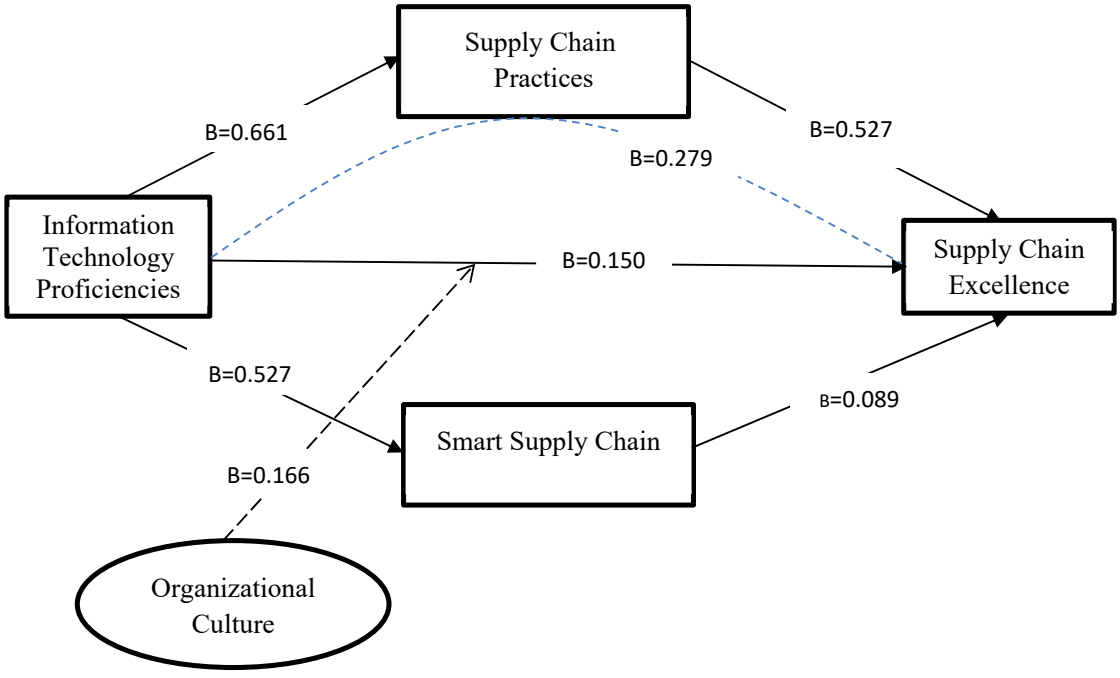

Fig. 3. Result of Path Analysis

The coefficient of determination (R^2), which proceeds from (0 – 1) and is best represented in Fig. 2, is the portion of the dependent variable's variance that can be predicted from the independent variable. Fig. 2 findings reveal that 58% of the variance in SC excellence can be attributed to IT proficiency, whereas 34% of the variance in SC performance can be attributed to both IT proficiency and SC practices. In the above Fig. 3, the hypothesized model was displayed with statistical results explaining each construct relationship determining a significant positive coefficient. The overall hypothesis data depicted as accepted according to the benchmark values. Moreover, the coefficient of determination (R^2), which proceeds from 0 to 1 and is best represented in Fig. 2, is the portion of the dependent variable's variance that can be predicted from the independent variable. Fig. 2 findings reveal that 58% of the variance in SC excellence can be attributed to IT proficiency, 27% of the variance in smart supply chain can be attributed to IT proficiencies, whereas 34% of the variance in SC performance can be attributed to both IT proficiency and SC practices. The overall hypothesis summary is listed in table 4 asserting each hypothesis as accepted.

Table 4
Summary of Results of Hypotheses Testing

Hypothesis	Causal path	p-value	Result
H1	IT Proficiencies on SC Excellence	0.000	supported
H2	IT Proficiencies on SC Practices	0.000	supported
H3	IT Proficiencies on Smart Supply Chain	0.000	supported
H4	SC Practices on SC Excellence	0.001	supported
H5	Smart Supply Chian on SC Excellence	0.021	supported
H6	Indirect effect of IT Proficiencies on SC Excellence through SC Capabilities as mediator	0.005	supported
H7	Organizational culture moderating effect on IT proficiencies and SC Excellence	0.016	supported

* Significant at a level of ($\alpha \leq 0.05$).

5. Discussion of the results

The research findings excel reveal the hypothesized model and construct relationships. The empirical analysis of the research encompasses the study variables from the automotive retail industry. However, the research outcomes revealed Supply chain excellence is a paramount goal for organizations seeking to remain competitive in today's dynamic business environment. This research discussion highlights the crucial interplay between four key elements: Information Technology (IT) Proficiencies, Supply Chain Practices, Smart Supply Chain, and Organizational Culture, in achieving and sustaining supply chain excellence.

Based on the targeted population, the research findings show the impact of IT proficiencies' access to real-time data and advanced analytics enables retailers to forecast demand, optimize inventory, and streamline supply chain operations. These insights are critical for staying responsive to changing customer preferences. Moreover, IT solutions enable seamless integration between brick-and-mortar stores and e-commerce platforms, offering a unified shopping experience for customers and efficient order fulfillment. However, effective inventory management practices, such as just-in-time inventory and demand forecasting, help retailers reduce carrying costs and prevent stock outs or overstock situations. Similarly, smart supply chain solutions allow the businesses to optimize omnichannel strategies, enabling them to fulfill orders from various sources efficiently and improve customer satisfaction. The aspect of organizational culture reveals as customer-centric culture prioritizes meeting customer needs and responding to feedback. This approach is vital in a sector where customer expectations evolve rapidly.

6. Conclusion and Recommendations

The research has identified the significant correlation between each construct having mediating and moderating effects of the variables. The research concludes the statistical outcomes as achieving supply chain excellence in the retail industry is intrinsically linked to the synergistic interplay of IT proficiencies, optimized supply chain practices, smart supply chain solutions, and a progressive organizational culture. Retailers that invest in these elements are better equipped to build resilient, efficient, and customer-focused supply chains. In an industry where customer satisfaction and timely deliveries are paramount, understanding and harnessing the interplay of these factors is crucial to maintain a competitive edge and stay relevant in the fast-paced world of retail.

In addition, to lessen any bias in this research, thorough secondary investigation is advised. After taking into account the significance of information technology in the supply chain management system, the respondents must be encouraged to respond to questions. Furthermore, the study will be very useful for future researchers if authenticity and relevance are taken into account.

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