

The effect of main characteristics of accounting information on supply chain performance, empirical study in Saudi Arabia

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ABSTRACT

The study explored the influence of the main dimensions of accounting information (AI) relevance and reliability on supply chain performance (supply chain exchange information, supply chain collaboration, supply chain integration) at Noon e-commerce companies in Saudi Arabia. The researcher followed the descriptive analytical approach to describe the study variables based on previous studies and explore the study gap. The study adopted a questionnaire, of which 170 were collected. The data was analyzed using partial least squares (PLS) through structural equation modeling (SEM). The results indicated a positive effect of the relevance and reliability of AI on the dimensions of SC performance (SC exchange information, SC collaboration, SC integration), there is a positive effect of the reliability of AI on the dimensions of supply chain performance (SC exchange information, SC integration) and a negative effect of the reliability of AI on the SC collaboration parties. These results clarified the value and benefit of accounting information in improving supply chain performance.

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1. Introduction

The supply chain (SC) has currently received attention from the financial community and researchers, whether the SC is represented by large multinational enterprises or small enterprises, which have become of great importance in light of global, developmental, and economic changes (Zhang & Wu, 2013; Nazzal, 2016). Global SCs are a source of competitive advantage. Information technology helps companies access labor and raw materials with comparative advantages (Porter, 1985), better financing opportunities, and broader markets. The natural repercussions imposed by the modern business environment, which increase the difficulty of managing it, played a fundamental role in moving towards adopting the concept of SC by many institutions concerned with providing a specific product to improve their competitive performance and achieve their goals, and this requires the participation of chain members (Manuj & Mentzer, 2008; Anderson & Dekker, 2009). For businesses to be innovative, creative, and able to achieve their goals efficiently and effectively and to achieve a competitive advantage that enables them to confront competing establishments, they need to search for ways that would allow them to survive in the market so it began implementing a set of practices covering the upstream and downstream sides of the SC. These practices include strategic partnerships with suppliers, customer relations, information exchange, and flow. Its continued focus on the quality of information exchanged, outsourcing, core competencies, on-time production and inventory system efficiency, cross-functional work teams, and loss-free internal practices to enhance effective SCM and

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increase its response quickly, efficiently and effectively (Ghatebi et al., 2013; Sharma et al., 2013). The company's ability to change for the better requires responding to the requirements of the internal and external environment and seeking to create economic blocs with other companies, as well as appropriate planning for supply chain management (SCM) in terms of providing and sharing information and opening channels of communication and collaboration between suppliers, the company and customers to achieve the goal of integration between members of the SC (Fawcett et al., 2009).

To increase the speed of response, on the other hand, SCM is considered one of the modern trends in accounting administration (Sharma, A. et al., 2013). Competitive pressures have promoted establishing long-term relationships, including coordinating all matters. Internal efforts with external partners under the concept of SCM as a system that extends to include the external environment include all members of the SC who work through the concepts of partnership and strategic alliance so that more significant benefits are achieved for each member while maintaining the size of each company in the chain and its independent moral character (Ghatebi et al., 2013).

Information is of great importance to the supply chain in achieving integration between suppliers and customers, and accounting information is also important for the company, suppliers, and customers (Beheshti et al., 2014). Most previous studies discussed the SC's economic, social, and environmental performance. It did not address performance regarding SC exchange information, SC collaboration, and SC integration; the research identified the study gap in the following question: Does accounting information, suitability, and reliability dimensions affect SC performance (exchange information, collaboration, integration)? The study aims to measure the impact of accounting information's characteristics, including its suitability and reliability dimensions, on the SC performance with its dimensions (exchange information, collaboration, integration) at Noon e-commerce companies in Saudi Arabia.

The paper includes five sections: introduction, literature review, and hypothesis development, study method, results and discussion, and finally, the conclusion.

2. Literature Review and Hypotheses Development

2.1 Supply Chain (SC)

The SC is an integrated process where raw materials, after a transformation process, are presented in finished products and then delivered to customers through distribution through four links that comprise several large and complex interest systems. These are (a) supplies, (b) manufacturing, (c) distribution, and (d) consumers (Chen & Kitsis, 2017; Jodlbauer et al., 2023; Mentzer et al., 2001; Cooper & Ellram, 1993). Established entities are activated to procure raw materials, design goods, and transform them into semi-finished and final products for delivery to the final customer (Bozarth & Robert, 2019). It is also related to ensuring the flow of raw materials and information from suppliers to organizations, exchanging information with organizations and their suppliers, flexibility of supply, and post-supply services (Wieland, 2021; Jaboob et al., 2024; Hendriksen, 2023). The SC consists of a set of activities that must be performed to create value, which begins by purchasing raw products; they go through the operating processes to transform them into finished products until they are presented to customers, as competition in the global business environment intensifies, companies increasingly face competitive pressures such as increased product variety and shortened product life cycles. As such, efficiency is no longer achieved. Just enough for companies to be competitive, they have to design and manage a SC that is flexible, adaptive, and compatible while at the same time following SC strategies; it ensures the achievement of the desired organizational goals and has a SC that is flexible, adaptive and compatible, the company must be able to coordinate among participants in the SC such as suppliers, distributors, and customers effectively (Kim, 2013; Malik et al., 2023; Ghasemi et al., 2023). The concept of (SCM) is one of the most critical trends that seek to achieve compatibility with the requirements of globalization and achieve the competitiveness of organizations, as competition has moved from its traditional framework in the form of competition between organizations to another, more powerful form, which is competition between SCs with each other. And the ability of these chains to respond quickly to continuous changes in the business environment (Taylor, 2006; Salhab et al., 2023).

2.2 SC Performance

SC performance is the level of effectiveness and efficiency in achieving tasks related to SC objectives. Effectiveness refers to the extent to which objectives are achieved as planned. Efficiency is how resources are used while working to achieve goals in a way that saves costs such as inventory and operating costs (Lai et al., 2002). For the organization to know the proper performance of its SC, it must measure that performance. Some researchers have confirmed (Arzu Akyuz & Erman Erkan, 2010), as explained, that the goal of measuring performance lies in identifying the extent to which customer needs are met, better understanding SC operations or practices, identifying possible improvement opportunities, tracking the level of progress that has been achieved, or making decisions. Certain. Researchers have adopted several dimensions to describe and measure SC performance, and these dimensions have varied depending on the viewpoints related to measuring SC performance. The SC has a structure that is influenced by the efficiency and effectiveness of operational and administrative processes, where sales income is taken into account compared to the total cost of the SC and provides differential value to organizations (Kato-Yoshida et al., 2023). Currently, priority is given to measuring the performance and efficiency of SCs

to identify the links where problems lie and provide solutions. Performance is reflected in the extent to which this SC meets the requirements of the end consumer regarding management indicators, both in any link and at low cost (Ortiz & Jiménez, 2017). Some researchers have been interested in measuring SC performance by focusing on the performance itself using dimensions such as the degree of dependence on the organization in implementing the product delivery process, speed in delivering products and achieving customer satisfaction (Wagner & Bode, 2008) and other dimensions such as cost efficiency and market performance. , responding to customer requests (Singhry et al., 2016), ensuring quality, and reducing costs (Hall & Saygin, 2012a). According to (Wagner and Bode (2008), the performance of the SC is primarily related to the organization's effectiveness and efficiency in achieving the SC's objectives. Depending on the multidimensionality of the SC, determining its performance is related to identifying the performance of each of these dimensions. Researchers have used direct or indirect measures to measure SC performance. Examples of these direct measures include the company's ability to deliver products, the ability to meet all demands in the market, and the speed of delivering products to customers. Examples of indirect measures include customer satisfaction. The study by Fawcett et al. (2007) relied on directing questions to managers that required evaluating the performance of their companies' SC compared to the SCs of competing companies or directing questions to managers that included evaluating dimensions of SCP, such as SC integration, to evaluate SC performance. There are many points of view in determining the dimensions of SC performance, and most of these studies focused on the financial, environmental, and social dimensions as primary dimensions of SC performance (Green Jr et al., 2012; Liu et al., 2018; Acquah et al., 2020; Bag & Rahman, 2023). Other dimensions have also emerged, such as the exchange of information between SC parties and the operational performance of the SC, which can be judged through non-financial indicators such as the organization's ability to deliver products on time and the economic performance of the SC, which revolves around reducing costs and improving the organization's cash flows (Garcia-Alcaraz et al., 2017; Kochan et al., 2018). Some studies have reported on a set of dimensions of SC performance, which are as follows: integrative behavior in implementing SC activities, joint exchange of information, sharing of risks and rewards, and collaboration., establishing common customer service goals, integrating SC operations, partnering among SC partners are geared toward building and developing long-term customer relationships (Min et al., 2007; Inderfurth et al., 2013).

2.3 Accounting Information

According to Andon et al. (2015), accounting is not inherently beneficial. Artificial Intelligence (AI) is a heterogeneous agglomeration that becomes useful in practice because the diverse interests of interested parties are mobilized in processes that confer benefit. Following (Jordan & Messner, 2012), the heterogeneous and changing nature of practice provides discretionary space to use AI in ways that are locally sensitive and situationally useful, and accounting scholars (Ball & Brown, 2014) have long been advocates of the utility of current models of accounting information. They investigated the effect of AI communicated through financial statements on stock price returns. Based on their analysis, they concluded that income values were helpful because they were linked to stock prices. AI was valuable because it conveyed excellent or bad “news”, which positively or negatively affected the company's stock price. However, these authors also acknowledge a prevailing counterargument asserting that there is no economic meaning to AI based on the fact that AI combines historical costs with changes in the price level, which limits investors' decisions. Thornock (2016) studied the usefulness of financial statements (annual and quarterly). Annually based on an analysis of four scenarios, they expect investors to resort to the abovementioned AI long after publishing it. They considered that since they had not contained news or reveal new information to the market, the benefit of financial statements to investors may lie in providing information that sets the context and terms of the information available. The research adopts a user-based approach. AI is data the company has obtained from various sources, arranged, and transformed into information contributing to the decision-making process (Romney & Steinbart, 2015). The quality of AI is a characteristic that characterizes AI (Mai, 2013). Information is of appropriate quality if it is relevant and contributes to decision-making (Haag & Cummings, 2008; O'Brien; Hall, 2011). Stair et al. (2015) stated that good AI is reliable, accurate, complete, current as long as it is presented in a clear format.

2.4 Main Characteristics of AI& SC Performance Dimension

The production of information characterizes accounting to serve internal and external parties, and this information must be described by characteristics that make it useful for decision-making. These characteristics are called the characteristics of accounting information, which determine the quality of this information (Kimmel et al., 2020). According to (Abdelraheem, 2024a; Abdelraheem et al., 2021; Abdelraheem, 2024b; Kwakye & Ahmed, 2024; Alsmady, 2022), the main characteristics of AI are the relevance and reliability of this information. The dimensions of SC performance used in the current study are information sharing, communication, joint planning, collaboration, and SC integration. These were chosen in light of previous studies that showed their importance when studying the SC, including focusing on information sharing between SC partners (Hall & Saygin, 2012b), communication (Voigt & Inderfurth, 2012), and joint planning between partners (Braunscheidel & Suresh, 2018), collaboration (Wu & Chiu, 2018), and SC integration (Lu et al., 2018), where relevant and reliability AI is used for decision-making in evaluating the performance of SCs relevance and reliable AI is used to assess the performance of SCs. This information must be exchanged between members of the SC through collaboration, and the exchange of information is essential about production plans, quality, and design, as the exchange of information allows companies to better direct quality improvement programs and achieve quality improvement flow smoothly and

efficiently supply of materials within the supplier network, preventing potential obstacles in the purchasing process and production (Danese, 2013). Thus, the first and second hypotheses:

H₁: *There is a scientific value of the relevance of AI on the SC exchange of information.*

H₂: *There is a scientific value in the reliability of AI on the exchange of information in the SC.*

SC collaboration is considered one of the most essential tools for achieving an organization's competitive advantage and improving performance (Acquah et al., 2021). Business organizations seek to ensure survival and create value through the innovation process, which in turn depends on developing a joint innovation process between the organization and business partners across the SC in the form of cooperative arrangements and relationships (He et al., 2022) Therefore, collaboration within the SC is one of the determinants of innovation success in terms of the necessity of creating internal and external integration with suppliers and customers to improve companies' innovative capabilities (Freije et al., 2022), studies in the field of SC management are currently moving towards studying how industrial business organizations can improve their competitive advantage through SC activities and capabilities, by enhancing collaboration processes regarding innovation activities and building cooperative relationships with chain business partners. Collaboration also provides access to the necessary knowledge and information. Therefore, relevant and reliable AI must be available to achieve collaboration between the SC (Liao & Li, 2019). Thus, the third and fourth hypotheses:

H₃: *The relevance of AI to SC collaboration has a scientific value.*

H₄: *The reliability of AI on SC collaboration is of scientific value.*

To integrate the SC, there must be a minimum level of planning, collaboration, and information exchange between all members of the SC, as accounting information, with its relevance and reliability, is considered the decisive factor for achieving joint planning, collaboration, information exchange, and SC integration (Alfalla-Luque et al., 2015; Koufteros et al., 2010). Thus, the fifth and sixth hypotheses

H₅: *The relevance of AI to SC integration has a scientific value.*

H₆: *The reliability of AI has a scientific value on SC integration.*

3. Research Design

3.1 Questionnaire Development

The study explores the main characteristics of AI on the performance of SCs at Noon e-commerce companies. A five-point Likert model (strongly agree, agree, neutral, disagree, and strongly disagree) was used, and the questionnaire was designed and distributed to the parties of the SC at Noon e-commerce company. 180 questionnaires were distributed, of which 173 were collected, 170 of which were suitable for analysis. Smart pls (partial least squares) programs were used to evaluate the measurement and structural models and test the study hypotheses through the descriptive analytical approach.

3.2 Data Gathering Process

Data was collected from the study sample: the parties related to the quality of accounting information, namely the administrators, and the parties associated with the performance of the supply chain, namely the administrators, suppliers, and customers of Noon Company. Analysis of the study sample data revealed, according to Table 1, that 137 of the sample members had a bachelor's degree, 24 had a master's degree, and 9 of them had a high diploma; it was also evident from the data analysis that 88 of the sample members majored in business administration, 34 in marketing, 30 in economics, and 18 in accounting and finance.

Table 1
Study Sample

	Frequency	percentage
Qualification		
Bachelor's	137	81%
Master's	24	14%
High diploma	9	5%
Total	170	100%
Specialization		
Business Administration	88	52%
Marketing	34	20%
Economics	30	17%
Accounting and Finance	18	11%
Total	170	100%

4. Result and Discussion

4.1 Measurement of the Model Validity

According to (Mohd Dzin & Lay, 2021; Sürücü & Maslakci, 2020) the first step is to Smart pls (partial least squares) measure the validity of the model; this is done by measuring the loading of the questionnaire statements on the latent variables and the extracted variance (Hair Jr, Joseph F. et al., 2010; Purwanto, 2021). The loading rate must exceed 60%, and the extracted variance is 50%; in Table 2 and Fig. 1, we notice that the loading rates exceed 60%, and the extracted variance is more significant. of 50%, which indicates that the measurement model is applicable.

Table 3

Model Validity

			Average Variance Extracted (AVE)
Relevance of Accounting Information	Relev1	0.955	0.850
	Relev2	0.901	
	Relev3	0.895	
	Relev4	0.935	
Reliability of Accounting Information	Reli1	0.907	0.761
	Reli2	0.914	
	Reli3	0.870	
	Reli4	0.793	
SC Collaboration	SCC1	0.928	0.707
	SCC1	0.848	
	SCC1	0.869	
	SCC1	0.700	
SC Exchange Information	SCEI1	0.903	0.840
	SCEI2	0.797	
	SCEI3	0.819	
	SCEI4	0.688	
SC Integration	SCI1	0.931	0.649
	SCI2	0.916	
	SCI3	0.910	
	SCI4	0.909	

4.2 Measurement of the Model Reliability

The second step is to verify the reliability of the model through composite reliability (CR) and Cronbach's alpha (CA), and it must not be less than 70% (Mohd Dzin & Lay, 2021; Hair Jr, Joseph F. et al., 2010; Hair Jr, Joe F. et al., 2017; F. Hair Jr et al., 2014; Fuller et al., 2020). From Table 3, we note that the composite reliability (CR) and Cronbach's alpha (CA) rates exceed 70%, which indicates adequate reliability and internal consistency for the study variables

Table 3

Model Reliability

			Composite Reliability (CR)
Relevance of Accounting Information	Relev1	0.941	0.958
	Relev2		
	Relev3		
	Relev4		
Reliability of Accounting Information	Reli1	0.895	0.927
	Reli2		
	Reli3		
	Reli4		
SC Collaboration	SCC1	0.860	0.905
	SCC1		
	SCC1		
	SCC1		
SC Exchange Information	SCEI1	0.937	0.955
	SCEI2		
	SCEI3		
	SCEI4		
SC Integration	SCI1	0.818	0.880
	SCI2		
	SCI3		
	SCI4		

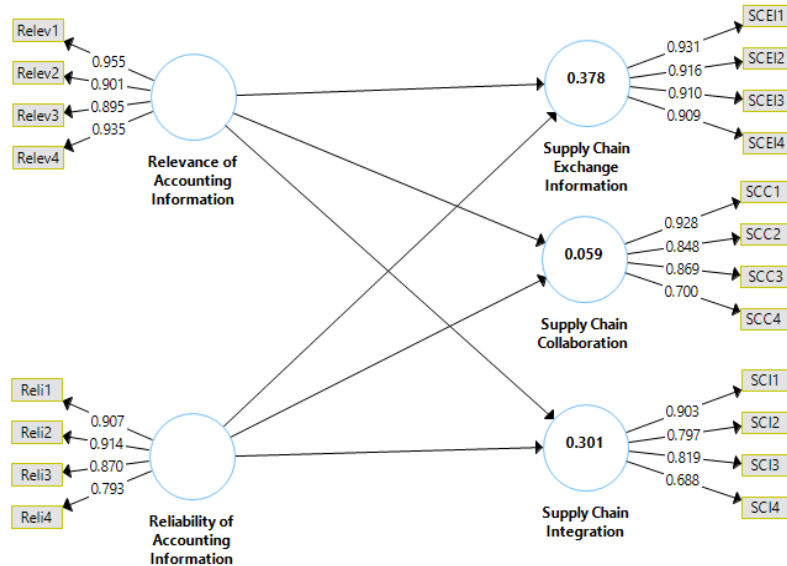


Fig. 1. Measurement Model & R Square

4.3 Discriminant Validity

The third step in measuring model assessment in SmartPLS is to measure discriminant validity, which shows the association of latent variables with themselves. (Purwanto, 2021; Cheung et al., 2023; Rönkkö & Cho, 2022; Plisky et al., 2021). This indicates that the correlation of the variable with itself must exceed its correlation with other variables, which is confirmed in Table 4.

Table 4
Discriminant Validity

	Relevance of Accounting Information	Reliability of Accounting Information	SC Collaboration	SC Exchange Information	SC Integration
Relevance of Accounting Information	0.922				
Reliability of Accounting Information	0.394	0.872			
SC Collaboration	0.239	0.060	0.841		
SC Exchange Information	0.501	0.525	0.186	0.917	
SC Integration	0.476	0.438	0.295	0.200	0.805

4.4 Structural Model Assessment

It is done through the coefficient of determination (R^2), which measures the variance in the dependent variable explained by the independent variable. (R^2) were calculated using the following: ≥ 0.67 = strong, $0.33 - 0.67$ = moderate, $0.19 - 0.33$ = weak; (Hair Jr, Joseph F. et al., 2010; Chin, 1998; Lin et al., 2020), according to Table 5 and figure1, the (R^2) for the dependent variables are greater than 0.19 expected the SC Collaboration. Therefore, the model is suitable for explaining the variance in the dependent variables by the independent variables. Calculating the (F^2) to measure the effect size of the independent variables on the dependent variables is also possible. (F^2) were measured using the following: ≥ 0.35 = large, $0.15 - 0.35$ = medium, $0.02 - 0.15$ = small, ≤ 0.02 = no effect (Chin, 1998; Selya et al., 2012). Table 5 shows the size of the effects of the independent variables on the dependent variables, where there is a small effect of the relevance of AI on SC collaboration with a value of 0.058, a moderate effect of the relevance of AI on SC exchange information, and SC integration with a value of 0.156 and 0.165, respectively. It was found that there was a moderate effect of 0.204 for the reliability of AI on SC exchange information, a weak effect on SC integration with a value of 0.106, and no effect on SC collaboration with a value of 0.001.

Table 5
 F^2 & R^2

F^2	SC Collaboration	SC Exchange Information	SC Integration
Relevance of Accounting Information	0.058	0.165	0.156
Reliability of Accounting Information	0.001	0.204	0.106
R^2	0.059	0.378	0.301

4.5 Hypotheses Test

According to (Purwanto, 2021; Guenther et al., 2023), the Partial least squares (PLS) method in structural equation modeling (SEM) contributes to determining the effect of independent variables on dependent variables and the direction of this effect. Table 6 and Fig. 2 show the values used to test the study hypotheses. It became clear that the relevance of AI has a positive effect of 0.349 on the SC exchange information at a significance level of 0.001 ($T = 5.388$, $P = 0.000$), which indicates the acceptance of the H1, the relevance of AI has a positive effect of 0.255 on the SC collaboration at a significance level of 0.01, ($T = 2.747$, $P = 0.006$), which indicates the acceptance the H2, the relevance of AI has a positive effect of 0.360 on the SC integration at a significance level of 0.001, ($T = 4.703$, $P = 0.000$), which indicates the acceptance the H3. These indicators showed that the relevance of accounting information positively affected the SC performance. As for the reliability of information and supply chain performance, the results showed a positive effect of 0.378 for the reliability of AI on the SC exchange information at a significance level of 0.001, ($T = 6.190$, $P = 0.000$), which indicates the acceptance of the H4, an adverse effect of -0.040 for the reliability of AI on the SC collaboration at a significance level of 0.05, ($T = 0.253$, $P = 0.800$), which indicates the rejected the H5, and a positive effect of 0.296 for the reliability of AI on the SC integration at a significance level of 0.001, ($T = 3.583$, $P = 0.000$), which indicates the acceptance the H6. The results obtained agreed with (Sharma & Routroy, 2016) about the importance of information in general and appropriate and reliable AI in particular in improving the performance of the SC in terms of the exchange of information between the parties of the SC, the results of the study also agreed with (Zhou & Benton Jr, 2007), who concluded that SC integration depends on good AI mutual exchange between SC partners and collaboration between them.

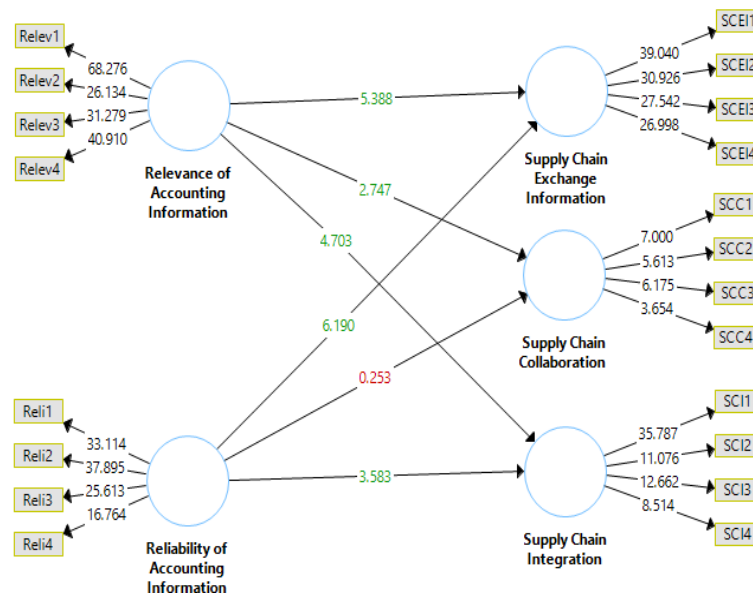


Fig. 2. Structural Equation Model

Table 6

Hypotheses Test

Hypotheses	Std. Beta	T -Value	P- Values	Result
Relevance of AI → SC Exchange Information	0.349	5.388	0.000	Accepted***
Relevance of AI → SC Collaboration	0.255	2.747	0.006	Accepted**
Relevance of AI → SC Integration	0.360	4.703	0.000	Accepted***
Reliability of AI → SC Exchange Information	0.387	6.190	0.000	Accepted***
Reliability of AI → SC Collaboration	-0.040	0.253	0.800	Rejected
Reliability of AI → SC Integration	0.296	3.583	0.000	Accepted***

5. Conclusion

There is a discrepancy in viewpoints regarding supply chain performance, as some studies have shown that supply chain performance is represented by the internal and external performance of the chain, and other studies have mentioned economic, social, and environmental performance. The studies have agreed that the main characteristics of AI are its suitability and reliability. The current study focused on dimensions of SC performance represented by the exchange of information, collaboration, and integration of SC partners. The study highlighted the presence of a moderate positive effect of the relevance dimension of AI on all dimensions of SC performance for the company under study. It also found a medium positive effect of the reliability of the AI dimension on the two dimensions of exchange of information and integration: SC, and a negative effect on SC collaboration.

The limitations of this study are that it relies only on basic accounting information and neglects the rest of the other information, such as demand forecasting, inventory quantities, and information about suppliers and customers, which are considered essential for the performance of SC. Therefore, the study recommends studying the effect of the administrative information system on SC performance.

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