

The Impact of Electronic Supply Chain Management Usage on Firm's Performance

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Abstract

This study investigates the status of e-SCM and performance among Jordanian manufacturing sector. The objective of this study is to analyze the impact of trust and communication on the e-SCM usage. Moreover, the study investigates the effect of the trust and communication on the firm's performance while the e-SCM usage is used as a mediating factor on firm's performance. The proposed research model was validated by distributing 250 survey questionnaires to the manufacturing sector in Jordan. Structural equation modelling (SEM) technique was used to analyze the results. One of the main limitations of this study was that the results could not be universal since the study was limited to Jordan. We discussed the implications of our results for research and practice.

Keywords

Firm's Performance, Communication, Trust, Electronic Supply Chain Management

1. Introduction

Small and medium enterprises that adopted electronic commerce (e-commerce) as a business model and used electronic supply chain management (e-SCM) operations showed impressive performance in commercial operations. Real time data, rapid data exchange and data availability provided by the Internet allow for efficient coordination and cooperation between different business (B2B) and for better trade values for both businesses and consumers (B2C) [1]. E-commerce is a new business model that enables users to exchange goods, services and information over the computer networks such as Internet. It is the process of transferring products, purchase, sale, and exchange of services or information through electronic media [2]. It is the fastest growing segment of

economy which allows different businesses sizes to spread globally and at the same time minimizes their total costs. E-commerce adoption is said to be contributing to the advancement of business processes and becomes critical considerations in small and medium-sized companies at the present time [1] [3]. Indeed, small and medium businesses need to consider e-commerce as a strategic weapon to improve SCM and increase performance in competitive markets. E-SCM is not only about changing technology, but also includes other important changes in management policies, organizational structure, performance metrics, and business processes across the supply chain must follow [2].

Companies such as Dell use SCM to create more integration with their suppliers to reduce distribution costs, enhance supplier relationships superior, and enhance the overall business performance. The success of such initiatives inspires many companies to use the Internet to streamline their supply chain management. Market research firms state that US companies are increasingly investing in Digital Supply Chains [4]. Although increasing the importance of recognition e-supply chain management, companies face many challenges in transforming their traditional linear value chain systems into digital supply systems. In fact, many companies in Jordan face disappointments and dissatisfaction results of transforming their traditional value chain into electronic supply chain management (e-SCM) [5]. Due to the increased investments in e-SCM and increasing challenges for effective implementation of such systems, there are still some question marks about whether such transformation of activities using the Internet is economically profitable. Notably, we know only a little about the key factors that promote or discourage the scope of the e-SCM activities [6]. Moreover, there is a relatively limited experimental documentation for the e-SCM application performance [7] [8]. As e-SCM applications require large investments in terms of money, effort and time, it is important to examine whether these systems lead to any positive performance improvement and investigation the major factors that affect its use.

This research aims to understand the key factors that have major impacts on the e-SCM activities. In this study, we investigate the use of electronic supply chain in the transformation activities by a sample of Jordanian companies [9]. We investigate the extent of e-SCM usage in the transformation activities such as procurement and logistics, warehousing, choice of suppliers and demand management, etc. Thus, the extent of e-SCM reflects the degree of transformation of functions of SCM using technologies and applications used in the transformation activities. In addition, we aim to analyze the performance of the e-SCM implementation.

Information and communication technology (ICT) managers claim that the implementation of ICT is determined by managing some factors, which include the decision of managers to adopt new ICT, and change resistance management, administrative skills, management flexibility, management authority, knowledge management, etc. [10] [11]. Previous studies show that most senior managers who graduated in the 1970s make decisions depending on their own experiences without relying on information systems [12] [13]. Most of these older managers do not believe in the value of using ICT in the workplace. Moreover, they have the fear of losing their power and/or position. Therefore, companies attempt to overcome this problem through awareness and training programs. On the other hand, some managers feel that they are in danger and must improve their practices and behaviour and develop themselves to deal with the speed of change in their companies [10]. Finally, the social and cultural forces, along with the management skills and experience are critical factors that determine the spread of ICT. So this study will focus on the two factors which may have direct effect on the e-SCM Usage; those factors consist of trust and communication in Jordanian environment. However, this research addressed two main questions about the affecting factors on the use of e-SCM and the relationship between e-SCM usage and performance of the firm. The two main questions are:

- 1) What are the main factors affecting the use of e-SCM?
- 2) What is the relationship between the e-SCM usage and performance?

2. Fundamental Review

Basic Internet services management and the use of e-business and business management systems should be integrated in the functions of the supply chain that are internally conducted between small and medium-sized companies [14]. Moreover, the integration of information technology systems between suppliers and consumers is an option for reducing costs through collaborative work [15]. On the other hand, the quality of service provided to customers is one of the most important characteristics for the success of supply chain [16]. Clients are considered as part of this success when dealing with the company in the development of products and processes according to their needs. E-commerce expands the traditional supply chain operations by expanding its capabili-

ties in order to improve the efficiency of small and medium-sized companies [16]. To compete successfully in today's market and to effectively meet customer's requirements, it is imperative for small and medium companies to adopt comprehensive supply chain operations. E-commerce is a major technological innovation in developed countries. At the same time, it spreads increasingly in developing countries, such as Jordan. Nowadays, the Internet is everywhere, and its use is effective in terms of reducing costs of businesses. Internet has changed radically the way companies deal-making, communication, acquisition and use of resources, as well as building and maintaining a competitive advantage [17] [18]. Information Technology (IT) can facilitate information management, enhances the flow of information which makes the supply chain more robust and flexible without compromising competence [19]. As a result, in response to the changing the dynamics of business processes, intensive use of the Internet to streamline the supply and distribution chains, and enrich the communications amongst different business stockholders lead to providing effective services in terms of cost and value-added. During the 1980s and 1990s, most companies focused on improving the internal efficiency of internal business processes. However, the current competitive dynamics coupled with the advances in web technologies are forcing companies to think outside of their boundaries in the supply chain in order to establish a distinct value-added offers and competencies networks. In fact, the new trend now is to employ digital supply systems instead of traditional linear value chain [13].

Many research in e-commerce adoption focus on the number of internal and external factors affecting the decision of adoption small and medium enterprises [20]. E-commerce facilitates the progress and growth of small and medium-sized enterprises in developing countries due to the information and communication technologies to reduce transaction costs, eliminate the mediating and facilitate linkages to global supply chains [21]. Many studies used the theory of the deployment of innovation as a framework for investigating the electronic data interchange (EDI) adoption [22]. Innovation can be affected by various technological factors such as the relative complexity and feature, ability, compatibility and trainability that may affect the decision of adopting e-commerce option by the small and medium organizations. Previous work that uses the deployment of the previous SCM models focus on technological innovation factors. E-commerce contributes to enhancing the efficiency of the work in three important ways: 1) reduce the distribution and transaction costs; 2) rapid development of products; 3) expanding the choices available to consumers and suppliers [23]. This argument is vital to the fact that vertical cooperation with consumers and suppliers plays an important role in innovation amongst SMEs operations.

2.1. Usage of e-SCM

e-SCM is the use of web technologies in the supply chain management activities that captures the degree to which Internet technologies are integrated with the supply chain activities [24]. The use of e-SCM empowerment reflects the efforts of companies to take advantage of the potential of recent advances in communication technologies in the SCM and strategies related activities. Despite making significant investments in web technologies, there is a large variation in the extent to which firms are able to understand these technologies and take advantage of their potential use in SCM [25] [26]. Companies that do not effectively use the web technologies take the risk of a decline in its competitiveness, apart from the lack of any significant value from their investment.

The process of SCM are rarely unfolds in a systematic way, unpredictable and often face many challenges. We need to understand e-SCM processes in parallels to the concepts of "the use of technology" and "technology absorption" prevailing in the study of management information systems [6]. It has been widely accepted that the current level technology usage as a criterion indicator for the success of information technology in organizations. Many researchers have sought to understand the commercial value of an experimental technology have documented the importance of the level of technology use. [24] showed that effective use of technology is considered as one of the main factors that used in evaluating the association between IT and its implementation benefits.

2.2. Performance of SCM

Although the experimental results about the efficiency of deploying e-SCM have been contradictory in the previous studies, there is a clear recognition with respect to the difficulty in directly linking the use of information technology to business performance. Researchers have recommended the assessment of the impact of technology through the study of specific benefits through the implementation of a system [24] [27]. A previous study

has found that deploying an electronic data interchange (EDI) systems produces significant improvements in performance [28]. [29] examined the value and impact of e-commerce by using e-procurement case study. They found that the process of purchasing on the web can provide better description for the items than in traditional purchasing process. [8] examined the use of supply chain management systems by 131 suppliers of large retail stores and documented experimentally the relationship between the use e-SCM and benefits and reported positive relationship between using e-SCM and benefits.

[30] collected data from 260 manufacturing companies; they show that the increasing use of web technologies is associated significantly and positively with the efficiency of the supply chain. Moreover, [31] found the higher levels of performance are associated with higher levels of activity e-SCM. Recently, [7] provided an evidence to raise the level of performance following a series of e-SCM initiatives. They found that the investment in information technology in the SCM creates more efficient functionalities than traditional functionalities provided in SCM which leads to increased performance. Increasing the use of digital technology in the supply chain enhances the operational and strategic coordination, which ultimately leads to better performance [32]. [33] found that the e-business techniques improve provider-supplier integration, which ultimately leads to superior performance.

2.3. Trust

Trust has been defined as the mutual confidence between partners [34]. [35] showed that trust amongst partners increases the performance positively. Therefore, trust is a key element in organizational relationships and management approaches to the issue of trust is of scientific and practical importance. Many research studies focus on proposing methods to develop and strengthen the trust amongst employees [36].

2.4. Communication

Some researchers pointed out that the existence of long-term relationships is a necessary but not sufficient to improve the communication skills of the strategic chain managers. Consequently, they must improve their skills for effective communication [37]. [38] showed that communication plays a crucial role in the performance and a satisfaction sign in cooperative relations. The impact of collaborative communication relations between the buyer and the supplier can be improved through the development of mutual commitment and cooperation [39] [40]. It is the collaborative communication element that is crucial to promote and safeguard the common ties between the organizations [39]. Strategic communications and information flows in the cooperative relations between the buyer and suppliers generate performance benefits such as financial gain from improved asset management, reducing operating costs, increasing productivity and improving planning and control of resources [41].

Communication with the mainstream in the supply chain enhances the cooperative relations between buyers and suppliers by imposing the necessary investments in joint action and flexibility between the companies and partners [42]. Communication should have cooperative relations to exchange important information such as operational data, financial data, forecasting data and supply chain data; to gain efficiency and effectiveness, and sharing of profits from the joint relationship [43].

2.5. e-SCM and Performance

e-SCM is the collaborative use of the web technologies to perform business activities and to enhance the communication efficiency with customers, improve speed and agility, provide real-time control and increase customer satisfaction. Infrastructure such as the online information systems on the Internet, EDI and the reliability of both hardware and software are critical to the formation of e-SCM and effective communication between the members of the supply chain [44]. e-SCM in small and medium-sized companies is a tactic that helps organizations to be more flexible and cost-effective by integrating the different partners' processes at all the three levels of strategic, tactical, and operational managements. Although globalization has increased the pressure on small and medium-sized companies to reduce their prices, e-SCM can improve the performance of small and medium-sized enterprises and the growth of profitability by enhancing their ability to obtain supplies of the right quality, at the right time, and the most affordable ones. The primary goal of e-SCM is to reduce the overall costs of the SCM systems while meeting service requirements and integrating the purchase of customer queries,

manufacturing, and storage in small and medium-sized companies. Electronic supply chain integrates all information chains on both, the client side and the supplier side. Electronic supply chain management is a main application in small and medium-sized companies that help achieving lower operating costs, improve service quality, reduce order cycle time, keep low inventory levels, improve customer satisfaction and the development of the overall competitive advantage [45]. The use of information technology in small and medium-sized companies improves supply chain operations such as procurement, as well as supply chain management. Supply chain management includes planning, coordination, and so on.

Moreover, e-SCM is not about changing the technology only, it also includes altering the business methods, management policies and procedures, performance level, and organizational culture and structure across supply chain [2]. The performance and benefits of e-SCM for SMEs is reported in earlier studies include gaining a competitive advantage through relationships between customers and suppliers [46]. Electronic commerce can serve as an empowerment that offers a clear competitive advantage. B2B electronic SME market provides high strength and high supply chain capabilities for online interaction. The economic benefits that can be gained from e-commerce include reducing time to market, lowering operating costs, and increasing revenue growth and enhancing the level of customer service [17].

3. Research Methodology

3.1. Instrument Development

Measures for the research constructs used in our study were developed by borrowing and adapting established measures from prior literature. Most of the items were measured using a 7-point Likert scale ranging from “strongly disagree” to “strongly agree”. The antecedents in our research model comprise four constructs. Trust was assessed using five items; these items were adapted from [47]. Communication was assessed using five items derived from [48]. Five items used to capture e-SCM usage were adapted from [6]. Performance was assessed using five items derived from [6]. A list of measures we used in this study is provided in **Table 1**. Before conducting the survey, we pre-tested the survey instrument with three academic experts, and subsequently with four senior IT executives. The survey instrument was iteratively refined based on the assessment obtained.

3.2. Research Subject and Data Collection

The population of the study is the entire group of people, events, or things of interest that the study needs to investigate [49]. Top and middle IT managers of the Manufacturing sector in Jordan were selected as sample, which are made up of 25 companies according to Jedco [9]. This study uses a non-probability purposive technique. It enables the researcher to select a number of companies that are leading in the Jordanian manufacturing industry, and have complete application of IT capabilities in E-SCM service. The researcher chooses these kinds of companies depending on the high level of development in applying information technology in general, which is suitable for the study objectives. The sampling method used was judgment sampling which is type of the purposive sampling. This sampling method is considered as a non-probability sampling. It also occurs when a researcher selects specific organization as a unit of analysis according to some criteria previously defined.

4. Research Model and Hypothesis Development

This section discusses the research model and present hypotheses development. This paper studies the direct effect of trust and communication on the firm’s performance. Moreover, it studies the mediating effect of e-SCM usage between the trust, the communication, and the firm’s performance. This study hypothesizes positive linkages between dependent and independent factors as follows (**Figure 1**).

4.1. e-SCM Usage

The e-SCM usage refers to the extent of using e-SCM by business organizations in their daily procurements and/or provisioning. Since the empirical results regarding linking IT usage with business performance have been mixed, there is a clear recognition regarding the difficulty in directly linking IT usage to business performance. The realized benefits of employing a certain technology have been recommended as an assessment mechanism for using this technology [24] [27]. In line with these suggestions, we assess performance impacts of E-using

Table 1. Variables and measurement items.

Variable	Items
Trust	Managers in this firm feel that achievements are appreciated
	I believe that this firm offers a supportive for e-SCM environment
	Most of the employee in this firm trust our manager
	I believe my manager always behaves in good will
Communication	I believe that my employees sees the managers as responsible beings and does not need to control them
	Expected outcomes of the project are communicated to managers.
	Expected outcomes of the project are communicated to workers.
	Expected outcomes of the project are communicated by top management in advance.
Usage of e-SCM	Expected outcomes of the project are shared by workers
	Expected outcomes of the project are shared among workers across department
	Extent to which web applications are used in supplier selection (getting quotes, bids, etc.)
	Extent to which web applications are used in purchase order processing
Firm Performance	Extent to which web applications are used in procurement from suppliers (distribution, warehouse, logistics, etc.)
	Extent to which web applications are used in invoicing and payment processing
	Extent to which web applications are used in demand management (procurement analysis)
	Perceived, realized benefits from web-technology improved customer service
	Perceived, realized benefits from web-technology better inventory control
	Perceived, realized benefits from web-technology reduced operations costs
	Perceived, realized benefits from web-technology better relationship with suppliers
	Perceived, realized benefits from web-technology reduced cycle time

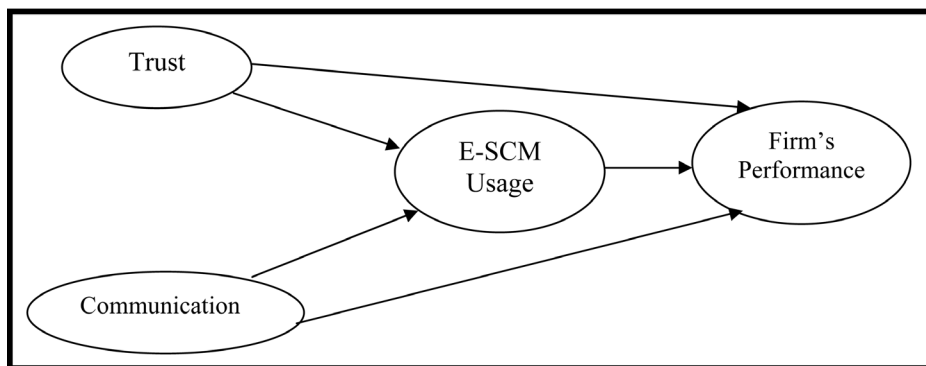


Figure 1. The research model.

e-SCM functions through the actual benefits realized by implementing e-SCM. Consequently, we formulate the hypothesis regarding e-SCM usage as follows:

H1: The e-SCM usage has a positive influence on the performance of a firm.

4.2. Trust

Trust reflects the depth of relationships between different business organizations and its existence between organizations indicates a healthy business environment. A growing body quickly from the literature acknowledges that trust represents an important variable affecting the organizational productivity [50]. Consequently, we for-

ulate the hypothesis regarding trust as follows:

H2: The trust has a positive influence on e-SCM usage.

4.3. Communication

The concept of communication in business refers to way of interaction between different business organizations. Intensive communication indicates large amount of business transactions between organizations. Nowadays, web technologies are considered as a cost-effective method of communications and it is being used to connect different business parties through using e-SCM. Empirical studies on EDI and IOS suggest tighter association between supplier synergies and higher technology usage. For example, for achieving more coordination with their suppliers, firms in food industry tend to use EDI more extensively [51]-[53]. In the context of e-procurement, synergies with suppliers play an important role in firm's adoption and usage of web technologies [54]. Consequently, we formulate the hypothesis regarding communication as follows:

H3: The communication has a positive influence on e-SCM usage.

4.4. Direct Effect of Factors on e-SCM Usage

In this study the researchers hypothesized the direct relationship between the factors in the framework (trust and communication) in order to show which of these factors has significant effect on e-SCM usage.

H4: The trust has a positive influence on the performance of a firm.

H5: The communication has a positive influence the performance of a firm.

4.5. Mediating Effect of Firm's Performance

In this study the researchers theorize e-SCM usage as a mediator in the relationship between the factors (trust and communication) and firm's performance. Therefore, we test the following hypotheses:

H6: e-SCM usage has a mediating effect between trust and firm's performance.

H7: e-SCM usage has a mediating effect between communication and firm's performance.

5. Research Results

The characteristics of the respondents are shown in **Table 2** which consists of gender, age and educational level.

5.1. Assessing the Reliability of the Variables

In order to proceed to the SEM analysis, it is essential to assess each scale for interconsistency reliability by using

Table 2. Characteristics of the respondents (N: 250).

Characteristics	Number	Percentage
Gender		
Male	130	52%
Female	120	48%
Age		
30 - 39	50	20%
40 - 49	100	40%
50 - 59	100	40%
Educational level		
Diploma	10	4%
Bachelor degree	100	40%
Master degree	90	36%
Others	50	20%

Cronbach's alpha. This stage is vital to exclude all components with low reliabilities in the SEM analysis in that the recommended Cronbach's alpha values between 0.60 and 0.70 [55]. While the description of the scale items as well as the reliabilities for the observed items of the survey constructs are presented in range from 0.66 - 0.80, as shown in **Table 3**, all of the research variables exceeded the recommended value of Cronbach's alpha (*i.e.*, between 0.60 and 0.70), and thus revealed a satisfactory degree of reliability and the composite reliability values ranged from 0.72 to 0.83, and all were greater than the recommended value of more than 0.60 [56].

5.2. Assessing the Validity of the Variables

While convergent validity test is important in the measurement model to verify if the indicators in a scale load together on a single variable, discriminant validity test is also important to confirm if the items developed to measure different constructs are absolutely evaluating different variables.

5.3. Convergent Validity

Some researchers argued that convergent validity is established when the factor loadings are significant [57]. Also, [58] emphasized that the greater the factor loadings, the stronger is the indication that the measured scales represent the variables. As shown in **Table 4**, the researchers examined the standardized regression weights for

Table 3. Reliabilities of the scales (N = 250).

Variables	Indicators	Cronbach's alpha
Trust	TS1-TS5	0.77
Communication	CO1-CO5	0.66
Usage of e-SCM	US1-US5	0.80
Performance	PM1-PM5	0.69

Table 4. Reliability and factor loadings.

Variable	Factor loading	Composite reliability
Trust		0.72
TS2	0.712	
TS3	0.621	
TS4	0.541	
TS5	0.566	
Communication		0.76
CO1	0.733	
CO2	0.524	
CO4	0.642	
CO5	0.544	
Usage of e-SCM		0.80
US1	0.617	
US2	0.653	
US3	0.717	
US5	0.801	
Performance		0.83
PM1	0.544	
PM2	0.611	
PM4	0.648	
PM5	0.719	

the research's indicators and found that some indicators had a low loading towards the latent variables (*i.e.* less than 0.50, which is the criterion value recommended by [59]). In particular (TS1 = 0.415, CO3 = 0.231, US4 = 0.143, PM3 = 0.221). Moreover, since all of these items did not meet the minimum recommended value of factor loadings of 0.50 [59], they were all removed and excluded from further analysis.

5.4. Discriminant Validity

Discriminant validity was investigated using several tests. [60] argued that discriminant validity could be examined in the measurement model by investigating the shared average variance extracted (AVE) by the latent variables. Also, the correlations among the research variables could be used to measure discriminant validity by examining if there are any extremely large correlations among them. Presence of such extremely large correlations implies that the models have a problem of discriminant validity. In addition, if the AVE for each construct exceeds the squared correlation between that variable and any other variables, then discriminant validity occurs [56] [60]. As shown in **Table 5**, and following [60] formula of calculating the average variance extracted of a latent variable, this study showed that all the variables explained 50 percent or more of the variance, and ranged from 0.71 to 0.88, which met the recommendation that AVE values should be at least 0.50 for each variable [58]. Furthermore, as shown in **Table 5**, discriminant validity was demonstrated, as the AVE values were more than the squared correlations for each set of constructs. Therefore, the measures significantly discriminated between the variables.

5.5. Assessment of Measurement Model

Maximum Likelihood Estimation (ML) is suitable in SEM for several reasons in order to have statistical influence in the model fitness to the dataset. Firstly, ML is a widely-used estimation method, especially with limited sample sizes of 100 to 200 [61]. Also, it is applied to estimate all model parameters simultaneously. The χ^2/df ratio is also considered as one of the indices that requires three or less values for an acceptable model [62]. In this case, the smaller the value of the ratio, the better is the fit. However, some researchers recommended the ratio to be between 2 and 5 [63]. Furthermore, if the AGFI, NFI, IFI, TLI and CFI values are from 0.80 to 0.90, they are considered acceptable [64]. RMSEA value takes the goodness-of-fit of the model into account. The accepted values should range between 0.05 and 0.08 [65]. Accordingly, the result confirmed that the measurement model fits with the data collected (**Table 6**).

Table 5. AVE and square of correlations between variables.

	TS	CO	US	PM
TS	0.85			
CO	0.55	0.88		
US	0.52	0.73	0.82	
PM	0.77	0.71	0.80	0.71

Table 6. Fit indices for measurement and structural model.

Quality of fit measure	Recommended value	Measurement model	Structural model
X ² /df	2 to 5	1.02	2.55
AGFI	0.80 to 0.90	0.70	0.82
CFI	0.80 to 0.90	0.81	0.87
TLI	0.80 to 0.90	0.77	0.86
IFI	0.80 to 0.90	0.83	0.88
NFI	0.80 to 0.90	0.85	0.89
RMSEA	0.05 to 0.08	0.030	0.066

5.6. Hypotheses Testing and Result of the Study

The findings from the empirical study presented interesting results for discussion, which extended previously research in the areas of e-SCM usage and performance. As noted in **Table 7**, seven propositions related to the aims of this study were developed and tested. Out of the seven proposed relationships, two were not supported and five were supported. **Table 7** presents each parameter's C.R. estimate. Based on the results provided, it is clear that e-SCM usage has a significant positive and direct impact on performance ($P = 0.001$). Therefore, H1 is supported. H2 is also supported as trust has a significant positive on e-SCM Usage ($P = 0.003$). H3 is also supported because communication has significant impact on e-SCM usage ($P = 0.004$). For H4, trust has a positive significant impact on performance ($P = 0.002$) indicating support for it. Communication has insignificant impact on performance ($P = 0.110$), indicating that H5 is not supported.

5.7. Result of e-SCM Usage as a Mediating Effect

For this study, the researchers tested the mediating effects of e-SCM usage in the relationship between the (Trust, communication) and performance as shown in **Table 8**. The insignificant result of empirical finding (direct effect 0.022 more than indirect effect 0.001) confirmed that e-SCM usage did not mediate the relationship between trust and performance. To conclude, this finding did not support H6. In contrast, the significant empirical result (direct effect 0.132 less than indirect effect 0.155) confirmed that e-SCM usage mediated the relationship between communication and performance. Consequently, H7 was supported.

6. Conclusions

This study has investigated adoption of e-SCM in manufacturing sector in Jordan. The use of web technologies is proving to be beneficial to enhance e-SCM activities in organizations [66]. However, practicing the advanced levels of supply chain management is proving to be difficult. For example, an extensive industry survey by [67] finds that the majority of companies “are still struggling to reach the more advanced stages of supply chain management in which collaboration and the use of digital commerce and other cyber-based communication techniques are applied with external partners”. Similarly, [68] suggests that while disputing the economic impact of supply chain management rarely exists, “initiatives to improve supply chain processes have fallen short of expectations”. Findings of our investigation about the key factors impacting the level of e-SCM activities have significant implications for advancing both the practice of e-SCM as well as enhancing the theoretical development of e-SCM. In this paper, we build upon [69] work on relational rents to understand the key factors affecting the e-SCM activities. Our research model also included the investigation of the impact of e-SCM on the realized gains in performance which found to be significant. The extent to which e-SCM is used in supply chain processes such as supplier selection, order processing, logistics, invoicing, demand management, etc. affects the perceived realized benefits in relation to improved customer service, better inventory control, reduced cycle time, greater competitive advantage, etc. Our findings validate those of several other recent research projects [30] [31].

Table 7. Summary of proposed results for the theoretical model.

Research proposed paths	t-value (CR)	Coefficient value (Std.estim)	P-value	Empirical evidence
US \Rightarrow PM	0.123	0.021	0.001	Supported
TS \Rightarrow US	1.46	0.201	0.003	Supported
CO \Rightarrow US	2.220	0.114	0.004	Supported
TS \Rightarrow PM	1.312	0.132	0.002	Supported
CO \Rightarrow PM	6.216	0.422	0.110	Not Supported

Table 8. Mediating effect of e-SCM usage.

Hypothesis	From	Mediation	To	Direct effect	Indirect effect	Total Effect	Mediating
H6	TS	US	PM	0.022	0.001	0.023	Not Mediating
H7	CO	US	PM	0.132	0.155	0.287	Mediating

The industry survey by [67] concluded that there were modest to significant impacts in terms of cost reduction but not in terms of revenue generation. This suggests that e-SCM projects are driven primarily by a cost-reduction approach rather than by a strategic attempt to boost gross revenues by leveraging the supply chain management, such as in the case of Dell and Wal-Mart.

Also, our findings on supplier synergy and e-SCM have several key implications for managers. First, it highlights the strategic and industry contexts in which supplier collaboration through e-SCM can work effectively. It provides empirical based results to support the various case-study based evidence that exemplifies how companies like, Wal-Mart, Dell, and Proctor and Gamble, are able move to advanced levels of e-SCM practice through exploiting the strategic synergies with selected trading partners using leading edge application of web technologies that provide online visibility and inter-enterprise collaboration. In order to achieve a success similar to Wal-Mart, Intel, etc., SCM managers need to develop a context that emphasizes strong supplier synergies before proceeding with e-SCM activities. Such supplier synergies can be more relevant in some sectors than others. It can be concluded that e-SCM initiatives are more likely to a larger impact in some industry sectors than others. For example, industry sectors that have a pre-existing tradition of supplier collaboration, trust, etc., are expected to have a natural advantage over others with a weaker collaborative tradition in supplier relationships. These results may also explain why so many of the new start-up “dot-coms” of the internet era that tried to exploit supply chain intermediary business models failed while the more traditional players with longer managerial traditions of building supplier synergies succeed at e-SCM activities at sophisticated levels.

Organizations are key economic players and an effective source of national and local economic development [70]. We found that the current status of e-SCM involving their suppliers and customers respectively. The results show that e-SCM and technological changes determine firm performance and the capacity of organization to reap the benefits of globalization. Organizations have begun to realize that with adoption of e-SCM information obtains by one party can be directly fed into its home application system for planning and execution. In this way, organization would be able to enhance the level of customer service and reduce operating cost on both sides. Therefore, it is recommended that all companies start to develop their strategies of using e-SCM to change the way business is being conducted. From the survey result it was found that strong relationship between e-SCM usage and organization performance. We also found a negative association between communication and the extent of organizations performance. Further, we also found strong positive association between extent of trust and performance and positive relationship between communication, trust and e-SCM usage. Moreover, this study found that there was mediating effect between e-SCM usage on the relationship between communication and performance, while there was no mediating effect with e-SCM usage on the relationship between trust and performance. This study also found that encouraging implementation of e-SCM at organization in Jordan, has increased growth in sales revenue, timely order and delivery to customer, lowed expenses in developing and maintenance a website, and increased the numbers of customers. This study has shown that e-SCM in Organization most extensively to support all the processes of their logistics activities. Furthermore, e-SCM can act as a strategic tool to help them to compete in a larger market.

This study presents the contributions made by this research from two main angles, theoretical and practical contributions. From the theoretical part this study reported that the new conceptualization of e-SCM usage and performance presents superior insights into the conditions of e-SCM in terms of the antecedent variables which consist from communication and trust, and the consequences in terms of the mediating processes in leveraging the organizational capabilities, and in turn, realizing the possible business values of e-SCM. The major focus of the current study is on e-SCM, and its importance to firm’s performance. Consequently, it is dissimilar to most of the preceding literature, which investigated either the impact of antecedents one-SCM, or the impact of e-SCM on performance. In contrast, current study examines an integrated model that comprises the impact of antecedents on e-SCM and the impact of e-SCM on performance and also the direct impact of antecedent on performance. Further more, from practical point, the research model could be used by top management and practitioners as an analytical tool to help firms mark where essential progress is missing, and at the same time as a practical method to identify processes that need to be created. Moreover, based on the above discussion, top management should agree to share responsibility for utilization e-SCM activities and realizing firm’s performance through it. Managers also have to understand that e-SCM is a dynamic practice, which needs frequent adjustment and readjustment. Indeed, since every firm are subject to an exclusive environment, the practical responses to the challenges of e-SCM vary from one firm to another. Thus, a successful partnership is one that can evaluate and react to the particular conditions faced. However, this study was conducted in Jordan, thus organi-

zations in other developing and developed countries might have different utilization of e-SCM usage; besides the current study focused on selected factors consisted of trust and communication; consequently, there could be several other factors such as the supply chain structure, complexity of processes that could potentially influence e-SCM usage.

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