
Innovation, Operations to Promote Competitiveness in Manufacturing SMES

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EXECUTIVE SUMMARY

SMEs must focus on creating value to survive in the market and constantly grow competitively in the globalized world that afflicts them. However, given the wide variety of activities that an SME can dedicate to the market, its current performance has not been adequate and its situation in the competitive and the economic world has been involved and affected by a series of economic, political, social and technological events. From the results obtained in this study, it is affirmed that reliability depends on having a master production plan which guarantees the efficiency of the process and increases productivity.

Key Words: Innovation, Operations, Manufacturing, Competitiveness

INTRODUCTION

SMEs is a word that has recently become fashionable and has impacted society. Why it is important to study is because, in our country, the unemployment rate has increased during the last years. According to the OECD, for 2015 the unemployment rate stood at 5.2%. This has caused many heads of families to have no work or opportunity to get ahead and provide a better lifestyle for their families.

That is why it is important for SMEs to start growing, to be more competitive, innovative, creating new and standardized processes, creating technology, correctly developing their personnel, etc. Doing so will provoke financial development that will lead them to business success, in addition reducing costs that many other companies still have.

JUSTIFICATION

SMEs represent the economic soul of our country. They are companies that provide over 75% of all jobs, contribute to the national GDP and are the main engine of the Mexican economy. Most of these companies start only from an idea, a person with a desire to work, to undertake and to be their own employer, practically without any kind of human, financial, technological and material resources, where the main tool they have is innovation.

RESEARCH PROBLEM

Manufacturing SMEs are mostly informal companies that lack competitiveness. This deficiency can be related to several factors. However, the operations they perform can dictate a fundamental course that contributes to improving this competitiveness, an aspect that improves the percentage of participation of the companies. SMEs in the market, which can grow an SME, can become a large established company with low chance of becoming obsolete in its market.

Jalisco is a state of entrepreneurial people. It ranks first in the country in its number of established SMEs, however, if these companies do not have automated systems, with adequate administrative control, with reliability in their processes and

personnel development, they will be increasing the possibilities not only of not evolving and becoming a big company but stagnating and disappearing.

INVESTIGATION QUESTION

What is the correlation between the independent competitiveness variable and the dependent variable operation in manufacturing SMEs in the metropolitan area of Guadalajara (ZMJ)?

HYPOTHESIS

- H1 Implementing automation increases the level of operations in SMEs.
- H2 With adequate reliability, the level of operations in SMEs increases.
- H3 With efficient personnel development, the level of operations in SMEs increases.
- H4 With efficient personal development, the level of operations in SMEs increases.

THEORETICAL REVISION

SMEs in the World Context

Levy and Powell (2005) comment that most of the economies of the world move based on SMEs, since there are few countries where SMEs do not represent more than 90% of existing companies. According to the organization for cooperation and economic development (OECD), 95% of companies in the United Kingdom, the USA, Australia, Europe and Latin America are SMEs that employ between 60% and 70% of workers. These companies are innovative, because they are constantly looking for the development of new technologies. Similarly, Saavedra (2012) explains that SMEs in Latin America are very important for countries, not only for their contribution to the GDP, but for the number of jobs they generate, constituting itself as an instrument of social mobility. The importance of SMEs for the economy of countries lies mainly in two points, in that these SMEs generate employment for all young people who are not trained or do not have experience to be hired by large companies, and the impossibility of countries meeting the demand for employment, if it were not for SMEs (Zevallos, 2005).

SMEs Manufacturing of Plastic

It can be seen that the lack of a career in plastic engineering, the lack of certification, and norms and standards in the processes of small and medium enterprises (SMEs) in the plastic sector has made this industry uncompetitive in the market nationally and internationally. "Of the 3,500 companies that make up the sector, only 100 are certified, equivalent to 2.85%, which puts them at a disadvantage compared to the foreign market that has better finished products," explains Rafael Blanco, president of the Mexican Institute of Industrial Plastic (IMPI). 60% of the plastics industry is made up of micro companies, 24% are small, 12% medium, and 4% large, which in their entirety generate around 150,000 direct and 750,000 indirect jobs.

Automation

Automation according to Milea (2015) is really essential for small and medium companies of this century. It can help companies manage easily and quickly quantities of production, safe storage, ensure the process, and increase the performance of the operations. All this and more is done by automation through PLCs. By implementing them, costs are reduced. The software help companies to identify problems,

Administrative Process

The administrative process is a set of steps, stages, or phases through which the resources that a company has are taken advantage of. These stages are divided into planning, direction, organization, and control (Carlos, 2006). It is said that adequate control avoids deviations in costs and deadlines, or at least allows them to be detected as soon as possible. In order to exercise a proper follow-up and control of the project, it is necessary that the person in charge of the project dedicate the necessary time to monitoring the status of each of the activities that are being developed, paying special attention to those that register any delay (INEGI, 2012).

Reliability

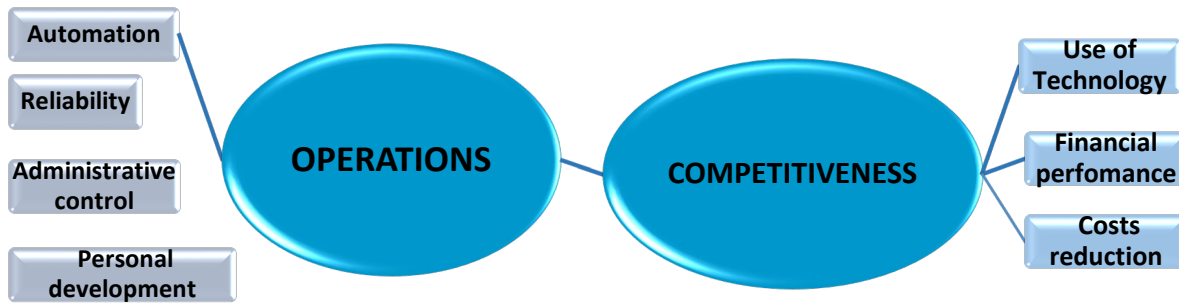
Ávila et al. describe that reliability can be defined as not only the ability of a product to satisfy the need or desire for which it was created, but also as the probability that that product meets the necessary characteristics to satisfy the public to which it is directed, in a specified time, and in the indicated conditions.

Personal Development

Ortiz (2006) argues that the main resource of companies to increase competitiveness is human resources, a resource that in most SMEs is poorly served and valued. Not much attention is paid to the planning of training and development of the human resources. Ávila et al. explain that the development of personnel implies a self-knowledge of the person, self-esteem, and self-efficacy that transforms into a life of personal, family, work, and social well-being whose objective is to achieve personal excellence to be leaders in the area and position in which they are developed.

Table 1: Data Sheet	
Characteristics	
Universe	3965 small and medium manufacturing companies in the metropolitan area of Guadalajara
Scope of study	The metropolitan area of Guadalajara
Sample unit	Companies with 11 to 250 workers
Information collection method	Personal survey
Sampling procedure	Simple random
Size of the sample	150
Sampling error margin	+ - 3% at a confidence level of 80% (P,Q:0.5)
Date of field work	June to July 2016

Table 3: Own elaboration



Construct

Source: Own elaboration

DISCUSSION OF RESULTS

		Sum of Squares	df	Mean Square	F	Sig.
PA1	Between Groups	186.589	16	11.662	14.066	.000
	Within Groups	110.271	133	.829		
	Total	296.860	149			
PA2	Between Groups	184.690	16	11.543	11.846	.000
	Within Groups	129.604	133	.974		
	Total	314.293	149			
PA3	Between Groups	124.086	16	7.755	5.828	.000
	Within Groups	176.988	133	1.331		
	Total	301.073	149			
PA4	Between Groups	195.156	16	12.197	11.055	.000
	Within Groups	146.738	133	1.103		
	Total	341.893	149			

Source: Own elaboration

In the previous table, it can be seen that the automation section consists of 6 items, of which only 4 have a significant level of significance. The first is PA1, questioning whether there are automated production processes within the organization. There is a significance of 0.000, so it is directly related to automation.

H1. Implementing automation increases the level of operations in SMEs. It is not rejected.

Table 3. Anova Reliability						
		Sum of Squares	df	Mean Square	F	Sig.
PC1	Between Groups	194.441	29	6.705	6.869	.000
	Within Groups	117.132	120	.976		
	Total	311.573	149			
PC2	Between Groups	226.614	29	7.814	12.523	.000
	Within Groups	74.879	120	.624		
	Total	301.493	149			
PC3	Between Groups	174.736	29	6.025	8.421	.000
	Within Groups	85.858	120	.715		
	Total	260.593	149			
PC4	Between Groups	148.022	29	5.104	3.787	.000
	Within Groups	161.738	120	1.348		
	Total	309.760	149			
PC5	Between Groups	106.353	29	3.667	2.182	.002
	Within Groups	201.647	120	1.680		
	Total	308.000	149			
PC6	Between Groups	175.889	29	6.065	6.254	.000
	Within Groups	116.384	120	.970		
	Total	292.273	149			

Source: Own elaboration

In the previous table, you can see the reliability section. It consists of 8 items, of which the 8 have a significant level of significance. The first of them PC1, referring to the productivity record. It has a significance of 0.000, so it is directly related to reliability.

The fifth item, PC5, questions whether technology has been developed by the company itself. It has a significance of 0.002, so it is directly related to reliability, besides being one of the factors with the greatest impact.

H2. With adequate reliability, the level of operations in SMEs increases. It is not rejected.

Table 4. Anova Administrative Control						
		Sum of Squares	df	Mean Square	F	Sig.
PO1	Between Groups	216.336	27	8.012	9.088	.000
	Within Groups	107.557	122	.882		
	Total	323.893	149			
PO2	Between Groups	207.039	27	7.668	9.659	.000
	Within Groups	96.855	122	.794		
	Total	303.893	149			
PO3	Between Groups	200.239	27	7.416	10.633	.000
	Within Groups	85.094	122	.697		
	Total	285.333	149			
PO4	Between Groups	197.101	27	7.300	8.017	.000
	Within Groups	111.093	122	.911		

	Total	308.193	149			
PO5	Between Groups	262.251	27	9.713	18.856	.000
	Within Groups	62.843	122	.515		
	Total	325.093	149			
PO6	Between Groups	135.179	27	5.007	5.827	.000
	Within Groups	104.821	122	.859		
	Total	240.000	149			
PO7	Between Groups	159.357	27	5.902	7.113	.000
	Within Groups	101.237	122	.830		
	Total	260.593	149			

Source: Own elaboration

In the previous table, you can see the section on Administrative Control consisting of 8 items, of which 7 have a significant level of significance. The first of them, PO1, refers to the statistical control of the production process. It has a significance of 0.000, so it is directly related to administrative control.

The seventh item, PO7, refers to if there is quality control. It has a significance of 0.000, so it is directly related to administrative control.

As has been observed, 7 of the 8 factors of administrative control have totally reliable significance, thus obtaining that the administrative control maintains a positive influence in the level of operations of the manufacturing SMM of ZMG.

H.3 With adequate administrative control, the level of operations in SMEs increases. It is not rejected

Table 5. Anova Personal Development						
		Sum of Squares	df	Mean Square	F	Sig.
PD1	Between Groups	205.868	16	12.867	13.041	.000
	Within Groups	131.225	133	.987		
	Total	337.093	149			
PD2	Between Groups	192.535	16	12.033	17.486	.000
	Within Groups	91.525	133	.688		
	Total	284.060	149			
PD3	Between Groups	206.523	16	12.908	22.657	.000
	Within Groups	75.770	133	.570		
	Total	282.293	149			
PD4	Between Groups	222.733	16	13.921	36.204	.000
	Within Groups	51.140	133	.385		
	Total	273.873	149			

Source: Own elaboration

In the previous table, you can see the staff development section. It consists of 4 items, of which the 4 have a significant level of significance. The first of them, PD1, refers to a recruitment program for production personnel. It has a significance of 0.000, so it is directly related to the development of personnel, besides being one of the factors with the greatest impact.

As has been observed, the 4 factors of personnel development have a totally reliable significance, thus obtaining that the personnel development maintains a positive influence in the level of operations of the manufacturing SMM of ZMG.

CONCLUSIONS

It is concluded that the management of operations of manufacturing SMEs in the metropolitan area of Guadalajara has a positive impact on their competitiveness, therefore:

H1 The better the level of operations in manufacturing SMEs, the greater the competitiveness. This hypothesis is not rejected. Four of the 6 automation factors, according to the statistical data obtained, maintain a positive influence on the level of operations of manufacturing SMEs in the ZMG, these factors are: The reliability of SMEs directly impacts their level of operations, which translates into business competitiveness, the reliability factors that present this impact are: The administrative control of SMEs directly impacts their level of operations, which translates into business competitiveness. The development of SME staff directly impacts their level of operations, which translates into business competitiveness.

Thanks to this research, we can realize the impact of operations in small and medium enterprises if these organizations can implement the tools and techniques mentioned above. Although at the beginning they represent a strong investment, in the medium and long term the results will reflect in a more competitive SME, with less possibility of disappearing, and greater possibility of consolidating in the market in which it operates and becoming a large company.

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