

Analysis of logistical management models to integrate SMEs from Ciudad Juárez to the maquiladora industry

PORTILLO-CASTILLO, Víctor Manuel*†, ROJO-SEMENTAL, Erick Octavio and GARCÍA-MORALES, Elid Uber

Received June 15, 2016; Accepted November 15, 2016

Abstract

Identify strategic and operational measures that guide decision-making in the performance of logistics management Small and medium enterprises at Juarez City. (PyMES) are characterized by the need to integrate the supply to maquiladora industry, which is demanding clients in the new competitive environment requiring global suppliers, with the need to requisition product to integrate faster to market and customers require rapid response supply and low costs. Therefore it is crucial through this quantitative descriptive study, the application of a questionnaire to assess the degree of implementation of some models of logistics management and criteria that integrate them, to identify their content and scope in SMEs of the locality and evaluate the results, through the statistical program for social sciences SPSS 17.0 for Windows. The results obtained in this study showed that a large percentage of PyMES do not know the criteria of the models analyzed to integrate logistics management system on the supply system of the maquiladora industry in Ciudad Juarez

PyMES, Logistic Management, Supply

Citation: PORTILLO-CASTILLO, Víctor Manuel, ROJO-SEMENTAL, Erick Octavio and GARCÍA-MORALES, Elid Uber. Analysis of logistical management models to integrate SMEs from Ciudad Juárez to the maquiladora industry. ECORFAN Journal-Republic of Peru 2016, 2-3: 1-8.

* Correspondence to Author (email: Victor-portillo@utcj.edu.mx)

† Researcher contributing first author.

Introduction

According to ProMéxico (2015), micro, small and medium-sized enterprises (SMEs) constitute the backbone of the national economy as a result of the trade agreements in which Mexico has negotiated in recent years, As a consequence of the high impact on job creation and national production.

Nowadays companies consider costs and quality as market entry qualifiers, while responsiveness and manufacturing efficiency are considered as order winners, arguing that logistics management in the supply chain must be one enabling a rapid response to cope with volatile demand.

However, in order for SMEs to be able to generate greater penetration in the local maquiladora industry, it is essential that logistics management is widely recognized as an important tool that contributes to strategic success, to help these companies meet the Challenges of an increasingly competitive and dynamic environment.

Logistics management, has generated that understanding and practice become an essential prerequisite to stay in the competitive market. Logistics management includes all activities, functions and facilities involved in the flow and transformation of goods and services from the material stage to the end user to integrate the various structures and processes of the supply chain.

Therefore, Cd. Juárez's medium-sized manufacturing companies are exposed to new conditions, which must be adapted through a logistical management model with indicators or variables that allow them to develop their organizational resources and allow them to operate from one a similar way in which large multinational companies operate.

However, the SMEs of the locality after 50 years in which the maquiladora industry settled down in Ciudad Juárez, only represents less than 2% of the inputs that these companies demand from the suppliers to integrate the inputs to their production.

Therefore the present study will analyze some models of logistic management developed by different authors and identify if the factors determined by them are being applied in the daily operations and tasks of the local SMEs.

Theoretical framework

Throughout time there has been a close relationship and its incidence between the production and / or configuration of cities and economic processes, generating a relationship that began from the second half of the twentieth century, promoting a series of deeper changes and restructuring Not only in the cities of developed countries, but also in those of developing countries. In the eighteenth century, the insertion of manufacturing industry into the city's space was the triggering factor for urban transformations, in which it promoted simultaneously the processes of urbanization and industrialization in the City Juárez, the arrival of the export maquiladora industry in the early 1960s involved not only increasing its size but also a social recomposition, reorganization and new physiognomy of urban space, new dynamics of circulation and polarization of Social and spatial structures (Rodriguez, 2002). For this reason, in the 1970s, the private sector was forced to face the employment crisis that was presented in the city, it was the initiative to induce a new development for the State through the transition of the sector Primary to a secondary or industrialized economy. Therefore, it was decided to take the road to the integration of the maquiladora industry, considering that it required relatively little investment and the high capacity it had to generate employment.

The promotional activity was carried out, in which the entrepreneurs and the government worked together, which invested in bridges, roads, shopping centers to detonate and demonstrate the potential they could have for the attraction of capital to the assembly of plants or Maquiladoras (Rodríguez, 2002).

Currently, SMEs have generated an increasing importance in the economic development processes of the Latin American countries. This has been mainly due to the contribution that they have had in employment (around 35-40% of the Economically Active Population) and its contribution to the Regional GDP (around 33%). For this reason, they constitute 93% of formal productive enterprises in Latin America and contribute on average 25% of exports. However, these companies should be able to develop all their adaptation capacities in order to compete in Markets that are increasingly large, dynamic and demanding, in the context of globalized markets and the global economic crisis (Ortiz, 2013).

SMEs generally have a lower performance than large companies, this is due to the limitations they face, which may include access to finance, poor management, low job qualification, Take advantage of economies of scale in production, incomplete information about market opportunities, new technologies and working methods. This leads to a result, where many SMEs do not grow, which poses certain difficulties in exporting, experiencing high costs and a high rate of business failure (World Bank, 2011). In technical terms, SMEs are born of the standards made and globalized by the European Union. They are considered small and medium enterprises which do not have a very large number of employees, their transactions are moderate, these companies are considered worldwide as the main engine of the economy, because they are the main employers within a nation (Infante, 2009).

Another study indicates that SMEs are considered important for the development and economy of the country by the number of jobs they represent, as well as their economic spillover in the market (Palomo, 2005).

Estrada, García, and Sánchez (2009) point out that competitiveness is determined by a number of internal factors, arguing that competitive success is related to the set of resources and capabilities that these businesses have individually, which generates the difference Among other companies competing in the same branch within the locality. On the other hand, they also point out that human resources play a strategic role in the competitiveness of companies because of their broad participation in daily operations.

According to (ProMexico, 2015), micro, small and medium-sized enterprises (SMEs) constitute the backbone of the national economy as a result of trade agreements in which Mexico has negotiated in recent years, As a consequence of the high impact on job creation and national production. According to data from the National Institute of Statistics and Geography, in Mexico there are approximately 4 million of 15 business units, of which 9.8% are SMEs that generate 52% of Gross Domestic Product (GDP) and 72% of employment in the country.

Likewise, Salas, Valles, Galván, and Cuevas, (2012) with data from the National Institute of Statistics and Geography, in Mexico there are approximately 4 million 374,600 business units, of which 99.8% are MSMEs. The SMEs in Mexico generate 52% of the Gross Domestic Product (GDP), integrated as follows: Microenterprises 18.1%, Small companies 12.5% and Medians 21.4%.

The jobs in Mexico, are in greater number generated by the MSMEs because they constitute approximately 80% of the total. Similarly, the figures indicate that, on average, 50% of SMEs fail in the first year of activities, 80% fail before age 5, and 90% of them do not reach the age of ten, To data obtained from the National Institute of Statistics and Geography in the 2009 census. On the other hand Pulido, (2010) points out that those who create MIPymes do it ignoring the poor chances of survival. Experience shows that 50% of these companies fail during the first year of activity, and not less than 90% before five years. According to the statistical analyzes, 95% of these failures are due to a lack of experience and training in the management of companies, regardless of the turn involved. There are several types of companies in the locality, including manufacturing, construction companies, hotels, restaurants, several of which are small and medium sized enterprises (SMEs), which have been classified according to Table 1. Established by (Nacional Financiera, 2015).

Size	Sector	Number range of Workers (7) + (8)
Micro	All	Up to 10
Little	Commerce	From 11 to 30
	Industry and services	From 11 to 50
Median	Commerce	From 31 to 100
	Services	From 51 to 100
	Industry	From 51 to 250

Table 1 Classification SMEs

According to The Council of Logistics Management (2015), SMEs, the research topic of this study, should define their logistics management as that part of the supply chain process that plans, implements and controls the storage flow of Products and services, and their related information, from the point where they originate to the point where they are consumed, efficiently and at the lowest possible cost, to meet customer requirements.

It follows that logistics management is part of a more global concept such as supply chain management; manages both product flows and information flows from suppliers to customers, that is, throughout the supply chain.

According to Rushton et al., (2010) manufacturing companies must undoubtedly integrate as the first element the organization of logistics management; an organizational structure is essential for the logistics function to operate effectively, many SMEs usually group logistics activities in the marketing, production and administration processes, since their size does not allow the incorporation of personnel exclusively for their management.

The Logistics Performance Index (IDL), which the World Bank publishes every two years, indicates in its 2012 report that Mexico is ranked 47 out of a total of 155 countries surveyed with a global logistics performance of 3.06, equivalent to 66%. This performance measurement consists of a scale of 1 to 5, with 1 being the least efficient level and 5 being the most efficient level. The logistic performance of Mexico in the 6 factors measured by the World Bank was: tracking and tracing: 3.15, customs: 2.63, competition and logistics quality: 3.02, infrastructure: 3.03, delivery times: 3.47 and international shipments: 3.07. These measurements and positions of Mexico in the world ranking reveal that there are opportunities for improvement in the different areas of logistics, which if corrected, will allow to increase in some measure the competitiveness of the country.

In spite of the importance at the international and national level of SMEs, in general, they lack a formal structure in most of their areas (Diaz - Guzmán et al., 2012), for which reason the development of a Management Model Logistics.

Some experts have proposed comprehensive models of logistics management to increase market competitiveness and allow the overall development of these companies.

Giraldo, Moreno, and Cortes, (2012) they point out that the logistics of companies is focused on a horizontal vision, so companies must orientate it to the organization by processes. It can be said that the management by processes is the model to implement this vision.

To achieve this, the processes are assigned to people, not to departments, with this is to eliminate the inefficiencies from the inputs to the outputs, since these tend to produce friction between the departments due to the lack of a global vision of the processes Logistics.

The supply chain is the management of the coordination of activities necessary to acquire, transform and deliver products to customers through the coordination of the efforts of suppliers, mediators, and service providers. Performance of supply chain management is the cost of purchased items, degree of deliveries and quality performance meet the standards set by buyers and sellers. Reducing costs can contribute to profitability, but can also lead to a decline in quality and thus contribute to less profitability (Fritch, 2013).

The logistical management model proposes the development of a tool that generates and supports companies in their objectives that allow them to generate greater growth and competitive advantage, with a systematic holistic approach that allows identifying the complex performance and generating the integration of The areas in which the company is applied for the achievement and scope of its internal objectives (Gómez, 2006).

In spite of the importance at the international and national level of SMEs, in general, they lack a formal structure in most of their areas (Diaz - Guzmán et al., 201), for which reason the development of a Management Model Logistics. Some experts have proposed comprehensive models of logistics management to increase market competitiveness and allow the overall development of these companies.

The models emphasize the importance within the organization, by representing the interrelationships, structure and functions of the system under study; additionally establish the limit of its action and allow to perform tests, within which a variation of its components can be generated, generating as a result a better understanding of the characteristics of the situation. Also the models are a tool that allows the analysis of experimental situations in which acceptable results can be obtained, which influence a low cost and ease of handling.

Hence the application of a model which can be perceived as a qualitative or quantitative representation of a process or an attempt that indicates or shows the effects of those factors or indicators that represent a greater impact in the purposes that are considered in the organizations (Velasquez, 2003).

The model developed by Ortiz, Izquierdo, and Rodriguez, (2012) contemplates the main flow of the process that allows the development of the logistics service. Figure 1 shows the different activities required to provide the service, as well as the actions Verify / Act, which include the monitoring and measurement of logistics management. According to Ortiz, et. To (2012), the model highlights the importance of obtaining information about customer satisfaction, generating measurements and evaluations that provide the vital information of the process of logistics management performance.

On the other hand, the model proposed by Cano, Orue, Martínez, Moreno, and López, (2015) contemplates the factors that the operation of this model:

1. Inventories: the objective of this area is to determine through quantitative models how much and when to order the materials.
2. Storage: this area aims to work under good practices
3. Production: its objective is to work under a master production program which will have to satisfy the market / client requirements in time feasible for continuous improvement of application in the process of transformation of goods and inventory in process.
4. Distribution, high responsiveness to the customer at the lowest cost is the goal of this area; this implies creating value in the supply chain through the optimization of the level of finished product inventory, as well as time in the transportation and delivery of the same.

Methodology

The research topic of the present study consisted in establishing a descriptive analysis of SMEs that implement a logistical management system, the instrument was developed through 30 questions, with a Likert scale of 5 points, the order of weighting Of the scale, where 5 represents the highest number in acceptance (Total agree) and 1 lowest degree (Strongly disagree), categorized in 6 dimensions, this instrument was developed during the study and is called MGL2016,

The methodology of the research was presented as follows: research design, sample, data collection, measurement instruments. A sample of 35 SMEs interested in participating in the maquiladora industry was sampled.

Results

Table 2 shows the categories in which the MGL2016 measuring instrument applied in the present investigation.

Dimensions MGL2016
Diagnosis
Logistic performance indicators
Logistics integration departments
Improve service and customer satisfaction
Operativity
Planning program

Table 2 Dimensions of the MGL2016

Also the information provided in table 3 expresses the summary and total percentage of the companies surveyed.

Summary of cases						
	Cases					
	Valid		Lost		Total	
	Nº	Porcentaje	Nº	Porcentaje	Nº	Porcentaje
\$ Total Dimensions	35	100.0%	0	0.0%	35	100.0%

Table 3 Summary of cases

On the other hand we can observe the most relevant data in table 4, which indicates that the implementation of criteria to generate supply in the maquiladora industry is located with 38.3 percent in general, indicating that only sometimes implement or develop some Elements of logistics management, which is why this percentage is very significant as regards the null relation of supply to the export maquiladora industry.

Frecuency TotalDimensions				
		Answers		Cases percent
		N°	%	
Total Dimensions	Nunca	110	11.2%	314.3%
	Rara vez	365	37.2%	1042.9%
	Algunas veces	375	38.3%	1071.4%
	Siempre	115	11.7%	328.6%
	Casi siempre	15	1.5%	42.9%
Total		980	100.0%	2800.0%

Table 4 Dimensional frequencies

Finally, in order to obtain the results of the descriptive statistics in which three questions were generated that represented the implementation of a logistical management model and which allowed to observe the number of suppliers that have been integrated into the maquiladora industry, it is observed that.

Average fluctuates at 1.66, which is very close to the data cited by CANACYNTRA, who pointed out that the level of supply did not exceed 2% at the local level towards the maquiladora industry.

Descriptive Statistics					
	N	Mínimo	Máximo	Media	Desv. típ.
Currently provides a maquiladora company	35	1	3	1.66	.802
Supply logistics management model	35	1	2	1.20	.406
Degree Implementation Logistics management model	35	1	1	1.00	0.000
N valid (according to list)	35				

Table 5 Descriptive Statistics

Conclusions

The results obtained are not far removed from the reality that prevails at the moment, the SMEs of Ciudad Juárez, as it was indicated before they have more than 50 with the opportunity to integrate itself to this supply chain, nevertheless by diverse circumstances that were not Covered in the present study cannot be noted.

This provides a great opportunity to recognize that the integration of SME activities and operations into logistics management can increase the linkage to the maquiladora industry by solving some of the technological and logistical tools required by the industry in order to accept supplier supply local.

The results can point out the need to develop some work plan, together with the support in the local chambers CANACYNTRA and National Chamber of Commerce to establish support programs in this area, as well as the implementation of technology platforms that allow linking From each company the needs between supplier and customer.

References

Cano, P., Orue, F., Martinez, J., Moreno, Y., & Lopez, G. (2015). Modelo de gestión logística para pequeñas y medianas empresas en México. *Contaduría y Administración*, 181-203.

Council of Supply Chain Management. (15 de 02 de 2015). Council of Supply Chain Management Professionals. Obtenido de <http://cscmp.org/about-us/supply-chain-management-definitions>

Díaz-Guzmán, H. C. (2012). Los retos de las empresas familiares ante su continuidad: caso Tehuacán. *Revista Internacional Administración & Finanzas*, 6 (1): 1-22.

Estrada, R., Garcia, D., & Sanchez, V. (2009). FACTORES DETERMINANTES DEL ÉXITO COMPETITIVO EN LA PYME: ESTUDIO EMPÍRICO EN MÉXICO. *Revista Venezolana de Gerencia*, 14(46).

Fritch, E. (2013). An Examination of Transformational Leadership Style and Supply Chain Management Performance. *Northcentral University*, 1.

Giraldo, C., Moreno, L., & Cortes, H. (2012). Modelo de gestión por procesos en logística aplicado a empresas pequeñas de medellin. *Revista soluciones de posgrado EIA*, P. 117-141.

Gomez, C. (2006). Propuesta de un modelo de gestión logística de abastecimiento internacional en las empresas grandes e importadoras de materia prima caso Canizales. *Manizales, Colombia: Universidad Nacional de Colombia*.

Infante, M. (2009). MODELOS DE INNOVACIÓN PARA LA MEJOR ORGANIZACIÓN DEL DEPARTAMENTO DE RECURSOS HUMANOS EN EL ÁREA ADMINISTRATIVA EN EMPRESAS PYMES. *ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL*, 64-65.

Nacional Financiera. (15 de 02 de 2015). Nacional Financiera, Bnaco de desarrollo. Obtenido de <http://www.nafin.com.mx/portalfn/content/productos-y-servicios/programas-empresariales/clasificacion-pymes.html>

Ortiz, A. (2013). Diseño de un modelo de sistema inteligente como soporte de decisión para la gestión empresarial en las Pymes. *Madrid: Universidad Politecnica de Madrid*.

Ortiz, A., Izquierdo, H., & Rodriguez, C. (2012). Modelo de Gestión Logística para

Pymes Industriales. 10th Latin American and Caribbean Conference for Engineering and Technology, # 87.

Palomo, M. (2005). Los procesos de gestión y la problemática de las PYMES. *Ingenierías*, Vol VII, No. 28.

ProMexico. (18 de 02 de 2015). PROMEXICO Inversion y Comercio. Obtenido de <http://www.promexico.gob.mx/negocios-internacionales/pymes-eslabon-fundamental-para-el-crecimiento-en-mexico.html>

Pulido, I. (2010). Capital humano como factor clave en el sustento y desarrollo de las Pymes. *Veracruz: Universidad Veracruzana*.

Rodriguez, O. (2002). LA CIUDAD QUE HACE LA MAQUILA: EL CASO DE CIUDAD JUÁREZ (MÉXICO). *Scripta Nova REVISTA ELECTRÓNICA DE GEOGRAFÍA Y CIENCIAS SOCIALES*, Vol. VI, núm. 119 (53),.

Rushton, A., & Croucher, P. y. (2010). *The handbook of logistics & distribution management* 4. ed. London:: Kogan Page.

Salas, J., Valles, E., Galvan, A., & Cuevas, T. (2012). Competitividad para las micros, Pequeñas y medianas empresas en Mexico, mediante las incubadoras de negocios. *European Scientific Journal*, pp. 267-282 vol. 8, No.25.

Velasquez, A. (2003). Modelo de gestión de operaciones para PYMES innovadoras. *REVISTA ESCUELA DE ADMINISTRACIÓN DE NEGOCIOS*, No. 47, pags. 66-87.

World Bank. (2011). *Impact evaluation of small and medium enterprise programs in Latin America and the Caribbean*. Washington.: World Bank.