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THE INFLUENCE OF INFORMATION TECHNOLOGY AND COMMUNICATION SUPPLY CHAIN MANAGEMENT PERFORMANCE FOR GREATER SME MANUFACTURING IN AGUASCALIENTES

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ABSTRACT

In this research, it aims to show how the information technology and communication (ICT) have influence on the supply chain management in manufacturing SMEs, likewise, analyze how it affects this relationship to operational performance in these organizations, however, for these companies, not all ICT can be adapted to any business, results of the statistical analysis indicate that employers in their interest to adopt ICTs require taking into account the complexity the supply chain to ensure that adoption is not a bad investment and especially the approach to maximize performance in these organizations. The research was conducted with a random sample of 120 SMEs in the manufacturing sector in Aguascalientes during the months of March and April 2012 through a survey designed under the technical fieldwork aimed at managers responsible for coordinating operations Manufacturing of SMEs. The analysis in this study implies that employers establish strategies to enable all workers to improve their skills in the subject of ICT and in this sense, the results are to be useful for decision making and for the better Management of supply chain.

Keywords: Information technology and communication, Supply chain management, Performance.

1. INTRODUCTION

In recent years, advances in information technology and communication (ICT) have been rapid and the proof is in the significant improvements that have occurred in activities such as the supply chain management (SCM), where is to always have effective results in the management of materials (Biniazi *et al*., 2011). The supply chain has in companies of significant importance since it directly affects the economy and the achievement of the objectives of the companies (Biniazi *et al*., 2011). It is also important to note that regardless of the current ways of managing a supply chain, this has gradually changed (Rayati *et al*., 2009), and in this sense, there are still significant delays in the strategies of how to coordinate logistics and material resources management in the supply chain (Aguilera *et al*., 2012), and for this, the adoption of new technologies have allowed

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these businesses, have better performance and development as a function of supply (Aravindh and Ganesan, 2011).

The impact to adapt ICT in any business up to now, has been a major topic of discussion in business, especially for costs on enterprises to make such investments and avoid risks in the financial performance of SMEs (Aravindh and Ganesan, 2011), however, recent empirical studies have shown that this important decision has had a significant impact on the administrative and operational dynamics in SMEs especially in the manufacturing sector (Rayati *et al*., 2009; Gonzalvez *et al*., 2010). In this sense, and as part of the benefits the ICT adaptations have, its integration in the management of the supply chain (Devaraj *et al*., 2007), will allow manufacturing SMEs have better control of information to material resources are in the organization in a timely manner to avoid damage to the operational activity due to lack of supply (Gonzalvez *et al*., 2010).

Supply Chain Management (SCM), is influenced directly by the integration of technological systems to be more effective and reliable suppliers both in internal control how to be made with materials (Devaraj *et al*., 2007). In this sense, the integration of ICT in the SCM aims to improve the capacity deliveries whereas the control and data management (inventory, market demand and production capacity), is accurate and reliable (Biniazi *et al*., 2011). Nowadays, the concept of SCM and its associated activities continue to evolve as new ICTs emerge to facilitate system-wide process integration (Wisner, 2003), in order to improve the flow of goods, services and information of the original suppliers to final customers, with the goal of reducing the cost system area and maintain required service levels (Ellram, 1990; Aitken, 2005).

Concerning the inherent interest in the SME manufacturing about increasing its performance, it is important to note that any technological adoption that have in supply chain management, should facilitate the management of information, reducing costs, compliance objectives such as inventory control and finance, improving the relationship with suppliers and with customers of course (Ayers, 2001; Hagel and Brown, 2005; Chun *et al*., 2011).

This study have an essential objective, measure and analyze the influence of the variable ICT in the variable SCM and in turn, the influence of the variable SCM in the performance variable. Nowadays, in the state of Aguascalientes, there is significant growth by the arrival of manufacturing companies both local and external and the supply is an issue that should be a priority for managers as this significantly affects to the manufacturing SMEs in the operational and financial performance. That´s why in this research work aims to analyze the influence of ICT on the SCM of manufacturing SMEs and whether this influence allows performance in these businesses is greater. For this it´s important to question whether integration of ICT increases in manufacturing SMEs increased SCM matter how complex it may be, and if a better GCS allows manufacturing SMEs become more profitable. To do this, through fieldwork during the months of March and April 2012, a survey of managers of manufacturing SMEs was applied using a randomly selected sample of 120 companies.

2. LITERATURE REVIEW

2.1. Information Technology and Communication and Supply Chain Management

Currently, the information of technology and communication (ICT) are a combination of elements which enable the organization performing the activities of the company either administrative or operational efficiently based on the processing, storage and exchange of data relating to the supply of materials (Biniazi *et al*., 2011), using the software and network hardware to create strategies and systems to handle automatically have the data to analyze the behavior of these data (Neef, 2001). It´s also important to highlight that ICTs have in their application objectives, analyze the data in order to improve the planning of market demand, the production control management of purchasing, managing supply chain materials and type of transport (Devaraj *et al*., 2007; Biniazi *et al*., 2011).

As already described, the resources that ICT's have such as hardware and software, are easy to implement, but it is important to emphasize that this decision alone is not an advantage or an improvement that impacts on the profitability of the firm (Devaraj *et al*., 2007; Ross and Buffa, 2009). However, for an implementation of ICT to be efficient and profitable companies like SME manufacturing is important that previously the ability to receive this kind of technology implementations is analyzed and that the investment is taken by these adoptions, allowing them to these companies have better rates of productivity and better control of the supply of material resources (Gonzalvez *et al*., 2010; Aravindh and Ganesan, 2011).

Concerning the SCM, integration of ICT is vital since its impact can improve the level of service both in the same supply chain and with customers (Childer House *et al*., 2002). It is therefore important that entrepreneurs have the vision that technology adoption in their organizations, will enable organizational outcomes have improved performance and thus better control of information (Devaraj *et al*., 2007; Mbang, 2012). For manufacturing SMEs, the use of ICT allows managing the supply chain more efficient since no matter how complex it can be a technological system, proper management of information will allow these organizations more easily monitor forecasts of market demand for the customers do not have compliance risks (Choi and Hartley, 1996), provided the availability of material resources have through proper control of inventories and therefore a greater reliability in production processes (Mukhopadhyay and Kekre, 2002; Mahama, 2006). For manufacturing SMEs, the use and application of ICT in the supply chain management has significant influence and which is focused on meeting the following objectives: Provides availability and visibility of information, can make decisions based on the interpretation of and allows data to be greater collaboration with partners involved in the supply chain (Ellram, 1990; Devaraj *et al*., 2007). The contribution of ICT's more common in the SCM in manufacturing SMEs is reflected in the handling of information that happens between suppliers and buyers which allows the management of the supply chain more efficient (Lee and Klassen, 2008). In this sense, the use of ICT is critical to these businesses for their dynamism and importance to have better management of material resources (Rayati *et al*., 2009), and this will

allow these businesses have greater competitive advantages and higher performance (Bowersox *et al*., 1989).

The importance and purpose of ICT in the SCM is mainly to focus in strengthening trade agreement that takes into business relationship with customers, streamline communication and information management as well as to reduce costs and time in the transmission the information needed in any business activity (Gonzalvez *et al*., 2010), and it is therefore important to meet the following objectives: Having the information available, to enable the interface in order to obtain data and have a close association with the supply chain so that information is always available (Srinivasan *et al*., 1994).

2.2. Management of the Supply Chain and SME Manufacturing Performance

Overall, the SCM is formed by two or more organizations which have a close business relationship among them, in order to streamline the management of materials, information and business strategies that enable them to constantly have a growth in their respective performance business (Biniazi *et al*., 2011). And it is important that employers have adequate monitoring and recording on market demand and specific customer needs (Devaraj *et al*., 2007). For manufacturing SMEs, it´s vital that internal operating systems allow domestic production processes are effective and this requires that between suppliers and purchasers of material resources with supply chain management organized and coordinated (Devaraj *et al*., 2007), so that all information is handled between them allow inventory control, warehouse records, optimization of space transportation and handling of materials that do not allow to be optimized quality problems or supply (Tracey and Tan, 2001) it has. For this it is important to note that there are 5 features that improve the efficiency of the SCM (Biniazi *et al*., 2011):

1.-The design of the SCM is a function of the strategies required to implement the company for its commitment to customer service, are not affected at any time, and this requires having the vision to have an efficient control over the needs market, have a wide range of products or services, have certified quality systems and have a capacity of reliable operation.

2.-Any changes in the supply chain must be informed immediately involved: suppliers, external support services or ancillary services, in order to have better management and better performance in the company.

3.- Strategic factor, it´s important to constantly review the design of the SCM in order not to affect the performance of the company and hereafter the strategy focuses on analyzing the feasibility of integrating the SCM external service or Outsourcing .

4.- To analyze the impact of the integration of technological improvements and innovations taking to support the use of software to significantly improve the operational activities that are related to the management of material resources.

5 .- Adopting strategies to reduce significantly the costs generated in the internal and external SCM once the decision to adopt or improve ICT in the management of the information required for manufacturing SMEs using any decision making.

According to the review of experts to study the SCM and its relation to performance in manufacturing SMEs, it´s important to note that the SCM is defined as a management philosophy that involves accurately manage the flow of material resources for production processes delays have not jeopardize compliance with the commitments to the customer (Rayati *et al*., 2009), for which it is important to note that it is also necessary to integrate with management, supplier collaboration. It is also important to note that there are other definitions that describe the SCM as a philosophy that allows the management of the flow of a distribution channel from the commissary to the end customer, considering the quality of service management and ethical management information through effective and reliable technology systems (Pearson and Ellram, 1995). On the other hand, the SCM is seen as a system in which coordination is an important strategy for any activity that is integrated into the control and flow of material resources, will allow manufacturing companies to improve their performance (Mentzer *et al*., 2001).

For manufacturing SMEs, it is important that the SCM will meet the following goals: Reduce inventory costs, better inventory control, reduce total production costs, negotiate better deals with the commissary on just in time, improve customer satisfaction and have better cooperation with distributors and vendors (Mentzer *et al*., 2001; Aguilera *et al*., 2012). Furthermore, to meet the total satisfaction of customers is important for organizations to be competitive, that market demands are met without delay with the required quality, better variety of products and certainly have a quality service that allows to SMEs among other things, avoid the maximum supply problem keeping costs to a level that does not affect the performance of the company adopting strategies of cooperation, mutual benefit with suppliers, distributors, retailers and companies linked to the management of their supply chains (Wisner, 2003).

In this regard, Mentzer *et al*. (2001) has placed special emphasis on the importance of buyers and suppliers to meet your line provider abilities in order to maximize product differentiation and individual needs while minimizing costs. Logistics practices and supply chain management together with its associated benefits (better customer service, lower cost, higher quality, and improved competitive advantage) are closely related to existing theories of strategic supply management (Wisner, 2003). That is why the activities of management by providers and the implementation of strategies related to customer needs require effective linkages which allow such strategies improve the supply chain management through good practice in purchasing and logistics management of material resources (Wisner, 2003). Regarding the management of the supply chain concept has gradually evolved, however, manufacturers have used the knowledge and resources of key suppliers deemed to support new product development efforts (Mbang, 2012). In addition, many companies have reduced their supply controls in order to form a limited number of highly trained providers for improvements in the quality of the product purchased and

the time (Handfield *et al*., 2005) set. For the SME manufacturing is necessary for the management of material resources allow the GCS has a significant impact on these businesses to the business relationship is reliable (Chun *et al*., 2011). These coupled with operational capabilities, resources are the key source for business success, and the heterogeneity of organizational resources have lead to greater competitive advantage and have higher performance (Ross and Buffa, 2009).

Therefore, with regard to matters relating to finance, cash flow returns which are often uncertain economic activities related to the supply chain, companies implies that some uncertainty is generated by the nature of their management financial (Handfield *et al*., 2005; Giunipero *et al*., 2008). Therefore, in manufacturing SMEs, entrepreneurs need to pay special attention to the financial control of their organizations. Generally strategic business alignment and SCM practices are essential for the achievement of corporate results of organizations focused on improving the financial performance of companies (Chun *et al*., 2011), and it is important to note that in business, entrepreneurial skills, provide significant advantages to facilitate the operational activities of the SCM, as the control of resources that lead to business performance, allow their competencies are those that have an influence in the production processes of which always are valuable and crucial to organizational performance (Tracey and Tan, 2001).

In this regard, the ability of companies to succeed and greater competitiveness depends heavily on their internal operational and administrative (Chun *et al*., 2011) capabilities. Economic theory delves into the superior ability of companies to the development of certain organizational capabilities, which consist of critical skills within a supply chain, SMEs try to offer products with a value that buyers perceive to exceed the value of alternative bids. As the life cycles of products are rapidly reduced in the modern setting of the supply chain, therefore, companies must rely on proprietary technology that exists today to achieve high quality products to market quickly and efficiently ahead of the competition. As part of strengthening in business for greater efficiency, it is important that the assumption of risk, the orientation of the characteristics of pro activity and coordination ability, positively affect the SCM in SMEs (Tracey and Tan, 2001).

The management of the supply chain as already described, is a comprehensive management philosophy designed to control the flow of material resources that are distributed from suppliers to end customers. The SCM is a system designed to harmonize the flow of products and services with the information that is being generated, and the values of individual customers in the market and providing innovative solutions (Chun *et al*., 2011) . Counting in the SME manufacturing with a business philosophy that guides organizations and their partners among distribution channels, the flow of material resources and internal capabilities of production processes in the right direction will allow these businesses to have more reliability to have better performance (Ross and Buffa, 2009). And for that, Mbang (2012) defines the SCM as a collaborative strategy to rebuild an organization with the influence of ICT in order to improve the efficiency of business enterprises, making strategic alliances with customers and suppliers which guarantee competitive advantage and higher performance.

To this end, the SCM aims to achieve global optimization of internal processes to achieve greater unity and efficiency in the control of material resources throughout the value chain (Varma *et al*., 2006). Srinivasan *et al*. (1994) refer to the SCM as a set of methods used to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed in the right quantities, to the right places at the right time, in order to minimize the costs of the entire system and thereby to achieve better development smoothly and a higher yield. For the SME manufacturing business today, it is important that the SCM designed for sharing this information flows of goods and capital from production to final sales and avoid unnecessary expenditure of time and costs across the supply Chain (Varma *et al*., 2006), especially, it is important not to lose sight of all vulnerable points where excessive costs may arise.

Within manufacturing firms is important that the financial performance indicators are being measured in not only financial performance but also non-financial performance (Mentzer *et al*., 2001; Chun *et al*., 2011). To do this, financial performance include return on assets, annual sales performance, the average market share, profit margin, and the rate of return of profits, while the main non-financial performances are full satisfaction customer, customer retention, product satisfaction and customer service satisfaction. In this sense, Varma *et al*. (2006) divided the performance of the SCM in the financial and non-financial, stressing that the latter is the most important in manufacturing SMEs. The financial information that are included in the process of decision making, allows such companies in their business relationship with all stakeholders in the SCM have significant and thus participation have higher performance in SMEs manufacturing (Chun *et al*., 2011). That is why the implementation of ICT implemented properly, allows the management of the supply chain more effective (Rayati *et al*., 2009; Gonzalvez *et al*., 2010; Biniazi *et al*., 2011). Therefore, one can pose the following hypothesis:

H1: A greater integration and influence of information technology and communication, greater supply chain management in manufacturing SMEs.

Finally, it is important to note that a company that has a suitable and better GCS allows to take into manufacturing SMEs, a significant increase in performance (Shin *et al*., 2000; Varma *et al*., 2006; Chun *et al*., 2011), and for this the following hypothesis is proposed:

H2: The higher supply chain management, improved performance in manufacturing SMEs.

3. METHODOLOGY

In this investigation, the influence of ICT in managing the supply chain for increased performance of manufacturing SMEs with a quantitative approach are analyzed. For the development of this work was taken from reference database featuring business directory Aguascalientes (SIEM, 2010), which describes in Aguascalientes, there are 8661 registered companies of which 584 are SMEs. Likewise, this is a field where a random sample of 120 companies from SME Manufacturing sector in Aguascalientes in which we applied a measuring

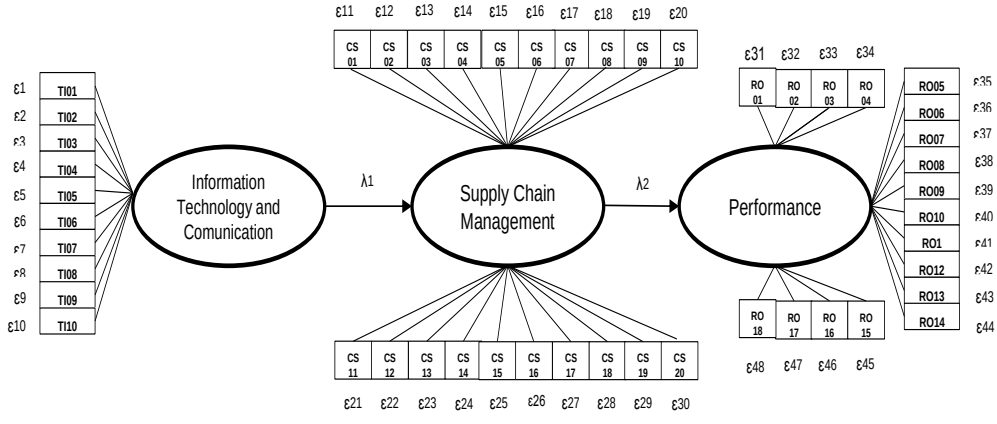
instrument type custom survey for managers or directly responsible for the operations used in this type companies in a period between March and April 2012.

3.1. Development of Measures

For the preparation of the measuring instrument, Was integrated 3 Factors which were evaluated with Likert scale 1-5 where it refers from full disagreement to full agreement. The factors of this theorical model are: Factor Technology Information and Communication with 10 indicators identified how (TI01 to TI10) adaptation of Gonzalvez *et al.* (2010). The second factor of Supply Chain Management with 20 indicators identified how (CS01 to CS20) obtained from Wisner (2003). And finally, for the third factor, measuring performance with 18 indicators identified how (RO01 to RO18), adapted from Raymond and St-Pierre (2005). In chart No. 1 theoretical model of this research is shown:

Chart-No.1. Theorical Model

Source: Adaptation: (Wisner, 2003; Raymond and St-Pierre, 2005; Gonzalvez *et al.*, 2010).



Graphic-No.2. Relationship of theoretical model for the analysis of structural equation

Source: Adaptation: Gonzalvez *et al.* (2010); Wisner (2003); Raymond and St-Pierre (2005).

4. RESULTS

In this research one confirmatory factor analysis (CFA) in order to evaluate the reliability and validity of the scales of each of the blocks as shown in the chart No.2 was performed.

Likewise, a Structural Equation Model (SEM), in order to check whether the structure of the model is properly designed, and it was used, the maximum likelihood method in the EQS version 6.1 software was used; for this, the reliability was evaluated considering the Cronbach's α and composite reliability index (IFC) (Bagozzi and Yi, 1988).

Table-1. Internal consistency and convergent validity of the theoretical model

Factor	indicator	t robust	CF > 0.6 factorial charged	Charged factorial square	Charged factorial mean	Error	mean error	alpha cronbach > a 0.7	IFC > a 0.7 Composite Reliability Index	IVE > a 0.5, Variance extracted index
Information Techonology and Comunication (F1)	TI01	1.000	0.768	0.590	0.814	0.410	0.337	0.958	0.952	0.929
	TI02	24.345	0.774	0.599		0.401				
	TI03	19.120	0.835	0.697		0.303				
	TI04	17.058	0.823	0.677		0.323				
	TI05	15.005	0.823	0.677		0.323				
	TI06	17.680	0.826	0.682		0.318				
	TI07	15.568	0.796	0.634		0.366				
	TI08	17.980	0.840	0.706		0.294				
	TI09	17.220	0.841	0.707		0.293				
	TI10	16.576	0.813	0.661		0.339				
	Σ		***8.139***	***6.631***		***3.369***				
Supply Chain Management (F2)	CS01	1.000	0.696	0.484	**0.707**	0.516	**0.500**	0.949	0.947	0.900
	CS02	10.146	0.701	0.491		0.509				
	CS03	10.141	0.710	0.504		0.496				
	CS04	8.201	0.693	0.480		0.520				
	CS05	7.435	0.691	0.477		0.523				
	CS06	9.891	0.693	0.480		0.520				
	CS07	10.770	0.710	0.504		0.496				
	CS08	10.386	0.717	0.514		0.486				
	CS09	8.515	0.711	0.506		0.494				
	CS10	9.955	0.721	0.520		0.480				
	CS11	10.604	0.696	0.484		0.516				
	CS14	8.502	0.693	0.480		0.520				
	CS15	11.663	0.752	0.566		0.434				
	CS16	10.138	0.719	0.517		0.483				
	CS17	11.145	0.720	0.518		0.482				
	CS18	7.394	0.697	0.486		0.514				
	CS19	9.687	0.707	0.500		0.500				
	CS20	8.610	0.698	0.487		0.513				
	Σ		***12.725***	***9.000***		***9.000***				
Performance (F3)	RO04	1.000	0.666	0.444	**0.721**	0.556	**0.478**	0.903	0.907	0.837
	RO05	8.239	0.629	0.396		0.604				
	RO06	7.599	0.638	0.407		0.593				
	RO07	8.640	0.741	0.549		0.451				
	RO08	8.578	0.769	0.591		0.409				
	RO09	8.531	0.776	0.602		0.398				
	RO10	7.727	0.746	0.557		0.443				
	RO11	7.883	0.750	0.563		0.438				
	RO12	6.948	0.771	0.594		0.406				
	Σ		***6.486***	***4.702***		***4.298***				
S-BX2 (df = 625) = 1293.7869; p < 0.0000; NFI = 0.919; NNFI = 0.953; CFI = 0.956; RMSEA = 0.078										
[a] = Parameters for the value in the identification process.										
*** = p < 0.001										

Table No.1 shows that the values of the IFC in each indicator of the main factors (F1: ICT from TI01 to TI10, GCS from CS01 to CS20 and RO01 to RO18 from RO), exceeds the recommended level of 0.7 in the analysis of the factor loading of each indicator, which shows clear evidence of the reliability of the constructs (Nunnally and Bernstein, 1994; Hair *et al.*, 1995) and thus allows to present a model adjusted to obtain the following data: (S -BX2 = 1293.7869, df = 625, p = 0.0000; NFI = 0.919, NNFI = 0.953, CFI = 0.956, RMSEA = 0.078 and). All indicators

related factors are significant ($p < 0.05$), the size of all the factor loadings are greater than 0.6 (Bagozzi & Yi, 1988) and the index of the extracted variance (IVE) of each pair of constructs is higher 0.5 recommended by Fornell and Larcker (1981).

Table 2 shows the results obtained that describe the discriminant validity across two test are shown. First, the range of 95% confidence, none of the individual elements of the factors contains the value 1.0 (Anderson and Gerbing, 1988). Second, the extracted variance between each pair of constructs of the model is superior to its corresponding IVE (Fornell and Larcker, 1981). Therefore, we can conclude that this research sample based on statistical analysis of their results sufficient reliability and convergent evidence besides discriminant validity.

Table-2. Measurement discriminant validity of the theoretical model.

Variables	Information Technology and Comunication		Supply Chain Management		Performance
Information Technology and Comunication	**0.929**		(0.262)2		(0.243)2
			0.069		0.810
Supply Chain Management	0.262	0.049	**0.900**		(0.235)2
	0.164	**0.360**			0.035
Performance	0.243	0.053	0.188	0.045	**0.837**
	0.137	**0.349**	**0.098**	**0.278**	

The diagonal represents the variance extracted index (EVI), while above the diagonal part of the variance (correlation box) is shown. Below the diagonal, the estimate of the correlation of the factors with a confidence interval of 95% is presented.

One SEM was performed to check the structure of the conceptual model and contrast hypotheses, using the blocks contained in the evaluation instrument which are described as follows: First block consisting of variables that measure the Information Technology and Communication the second block with variables measuring the Supply Chain Management and the last block, this is composed of the variables related to the performance of the company.

Table-3. Results of SEM Conceptual Model of Information Technology and Communication, Management and Supply Chain Performance.

Hypothesis	Structural Relation	Standardized coefficient	t Robust	FIT's Size
H_1: A greater integration and influence of information technology and communication, greater management of supply chain in manufacturing SMEs	ITC's ⟶ Supply Chain Management	0.477***	17.5918	S-BX2 = 1342.6722; df = 621; p = 0.0000; NFI = 0.919; NNFI = 0.951; CFI = 0.955; RMSEA =0.078
H2: The higher management of the supply chain, improved performance in manufacturing SMEs.	Supply Chain Management ⟶ Performance	0.402***	4.2373	

The nomological validity of the model was tested by performing the Chi square test, in which the theoretical model was compared with the measurement model (Anderson and Gerbing, 1988; Hatcher, 1994).

The assumptions made in the present investigation show in the table 3 favorable results that reveal results that are described below: Regarding the first hypothesis H1, the results presented in Table 3 ($\beta = 0.477$, $p < 0.001$), indicating that ICTs have a positive influence on the supply chain management in manufacturing SMEs. And regarding the second hypothesis H2 results ($\beta = 0.402$, $p < 0.001$), indicating that the management of the supply chain has an important influence in increasing the performance of manufacturing SMEs.

5. CONCLUSIONS

For the SME manufacturing in Aguascalientes (Mexico), better management of the supply chain will have better results provided that the adoption of ICT is efficient and appropriate to the specific needs of each organization, in this sense, it is important to note that impact between the elements in this implementation is the exchange of information with suppliers, quickly and efficiently perform applications provider, have better management and inventory control, control of working hours and control all indicators related to production processes. Also, the implementation of ICT allows the SME manufacturing have good results to have better control of human resources, records management specific information with customers, management related to control product quality indicators and any agreement which is carried out with the supplier.

Furthermore, the efficiency of the Supply Chain Management (SCM) can be improved if employers focus on the immediate needs as well as forecasts of deliveries to customers, constantly analyzing response times to meet any demand market, have a better level of confidence with the support of the integration of systems of continuous improvement, provide supplies according to the technique just in time and establish agreements and appropriate relationships with proveeduría order to minimize delays in supply. It is also important to consider in the management control of the business aspects of improvement in SCM improving communication in all directions, ie suppliers, auxiliary supports (Outsourcing), customers and internal areas of the company through sharing information to facilitate the work of each integrator of supply chain, report on all clients on agreements and modifications required to make the supply channel when a point for improvement is identified and have improvement teams where all stakeholders participate in the SCM are involved.

Finally, it is important to note that currently, companies gradually with the conviction managers have integrated various technology options for information and communication in order to improve and streamline the operational and administrative activities in their organizations to their time, managing the supply chain, can have a major impact on growth performance in manufacturing SMEs, which means that employers need to consider in the first

instance once identified the needs of their companies to adapt ICT to be require in order to be functional to the management and control of information.

5.1. Discussion, Limitations and Future Lines of Research

Regarding the vision that entrepreneurs on increasing profitability in their companies, it is important to note that for this to be possible, it is necessary to increase steadily in the quality management of products, improve deliveries inputs of both raw materials and finished product, the equipment is always available without maintenance problems that standard settings optimal production time, which are removed to maximize the "bottlenecks" or delays processes and the flexibility of the equipment according to the market needs.

Also, it is important to know the nature of the distribution channel for the SCM is reliable, adapted to the management of resources and materials attached to the system just in time, where the entrepreneur strategy requires combining the vision of a business must be profitable financially and for this they should be administered as managing and material resources with professionalism, based on market needs and capabilities of the warehouse for inventory management which does not allow operating costs affect so important to the profitability of the company. Although the SCM and operability analysis is complex, it is also a reality that managers and direct traders, always take the challenge to streamline the management of material resources taking into account among other objectives, profitability and organizational development are priority for managers and those involved in the growth of organizations.

The results obtained in this study show that the relationship between the main factors (ICT SCM and Performance), have a strong influence which implies that entrepreneurs and owners of manufacturing SMEs should focus their efforts on establishing strategies which develop the skills in the management and optimization of ICT especially in control of everything that is related to the supply as well as the management of information between the parties involved and it is necessary to dig deeper on how best to optimize the management in the supply chain.

This study contributes to the existing literature, as it coincides with the results obtained in the present study regarding the influence of the technologies of information and communication as well as the supply chain management performance of manufacturing SMEs. This study uses new estimation methodology, using a structural equation model to relate factors. This study originates new formula through the design of a theoretical model obtained from three different authors.

This study is one of the few studies, which have investigated because each factor has been studied in a particular way or otherwise, related to issues of production and quality systems. The paper contributes the first logical analysis, mainly on providing managers analysis that can influence the decision making process regarding the provision of materials and information management with agents related to the supply chain. The paper's primary contribution is finding that managers require greater care in handling information related to the provision and identify the

key elements that are efficient in managing the supply chain, especially the right time and proper handling of supplies. This study documents an adequate theoretical analysis can establish both statistical analysis based on the information provided by managers to be empowered to provide options and strategies for improving operational activity and supply in manufacturing SMEs.

As limitations of this research it is emphasized that only worked with the built in blocks of Information Technology and Communication with Supply Chain Management and Performance in order to analyze their effects variables SME companies in the manufacturing sector. As future lines of research aims in the short term as well as expanding the sample, analyzing the impact of these related to the need for improvements in manufacturing SMEs blocks, and thus to offer the employer of this important sector, proposals to allow them make decisions with greater empirical support for that so they can get their organizations more performance and better development.

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