POSTCOVID

COMPETITIVENESS

BUSINESS RESILIENCE & ADAPTIVE SYSTEM

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TANIA GONZÁLEZ-ALVARADO
(COORDINATORS)

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Prologue

Post-Covid Competitiveness: Business Resilience & Adaptive System is of interest to those who expect a critical but positive vision of the pandemic times we live. Experts explain the situation of the organizations, institutions and regions according to resilience, innovation and adaptation for the new ways and best practices according to the Sustainable Development Goals (SDGs). SDGs are the essential guidelines that facilitate the strategic consideration of the Post-covid competitiveness.

The authors are from Colombia, Spain, Poland and Mexico. All of them are experts in Economic and Business Sciences. The institutions that participate in this project are Fundación Universitaria Konrad Lorenz, Universidad Complutense de Madrid, Universidad Externado de Colombia, Pontificia Universidad Javeriana, Universidad Autónoma Metropolitana-X, Instituto Politécnico Nacional, Universidad Autónoma de Aguascalientes, Universidad Michoacana de San Nicolás de Hidalgo, Universidad Autónoma de Coahuila, Instituto Tecnológico y de Estudios Superiores de Monterrey, and Universidad de Guadalajara.

Each chapter of this book was based on empirical real-life evidence from enterprises, universities, governments and institutions. All of these studied organizations are part of the Post-Covid competitive environment.

The writers believe in economic progress in line with innovation, resilience, entrepreneurship and international cooperation between regions, countries and corporations.

This publication was created following the best practices of scientific edition. Turnitin was applied to favor the originality. The editorial team carefully analyzed the quality and originality of the contents. Every chapter was selected, evaluated, and modified with the support of international peers. Editors and authors hope is that this book will contribute to the advancement of theoretical and practical knowledge.

Dr. José Sánchez-Gutiérrez

Business Resilience and Complex Adaptive Systems

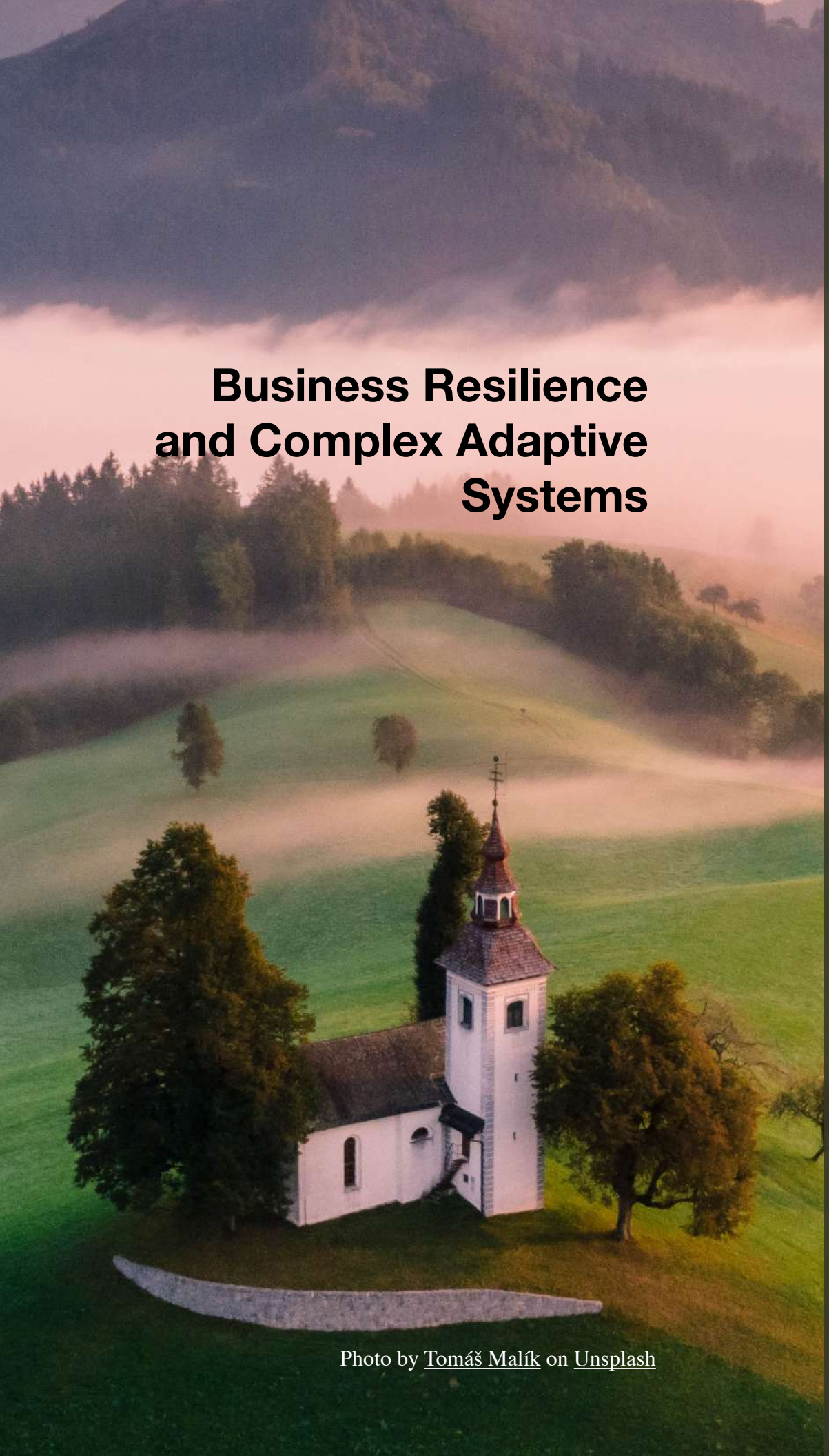

Photo by Tomáš Malík on Unsplash

Chapter 1

Business Resilience and Complex Adaptive Systems

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INTRODUCTION

The complex adaptive system has facilitated advances in artificial intelligence (Moon *et al.*, 2011; Padilla, 2012; Chandrasekaran, 2013; Yagüe & Balmaseda; 2020); but it is also a metaphor to understand the way in which the network of companies responds to changes.

In recent decades, the systemic approach has contributed to the advancement of knowledge in administrative, economic and organizational sciences (Mas, 2008; Jackson, 1994).

This approach has made possible a more thorough study of companies, their competitiveness and the way in which they contribute to the economy (Ackoff, 1999, 1971; Scott, 1988; Cooke, 2001; Johnson, Kast & Rosenzweig, 1964; Malmberg & Maskell, 2002; Bozeman & Bretschneider, 1986). The economic framework is seen as a complex system, constantly adapting to the environment. It facilitates the analysis of the achieved results, their impact and possible corrections in their dynamics.

As a global trend, companies constitute networks that intertwine and form more complex systems. Business activities involve various agents (public or private, local or international, with innumerable economic activities). Their heterogeneity and complexity contribute to a better adaptation to changes in the environment.

During 2020 the business system, international competitiveness and the ability of operational continuity of markets were tested in the face of the COVID 19 pandemic. This pandemic added to the global crisis that the capitalist system has experienced in recent decades and that lengthens and deepens each time (Argyriades, 2020; Alvarado, Kubus & Sánchez, 2020).

What is free of doubt is that the experience is essential for learning (Estrada & Dong, 2020; Mückschel *et al*., 2020; Covas *et a*l., 2021; Argote & Miron-Spektor, 2011; Boud, Cohen & Walker, 1993; Boyd & Fales, 1983), but the way in which this learning is processed by each organization, territory or economic sector makes the difference, especially in what refers to the adaptation period and the achieved results. There are new and marked inequalities that generate profound changes in the business system.

In this phase of COVID 19 scenario, the theory of complex adaptive systems is the basis for analysing and understanding competitiveness, international business and marketing in the companies (Ma, Xue, & Huang, 2020; Basile & Dominici, 2016; Langdon & Sikora, 2006; Haataja & Okkonen, 2004; Etemad, 2004; Rullani, 2002). The reality of this last year, renewed the importance of the study regarding complex adaptive systems in business while facing the need for resilience (Yaroson *et al*., 2021; Liu, Tong & Sinfield, 2020; Korhonen, 2020).

The Metaphor of complex adaptive systems and resilience in business

Complex adaptive systems are made up of agents that perform actions from which they learn to adapt, while interacting with others. Thus, the company is an agent. At the same time, the company is made up of individuals who learn. Individual learning depends on the environment (it encourages learning or not); the availability to learn (the person must be interested in constant learning); and the individual's ability to study (skills, aptitudes, and attitudes that lead to critical thinking) (Tejedor & Aguirre, 1998; Peña, Gómez & Rubio, 1999; Esteban, 2002; Pérez, 2002; Prot, 2004; González, 2006; de Medrano & de Paz Higuera, 2010; Morgado, 2014; Bruner, 2018).

The contribution of individual to business learning leads to endless ways and possibilities. Because of that, a company can take months or years to change and adapt to the environment. The bottom line is that the same process is responsible for each of these changes (Holland, 1992).

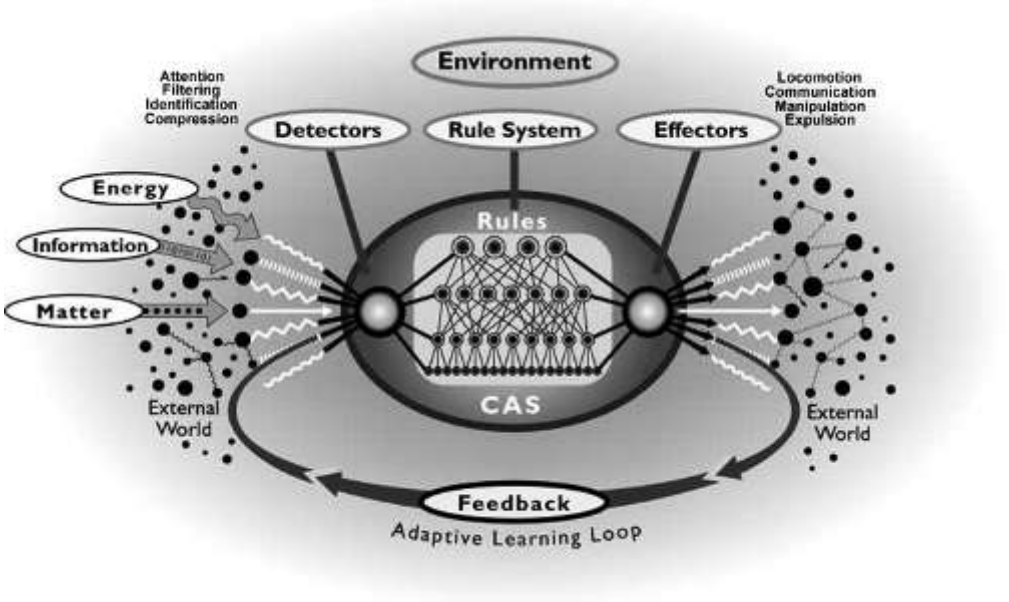
In case where the company is analysed as an agent of an adaptive system, it is necessary to divide the system into three subsystems: execution one (what the system can do without adapting), credit allocation (decision between the rules that work and those that do not), and identification of rules (Holland, 1992).

> "An agent in such a system is adaptive if it satisfies two additional criteria: the actions of the agent in its environment can be assigned to a value (performance, utility, payoff, fitness, development of a general mathematical theory or similar); and the agent behaves with the aim of increasing this value over time". (Holland & Miller, 1991)

The company (economic unit) is represented as a one hundred percent rational agent. However, the same does not happen with the individuals that constitute it. The person is not one hundred percent rational, but the role acquired within the company usually adjusts both the decision-making and the actions of the individual in such a way that the possibility of acting according to the organizational objectives exceeds the individual impulses and interests (Simon, 1990).

On the other hand, Artificial Intelligence (AI) has provided companies with electronic tools and processes that support analysis for decision-making, fully adjusted to what the theory of complex adaptive systems exposes (Yu *et al*., 2016; Melnychenko, 2020; Anagnoste, 2018; Schoemaker & Tetlock, 2017; Dhingra, Jain & Jadon, 2016; Impedovo & Pirlo, 2020; Kerzel, 2021). Nonetheless, decisions and actions are taken by people with limited rational ability.

Figure 1. Complex Adaptive System Model



Source: McElroy (2000).

In complex adaptive systems, rules are used for hierarchical decision making. The hierarchy between the rules is obtained by experience (Holland, 1992). The difficulties increase because the agents' rules are continually changing (Holland, 2006). In companies, policies, norms and rules are derived from previous experiences and allow the reduction of errors and/or waste.

In some areas of the company, the rules are closely followed because the decrease in costs in the production chain depends on them. Notwithstanding,

this is not the case of the entire company. In an adaptive system, focusing the mechanisms to interact on the rules of the company would decrease its ability to learn and to adapt.

Based on experience and the search for better results, employees in senior and middle management and in strategic positions have the individual freedom to rank the rules, to modify and to replace them. These same strategic employees contribute to changes in rules not only of the company, but of the system, transposing them into the political, legal or social environment. However, this has not always been used to benefit the company or the system. There are cases where this ability was used to adapt the environment for individual interest, affecting the system in general (Stiglitz, 2004).

Complex adaptive systems can anticipate or forecast, and this is not limited to those which are like humans and that can change their activity in the future, even if that forecast can be wrong (Holland, 1992). Agents rarely reach equilibrium, and the combination of conditional action, regular innovation, and perpetual novelty, disrupts the formation of attractors (Holland, 2006).

This exercise of anticipating, predicting and making mistakes is essential to develop the ability to learn (Peña, Gómez & Rubio, 1999; De la Torre, 1993; Rodríguez, 2006; Salas & Salas, 2014). The possibility of reducing errors, making better decisions and leading to actions more congruent with reality is ensured to the extent that they are exercised. For the person, the company and the economic system, mistakes and failures are essential for learning and adaptation.

The properties of the adaptive system are: 1) aggregation, as companies contribute to the Gross Domestic Product; 2) flows, feedback from production, and the multiplier effect; 3) non-linearity, as there are catalysts; and 4) the diversity (Holland, 1992).

Models based on natural (not artificial) systems become incomplete because reality is more complex. Thus, it is impossible to reach their thorough representation (Holland, 1962). The economy indeed is a complex system (Holland, 1988).

Emerging models for reality forecasting and explanation are incomplete. This characteristic poses clear boundaries for their study and conception. However, the theory of complex adaptive systems allows the understanding of how companies learn and how this learning leads to a better adaptation to change. This adaptation of the company has been determined through the concept of "competitiveness". Nonetheless, adaptation must be assessed on the basis of its contribution to a greater resilience.

Resilience as a characteristic and the competitiveness-oriented practice of management

Additionally, resilience is a quality or characteristic that may or may not be present. Business resilience by itself is not an implied process, and the studies that address it as a process, actually present an administrative practice with its proceedings, principles and tools that have been classified as “good business practices”.

Coupa's case exemplifies this. Its web page suggests to companies the generation of resilience in times of commercial uncertainty. It is to be achieved by different means: by enhancing the visibility and by controlling the cost of their business, as well as by revealing the strategic areas of cost containment; by implementation of essential steps to immediately reduce supplier risk, or by supporting the state of business today while generating agility for the future (Coupa, 2021). These actions are general and closely related to risk management. There is neither an indication of focusing attention on learning environments in and for the company, nor of the learning based on experience.

Another case is PMK Digital Learning (2021). They consider that business planning, leadership and management, complemented with metric measures, contribute to resilience. They do not consider learning from experience as a key element; while even promoting the "idea that adversity will pass, and the situation will improve.”

They consider that the change in the environment is due to an isolated event and that the normality will return soon. However, experience of the last year teaches us that unexpected changes can last for years and there is no return to what was normal before. Instead of that, inside the same dynamics a new normal is built.

The idea that "adversity will pass" does not contribute to resilience. In the long run, it fosters self-deception and the anxiety of those who make up the organization. The latter, is due to the reality that sends the constant message that "adversity does not pass and the situation may not improve in the short term." A more consistent option is to encourage continuous learning and adaptation to reality.

PMK Digital Learning (2021) explains resilience more clearly but it does not link resilience theory to managerial practice. However, to entrepreneurs and senior management the approach this company makes about resilience is interesting. It urges them to see the firm as "a living and dynamic system that can continually learn, build stable relationships, and focus on a greater purpose". It is perhaps at this last point that this entity would establish the link to resilience by

adopting the metaphor of complex adaptive systems, considering their limits and scope.

A third and final example of the confusion between resilience and management can be found in the Practical Handbook on Business Resilience (U.S. Chamber of Commerce Foundation, 2017). The manual focuses on risk management. It is interesting that it mentions the reasons why companies display "failure to understand the post-event environment" and "reluctance or inability to act in response to the new environment". However, it forgets these two key elements of resilience and it focuses on describing tools for risk management.

This manual uses the term "catastrophic" to justify resilience. It is a term or word that conveys the idea of resignation and victimization in the face of a change in the environment. Those who are victimized can hardly learn from reality or act rationally and innovate. Furthermore, the person that qualifies a phenomenon as catastrophic is the human being. Avoiding the classification as a catastrophe makes it easier to understand and learn from reality, as well as speeds an adaptation to the environment.

Avoiding the idea of "catastrophe" makes it easier to understand its temporary nature. There are short events with long-lasting effects, long-lasting events with short effects, and long-term events with difficulties in definition of the restraints in the maximization of their effects. It is important to know that unforeseen events can happen, and that the constant transformation of the environment is the norm. For example, a fire is something that happens in a short time, but its effects can last in the long term; a virus (COVID 19) is a prolonged event with short effects under system adaptation; climate change is a protracted event for which the moment of maximization effects countering is still unknown.

Business resilience has become important in recent decades due to climate change and the search for competitiveness (Lew *et al*., 2016; Winnard *et al*., 2014; Mclellan *et al*., 2012; Avery & Bergsteiner, 2011; Lele, 1998; Ludwig, Walker & Holling, 1997).

The emergence of COVID 19 is seen as a part of climate change (Cole & Doods, 2021). From this perspective, the Practical Manual on Business Resilience (U.S. Chamber of Commerce Foundation, 2017) is useful to promote risk management but at the same limited in what refers to the support the company resilience.

It is however true that in times of constant change and uncertainty, a company whose management has increased its competitiveness, is classified as highly resilient. This is justified because at times when job losses, company closures and the fall of markets normalize (Argyriades, 2020), the existing companies with opposite results are mostly highly resilient companies as well.

There are scenarios in which an increase in competitiveness is obtained through the resilience of the individuals that constitute the company and therefore contribute to the entity resilience itself.

Note that this kind of company would be rated as resilient; but it would rather be the result of the complex conjunction of human actions, decision-making and activities that correspond to both the administration and the response of the individuals who make it up or interact with the company. The result is classified as resilient, only after such outcomes are reached.

The resulting process that can serve as an explanatory model of how resilience was achieved is the adaptive complex system framework, not the resilience one. This adaptive system represents administrative practice in its entirety. However, it is oriented towards constant change, error and failure, as well as continuous learning.

Due to the complex nature of reality, the multidimensional heterogeneity of each company and the high uncertainty regarding the future, in each case there would be a specific and unrepeatable model, even for the same company with previous successful experience.

Currently, the exercise of creating a descriptive-explanatory model of the reality of a company has too many limitations due to historical determinism. Thus, it is misguided to later derive it in a prescriptive model that leads other companies to achieve better results.

If the environment is constantly changing, for the same actions, in the same sequence of events and with the same perspective it is difficult to obtain favourable results under all circumstances. In other words, a resilient business process as the one prescribed in the business literature presents strong internal contradictions.

A process establishes routines, and changing reality requires their overcoming. Improvisation and learning from mistakes are key for quick adaptation. Thus, descriptive-explanatory models are important instruments to learn from experience. Nonetheless, there is no certainty that they can serve to prescribe future actions because they should be learned from the predominant environment. An exercise of the human capacity of anticipation without fears of error and failure is required.

This leads to the transformation of theoretical construction in the field of administrative sciences, so that they can better contribute to practice. More evidence and analysis regarding the understanding of mistakes and failure is needed and not so much on successes and successes in order to overcome availability bias (Kahneman 2017).

This forces a cultural and ideological change, because for individuals the failure is not so compelling as success. Perhaps this justifies the fact that

commercial literature is inundated with titles such as "positive impact", "benefits", "boosted competitiveness", "success". This can be as well an indication of this positivity bias in recent cultural mindset (Ehrenreich 2009).

In the business area there are many consulting firms that promote strategic planning, good administrative practices and other tools common to the enterprise under the label "increase resilience"; however, it is important to remember the difference between metaphor, tool, practice, and characteristic.

Resilience is a characteristic that not necessarily can be reached through certain administrative tools and practices. The metaphor of complex adaptive systems allows us to identify the limits that the companies' prescriptive models have in reality. What is sold in the consulting market as an engine for change may be more than anything just an anchor to the past. Especially, if the points outlined in this chapter are not considered. The costs to the company, the business sector and the economic system can be high.

In the same way, measuring resilience in companies (Kativhu, Mwale & Francis, 2018; Ayala & Manzano, 2014) leads to confusion; at best, with organizational performance (financial and market behaviour); and in most of the cases, with organizational development (planned change of the organization using behavioural science knowledge) (Austin & Bartunek, 2003; Worley & Feyerherm, 2003; Burke & Litwin, 1992; Porras & Robertson, 1986; Staw, McKechnie & Puffer, 1983).

Both organizational performance and change are tools that facilitate the analysis of the company's situation vis-à-vis the environment and contribute to improving its situation vis-à-vis reality. Resilience may or may not be an emerging business characteristic. Because it is a characteristic, it is expected to be found in a certain reality, which makes it even more subjective and difficult to measure.

Resilience is not the first attribute that is confused in the exercise of measuring it; especially when a measure is not always a prerequisite to comprehension and not everything that is measured is understood. It is probably so because of the reigning (wrongly attributed to Drucker) assumption that what gets measured gets managed. Nonetheless, hereby it is considered that it is more important to understand resilience than to measure it. If not, it is the company that ends up being measured. In companies, the understanding of resilience as an emerging characteristic and a quality of the people that make it up, facilitates the adaptation to the environment.

Resilience is the capacity of a dynamic system to adapt successfully to disturbances that threaten its function, viability, or development (Masten & Reed, 2002; Zolli & Healy 2012). Thus, complex adaptive systems make possible the

explanation of how and to what degree companies manage to adapt successfully under challenging circumstances.

"Resilience" has its origin in Latin, in the term *resilio* which means to go back, jump back, highlight or bounce (Kotliarenco, Cáceres & Fontecilla, 1997). Physically, resilience is synonymous with elasticity or buoyancy and expresses the ability of a body to recover its original state or position once those forces that tend to deform, displace or submerge it cease their action (Oriol, 2012).

It is also used to refer to the ability to have a successful development despite very adverse circumstances (Iglesias, 2006) and reflects the dynamic confluence of external and internal factors that promote positive adaptation (Truffino, 2010).

Resilience from an organization perspective is the result of administrative dynamics combined with uncertainty. An entity operates within a complex adaptive system. The resilience of an organization is related to the resilience of other economic agents with which it is linked (Medina, 2012).

In general, most of the studies that address organizational, or company resilience tend to include it or to link it closely with administrative functions or with strategic planning. This kind of research hardly considers resilience as a characteristic of a much more complex business phenomenon. Resilience is more an emerging characteristic that qualifies it. Additionally, it is attributed to an organization when it has overcome unforeseeable adverse circumstances.

In fact, the circumstances that lead to the qualification of a company as resilient are different. There are at least three situations of an entity: 1) it has a better position than before; 2) it has a better position compared to other companies; 3) its situation is better than what could be expected under certain circumstances, even though it is less advantageous than in the past.

CONCLUSIONS

It is worrying that resilience is confused with planning and other administrative practices. Indeed, there is a certain promotion of the idea that anticipation is the key to resilience. Meanwhile, when faced with the complexity of reality, the greatest negative impacts are associated with the least predictable challenges. Under this last perspective, the theory of complex adaptive systems is considered important. This theory leads to the understanding of the underlying principles or fundamental characteristics which are necessary for a better system adaptation.

This study offers a more convenient theoretical perspective than the prescription of scenarios that can be infinite given the many challenges that can arise. An adaptive system, even if it can learn from past experiences in order to improve its future results, requires that the agents that constitute it have a long-term vision and a capacity of analysis of what happens in the short term. The

non-linearity of complex adaptive systems encourages constant learning and an increasingly dynamic system, capable of responding quickly and efficiently to unexpected changes. Adaptive learning focuses on experience with an emphasis on mistakes and failures rather than successes.

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Chapter 2

Control of Production Activities in Manufacturing SMEs Competitiveness and Resilience

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Control of Production Activities in Manufacturing SMEs Competitiveness and Resilience

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Introduction

For the last years, small and medium-sized enterprises (SMEs) have been the main cornerstone of the economy in the areas where this type of enterprise is established mainly due to the production development and their help to support the workload. These two indicators have been a relief in general for the economies of different governments (Luciani, Zambrano & González, 2019; Araque, 2012).

However, there is an important element that cannot be forgotten which is the short term of life that most companies have regardless of their line of business and sector (Lasio *et al.*, 2015).

In this set of ideas, both scholars and managers must consider if the problems of the firms to survive in the market are because of a lack of organizational structure that allows them to be profitable and competitive or because they perceive globalization as a threat that deters them to innovate or

carry out key improvements (Cruz *et al*., 2012). The ability to be resilient is an important issue for SMEs (Bak *et a*l. 2020; Iborra, Safón & Dolz 2020).

Many factors affect SMEs to have better performance and more competitiveness, so they are always strong. Nonetheless, an essential and operative element that provides energy to a manufacturing enterprise is the coordination among supplies, intermediaries, efficient transportation as well as an internal operative process that is synchronized and controlled in a way that companies have excellent results in terms of productivity and product quality (Salas *et al*., 2019; Salas, Maiguel & Acevedo, 2017).

Therefore, some conditions must take place. Suppliers will need adequate control of deliveries and good financial negotiation that does not affect the relationship. Inside the company, it will be necessary a strict control in terms of production, maintenance, quality of internal systems, trained personnel, and a good improvement system that guarantees excellence in the manufacturing of products that will eventually be sent to the customer (Viana, 2015)

This paper attempts to analyze how production elements (especially the degree of automation of production lines, the production status of manufacturing SMEs, and maintenance efficiency) affect this type of enterprise to become more competitive and resilient considering that nowadays there is a lot of competitiveness and customers are increasingly demanding.

In this regard, it is important that managers, who are in charge of their operation and permanence in the market, evaluate whether the competitiveness of their manufacturing SMEs depends on the degree of automation of their equipment, the internal production control that allows them to have higher levels of productivity and an excellent preventive maintenance program that ensures the operation of their production equipment.

THEORETICAL FRAMEWORK

Nowadays, it is very important for manufacturing SMEs that their processes, as well as their products, have adequate quality control. Even when it is true that customers demand quality, the offer in the market of quality products indicates that within this type of enterprises there is an operations division that is organized and coordinated with qualified personnel (Usuga *et al*., 2020; Altaf *et al*., 2018; Bergmann, Feldkamp & Strassburger, 2016) which in turn builds confidence in the relationship with clients.

Consequently, quality control must pass through the systems of production, organization of the lines of production processes, training, material management, supplies, and operation strategies that always ensure the demands of clients since they need reliable and long-lasting products at a reasonable price

(Carvajal, Tavakolizadeh & Gyula, 2019; Diaz, Bielza & Larrañaga, 2017; Ding & Jiang, 2018; Harding *et al*., 2006).

As part of the production activities, it is important to create impact strategies so manufacturing SMEs can have competitive advantages and for that to happen the ones in charge must have enough perspective to have a good plan of their operative processes (Kretschmer *et al*., 2017; Kumar, Shankar, & Thakur, 2018; Kusiak, 2017; Lemieux *et al*., 2015).

The more advantages the company creates, the more resilient it is (Fitriasari, 2020; Emueje *et al*. 2020). Other factors affect the competitive improvement of these enterprises. Nonetheless, for the specific case of the production area, it is important to consider the current condition of the equipment, secondary materials, tools, and systems for the internal management of materials and thus avoid unnecessary damage that affects the quality of the product (Kapulin & Russkikh, 2020; Valilai & Kivi, 2017; Lu & Chen, 2018).

On the other hand, it is important to highlight that not all manufacturing SMEs have all their processes automated. Nonetheless, they are getting interested (slowly but steadily) to be resilient and adopt technologies that enable them to expand their capacity and business life (Ibarra, González & Demuner, 2017; Pierri & Timmer, 2020; Sharma, Rangarajan & Paesbrugghe, 2020).

Despite the difficulties, some enterprises that have been able to make technological improvements, as well as automated their processes partly or totally, also have trained staff who ensure that their products will have a reliable level of quality demanded by their customers.

This means that they can place their products at an international level as they comply with the standards required by the market (Aragón et al., 2010; Aragón & Rubio, 2005; Cuevas et al., 2015; Estrada, García & Sánchez, 2009; Flores & González, 2009; Ibarra, González & Cervantes, 2014; Zevallos, 2003).

As it was mentioned earlier, it is of paramount importance to manage and control the production processes besides paying special attention to the aspects of quality, planning, and maintenance of equipment. Similarly, managers or owners of this type of manufacturing enterprise have to deal with other internal activities that are linked to production activities such as supplies (Lombana *et al*., 2017).

Also, it is important to highlight that if manufacturing SMEs have efficient production processes it is partly due to the efficient controls over maintenance plans (Diez & Abreu, 2009).

It is precisely in this area where trained staff committed to the company is mandatory because their role is key for the development of the organization (Tafolla, 2000; Diez & Abreu, 2009).

Regarding productivity, manufacturing SMEs have a special approach since many enterprises have complex processes due to the nature of the production of their goods. This requires internal controls and systems that, instead of affecting production times, should have a constant improvement so the productivity index is not affected (Ibarra, González & Demuner, 2017).

To do this, it is necessary to coordinate regularly other activities such as the planning and supplying of raw materials, inventory control, and the management of internal materials of the organization.

Accordingly, it is important to have a good distribution of the layout as well as to implement techniques of discipline, order, and classification with the staff regarding anything that involves the production process to increase the positive results of productivity of the company (Du & Banwo, 2015; Medina & Naranjo, 2014; Zevallos, 2003).

It is important to notice in this research paper that the production aspects must have a special inner control (such as the management regarding production, maintenance, equipment adjustment, and quality assurance of all internal systems) to create positive results that have an impact on the competitiveness of manufacturing SMEs (Ibarra, González & Demuner, 2017; Hernández, López & López, 2013; Maldonado, 2008; Gardiner, Martín & Tyler, 2004). In these time of crisis: more competitiveness, more resilience. Thus, the following hypothesis is established:

H_1: Does the control of production activities have a positive impact on the competitiveness of manufacturing SMEs in Aguascalientes?

METHODOLOGY

The present research analyzes the level of likelihood among production activities such as automated processes, productivity, and having adequate maintenance so manufacturing SMEs in Aguascalientes become increasingly competitive. To do this, the National Institute of Statistics and Geography directory (INEGI, 2018) was taken as the reference of the database which mentions that Aguascalientes State has 442 enterprises (Table 1).

Table 1. Fact sheet

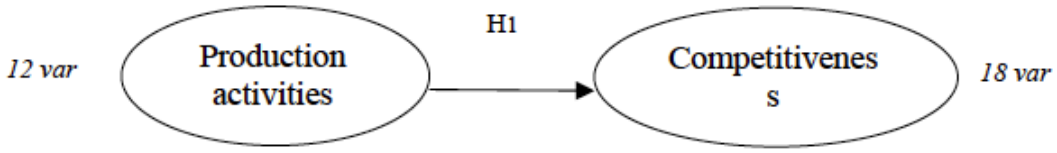
Study indicator	Description
Universe	Small and medium-sized enterprises of the manufacturing sector which have between 11 and 205 employees
Geographical scope	National
Size of the population	442
Size of the sample	250
Sampling procedure	Proportionate stratified sample to the size and sector of the enterprise
Sampling error	+/- 5
Level of reliability	95 %; Z = 1.96; p = q = 0.5
Period of fieldwork	March-April 2019

Source: Own elaboration.

Development of measurements

The measuring instrument that was applied to manufacturing SMEs in Aguascalientes was built for different groups. Twelve items were used for the group of production activities based on a Likert-type scale of five positions from 1 to 5 where 1 refers to low importance and 5 refers to high importance (Machorro *et al*., 2007). Eighteen items were used for the group of competitiveness based on a Likert-type scale of five positions from 1 to 5 where 1 refers to low importance and 5 refers to high importance (Maldonado, 2008). Similarly, as it is shown in Figure 1, a theoretical model was designed to analyze the influence of production activities on the competitiveness of manufacturing SMEs from Aguascalientes State in Mexico. Figure 1 shows the theoretical model used in this research paper.

Figure 1: Theoretical Model of the Research



Source: Own elaboration (Machorro et al., 2007; Maldonado, 2008).

The theoretical model is an adaptation of Machorro and others (2007), and Maldonado (2008) to analyze how managers or owners of manufacturing SMEs in Aguascalientes perceive the improvement of competitiveness of their enterprises by considering as a relevant element to focus on the control of production aspects from the perspective of automated processes, productivity, and efficiency in maintenances plans.

RESULTS

This section of the research paper shows the results of the reliability of the instrument used. It is important to mention that Cronbach's Alpha value was used for the reliability of the instrument, which needs to comply with some acceptance conditions (Frías; 2014; George & Mallery, 2003; Nunnally, 1967). If the value is higher than 0.7 then the construct is considered reliable. These are the results obtained from the instrument used:

a) Production activities: 0.918
b) Competitiveness: 0.951

Regarding the general data of the subject matter, it is necessary to establish that around 80% of manufacturing SMEs in Aguascalientes have a person in charge of the quality control activities. Regarding the management of enterprises, 83% are men and 17% are women.

The female managers or directors that have labor seniority between 10 and 15 years represent 20% of the sample and those that have more than 30 years of seniority represent around 5%. Regarding the academic degree of business owners, the results show that around 60% of them have a bachelor's degree and 3.5% have a higher degree. Regarding the median age of the facilities, the results are shown in Table 2.

Table 2. Median age of the facilities of manufacturing SMEs

Range of mean age of facilities	Percentage
More than 15 years	22.6
Between 11 and 15 years	21.5
Between 7 and 11 years	17.7
Between 3 and 7 years	27.4
Less than 3 years	10.8
Total	100%

Source: Own elaboration.

The Pearson correlation analysis, which has a range of $-1 \leq \varrho \leq 1$, is measured by the degree of relationship that exists between two random variables (Joe, 1997; Pita, 1996). This helps us to measure the strength or degree of association between two quantitative random variables.

When the value of ϱ is positive (+), the relationship is directly between the variables. When the value of ϱ is negative (-), the relation is indirect between the variables. When the value of ϱ equals zero (0), the value of the variables will be independent. Table 3 shows the Pearson correlation analysis.

Table 3. Pearson correlation analysis

Independent variable	Competitiveness	
Many production processes are automated	Pearson correlation	.539**
	Sig. (bilateral)	0.000
Most of the equipment is controlled automatically	Pearson correlation	.596**
	Sig. (bilateral)	0.000
The technology incorporated in their production processes gives them an advantage against their competitors	Pearson correlation	.589**
	Sig. (bilateral)	0.000
The production process includes records and analyses of productivity	Pearson correlation	.573**
	Sig. (bilateral)	0.000
There is a frequent analysis of inventory levels	Pearson correlation	.602**
	Sig. (bilateral)	0.000
Decision making ponders possible types of "scale economy"	Pearson correlation	.690**
	Sig. (bilateral)	0.000
Production is flexible	Pearson correlation	.680**
	Sig. (bilateral)	0.000
It can create quality products	Pearson correlation	.375**
	Sig. (bilateral)	0.000
The facilities are in excellent working conditions to use them every day	Pearson correlation	.319**
	Sig. (bilateral)	0.000
The machinery and equipment are in perfect conditions to use them every day	Pearson correlation	.422**
	Sig. (bilateral)	0.000
Constant maintenance is provided to the machinery and equipment	Pearson correlation	.356**
	Sig. (bilateral)	0.000
The person in charge analyzes the amount of money invested in the area of Maintenance	Pearson correlation	.378**
	Sig. (bilateral)	0.000

**The correlation is significant in the level 0,01 (bilateral)

Source: Own elaboration.

The results of the Pearson correlation analysis show that, in the perception of managers or directors of manufacturing SMEs in Aguascalientes, it is very important to analyze constantly the level of inventory to make correct decisions that have an impact on other internal processes of the enterprise.

Similarly, managers need to automate their internal processes (even if it is only at a small scale) not just because they consider it necessary but also because they state they own automated equipment in their enterprises.

On the other hand, those in charge of the manufacturing SMEs in Aguascalientes mention that the technology that is included in the production processes creates competitive advantages against their competitors along with high levels of productivity that managers claim they have in their internal processes.

Accordingly, a regression analysis was conducted in this research to know the impact of each one of the indicators from the block of production activities with the dependent variable of competitive considering the regression model

$$Yi = \beta_0 + \beta_1 X_{1i} + \ldots + \beta_k X_{ki} + \varepsilon$$

According to Mood and Graybill (1974), this statistical method allows the independent variable to explain the forecast and behavior of the dependent variable. The results obtained from the regression analysis are listed below as well as the attainment of the equation from the variables that have an impact on the dependent variable. All this is shown in Table 4.

Table 4. Regression analysis results

R^2 adjusted	0.611	Anova	0.000
valor F value	113.528	FIV	1.276
Durbin – Watson	1.504	t value	7.170
Regression equation	Competitiveness = 0.700 + 0.198 (Decision making considers economy of possible scales) + 0.295 (The production is flexible) + 0.166 (Most of the equipment is automated + 0.092 (The machinery and equipment are in excellent conditions to be used daily) + 0.032 ε		

Source: Own elaboration.

It can be seen from the results obtained in Table 4 that, for manufacturing SMEs in Aguascalientes to have better competitiveness, managers consider that within the production aspects the most significant one is to have flexible production.

After this one, managers established in order of importance the following production aspects: having strategies to make better decisions considering the type of economy where enterprises are located; having equipment that is as automated as possible; and, having the production equipment in excellent operative conditions, which is a hard task for the maintenance area.

DISCUSSION

The research of operative activities of SMEs will always be essential from different perspectives, especially regarding the manufacturing sector for what they represent for their governments and their contribution to the gross domestic product.

This kind of enterprises create jobs and can adapt to changes as long as their managers are prepared and have a trained and skillful staff to produce strategies that help companies to evolve and diversify their activities (Gonzalez & Martin, 2013). In this regard, Usuga and others (2020), consider as part of their key strategies to have strong control in the administration of processes, the planning of production, and have a quality control system that is not only about the process but everything related to the management of operations, especially if this kind of enterprises have a level of technological adoption.

In this regard, it is important to mention that, according to the research conducted in this paper, it is very important for managers to have internal controls in operative activities as it is a coordinated process. In other words, if there are breakdowns among supplies, inventory, processes, and product deliveries to customers, the results will have an important and harmful impact on clients due to faulty deliveries, defects on products or simply not delivering purchase orders on time.

This means that managers have to pay special attention to implementing suitable quality systems and train their staff so the planning of production can be effective as mentioned by Kapulin and Russkikh (2020). This requires that all production activities have a design and control that is focused on always having competitive advantages against competitors.

Regarding the implementation of improvements in this kind of enterprises, managers are advised to run diagnostic tests that allow them to know their weaknesses and areas of opportunity such as the lack of records and control, review of the functioning and efficiency of the management of inventory, and determine if the layout is ideal for the handling of materials.

Also, it is recommended to consider if more training is necessary for the staff since this will never be a waste of time but rather an excellent investment. Similarly, it may be useful to motivate to implement or prioritize working methods such as KAIZEN, SWOT, Value Chain, the importance of teamwork and the implementation of the 5S (which are already nine). Each manager will have to decide what aspects are necessary to implement in their enterprise as long as the goal is to improve and be more competitive.

Finally, it is important to notice that this research took place in Aguascalientes State and it was aimed specifically at the manufacturing sector and SMEs. This research paper only aims to analyze production activities focused on the planning of the production, productivity, maintenance of equipment, and quality control as well as competitiveness of the enterprises mentioned above. It is recommended to broaden the research and test the model in other scenarios and regions to compare results and define more clearly what elements have more impact besides the ones shown in this paper so other companies can be increasingly competitive in our country.

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Chapter 3

Creating Competitive Advantages: Functional Foods and COVID-19 in Mexico

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Creating Competitive Advantages: Functional Foods and COVID-19 in Mexico[1]

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Introduction

Globally, the pandemic caused by Covid-19 has changed the lifestyles of millions of people and has seriously affected the world economy. The way people consume and spend will never be the same again, so innovation, resilience, and adaptation will become key factors in creating new business opportunities in these new scenarios. As a result of the pandemic, one of the issues that have become a priority for consumers is health and wellness.

For example, the increase in obesity is now a global health problem and is also a risk factor in the current scenario, which according to scientific evidence (Lighter *et al*., 2020; Petrilli *et al*., 2020; Simonnet *et al*., 2020; Stefan *et al*., 2020); predisposes the acquisition of the COVID-19 virus as well as the aggravation of the symptoms of infection and even death. According to World Health Organization reports, being overweight, including pre-obesity and obesity,

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predisposes to the acquisition of noncommunicable diseases, including diabetes, cardiovascular disease, and certain types of cancer (World Health Organization, 2019).

Obesity is a complex problem that requires further research in terms of prevention and the challenges it faces because it is not only a problem of self-control. There is no simple solution, and so far, no country has managed to significantly reduce the prevalence of obesity.

Excess body weight has profound impacts on different levels as it generates serious chronic diseases that reduce the quality and life of individuals, increase costs to society and affect the operation of health systems (OECD, 2019; PwC, 2015).

In Mexico, the latest results of the National Health Survey (Ministry of Health, National Institute of Public Health & Statistics and Geography, 2018), show that on average 22.2% of the population between 0 and 4 years of age is at risk of overweight and 8.4% of children between 0 and 4 years of age in urban areas and 7.8% in rural areas are overweight.

In the case of the population between 5 and 11 years old, 35.6% suffer from overweight and obesity, considering the type of locality, in rural areas 29.7% suffer from it and in urban areas 37.9%. In the population between 12 and 19 years of age, 33.2% of men and 35.8% of women are overweight and obese. In rural areas, 34.6% of men and 39.7% of women are overweight and obese.

Finally, in the population, aged 20 and over, the percentage of adults with overweight and obesity is 75.2%, which is 2012 was 71.3This not very encouraging scenario, both in Mexico and in the world, constitutes a source of opportunity to refocus the business efforts of food manufacturers, analyzing their product offerings and adapting to the new times; consumers today are concerned about the food they eat and are looking for it to provide benefits beyond basic nutrition. According to a study by Nielsen Mexico (Malacara, 2020), concern for health in the country has led to a 20% increase in the health and well-being market between August 2019 and August 2020.

According to data from Euromonitor International (2021), in Latin America, in 2019 fortified/functional packaged foods reached sales of US$19,891 million, with a 27% increase between 2014-2019.

In Mexico, the behavior of these products has been similar. In 2019 this market reached sales of US$ 6,786 million, an increase of 5.4% compared to the previous year. Proteins, fibers, and probiotics were the leading demands within the trend of fortified/functional food ingredients in the Mexican market.

PROBLEM STATEMENT

Obesity is considered a risk factor for morbidity and premature mortality, and the consequences of obesity for the health and quality of life of those who suffer from it are multiple. Obesity is considered a risk factor for more than 20 chronic conditions such as type 2 diabetes, hypertension, dyslipidemia, cardiovascular disease, stroke, sleep apnea, and more than 10 types of cancer, in addition to the risk for the new COVID-19 19 (Di Angelantonio *et al.*, 2016; Lauby-Secretan *et al.*, 2016; Upadhyay *et al.*, 2018).

Obesity-related deaths are on the rise. Diabetes mellitus, metabolic damage, and heart disease are the leading causes of death in Mexico (Ministry of Health, National Institute of Public Health & Statistics and Geography, 2018). Overweight and obesity have a strong impact on the quality of life of the Mexican population that suffers from them, affecting at the same time the competitiveness and productivity of the country.

Paradoxically, the government has reduced the budget allocated to the reduction of obesity. However, it is hoped that the current government, through the health sector and civil society, can support actions for the development of prevention policies, considering that this problem requires transversal policies and not just the identification of the problem.

Among the possible solutions to this problem, changes in the diet are considered, considering that processed foods are one of the main causes of obesity in Mexico. In this sense, the National Institute of Public Health in Mexico suggests the population choose other options to substitute a certain food for another one of similar nutritional quality and more accessible now.

This option presents advantages in the short-term considering that according to studies carried out worldwide, consumers choose functional foods derived from the ease of being persuaded to replace something they already eat regularly rather than asking them to break a habit or form a new one (Euromonitor International, 2018).

If the State must guarantee food for the entire population, regardless of their socio-economic status, and 80% of the population has some degree of poverty, we have to give recommendations and generate public policy with local food production, access to food that goes directly to the consumer (Conacyt, 2018).

The National Polytechnic Institute, as part of its work to help solve the major national problems, is working on technological innovations in the food sector (Project SIP-2020-0481).

The focus on functional foods has increased considerably in recent years, because of the growing dissemination of knowledge of the benefits to

health of eating foods enriched in bioactive compounds; therefore, the IPN is working on developing functional products, with low caloric density, low glycemic index, containing antioxidants, dietary fiber, probiotics, which together are a viable option that contributes to the control of overweight and obesity.

The objective of this work is to identify the business opportunities that are being generated in times of COVID-19 for innovative functional foods (Cookies) of low caloric density, with a low glycemic index, containing antioxidants, dietary fiber, probiotics added through biotechnology processes, which together are a viable option that contributes to the control of overweight and obesity in Mexico.

Method

This study is based on the identification of the existing economic conditions in the agri-food sector in Mexico with emphasis on the subbranch of cookie and soup paste production to establish the context to identify business opportunities in the food sector specifically cookies with functional food characteristics.

Research design

Several secondary information sources such as WHO, OECD, Euromonitor, INEGI were reviewed to identify potential market opportunities for the marketing of functional foods (cookies) to support the reduction of the obesity problem. A search in databases of Scopus, ScienceDirect, and Google Scholar was carried out to retrieve the studies to be included in the review. Research papers published from 2000 to 2019 are considered.

THE COMPETITIVE ADVANTAGE THAT IS AND HOW IT IS SUSTAINED

It was during the eighties, and mainly thanks to the contributions made by Porter (1980) that the development of strategic analysis for the purpose of generating competitiveness was based on the relationship between the company's strategy and the environment.

According to him, the attractiveness of industrial sectors and the determinants of a relatively competitive position within them, are the cornerstones of the strategic choice that finally conditions the obtaining of a superior return on investment for the company.

Based on this, Porter (1980) proposes the five forces model that was an obligatory reference that favored the influence and dominance of the strategic approach based on the attractiveness of the markets (Figure 1).

This model allows the analysis of the structure of the sector and, with it, to direct the strategies to generate advantages, in the same way, it allows to determine which sectors are the most attractive now of investing.

For Porter (1980) the five forces will have a different impact on each market. In some markets, in particular, the threat of new entrants is accentuated. In others, the bargaining power of suppliers can be disastrous for profits. If the forces are intense, as they are in the textile and hotel sectors, virtually no company gets attractive returns on investment. If the forces are benign, for example in the software, beverage, and personal care sectors, many companies are profitable. The structure of the sector, which manifests itself through its competitive forces, is what determines the profitability of the sector in the medium and long term.

Figure 1. The five forces shaping competition in the sector

Source: Porter (1980).

Porter (1980) believes that competitive advantage is born from a set of company activities that systematically coordinate and reinforce each other and result in superior performance over competitors by increasing profitability and delivering a unique value proposition to customers.

It is worth mentioning that competitive advantages are based on corporate strategies set by companies, which consider which markets they want to cover and what kind of alliances it is important to strengthen. These strategies oversee the company's core issues, that is, its mission and vision of the organization, new opportunities to create value, strategic alliances, among others; hence, we have competitive strategies, which aim at creating, caring for and, if necessary, maintaining the company's competitive advantage (Guerras & Navas, 2015).

The competitive strategy must come from a deep knowledge of the environment, as well as of the rules that govern competition in the respective

sector or industry, in which, according to Porter, five forces are established: threats from new competitors, threats from substitute products, negotiating power of buyers, negotiating power of suppliers and revalidation among the current competitors. Each of these forces has its nature, as well as its degree of difficulty in circumventing it.

The threat of new competitors is latent at all times; however, to access the respective sector or industry, a series of barriers must be overcome that this entails such as economies of scale, which make many companies highly competitive, making it very difficult to compete with those prices; brand identity with the consumer, who is largely unwilling to change or try a different brand; a learning curve overcome by the dominant competitors, who have learned from their mistakes by minimizing their losses (Porter, 2015).

As far as threats from substitute products or services are concerned, it represents both a barrier and a facility for their replacement. This is so because if we consider some factors that are currently extremely relevant, such as technological change, a possible substitution rather than a barrier could mean a necessary step, especially if the factor in question involves lowering costs to the benefit of the consumer or make the shopping experience better.

The buyer's bargaining power is related, among other factors, to its price sensitivity and brand identity, since many customers, faced with price variations, may choose to consume similar products that have a better price, or continue to consume the same product, regardless of whether its price increases, since they may consider that the brand would be more valuable than the price, depending on the type of product or service offered, as well as the respective segment.

The negotiating power of suppliers is based on the quality of the inputs they provide, their capacity to supply the required volumes, among others, which will represent the degree of ease or difficulty in replacing suppliers and, therefore, their ability to negotiate better prices with them.

Thus, to achieve a competitive advantage the company must be more efficient than its competitors; this efficiency will be achieved according to the rules of each industry or sector; however, the company will opt for certain actions to achieve it, catalogued as generic strategies, namely: cost leadership, differentiation, and focus.

The first refers essentially to achieving better costs of the product or services, which is achieved, for example, with the economy of scale, efficiency in operations to achieve savings in internal processes, among others. The differentiation consists in the fact that the company must distinguish itself within its sector in aspects relatively appreciated by its clients, such as the

characteristics of the product or service, delivery system, among others (Porter, 2015).

The third is the approach, that is, the company is dedicated to serving a certain market segment, establishing a tradeoff (Porter & Kramer, 2011); that is, concentrating on certain activities to the detriment of others, in such a way as to achieve a unique position, opting for some determinations instead of others. This strategy can be based on costs, or differentiation (Porter, 2015).

Characteristics of competitive advantage

Although the competitive advantage is supported by a set of activities of the company that result in higher performance than its competition, for diagnostic purposes, it must be observed from its substantial activities, that is, from its value chain, which is the set of specific activities that the company performs in its various processes, from product design or after-sales service.

The literature is constant in that the value chain is not identical, even in companies that compete in the same sector. However, nine general categories describe the most important activities of the business, which are first classified into primary activities and support activities (Porter, 2015).

The first ones are those related to the creation of the product, sale, and transfer to the client, particularly are the input logistics, that is, those related to inputs, inventories, and suppliers; the operations (processes), output logistics (storage, distribution), marketing and sales (advertising, sales, channels, prices), as well as service. Each of these categories can be divided into other more specific sets of activities.

Support activities are procurement (inputs, supplies), technological development (applicable to any of the activities), human resource management (recruitment, training, staff development), and company infrastructure (administrative activities, corporate governance). It should be noted that the above activities are not isolated areas or activities, but are part of a whole because they are interconnected so that together they could represent a competitive advantage.

Innovation, technological change, and competitive advantage

According to Porter, technological change is one of the main factors that encourage or modify the rules of competition between companies in a sector, including some companies, were born of technological change.

In any case, technological change tends to benefit companies, improving their profitability or market share, to the detriment of others, whose

competitiveness will decrease, others will not disappear by not adapting to or taking advantage of technological change.

Technology, understood in a broad sense, is immersed in all primary and support activities of the value chain. This is so because it is from there that the role of technology in competitive advantage will be known. At the same time, technology has a definite impact on cost leadership strategies, differentiation, or both (Porter, 2015).

In terms of cost leadership, technology can positively affect, for example, whether economies of scale are achieved or whether technologies are introduced into processes that reduce waste. In the case of differentiation, this is even more notable, given the rapid changes in practically all sectors or industries, as would be the case of a company that introduces electronic collection systems, which represents an advantage when its competitors have not yet begun to use this technology. In this sense,

Porter believes that technological change will create a sustainable competitive advantage if four barriers are overcome. The first is if the technological change reduces or lessens costs or improves differentiation; the second is if the technological change favors the company; the third is that the technological change will be enjoyed for longer by whoever introduced its first; and the fourth is that the technological change could improve the overall structure of the sector or industry (Porter, 2015).

It is important to know the different types of innovation to avoid confusion and to establish the objectives of the research in this sense. Concerning competitiveness, innovation represents a strategic factor, Porter (1991) points out that "competitiveness depends on permanent innovation, sustained investment and constant development of productivity in the sectors or segments".

The search for competitive advantage requires companies to constantly implement new ways of offering value; intensifying competition necessarily implies innovation as a factor that promotes competitiveness.

The literature review in this sense includes numerous studies (Álvarez & García, 1996; Aragon & Rubio, 2005; Bird, 1989; Cherubini, Carneiro, & Domingus, 2011; Esteban, Coll, & Blasco, 2005; Estrada & Heijs, 2005; Larson, 1987; OECD, 2006; Rubio & Aragon, 2002, 2008; Viedma, 1998), who consider innovation as a competitive factor because, in an increasingly competitive business environment, innovation is the best source of sustainable competitive advantages. Innovation must take advantage of technology, but at the same time, it must transcend it and educate in innovation as an attitude.

Therefore, to innovate, the company usually needs to combine different types of resources such as those related to knowledge production, industrial

capacities, and facilities, markets, knowledge, efficient distribution system, financial resources, among others (Cherubini *et al*., 2011).

Authors such as Cooper (2001); Stalk, Evans and Schulman (1992); Wheelwright and Clark (1992); and Christensen (2003) argue that the most obvious applications of innovation are those that result in new products and processes and are recognized as an important source of competitive advantage, supporting the above.

On the other hand, Banyté and Salickaitė (2008) consider that the innovations most likely to succeed are those related to improvements to existing products rather than those focused on solutions and radical changes.

The success of implementing innovation lies in creating a product that represents an advantage over its competitors, offering superior quality, new properties, and greater value in use. According to Peñaloza (2007)

> "Companies find in innovation one of their best sources of competitiveness because, for example, innovation produces savings in production factors per unit of product, which leads to an increase in productivity and a decrease in costs, allowing, in turn, a decrease in the prices of final goods and services".

FUNCTIONAL FOOD MARKET ANALYSIS OF SECTOR FORCES

Globally the area that dominates the functional food market is The Asia Pacific with 42%, in second place is Europe with 30%, North America (Canada and USA) absorb 15%, Latin America 9%, and the Middle East and Africa only 4% (SUDOE-EU, 2011).

The food and nutrition industry in the world is constantly evolving, adapting strategies that focus on satisfying the changing needs and demands of the consumer. Ultra-processed foods are increasingly subject to criticism and nutritional studies that associate them more and more with chronic non-communicable diseases (NCDs).

Consumers are looking for more natural products, without artificial colors or flavors, or sweeteners. This is what drives the so-called conscious eating (Bagul & Koerten, 2019).

This trend has boosted the functional food market in the world, making it one of the most successful. In 2017, it generated revenues of 299.3 billion dollars, and it is estimated to be worth 441.6 billion dollars by 2022 (Statista, 2018) which implies an average annual growth of more than 15%. This is a favorable expectation considering that in 2004-2005 its value was 40 billion dollars (Euromonitor, 2006).

Japan is the world's largest market for functional foods, largely due to the Japanese government's support for agricultural research. In the US, functional foods account for 3% of total food sales. The United Kingdom is the largest

Western European market for such products given the growth of "health-conscious" consumers with the characteristic that they are increasingly wary of those that include "chemicals".

The characteristic of the German market is that the focus is on fitness, health, and wellbeing. In France, the conservative attitude towards food will keep the functional products market small. In developing countries, the sale of functional foods is limited by income level, being restricted only to the higher income population (Euromonitor, 2006).

Nielsen, a leading company in audience measurement and consumer knowledge, investigated 21,450 households in Brazil, Chile, Colombia, México, and Puerto Rico in 2014, in relation to the consumption of healthy foods. The results show that spending on these products is 17% of the total, where Brazil is the country with the highest consumption, and Chile has the highest spending in relation to the total population. Cookies are the most demanded product in most countries, except in Mexico (Nielsen, 2011).

Nielsen (2011) agrees with Euromonitor that the largest consumers are the upper classes in these Latin American countries, however, in Puerto Rico, Mexico and Chile the middle class consumes a representative percentage. Sales growth also shows good dynamism, with 9.3% in Brazil, followed by Mexico with 9.6%, Chile 7.8%, Colombia 4.98%, and Puerto Rico was the only one to decrease with -5.1%.

It is considered that since Mexico has the lowest expenditure on these products, there is a business opportunity for this type of product. If we also consider that in Brazil and Chile people buy food from healthy categories at least once a year, but not in Colombia and Mexico, this represents an opportunity to increase spending and reach 100% of households.

The aging of the world's population also presents growth opportunities, as it is recommended that the elderly consume functional products that benefit bone health, vitamin deficiencies, and diabetes. Even fast-food companies are expected to capitalize on the success of functional foods by producing product ranges that are marketed as snacks with a health benefit rather than as "healthy foods" (Euromonitor, 2006).

Added to this trend are the busy "millennials" focused on finding healthy snacks or products to consume on the go and the so-called portable nutrient options (Birch & Bonwick, 2019). In this group, it is relevant the reduction that in the market of the United Kingdom have had the "slimming" foods that of a several sales of 110 million pounds in 2001 has contracted in 27% in 2017 with a value of 81 million pounds.

The origin of the reduction is the change in lifestyle, the rejection of consumers towards short-term results in the fight against obesity, which

demands a food-based more on natural foods and ingredients. This implies a sales strategy to highlight the benefits of this type of products as a movement towards a healthier lifestyle and to highlight the natural virtues of the products to avoid the continuity of the fall (Birch & Bonwick, 2019; Markovina *et al*., 2011; Mintel, 2007).

In the case of medical opinions regarding obesity, there is a key recommendation which is the reduction of sugar, in surveys elaborated by Euromonitor one of the main motivations cited is if as "low sugar makes me feel better". This goes hand in hand with the holistic approach consumers are taking to their health and fits into the balanced lifestyle of feeling good.

The recommendation is that brands and companies that produce low-sugar products should highlight the medical benefits as well as the contributions to overall well-being (Shridhar, 2019).

The local element is also an issue to consider as consumers also have an interest in returning to traditional culture resulting in an incentive when biotechnology products emphasize the use of local products and support for communities and sustainability. Conscious consumers are concerned about food waste and demand action from both public policy and producers to avoid it (Sneyd, 2020).

A condition of consumers that is fundamental in the introduction of functional foods is the relationship between convenience and consumer awareness. Convenience is a key reason why consumers choose functional foods: it is much easier to persuade a consumer to replace something they already eat regularly with a healthier alternative than to ask them to break a habit or form a new one. Health education is important in this way, but it will have little effect if there are no convenient foods to attract the consumer (Brown *et al*., 2015; Market Research World, 2016; Editor, 2016; Siró *et al*., 2008).

Success according to these proposals is found in taste, convenience, and trust. Because consumers, except for a small minority, will not be willing to sacrifice taste for health, products must be adapted to consumers' lifestyles.

In addition to these marketing strategies, this market requires reliable brands that are determined to guide consumers, establishing good relationships with them by providing information and advice online, as well as service options. In this area, companies need to consider people's concerns about the decisions of the food they consume, which drives them to demand more nutritional information in the products (Bagul & Koerten, 2019).

In Mexico, the changes in consumption patterns of the inhabitants have gone from the usual vegetables and legumes to be replaced by industrialized products sold in local shops and supermarkets. In this regard, the role of supermarkets has been a negative influence. In the middle cities, the number of

units has increased by a staggering 45% in the period 1990-2000, while in the USA this increase took 60 years (Soria-Sánchez & Palacio-Muñoz, 2014).

In 2009, it was believed that the healthy food market in Mexico would advance rapidly, due to increase per capita income and consumer awareness of the benefits of a healthy diet. The value of the market was estimated at around one billion dollars per year and average annual growth of 10% was expected at that time. Seventy percent of these foods were produced domestically, and 30 percent were imported, with 65 percent coming from the U.S. consisting mostly of soy products and soy ingredients, dietary and fiber supplements, energy bars, and ready-to-eat foods (Editor, 2009).

Business Opportunities and Creating Competitive Advantage in the Post-Covid-19 Era: The Mexican Cookie Market

In Mexico the so-called "democratization of consumption" over time has developed consumption habits in the population with less access to education and low socioeconomic levels that cause distortions in the consumption of traditional foods in the diet of Mexicans. Improvements in income do not always translate into improvements in healthy diets.

In Mexico, the cookie industry is a strong and expanding market, currently worth 2.4 billion dollars. The consumer market for cookies in Mexico is classified into two large segments: Luxury cookies (gift) and convenience cookies (daily consumption). In the first segment are located the brands Gamesa, Marinela, Lara, and Nabisco which cover 90% of the national market. Derived from the reports provided by the Mexican organization.

*El Poder del Consumido*r, one can have access to the nutritional content of several brands of cookies, in the case of industrialized cookies, it can be observed that they present a high content of sugars more than what is recommended in the diet of an adult (Calvillo & Székely, 2018).

The size of the cookie market in Mexico is made up of 99.7% of the country's households, which consume an average of 12 kilograms a year per household, an amount that can rise to 23 kilos with an expenditure of close to one thousand three hundred pesos a year, which absorbs 3.4% of household expenditure and amounts to 16% during the time of travel. Of the total number of cookies consumed, 80% are sweet, preferably the type called "Marías". The main sales centers are the supermarkets with 41.9% of the total and the stores with 41.6% (Informador, 2017).

In the bakery products market, two companies dominate the cookie market: GAMESA, a subsidiary of PepsiCo Mexico, with 38%, and BIMBO, with 20% of the market. The rest of the market is shared to a lesser extent by the

supermarkets with 25% and the rest corresponds to the small and medium industry (Regeneración, 2014).

Bimbo is the largest bakery company in the world with its operations in more than 30 countries, with 5% of the world market. The brand's traditional products present a stable demand in mature markets, but not the Premium products and those enriched with nutrients that present increasing growth.

Its participation in the cookie market is through the brands Marinela, Lara, Suandy, Tía Rosa, and Gabi and its high-end products for upper market layers through El Globo and El Molino. The most popular presentation is the individual (Bimbo Group, 2010).

The company has stated that it seeks to improve the nutritional profiles of its products, however, its strategy does not mention functional foods, but rather friendly ingredients, health, and wellness products, and its global nutrition policy is based on "effectively communicating the importance of processed foods in terms of their accessibility and nutritional contribution to the daily diet (Bimbo Group, 2018).

GAMESA, without being the size of Bimbo, is the leader of the cookie market in Mexico with more than 90 years of experience. It became a PepsiCo subsidiary in 1990 and 2001 acquired the name Gamesa Quaker due to the purchase of the soft drink company, which increased its product offering.

It reaches 14 countries in the Americas and is the leader in the Hispanic cookie market in the United States (Publishers, 2019). It is the largest food company in Latin America with sales of more than four billion dollars, has 17 production plants, and more than 18 thousand sales routes, estimated at nine hundred thousand Mexican consumers who buy their products (Estrada, 2018). All the above has allowed it to become the second-largest market in the world for PepsiCo's food division after the North American market (Hernández, 2017).

Regardless of the almost monopolistic power exercised by both companies, their strategies in the cookie market show no signs of addressing the health of the population. In both, the largest number of products, they do not present the characteristics of healthy food and even though since 2014 they are taxed with 8% by the Special Tax on Production and Services, the demand has continued to grow 5% in 2016 (Editor, 2016).

Additionally, the economic power of BIMBO allowed it, through a special rule of the SAT, to avoid in 2014 the imposition of any type of tax on its boxed bread products, since they were not considered in the kilocalorie line, regardless of the opinion of the Ministry of Health and were applied to other products such as the "bolillo" and the "telera" (Regeneración, 2014).

By 2019, according to the report (Euromonitor International, 2020), cookies continued to represent the majority of the total cookie, bar, and fruit

snack sales in Mexico 2019. Sweet cookies are widely available throughout the country through multiple distribution channels, and the category offers a wide variety of brands and product types.

However, chocolate-coated cookies and filled cookies are expected to register relatively slow growth in retail volume sales during the forecast period. While this is in part because these types of products are considerably more expensive than plain cookies, the fact that they are perceived as having a high sugar content will continue to be the main barrier to demand, given the trend towards greater health awareness among Mexican consumers.

In the competitive landscape, PepsiCo remained the overall leader in cookies, bars, and fruit in terms of value in 2019. This was mainly due to its leadership in sweet cookies, although it was also present in bars. Bimbo Group was the second leading player in sweet cookies, bars, and fruit snacks in 2019. Offering a wide variety of products under brands such as Marinela, Bimbo, and Lara, it held the leading position in bars and ranked second in sweet cookies.

As for the distribution channels of sweet cookies, they are largely concentrated in the traditional channels, especially in small independent supermarkets. Consequently, during the forecast period, traditional channels will continue to be a focal point for sweet cookie manufacturers in terms of investment in distribution and promotion activities.

Demand Analysis and Consumer Profile

Some studies from the psychological point of view locate two trends in healthy food consumption, self-awareness of health and concern for improving health either through deterioration or loss (Annunziata & Pascale, 2009).

Also, sociodemographic changes that have resulted in increased life expectancy and scientific advances in the interconnections between diet and health and the effects of poor eating habits on health have impacted consumer choices of foods considered healthy (Alvidrez *et al*., 2002).

A report by the Global Agriculture Information Network (GAIN) (Guzman, 2009) noted that Mexican consumers between the ages of 20 and 50 are the most health-conscious. Most consumers live in major metropolitan areas and have sufficient income to purchase healthy food products. They represent approximately 5 percent of the population, between 4 and 5 million people, out of a total of more than 110 million Mexicans.

Generations born in the middle of the last century tend to self-care according to their ages, which are over 50 years old, and therefore tend to maintain a good state of health through food (Alvidrez *et al*., 2002). The increase in this age group in the future represents a potential market that is very attractive

not only because of the quantity, which will be increasing but also because of the increase in life expectancy that is observed in the country.

The demand for healthy food has also reached the Mexican hotel and restaurant (H&R) sector. In the period 2005-2009, the number of restaurants that have included healthier or diet foods on their menus has increased dramatically. These menus focus on low-calorie and low-fat meals. The industry prefers fresh raw ingredients and healthy preparation for low-calorie dishes and does not import processed foods, except for desserts and ingredients such as soybean paste. Among the products of interest to Mexican consumers are sweet and savory cookies (Guzman, 2009).

According to the Kantar World Panel Usage Mexico (2018) household panel, the most popular cookies in Mexico are: a) Marias Cookies, b) Sandwich Cookies, c) Crackers, d) Cracker Cookies, e) Animal Cookies.

The consumption of cookies also considers the socioeconomic level in the low levels the preferred ones are the Marías, the salty ones, the ones of snow, and the ones of animality. In the case of high-income levels, the consumption of oatmeal and crackers (habaneras), selected gourmet cookies and fruit and cinnamon cookies stand out. Cookies are not only consumed at home but also outside, 86% of Mexicans buy cookies outside of the home.

One out of every ten food purchases outside the home is cookie, with work being the second most popular place to buy them. 48% of the time these are bought in neighborhood stores. The main reason for purchase is craving, eight out of ten times they are purchased for their consumption, but they are shared in 65% of the times. The main moment of purchase and consumption is for breakfast. They are bought on Mondays, 33% of the times they are bought for breakfast is for consumption at work. 41.9% is purchased in self-service stores and 41.6% in small neighborhood stores and street vendors.

To deepen the consumption habits of Mariana Cruz, OOH & Usage Food Manager of Kantar World Panel points out that: "Cookies are a taste that Mexicans give themselves alone because, on the one hand, in 4 out of 10 times that they bought them they shared them, when they went out to buy them alone half the time they were accompanied and in 2 out of 10 times that they bought cookies they went to someone else".

CONCLUSIONS

Obesity in Mexico represents a serious problem for the country's competitiveness and productivity, it shortens life expectancy, and it threatens to collapse the health system due to the high costs involved in derived diseases.

In recent years, there is a paradox given that there is a problem of malnutrition on the one hand and obesity on the other, due to changes in the traditional diet of Mexicans, which has been transformed by the incorporation of processed foods.

This problem requires cross-cutting solutions that consider not only the government but also civil society. Changes in diet are transcendental to achieve positive changes, so public policy must consider support for changing food production to healthier options.

On the other hand, small businesses have greater market opportunities given the new trends that consider the consumption of less processed and fresher foods. In institutions that develop basic research such as the National Polytechnic Institute, there are research groups that have developed innovative food products that meet the purposes of attention to the solution of obesity.

Among these advances, there are patents that despite their benefits in the attention of this national problem have not been taken advantage of at a commercial level. Achieving their incorporation into the commercial sphere not only serves the wellbeing of the population but also contributes to the reduction of the growing public expenditure destined to the attention of diseases related to the problem of obesity that, as time goes by, absorbs increasing resources.

The cookie market in Mexico offers ample possibilities for the incursion of healthy alternatives due to changes in public policy, the approval of the law of front labeling and the greater awareness of society about this serious health problem.

This work contributes with the study of the sector to establish the bases to propose business models that allow commercializing these products and to achieve that the innovations in food generated by the academy can reach the markets and achieve value chains with producers as well as with distributors, generating competitive advantages for those who decide to start ventures in this sense.

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Chapter 4

Business Resilience: Commercial Aviation Sector in Latin America

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Business Resilience: Commercial Aviation Sector in Latin America

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Introduction

The commercial aviation sector is among the fastest-growing industries, owing to its rapid and reliable transportation, generation of direct and indirect employment, and fostering of business and tourism activities with a strong economic impact (WEF, 2020). Resilience in business has been harshly questioned in the case of Latin American airlines. Some airlines have declared bankruptcy. While others have made an effort to continue operating against the Covid19.

This industry, therefore, constitutes a large market worldwide, and it has been acknowledged to foster technological development, generating more efficient aircraft with lower fuel consumption (WEF, 2020). However, this considerable growth has also brought various economic, social, and environmental challenges. Regarding the industry's environmental impact and regulations, the International Air Transport Association (IATA, 2020)—one of the major worldwide civil aviation authorities—has set priorities for the industry and will enforce the following measures across the industry:

- improving fuel efficiency by 1.5% per year from 2009 to 2020
- capping net aviation CO2 emissions (promoting carbon-neutral growth)
- reducing net aviation CO2 emissions by 50% by 2050, relative to 2005 levels

IATA is one of several organizations that encourage environmental improvements by promoting the use and implementation of green technologies in the aviation sector. However, the COVID-19 (coronavirus disease 2019) pandemic has severely affected the sector's financial performance. To address this problem, IATA has been working with the main countries of Latin America as Argentina, Chile, Colombia, Brazil, and Mexico to formulate plans to reopen the sector. Airlines suffered approximately $18 billion losses in the first half of 2020 and have been estimated to take up to three years to return to their 2019 performance levels.

Moreover, according to the World Economic Forum (2020), the air transport industry accounts for about one in ten jobs worldwide and 10.4% of the global gross domestic product (GDP). In Latin America alone, this sector employs nearly 430,000 people. These employment numbers emphasize the sector's current economic and societal relevance.

Furthermore, according to Echevarne (2020), the director of the Latin America and Caribbean division of the International Airports Council (ACI-LAC), "Air traffic has practically disappeared," which suggests that the crisis in the first quarter after the pandemic started was severe. This industry is expected to need time to recover since tourism will decline and controls and restrictions on regional and international trade traffic are expected to be stricter in the short and medium terms (ECLAC, 2019).

In assessing this sector, it can be noticed a lack of studies addressing business sustainability in Latin America at not only airlines' business level but also their organizational levels. Thus, we decided to collect information from the strategic intelligence of reliable international databases, as well as some think-tank organizations with some publications on the industry. Additionally, regulations require some commercial airlines to produce business sustainability reports regularly, given their considerable social, economic, and environmental impact.

The commercial aviation sector faces several challenges in maintaining its number of employees and providing customers safe, fast, and comfortable transportation. Financial performance is essential despite changes to financial regulations and pressure due to the ongoing pandemic. Moreover, airlines must enact strategies that help them diminish their negative environmental impact. For these reasons, this paper addresses the importance of business sustainability for Latin America's commercial aviation sector. We focus on Aeroméxico, Avianca, Interjet, LATAM, and Aerolíneas Argentinas, which are some of the regions' most important carriers.

Methodolgy

This project's research methodology comprised a document study addressing the importance and awareness of the Latin American commercial aviation sector's business sustainability. A literature review was conducted, supported by journal articles, specialized books, business sustainability reports, intelligence reports, and other research materials obtained from databases such as Scopus, ScienceDirect, EBSCO, Euromonitor, and think-tank organizations such as the World Economic Forum (WEF) and the International Air Transport Association (IATA). Search questions and keywords were determined through a search strategy combining words with Boolean operators, proximity operators, truncation operators, and parentheses.

Due to the industry's nature (specific information about the airlines' actions), most of the documents reviewed in our research were obtained from key industry reports and business intelligence databases, which provided reliable and accurate information for researchers, industry decision-makers, policy-makers, and think-thank regulators.

Thus, sources were selected, collected, synthesized, and categorized based on characteristics such as their number of citations, the authors' relevance (quantity of studies and citations), database quality, and subject relevance to the commercial aviation sector. Finally, a discussion was established on Latin American airlines' business sustainability actions and programs.

A category analysis was then conducted, based on social, financial, and environmental activities, allowing for our final analysis and discussion. We drew our main conclusion based on relevant findings throughout this research process, which is based on the actions carried out by airlines in the three social, economic and environmental pillars.

From Sustainable Development to Business Sustainability

Sustainable development has been defined as development that fulfills present needs without compromising future generations' ability to fulfill their own needs (UN, 2020). Sustainable development (SD) is a fundamental concept that focuses on economic, social, and environmental agendas. SD has evolved since its first introduction, around 1972 to 1987, incorporating several issues over time until the present SD concept emerged, addressing the world's most relevant agendas for sustainable development problems (UN, 2020).

Through the years, SD has shifted from a "hot topic" in the international community to detailed action programs that aim to address sustainability goals. However, SD has not always been considered seriously; the international

community and some governments from Europe had been skeptical at the beginning about some global sustainability problems (UN, 2020).

Debates about origins, causes, and action programs have also surrounded global problems such as poverty, inequality, global warming, water use, sea and land pollution, CO2 emissions, and energy, often with little or no agreement about how to resolve these problems through international strategies and commitments among participating and non-participating countries.

Shi and others (2019) identified a trend in the existing research, which they found to center on SD practice, rather than theory. This trend suggests that theory development and research are declining about deep and quantity. Previously, SD had undergone several important stages of development. First came the embryonic period up to 1972, when the SD concept was not yet recognized.

During this period, the idea was to take advantage of natural resources and reduce the negative effects on nature and the world. One of the most important events during this initial period in SD's history was the first publication concerning the concept of "sustainability," Carlowitz's monograph Afforestation and Economy. This monograph was published in 1713, and it discussed sustainable forestry. The second phase of SD's history was the molding period from 1972 to 1987 (UN, 2020).

During this period, the United Nations hosted a world summit in Stockholm, Sweden, in an attempt to urge all of the world's countries to strengthen their environmental management policies while developing their national economies. This summit was motivated by the discovery that policy development in different countries primarily focused on economic growth, failing to address serious environmental problems.

The developing period then began in 1987, and it continues to the present. During this period, strategic plans and goals were formulated at the Rio de Janeiro meeting in 1992, which aimed to implement sustainable development policies and build a global partnership to solve global environmental problems.

Moreover, two declarations were signed at this important conference that was greatly relevant to the globalized world, the Rio Declaration on Environment and Development and Agenda 21, the main agreement to acknowledge SD's importance in international commitments and humanity's development of sustainability and global actions. Subsequently, in September 2015, the United Nations brought more than 150 countries together in Paris, France, for a summit, formulating the 2030 Agenda, which established the organization's Sustainable Development Goals (SDGs) (UN, 2020)

The United Nations stated that its "composition of intertwined social, economic, and environmental goals and targets requires a new way of thinking

about development". Accordingly, the organization's 17 SDGs address water, energy, the climate, oceans, transport, science, and technology, and they involve 169 indicators that serve as guides for governments, companies, and society in general. These objectives are universal, and they apply to all countries. The challenges they identify concern everyone on Planet Earth and require, therefore, fundamentally strong commitments from all countries involved, considering their resources and capabilities.

SD has played a very important role in policymaking over the last 20 years. In this capacity, business sustainability—or, simply, sustainability, as some researchers have termed the concept—has been part of governments' national and local strategies. Sustainability has been studied in several areas and is not limited to engineering, environmental sciences, economics, or business management (Mura *et al.*, 2018; Rajeev *et al.*, 2017; Stirman *et al.*, 2012).

In business and management, the importance of creating and developing sustainable business practices in most business operations has already been recognized (Stubbs & Cocklin, 2008; Evans *et al.*, 2017; Laasch, 2018; Freudenreich *et al.*, 2020; Toussaint *et al.*, 2021). New business models are needed to address sustainable products and services that effectively contribute to mitigating some of the main SD problems. Thus, sustainable business development has become a challenge with a considerable impact on the United Nations' SDGs.

Business sustainability, in addition to economic benefits, concerns social values and measurable ecological values (Boons & Lüdeke-Freund, 2013). In this regard, business sustainability can be perceived as the fulfillment of the "triple bottom line"—that is, people, the planet, and profit orientation (Dyllick & Muff, 2016) or social, environmental, and financial outcomes (Gupta, 2017; Kumar *et al.*, 2018; Cherrafi *et al.*, 2018).

By incorporating sustainability into their business processes, organizations may reap benefits such as a positive image, enhanced trust from stakeholders, higher returns on investment, profitability, and more efficient resource management (Horak *et al.*, 2018; Rahman *et al.*, 2019; Durst & Zieba, 2020; Tsvetkova *et al.*, 2020).

Economic indicators refer to a company's profitability, while social indicators measure a company's influence on a community and environmental indicators assess a company's ecological aspects, resource utilization, and pollution levels (Dyllick & Muff, 2016). Indeed, these indicators aim to achieve a balance between these dimensions and to enable companies to transition to the practices of business sustainability. In contrast, companies that do not address these indicators will lose market exposure, resulting in declining revenues and a possible disappearance from the market over time. Nevertheless, sustainable business transitions require orienting politics toward business sustainability

through improving waste utilization, reducing production and labor losses, improving productivity, and continuously evaluating improvement.

Business sustainability research, which has flourished over the past four decades (Linnenluecke & Griffiths, 2013), is under pressure from governments, communities, media, employees, suppliers, and other parties. These stakeholders have varying levels of power and influence that affect companies' sustainability policies (Ackermann & Eden, 2011) and levels of possible development or sustainability (Dyllick & Muff, 2016).

Ultimately, developing countries' tax reforms and regulations have not positively contributed to companies' sustainability. Also, tax reforms have enacted increased tax collection and increased tax revenues, positively influencing state obligations and liabilities but undermining foreign investment and corporate sustainability (Pacheco, Jaimes & Duarte, 2017; Bird, R., & Davis-Nozemack, 2018).

Discontent with such reforms has grown in several Latin American countries, where some stakeholders have expressed disagreement, regarding these regulations as a threat to business sustainability. One example is Colombia, where—according to the National Association of Entrepreneurs of Colombia—Law 1819 of 2016 failed to promote competitiveness by maintaining a high taxation rate compared to other countries (ANDI, 2017).

Moreover, the creation of new taxes has directly affected competitiveness in this region. Additionally, objectives and initiatives promoting business sustainability are lacking. Sustainable companies create economic, environmental, and social value over time, thus contributing to an increase in well-being and progress among present and future generations; from an environmental perspective, any changes in corporate tax rates must be assessed for their impact on capitalization in a country through decreases in cash flows and other accounts (Schmidheiny & Zorraquin, 1998). Additionally, corporate taxes significantly affect the development of countries' tax systems and, therefore, progress.

While it is vitally important for corporate, as well as national, sustainability (Pérez *et al.*, 2016). For instance, a key finding in Carlos Montalvo's survey (2008) was that government policies are a key element of business sustainability. Therefore, governments drive business sustainability, and technological opportunities are essential for business sustainability.

Thus, sustainable businesses must project this condition and focus on customers, the environment, and communities by incorporating sustainable operations into their business strategy, prioritizing the environment, and collaborating with communities (Rajala *et al.*, 2016). However, significant challenges hinder the cultural changes, green technologies, sustainability

standards and regulations, financial investment, and systematic sustainability programs that foster sustainable business in the medium and long terms.

In summary, business sustainability refers to social, economic, and environmental performance, as well as the rapid growth of sustainability practices in developing countries. A cross-industry comparison of sustainability practices is needed, measuring these practices' impact on BS performance in developing countries. Through such a comparison, business sustainability can serve as an integrating concept, bridging current understandings of sustainable development and incorporating economic, social, and environmental aspects into SD practices (Doyle & Perez-Alaniz, 2017).

Deploying and Measuring Business Sustainability

Deploying and measuring business sustainability have become challenges for all organizations. Planning for and establishing BS in companies' strategic plans do not necessarily guarantee success. Imbrogiano (2020) defined the process of BS deployment in output and outcome levels; the output level refers to what companies intend while the outcome level refers to organizational performance and the impact of global sustainability objectives.

Deploying BS and measuring outputs and outcomes are important for all organizations, which must fundamentally understand how these parameters are measured. According to Imbrogiano (2020), the percentage of studies (research) on the application of management tools, mechanisms, and procedures to deploy business sustainability is 30%; meanwhile, perceptions of leadership, reputation, performance, and organizational development are 20%, and the rest (around 50%) is distributed in the strategic integration and product development categories.

While this body of research has contributed to advancing concepts and theories in the business sustainability field, it also risks promoting management approaches with unclear means-ends relations (Bromley & Powell, 2012). Thus, companies must align their business sustainability programs not only with their needs and outcomes but also align with global sustainable development goals (SDGs) that reflect their performance and contributions to global problems.

Baumgartner and Ebner (2010) proposed four levels to determine companies' maturity levels in adopting business sustainability; they classified companies into beginner, elementary, satisfactory, and sophisticated categories. In the same work, Baumgartner and Ebner (2010) also provided one of the most comprehensive frameworks for understanding and measuring organizations' business sustainability maturity levels.

The beginner level refers to companies that may consider business sustainability and be aware of such initiatives. The elementary level refers to

companies that have essentially integrated BS into their current activities. The satisfactory level refers to organizations that have incorporated BS regulations and standards into their operations, are usually to a level that exceeds industry standards.

The sophisticated level refers to companies that have made an outstanding deployment and contribution to their business sustainability, pioneering BS deployment, standards, and regulations in their industry. To determine a company's maturity level in this framework, its economic, ecological, and social dimensions must be evaluated and compared to the industry, considering business sustainability not as a goal but, rather, as a way of being for any organization. (Meza-Ruiz *et al*., 2017). Consequently, companies undertake actions that aim to measure their business sustainability as a part of their missions and values and to comply with government and industry standards and regulations.

Thus, companies must adapt their business sustainability cultures to societies emerging needs to generate long-term value, reinvent themselves when necessary, better prepare for economic, social, and environmental challenges facing the SDGs.

The Commercial Aviation Industry

Airlines play a very important role in globally transporting customers and goods to markets with efficiency and speed. They are the fastest and most cost-effective way to transport people and goods, so they are widely used in international trade.

According to IATA (2020b), the industry's main strategies focus on generating cash for the airlines to achieve $120 billion in US dollars, reducing air costs by $50 billion in US dollars by promoting alliances with suppliers and negotiating taxes, helping airlines reach activity levels of 60% by 2020, and, finally, ensuring IATA sustainability by reaching reduction costs targets and ensuring the safe and secure delivery of IATA's industry services.

These goals appear very difficult to fulfill in the short term, given the challenges we have mentioned and the effects of the unexpected COVID-19 pandemic as the return to the 2019 levels of profitability and efficiency. We will return to this discussion later on, after establishing the specific context for Latin American commercial airlines.

Latin America's Main Commercial Airlines

The airline industry provides services to most countries and plays an integral role in creating a global economy. According to the World Economic Forum (WEF, 2020), Latin America's policies focus on long-term economic growth,

promoting integrity and transparency, and strategies to better prepare the workforce for a technology-driven future.

This region is growing and developing, increasing its level of competitiveness among global markets. Air transport and commercial aviation in Latin America and the Caribbean have also shown substantial growth over the last few years. According to the World Bank (WB, 2020), in 2019, nearly 250 million passengers were transported by air in the main Latin American countries (Table 1), a significant increase compared to previous years. This growth reflects the aviation industry's rapid development in the Latin American region.

Table 1. Passengers Transported by Air in Latin America, 2014–2019 (in Millions)

Country	2014	2015	2016	2017	2018	2019
Argentina	12,121.913	14,245.183	15,076.354	16,749.271	18,081.937	19,461.377
Brazil	100,403.628	102,039.359	94,142.377	96,395.709	102,109.977	102,917.546
Chile	14,347.893	15,006.762	16,362.437	17,664.974	19,517.185	21,197.759
Colombia	28,675.159	30,909.723	32,262.658	32,504.898	33,704.037	37,031.843
Mexico	39,570.522	46,966.763	53,313.307	58,537.832	64,569.640	69,937.838

Source: Own elaboration (World Bank data on air transport passengers carried, 2014–2019).

The region's country with the most passengers transported during the period (2014 – 2019) observed was Brazil, suggesting more economic activity in Brazil compared to the other Latin American countries. On the other hand, Argentina reflected the lowest demand; however, Argentina's demand has undergone a continuous increase over the last years (2014 – 2019).

Commercial aviation transport in the Latin American region has ceased to be exclusive for specific groups and has become more accessible. Wealth and economic progress in the region have brought low-cost airlines and increased routes, reducing transport times and ensuring quick responses to people's contingencies and mobility. Such changes have promoted foreign direct investment and tourism in the region.

Table 2 presents the main characteristics of the Latin American airlines in this study, including some of the principal sustainability initiatives that they are participating in or promoting.

Table 2. Latin American Airlines' Characteristics

	Aeroméxico	Avianca	Interjet	LATAM	Aerolíneas Argentinas
Official name	Aerovías de México S.A.	Avianca Holdings S.A.	Interjet	LATAM Airlines Group S.A.	Aerolíneas Argentinas S.A.
Foundation date	September 15, 1934	December 5, 1919	December 2, 2005	March 5, 1929	May 1950
Headquarters	Mexico City, Mexico	Bogotá, Colombia	Mexico City, Mexico	Santiago, Chile	Buenos Aires, Argentina
Workforce	16,660	16,725	Approximately 5,000	41,719	10,230
Fleet	125 aircraft	171 aircraft	85 aircraft	345 aircraft	56 aircraft
Routes	42 domestic destinations and 43 international destinations from Mexico	135 domestic destinations and 76 international destinations	50 destinations in Mexico, the United States, Canada, Latin America, and the Caribbean	145 destinations in America, Europe, Africa, and Asia	60 destinations, including national and international destinations
Passengers	20.6 million	30.5 million	12 million	74.2 million	9.4 million
Flight revenue (in US dollars)	Approximately $3,035,081	Approximately $4,890,830	Approximately $256,643.25 (in the first trimester of 2019)	$10,430,927 (in 2019)	$1.658 million (in 2019)
Green projects	Four-pillar sustainability strategy: •customer responsibility •responsible business practices •environmental sustainability •community linking	The Avianca Ambiental program, through which the company connects environmental value through responsible management, alliances, and connections with products and certified initiatives	The Social Responsibility project Ecojet, an initiative to promote sustainable projects that generate positive changes in the environment and reduce environmental impacts by cutting down fuel consumption	Collaborating on carbon footprint reduction, increasing eco-efficiency, and sustainable alternative energy	A fuel efficiency program (CO_2 emission mitigation and sound pollution), an agreement with the Bioandine Foundation for the Conservation of the Andean Condor, and a collaboration to transferring animals needing geographical relocation, working with the GCBA Eco Park

Source: Own elaboration (Aeroméxico, 2020; Aerolíneas Argentinas, 2020; Avianca, 2020; Interjet, 2020; LATAM, 2020).

The Impact of Latin American Commercial Airlines

According to IATA (2020), the airline industry in Latin America and the Caribbean in 2019 generated 5.2 million jobs. These companies have made considerable progress in terms of technological innovation, with new aircraft and technological implementations in their internal processes and overall operations.

Moreover, these companies promoted significant improvements to their services, which can translate into a competitive advantage by providing high-quality services that satisfy end-users and stakeholders while fostering economic development (Chen, 2008). Travelers are usually attracted by modern airport infrastructure and more comfortable and safe airlines (IATA, 2020).

Therefore, Latin American airlines have introduced upgrades and substantial changes to their fleets to offer forward-looking products and services with high-quality standards. For example, since 2014, Aeroméxico has

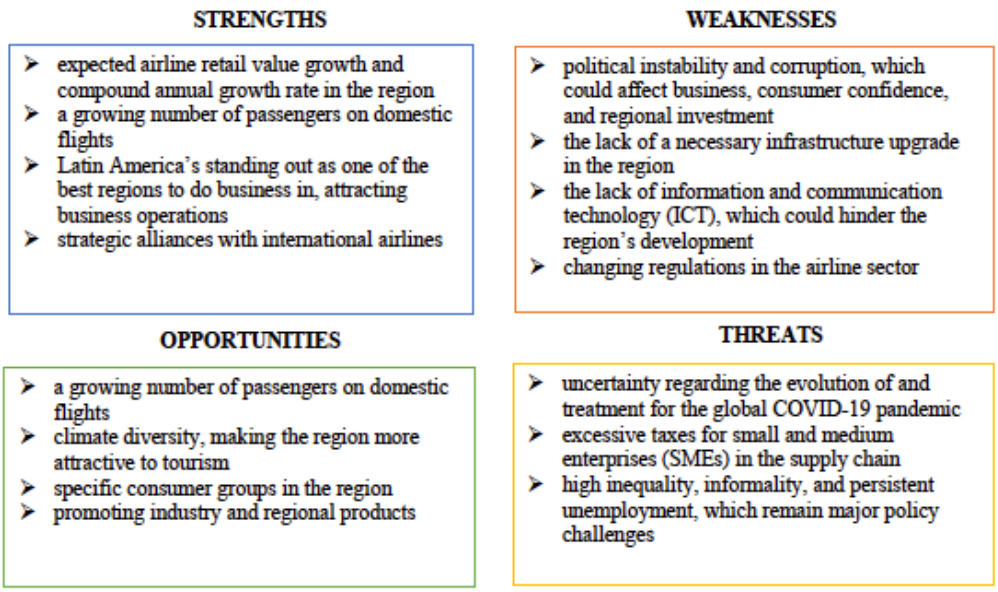
introduced next-generation aircraft, including Boeing 787s and—more recently—Boeing 737 Maxes (Aeroméxico, 2020). Similarly, Avianca incorporated into its fleet its first A320neo aircraft, featuring new engine technology that saves up to 20% of the fuel and decreases CO2 emissions by 5,000 tons per year.

The company also acquired its first portfolio of carbon-neutral-certified projects in Colombia and Latin America (Avianca, 2020), demonstrating the company's commitment to investing in carbon-neutral projects to compensate for CO2 global emissions. LATAM also boasts a young and modern fleet, with aircraft aged less than nine years, on average (Avianca, 2020b).

Its fleet for long-haul flights includes the Airbus A350-900 and Boeing 787 Dreamliner aircraft, which allow for significantly less fuel consumption (between 15% and 20%) and less noise (Latam, 2020). Meanwhile, the Mexican low-cost airline Interjet uses the Airbus A321neo, allowing for the optimization of operations along various routes while maintaining a fleet with cutting-edge technology, comfort, and efficiency (Interjet, 2020).

Finally, Aerolíneas Argentinas—despite some financial troubles—has managed to renew its fleet, which is now among the region's most modern fleets, providing greater comfort to passengers and improving overall operations in Latin America (Aerolíneas-Argentinas, 2020).

Figure 1. Latin American Commercial Air Sector Strength, Weakness, Opportunity, and Threat Analysis



Source: Euromonitor International Airlines per country, Country Profile, Latin America: Regional Profile and Business Dynamics (Euromonitor , 2019, 2020).

The commercial air sector in Latin America and the Caribbean offers great potential for the region as tourism and business activity quickly develops. Foreign and local direct investment has considerably increased over the last decade, triggering economic development in the region (Euromonitor, 2019, 2020).

Some cities in the region have emerged as international destinations for business and tourism among emerging economies, including Mexico City, Monterrey, Guadalajara, Bogotá, Santiago de Chile, Lima, Buenos Aires, Panama City, São Paulo, Rio de Janeiro, and major beach destinations—all connected through direct flights with most regions, including Europe, North America, and Asia.

Latin American airlines will try to leverage opportunities in the short and medium terms, taking advantage of increasing visitors and business activity. Additionally, they remain attractive to local and international visitors during most times of the year, which offers a further advantage compared to other regions that depend more on seasons.

Also, strong business relationships with airline groups such as Star Alliance, One World, and SkyTeam provide Latin American airlines a competitive advantage worldwide (Euromonitor, 2019, 2020).

On the other hand, the weaknesses facing these companies seem more related to countries' political, economic, and environmental problems in the region since decades ago before the 21st century. A lack of investment in information technology, education, infrastructure, technical skills, and communications could delay the industry's development. Inequality also plays a major role since it generates many social problems, such as poverty, violence, and criminality. These problems seriously hinder the development of not only the commercial airline industry but also most business operations, as well as social development.

High taxes are also pressuring companies' finances—particularly medium and small companies in the supply chain—limiting their capability to invest in other priority areas, such as information technology, professional training, and infrastructure. Moreover, the entire industry in Latin America and worldwide is currently suffering from the impact of the COVID-19 pandemic.

Many airlines in the region have gone bankrupt, including AeroMexico (2020) and Avianca-S.A. (2020).. They have had to restructure their entire operations and borrow large amounts of money to keep operating. Other companies, such as Interjet, are nearly bankrupt or facing severe financial problems to survive.

This crisis has extended to problems with government authorities that collect taxes and with labor unions that threaten strikes because airlines have not

paid salaries and bonuses to pilots, crews, airport facilities, aircraft maintenance workers, etcetera. This difficulty, combined with the pandemic and mobility restrictions, has placed the entire industry in one of its worst scenarios in history.

Once COVID-19 vaccines have started being administered and mobility restrictions have become more flexible, tourism and business activity are expected to start recovering, giving the Latin American airlines the "fuel", they desperately need to stay in business (IATA, 2020). In summary, the commercial air transport industry plays a vital role in connecting cities and people and in moving goods for daily consumption.

Analysis and Discussion

Sustainable Organizations and the airlines in Latin America

A sustainable organization is an organization that simultaneously seeks to be economically productive, environment friendly, and socially beneficial (Barbieri *et al.*, 2010).

Most definitions in the literature are very similar, and they involve these three dimensions. We, the current authors, do not wish to discuss this definition itself; instead, we aim to contextualize these dimensions within the commercial airline industry. Business sustainability and sustainable organizations may seem feasible, but in practical terms, they could be either very difficult to achieve or not attainable at all.

The social dimension—which concerns the impacts of product or services, innovations, or any subproduct of a profitable or unprofitable business on human communities inside and outside an organization—affects employment, social inclusion, poverty mitigation, diversity, gender equality, business ethics, and more. The environmental dimension addresses impacts on not only the environment but also the entire biodiversity system.

This system is complex, and human activity has been modifying it, producing very negative effects on the Earth. Climate change, air and land pollution, sea contamination, droughts, floods, and fires, are some of the main environmental problems associated with human economic activity. Then, the economic dimension is associated with the transformation of raw materials into final products and services, generating profits under the current economic system and motivating centuries of business-oriented companies.

The performances of organizations and entire countries are measured by macro and microeconomic indicators associated with productivity and overall economic activity (Barbieri *et al.*, 2010). Any imbalance in these dimensions signifies human irrationality combined with other factors that threaten the sustainability of life on earth as a whole.

Table 3. Sustainable Development Goals and Airlines' Main Initiatives

	Sustainable Development Goals (SDGs)	Airlines' main initiatives
Social dimension	Goal 3: Good Health and Well-being Goal 4: Quality Education Goal 5: Gender Equality Goal 8: Decent Work and Economic Growth Goal 10: Reduced Inequality	Decent working practices and a commitment to wage equity, a detailed commitment to a company's code of conduct, the Supplier Code of Conduct, and supplier management requirements and systems, occupational safety, risk prevention and mitigation programs, et cetera
Economic dimension	Goal 8: Decent Work and Economic Growth Goal 9: Industry, Innovation, and Infrastructure Goal 17: Partnerships to Achieve the Goal	Airlines in Latin America seek to improve regional and international cooperation, improving coordination between existing mechanisms, facilitating access to and the improvement of technology, and making strategic alliances with various organizations
Environmental dimension	Goal 6: Clean Water and Sanitation Goal 12: Responsible Consumption and Production Goal 13: Climate Action Goal 14: Life Below Water Goal 15: Life on Land	The use of non-hazardous waste compared to the total waste generated, reducing the mass of CO2 emitted by aircraft per 100 passengers per kilometer traveled (RPKs), and programs for preserving the environment

Source: Own elaboration (Aeroméxico, 2020; Aerolíneas Argentinas, 2020; Avianca, 2020; Interjet, 2020; LATAM, 2020).

Social performance

The commercial airline industry significantly affects not only sustainability but also business sustainability and sustainable development. On the social front, Latin American airlines have major challenges to address. Some stakeholders, such as the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO), promote respecting and guaranteeing human rights and good labor practices among their member organizations. Latin American airlines collaborate with the Federation of the Red Cross and the Red Crescent of the Americas to air-transfer humanitarian aid to serve affected populations or by transferring rescue personnel, as well as fostering initiatives to build social value among vulnerable communities in their home countries and other parts of the region.

Other initiatives by Aeroméxico, Avianca, Interjet, LATAM, and Aerolíneas Argentinas provide a positive and aligned response to the following SDGs: "Goal 3: Good Health and Well-being"; "Goal 4: Quality Education"; "Goal 5: Gender Equality"; "Goal 8: Decent Work and Economic Growth"; and "Goal 10: Reduced Inequalities." The Aviation Benefits Report prepared by the International Air Transport Association (IATA) and the International Civil

Aviation Organization (ICAO) emphasizes that the international aviation sector enables improvements to people's quality of life through various actions that affect daily life, centering on five pillars: "Developing Skills," "Tourism Enabler," "Community Lifeline," "Rapid Disaster Response," and "Safety Culture" (ICAO, 2020).

Financial Performance

By the end of 2020, Latin American airlines had faced a severe financial crisis due to the COVID-19 pandemic. The pandemic's spread has had a major impact on the economy, social activities, travel, trade, and tourism, leading to airport closures and limited air traffic, which have directly affected the airline industry.

To face this crisis, IATA (2020) has presented a policy that airlines must follow to return to their activities and restore connectivity, stating "Today we face the biggest challenge in commercial aviation's history: Restarting an industry that largely has ceased to operate across borders while ensuring that it is not a meaningful vector for the spread of COVID-19" (IATA, 2020).

The commercial aviation industry in Latin America has decided to further avoid negative financial effects. Avianca Holdings, LATAM, and Aeromexico have invoked Chapter 11 of the U.S. Bankruptcy Code to reorganize their operations and gain time to cancel their liabilities (IATA, 2020; CNN, 2020).

In the meantime, Aerolíneas Argentinas and Interjet have requested financial assistance from their governments and updated their commercial and financial policies to avoid penalties for canceling or postponing flights. Recently in the middle of 2020, strikes have occurred among Interject employees, who argue that the airline has not paid salaries in four months.

In addition to contractual problems, the airline faces very limited operations due to the pandemic and legal problems with the Mexican government for tax debts in 2019–2020. The airline seems to be facing a very difficult financial situation in the short and medium terms.

Meanwhile, major Mexican airline Aeroméxico, one of the biggest airlines in Latin America, has also requested to finish work contracts for pilots and crew members with labor unions and the Mexican Employment Secretary, a compulsory reorganization measure requested by financial institutions like the International Monetary Fund aiding the airline during its financial crisis. For this airline, the current financial year remains uncertain. It must reorganize its operations according to the U.S. Bankruptcy Code; however, it must also soon reach an agreement with financial institutions, the government, and labor unions.

On the other hand, considerable investments in aircraft and technology have occurred in recent 5 years, upgrading to the latest models from Boeing and Airbus global providers. Latin American airlines have also invested in the latest information technology infrastructure to optimize operational processes, supporting service excellence in punctuality, connectivity, quality, and innovation among their front-desk operations and fleets (IATA, 2020).

Moreover, strategic alliances with international airlines have helped share risks and optimize operational costs by sharing airline flight codes. These airlines have been found to contribute to SDG "Goal 8: Decent Work and Economic Growth," "Goal 9: Industry, Innovation, and Infrastructure," and "Goal 17: Partnerships." As we have shown, Latin American airlines' investments have improved operational performance; however, their financial situation is at stake while the pandemic and mobility restrictions persist.

Environmental performance

Environmental performance is one of the key areas in which Latin-American Airlines are being assessed by international organizations, industry regulators, governments, and final customers. Most of these airlines have been embarked on developing business strategies that consider environmental impact's inclusion in their current performance.

In this way, evidence shows they have deployed projects and efforts to reduce their environmental impact (AeroMexico, 2020; Aerolineas-Argentinas, 2020; Avianca-S.A., 2020; Interjet, 2020; Aeromexico, 2018). The renewing of their fleet with Boeing's and Airbus' aircrafts latest models shows a significant reduction of CO2 emissions thanks to the new generations of Rolls Royce and GE engines which provide lower fuel consumption, and consequently less harmful emissions (Boeing, 2020).

This is a milestone in terms of environmental responsibility and follows IATAS's voluntary initiative to increase the use of biofuels and join the Carbon Neutral Growth Commitment (CNG,2020).

Table 2 showed major green projects that airlines are currently deploying as part of an integrated business sustainability strategy. E.g., Aeromexico has deployed several strategies including optimization and recycling of materials used in operations, as well as improvements on the management of hazardous materials (Aeromexico, 2018).

The use of materials such as paper, plastics, cardboard, adhesive tapes, among other have been significantly reduced up to 40% (Aeromexico, 2018). These examples show how the airline has made progress not only in following international and national standards but in significant reductions of CO2 emissions and materials used for operations.

The efforts of these airlines to the Sustainable Development Goals (SDGs) include but are not limited to clean water and sanitation, responsible consumption and production, climate action, life below water and land. These contributions can be direct or indirect through communities and external organizations. However, despite those good efforts it is important to say that these airlines and the entire industry are far from being sustainable. The use of fossil fuels is still a big issue for the environment and maybe only be sorted out when a full introduction of renewable energy is fully integrated with the aircraft's technology.

Also, the production of aircraft demands tons of raw materials and resources of all types, making it one of the most complex supply chains with intensive energy-use. Big challenges remain also in the recycling of all types of materials once the aircraft come to the end of the useful life based on circular economy practices. Therefore, it looks pretty difficult that this industry becomes sustainable in the medium and even long terms, considering its environmental impact and footprint on Earth.

CONCLUSIONS

This manuscript has reviewed the importance of business sustainability of some of the main commercial airlines in Latin America. A literature review was conducted using intelligence-industry databases, think-tank organizations, airlines' business sustainability reports, and journal articles from prestigious scientific databases. Analysis and discussion were presented in terms of business sustainability categories, and based on it, we present our main conclusions.

Main findings with this set of airlines' business sustainability suggest they have done very good efforts in terms of social and environmental responsibilities, but serious challenges were found in terms of their financial performance due to the Covid-19 pandemic, leading to a critical financial situation of some of the airlines.

This poor financial performance adds to previous airlines' financial liabilities as some of them were recently financially re-structured. The case of Interjet is the most critical of all them as the airline has stopped flying due to current debts and liabilities with the government's tax secretary and financial institutions.

The airline has entered into a weak position with labor unions, tax agencies, and financial institutions owning months of salaries and taxes, which has led to liens from the government and consequently to stop operations. It is not sure when the airline will be able to start operations in 2021. Avianca, Latam, and Aeromexico were bankrupt under Chapter 11 of the US law bankruptcy code.

In the case of Aeromexico, negotiations are in progress to have access to international funds, but funders demand Aeromexico deploy a deep reorganization of its operations that involve reducing current operations, pilots, crews, and staff. This has led to a legal battle with airline personnel, labor unions, and government agencies. Thus, these legal battles, financial problems, re-structures, combined with low demand in tourism and business activity in the region, have put at stake the airlines' survival in the short-medium terms.

The airlines under study are developing performance systems to measure business sustainability and sustainable development through the SDGs. The link between airlines performance to Sustainable Development Goals (SDGs) have come from the pressure of several stakeholders which includes governments, regulatory agencies, industry standards, non-government organizations (NGOs), among others to assess in the first stage social and environmental impacts, and in further stages to set limits and operational standards for conformity.

Assessing social impact seems to gain room for the airlines under study compared to the past and are now also associated with SDGs. The airlines have deployed several strategies to improve not only the life in the organizations but also to consider a whole impact on communities and society.

In this way, the introduction of gender equity and equal opportunities have improved this issue allowing women to take more decision-making roles inside the airlines' administrations. Better training at all levels has been deployed beyond standards for conformity, especially in technical areas such as maintenance. This can be perceived in few serious incidents that these airlines have had in recent years.

The airlines also contribute to a significant generation of direct and indirect jobs due to their commercial activity for tourism and business, accounting for positive social and economic impact as discussed in the manuscript with hard data. In summary, social impact is being assessed and programs are linked to support gender equality, poverty, good health, and well-being. Some areas of opportunity are in working overall-conditions, program retirements, health services, and better salaries for pilots, crews, and staff, as these aspects in Latin American have been usually lower compared to North America or Europe's working conditions.

Finally, one of the major airlines' environmental impacts is CO2 global emissions that have led to contribute to global warming and its devastating consequences. Several efforts and large programs from airlines were found to tackle this problem. The upgrading of some of their fleet with the latest Boeing's and Airbus' lower consumption fuel aircraft that save up to 20% is a significant step in reducing CO2 emissions.

Participation in carbon bond markets to compensate for CO2 emissions is another parallel action. Other actions are focused on the management to reduce waste and hazardous material in operations, plus optimization in the material used such as paper board, paper, plastics, adhesive tapes, etc. In this sense, recycling programs are also an action that has been deployed to support materials' optimization. Major challenges and opportunities remain in measuring impact on biodiversity as a whole, pollution of land and seas, including health problems for animals and human due to CO2 and other harmful emissions, noise, use of fossil fuels, waste of hazardous material, high consumption of all sort of resources for the intensive production of aircraft and the entire supply chain for the industry.

In this way, the airlines are far from being sustainable and claiming business sustainability. However, actions have started to take place a few years ago from several industry stakeholders and this progress is better than nothing, but sadly not enough, nor even close to a modest desired situation. Thus, a big room for opportunity exists for non-fossil fuels, optimization of the use of materials, optimization in aircraft production, renewables sources of energy, circular economy business models and programs, and cultural change for consumption.

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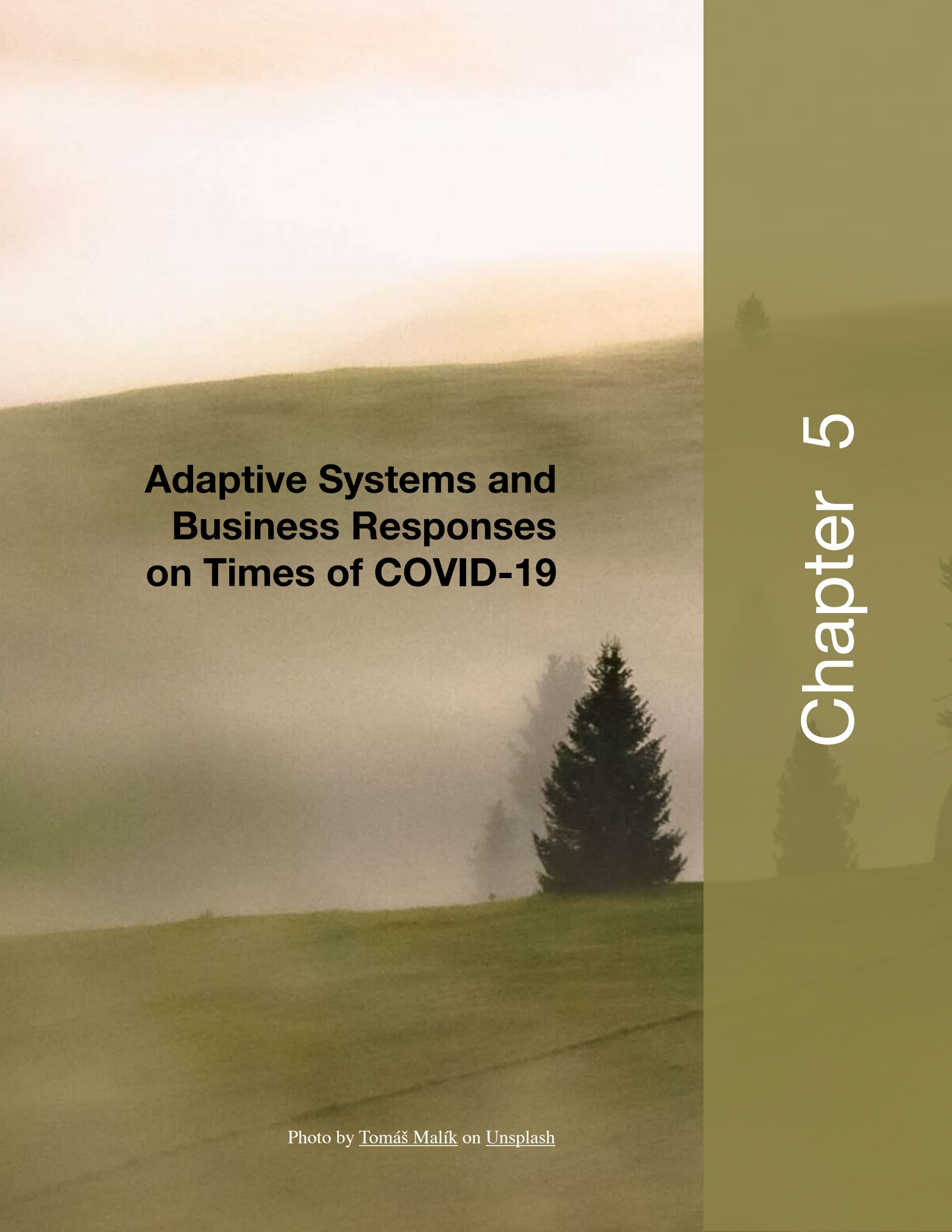

Chapter 5

Adaptive Systems and Business Responses on Times of COVID-19

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Adaptive Systems and Business Responses on Times of COVID-19

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Introduction

Companies are part of a system. They are also a system by themselves. From this systematic perspective, the company adaptation is more efficient in adverse scenarios and more resilient (Shen *et al*., 2020; Liu *et al*., 2020; Sutherland & van den Heuvel, 2002; Haeckel, 1999).

The coronavirus pandemic is causing large-scale loss of life and severe human suffering globally. It is the largest public health crisis in living memory, which has also generated a major economic crisis, with a halt in production in the affected countries, a collapse in consumption and confidence, and the stock markets responding negatively to the greater uncertainties.

The effects of the pandemic due to the spread of COVID-19 are shaking socio-economic structures globally. The impacts are estimated in astronomical numbers of loss of life and jobs.

The countries of Latin America and the Caribbean (LAC) are deploying health and economic measures to halt the advance of the epidemic with great uncertainty still about the duration of the health emergency period and the real consequences of the pandemic on the population and the productive fabric.

Although the magnitude of the development of the pandemic makes it especially difficult to predict the economic impact, the clear possibility of a global recession has become concrete. The most recent forecast from the OECD (March 27) indicates that the initial direct impact of the closures could be a decrease in

the level of production of between a fifth and a quarter in many economies, with consumer spending potentially decreasing around from a third party.

The implication for annual GDP growth is estimated to be a decrease of up to 2 percentage points for each month that strict containment measures continue, although this impact will depend on many factors, including the duration and magnitude of national closures, the degree reduction in the demand for goods and services in other parts of the economy, and the speed at which it provides significant support to fiscal and monetary policy (OECD, 2020a).

In recent weeks, several international organizations have published studies on aspects of the economic impact of the coronavirus pandemic. For example, the United Nations Conference on Trade and Development (UNCTAD) has calculated that the impact of the coronavirus in China has cost global value chains $ 50 billion in exports. (OECD, 2020)

While at the beginning of March 26, UNCTAD expected that foreign direct investment (FDI) could be reduced by 5-15% 4, of March 26 the forecast was revised to a reduction of 30-40% in 2020-21. (OECD, 2020)

International Labor Organization (ILO) estimates that the impact of COVID-19 will increase global unemployment by between 5.3 million ("low" scenario) and 24.7 million ("high" scenario), noting that "maintaining business operations will be particularly difficult for small and medium-sized enterprises (SMEs)". (ILO, 2020)

As like OECD (2019) the International Monetary Fund (IMF) has published a series of reflections on the expected effect and the required policies (IMF, 2019). In particular, compared to the global financial crisis as of 2008, this time the decline in services appears much greater, reflecting the consequences of roadblocks and social distancing, especially in urban settings. The IMF's World Economic Outlook published on April 14 forecasts a 3% decline in global GDP in 2020, with considerable additional downside risk (IMF, 2019). Several banks and institutes have also made strong negative adjustments to their GDP growth forecasts for 2020 (Deutsche Bank, 2020).

The purpose of this article is to analyze the strategies of companies in the face of this global phenomenon, to reactivate and increase sales in a faster way, revealing the digital marketing strategies that are used to improve the sales of the products and services offered. by companies. Digital marketing strategies facilitate the adaptation of the company to the Post-Covid scenario (Low *et al*., 2020; Ritz *et al*., 2019). The analysis applied in this article is descriptive according to secondary sources, such as reports, scientific articles, websites, and books, etc.

The coronavirus pandemic is causing large-scale loss of life and severe human suffering around the world. It is the largest public health crisis in living memory, which has also generated a major economic crisis, with production

disruption in the affected countries, a collapse in consumption and confidence, and stock markets responding negatively to the greatest uncertainties (OECD, 2020), the number of COVID-19 continues to rise at the time of writing, in several OECD countries cases are decreasing, and lockdown and containment measures are gradually being lifted.

The economic forecasts issued between April and June 2020 show an increasingly negative outlook in terms of the scale of the global economic recession caused by the pandemic. In its June 2020 Economic Outlook, the OECD projected a 6% drop in global GDP and a 7.6% drop in the event of a second pandemic wave by the end of 2020, with a double-digit decline in some of the most affected countries, followed by a modest 2.8% recovery in 2021 (OECD, 2020b). This follows a forecast at the end of March, which indicated that the initial direct impact of the closures could be a decrease in the level of production of between a fifth and a quarter in many economies, with consumer spending potentially falling around a third (OECD, 2020b).

In recent weeks, several other international organizations have issued forecasts on aspects of the economic impact of the coronavirus pandemic. The IMF's June 2020 economic outlook update projects a 4.9 percent decline in global GDP in 2020, 1.9 percentage points below the April forecast, followed by partial recovery, with a growth of 5, 4 percent in 2021 (IMF, 2020). The June 2020 World Investment Report (UNCTAD, 2020) forecasts a decrease in global foreign investment of up to 40% in 2020, with a further decrease of 5-10% in 2021. The OLI mentions that maintaining business operations will be particularly difficult for small and medium-sized enterprises (ILO, 2020).

The WTO reported a decline in the volume of world merchandise trade in the first quarter of 2020 by 3% year-on-year and expects an unreported decline in the second quarter of 18.5%, which could lead to a 32% drop from 2020 (WTO, 2020).

IMPACT OF COVID-19 ON SMES

SMEs are independent entities dedicated to the production of goods or the provision of services to satisfy different market needs (Arévalo & Morocho, 2016). SMEs generate employment and productivity in the Country and allows them to supply the demand for products and services of national, multinational companies (Varea & Navas, 2015).

Recent OECD data show that SMEs represent more than 50% of employment in OECD countries, in these sectors the proportion of SMEs employment is 75% on average in OECD countries, and almost 90% in Greece and Italy. While the participation of micro-enterprises in the most affected sectors

is 60%, while their participation in total employment in the business economy, respectively, 45% and 55% (Cukier & University, 2020).

SMEs, thanks to their great potential for job creation, represent an excellent means of promoting economic development and a better distribution of wealth. SMEs in Mexico generate 72% of the labor force and contribute to the production of 52% of the country's Gross Domestic Product (GDP). That is, 4.1 million are SMEs of the total that represents 95.4 percent, of these 3.6 are small and 0.8 are medium (Zepeda, 2020).

According to Tabares (2012), the competitiveness of a country is linked to the competitiveness of its companies. As mentioned by Valdaliso and López (2000), the role of SMEs in the countries of the world to the contribution of the employment rate and GDP shows that they are a sector with high participation in the national economy.

SMEs play a fundamental and important role in Colombia, mainly due to the generation of employment and their contribution to the national GDP (Betov, 2020). For Carrión, Zula and Castillo (2016), small and medium-sized companies (SMEs) are forms of business organization that are responsible for the production of a good part of the goods and services in contemporary society.

León (2015) highlights the following positive characteristics of this productive sector: they are key factors for generating wealth and employment; It is the key factor to boost the economy of depressed regions and provinces, therefore it will boost the environmental economy in the country; maintains a high capacity to provide goods and services to large industry (subcontracting), which is why closed production chains can be formed with large companies; it is flexible to associate and face environmental demands of the market; operational mobility; location management and rapid implementation of processes.

That is why several analysts anticipate a global stagnation or recession this year due to the crisis caused by COVID-19. Fitch group estimates that 2020 global GDP will be $ 850 trillion lower than the figure they forecast in December, despite this, it maintains a global growth outlook of 1.3% (compared to the 2.5% forecast in December).

However, it is recent forecast warns that the outlook may be revised downward depending on events. In the case of China, the company anticipates a 5% drop in GDP in the first four months of the year, something unprecedented in recent times for that country. For Italy and Spain, an annual GDP contraction of 2% and 1%, respectively, is forecast (World Economy News, 2020). For its part, the International Monetary Fund makes more pessimistic forecasts, anticipating that the pandemic will cause a global recession in 2020 that may even be worse than the one caused by the financial crisis of 2008 and 2009 (CAF *et al*., 2020).

According to ECLAC., this recession would affect Latin America and the Caribbean, reducing GDP by 1.8%.

There are several ways in which the coronavirus pandemic affects the economy, especially SMEs, both on the supply and demand sides (Internacional, 2019). On the supply side, companies experience a reduction in the supply of labor, as workers are not well or need to care for children or other dependents while schools are closed, and movements of people are restricted. Measures to contain the disease through lockdowns and quarantines lead to further and more severe drops in capacity utilization. Additionally, supply chains are disrupted, leading to shortages of parts and intermediate goods.

On the demand side, a dramatic and sudden loss of demand and income for SMEs severely affects their ability to function and/or causes a severe liquidity shortage. Additionally, consumers experience loss of income, fear of contagion, and increased uncertainty, which in turn reduces spending and consumption. These effects are exacerbated because workers are laid off and companies cannot pay wages. Some sectors, such as tourism and transport, are particularly affected, which also contributes to lowering business and consumer confidence. More generally, SMEs are likely to be more vulnerable to "social distancing" than other businesses (Perry, 2020).

Faced with unprecedented changes and impacts in companies' operations or their supply chains, linked either to a decrease or increase in activity, companies have sought to adopt a variety of responses, many of which actively put forward resources, logistics, skills, and innovative approaches to service in the fight against the pandemic (OECD, 2020a). For example, companies have taken extraordinary measures to ensure the continuous supply of essential goods and services, redirecting production to make protective products and health equipment. (CNN, 2020)

Many companies have directed their staff to work from home and, if this is not possible, have established hygiene protocols to protect their workers. Such protocols have also been implemented to ensure that goods and services provided to customers do not put them at risk of contamination. To respond to the economic risks faced by workers, contractors, and suppliers, some companies have taken proactive steps and made commitments to protect them from unemployment, pay cuts, or reductions in orders (CNA, 2020).

In recent weeks, more empirical evidence became available on the impact of the crisis on SMEs, including the possible impact of policies to counter it (Chen *et al.*, 2020a ; 2020b; Liu & Volker, 2020; Gobbi *et al.*, 2020; Uribe & Wang, 2020; Humphries *et al.*, 2020; Chetty *et al.*, 2020; Portes, 2020; Boot *et al.*, 2020; English & Liang, 2020; Deb *et al*., 2020; Federal Reserve Bank of New York, 2020; Vogt & van der Wiel, 2020; Hassan *et al.*, 2020; Goolsbee & Syverson, 2020;

Bennedsen *et al*., 2020; Juergensen *et al*., 2020) . In his studies, he gives one more indication of how SMEs have been more affected by the crisis than larger companies.

There is an above-average representation of SMEs in the sectors particularly affected by the crisis, which, according to the OECD analysis, include: transport manufacturing, construction, wholesale and retail trade (OECD, 2019), air transport, accommodation and food services, real estate, professional services, and other services.

Recent OECD data show that while in the business economy in general, SMEs account for more than 50% of employment in OECD countries, in these sectors the share of SMEs employment is 75% on average in the OECD countries and almost 90% in Greece and Italy. While the participation of micro-enterprises in the most affected sectors is 60%, while their participation in total employment in the business economy is, respectively, 45% and 55% (Cukier & University, 2020).

Given the specific circumstances SMEs are currently facing, countries have implemented measures to support them. While the first concern is public health, a wide range of measures is being introduced to mitigate the economic impact of the coronavirus outbreak on businesses. Specifically, many countries are urgently implementing measures to support SMEs and the self-employed during this severely challenging time, with a strong focus on initiatives to maintain liquidity in the short term. Such policies take various forms. Some countries have focused on broader policies that have the potential to cushion the blow for the economy and all businesses. For example, in many countries, central banks have stepped in to support loans by easing monetary conditions and allowing commercial banks to make more loans to SMEs. Examples include the unprecedented actions taken by the United States Federal Reserve and the European Central Bank (OECD Secretary General, 2020).

Similarly, Mexico announced that it is working on a people-centered support package (Reuters, 2020). The Central Bank reduced interest rates to 6.5%. On April 3, the government announced a financial support package (International Small Business, 2020). The following measures have been put in place relevant to SMEs:

- The National Institute for Workers' Housing (INFONAVIT) will cover up to 3 months of credit payments for workers who become unemployed. This extension will continue for up to 6 months with no additional charges.
- The Federal Government, through the development bank Nacional Financiera (Nafin), will support SMEs up to MXN 25 billion (USD 1 billion USD). One million loan products of MXN 25,000 each (USD 1,000), and 500,000 loan products will be provided to the formal economy and 500,000

loans will be made to the informal economy. The credits will be settled over a period of 3 years, without payment in the first three months and with additional monthly payments of $ 1,000 (USD 42), at an average annual rate of 6.5%.

- The National Banking and Securities Commission (CNBV) issued provisions to support financial clients. These measures consist of the total or partial deferral of capital and/or interest payments for up to 4 months, with the possibility of extending this term for an additional 2 months. Balances could be frozen if the credit is considered a current loan as of February 28, 2020. This measure will apply to consumer, housing, and commercial loans.

Also, the government strengthened existing social programs to support SMEs. The "Tandas para el Bienestar" program will invest MXN 3.4 billion to grant 450,000 new loans to small businesses. The Mexican Institute of Social Security (IMSS) is granting loans for MXN 25,000 at a rate between 6.5% and 10% for formal and informal micro and small businesses (Mexico News Daily, 2020).

On April 21, the Central Bank lowered rates to 6.0%. It announced a liquidity injection of MXN 750 billion to alleviate the liquidity needs of companies through private banks. On April 22, the Tax Administration of Mexico extended the deadline to present the personal income tax return from April 30 to June 30, 2020. On April 27, INFONAVIT announced that companies with up to 250 employees could defer the second and third bimonthly 5% of contributions to housing until September. Companies with 250 or more employees could defer the second bi-monthly payment until July. On April 27, the Federal Government announced that the increase in residential electricity consumption will not be reclassified to higher rates. On April 26, the Inter-American Development Bank (IDB) and the Mexican Business Council (CMN) announced a loan scheme that will provide up to USD 12 billion a year to small and medium-sized companies to help them overcome the coronavirus crisis. The program has the support of the Federal Ministry of Finance and will aim to grant loans to 30,000 companies, lines with an average term of 90 days. IDB Invest and CMN also seek to build USD 3 billion.

The Mexican government sees fintech as a means to support financial inclusion, also during the outbreak. A Mexican fintech start-up (Credijusto) raised USD 100 million in debt that will help it extend more loans to small and medium-sized companies to respond to the impact of the coronavirus. More private initiatives have been developed to support the digitization of SMEs in the context of the crisis (Logo, 2020). Companies offer support to SMEs (De Rijksoverheid & Nederland, 2020).

Strategies for Mexican SMEs on COVID-19 times

There are different strategies applied in SMEs, the Latin American Center for Innovation and Entrepreneurship proposes three strategies that allow companies to keep up with the current crisis:

1. The financing of the capital of the work. - is essential for them to maintain their work. According to Gutiérrez (2020), among the first was the moratorium on value-added tax, the elimination of partial payments of the tax on profits, the moratorium on the selective consumption tax, the moratorium on import duties, and the exemption from the tax on value-added in commercial leases.
2. Technical assistance for business development.- which consists of consulting in the field of marketing and the implementation of new electronic commerce strategies. The main objectives of the technical assistance are to attract customers to increase their audience, the creation of advertising campaigns on platforms such as Google, Facebook, and other social networks to generate an increase in sales. Some of these assistances elaborate web pages with the purpose that the products or services offered have more visibility in the market (Álvarez *et al*., 2020).
3. The implementation of new e-commerce strategies will help these companies to cope with the situation in which they find themselves and will find themselves while the pandemic lasts. The use of social networks has had significant growth since social confinement began, making this an essential opportunity for companies to promote their articles and services through the creation of profiles on social networks such as Instagram, Twitter, and Facebook, since, according to Gudiño (2020), physical sales have decreased considerably up to 66% in the country's SMEs.

The strategy of executing promotions and raffles has become very popular to publicize the page, obtaining more followers and, with this, greater visibility of the products and services offered. Another strategy to consider is updating payment methods. Currently, there are platforms through the country's banks that facilitate the payment of different services, as well as the realization of bank transfers without the need to physically appear at a branch, either between accounts or between phone numbers through mobile applications. Accepting different payment methods can create a competitive advantage (Álvarez *et al*., 2020).

Currently, the meanings of the classic schools of strategy are used, such as the capacities of the organization and the assessment of the environment, how a strategy is formulated, strategic thinking, and competitive advantages (Noruega *et al*., 2001; Porter, 1991), following the strategic assumptions, as well as (Restrepo, 2005) regarding the development of effective strategies to manage the

organization with better conditions. Contreras (2013) affirms that the strategy is the coordinated form or works to implement the way of carrying out things. For Davies (2000) the strategy has various options, such as routes and various solutions, many times complex and difficult to carry out.

Companies worldwide are conditioned by the way of operating and managing political, social, economic, legal, environmental, and technological factors, as well as the cultural part and its environment, therefore, its success or failure will often depend on the way they carry out strategies to stay in the market. Crises often represent bankruptcies, but it also brings new business opportunities, business rethinking, which is why companies need to develop new strategies or business models to counteract bad times. Some necessary strategies are the in-depth review of expenses, control of personnel such as their reorganization, analyze the level of debts incurred, adjust business expenses, and salaries (Meza, 2020).

According to Castro (2020), the effects of the pandemic will be a change in consumption habits, beliefs, customs, and attitudes, and companies must comply with the guidelines set for the protection of workers, be open to a change, keeping in touch with customers through social networks, which today is what is maintaining many businesses since some did not have a presence in social networks and now they have entered strongly. The Pan-American Institute of Senior Business Management IPADE (2020) published strategies for companies in the face of the crisis due to the pandemic, some of which coincide with experts such as renegotiating their strategy, this is to agree with suppliers about debts, reduce expenses and negotiate salaries with the staff, taking care of the cash flow since if a loan is requested, depending on the size of the company, it may become the cause of the closure, focus on savings, the creation of a new strategy aimed at e-commerce, because, during this situation, businesses with social networks are the ones that are succeeding due to their presence in the market, in the same way, do a risk analysis, analyzing the possible scenarios when the pandemic returns.

That is why applied digital marketing strategies are a new reality in companies, so it is important to Know all areas of digital marketing to understand what are the qualities that the company has and what are the needs that you must consider ensuring that you are going to deliver results under the expectations of the company.

DIGITAL MARKETING STRATEGIES IN SMES

Companies achieve greater success when they mix traditional and digital mechanisms, taking into account their positioning (Porter, 2009). Digital Marketing can be defined as the various strategies that are carried out through computer platforms to reach potential customers (Selman, 2017) to achieve

community engagement, they must contain social incentives, content that is entertaining and achieves that the community can participate and at the same time give feedback to these publications (Bradley & McDonald, 2011), to this day there are hundreds of interactions between the community and the companies, through contact networks (Awad, 2007).

For Rayport & Jaworski (2001) digital marketing is defined as exchanges measured by technology between various parties (individuals, organizations, or both), as well as electronic activities within and between organizations that facilitate these exchanges. The Spanish International Institute of digital marketing defines digital marketing as a type of application of marketing strategies carried out through digital media (Striedinger, 2018).

Social networks give the possibility of advertising to be able to converse and retain potential clients (Castelló *et al*., 2014) through corporate values and brand attributes (Altamirano & Silva, 2018) knowing the client's needs (Schultz et al., 1993). In this sense, companies must adapt to work through new attitudes and approaches (Mathison *et al*., 2007) for this they must use the resources held by the company in the most efficient way (Mazariegos *et al*., 2013) considering both quantitative and qualitative aspects (González & Arciniegas, 2016).

Digital Marketing is a new challenge for companies to gain visibility (Moschini, 2012), they can also segment customers, promotions, and have more direct communication with them (Castillo, 2014). In this sense, consumers can receive communications by various means which are tailored to their needs (Schultz *et al*., 1993). Therefore, it is vital to effectively segment the target audience (Novoa *et al*., 2016). To develop a Digital Marketing strategy, you must know the objective audience, integrate and determine the communication channels to evaluate them (Key & Czaplewski, 2017).

Consumers through these means of contact have active participation, being able to comment, publish and recommend the company in question (Kotler *et al*., 2017) which is why it is visualized that the management of uncertainty becomes a relevant pillar for many companies. to corporate communication (Xifra, 2020). The employer must know the potential of social networks, since, if not, they will not take advantage of all the opportunities they offer (Valos *et al*., 2016).

Digital strategies are applied to be able to turn into results the interactions that the organization presents with its community (Selman, 2017) with pillars such as having fun, informing, and becoming the first option. Through a study carried out by Astor Warehouse, it was concluded that the COVID-19 crisis has advanced the evolution of e-commerce by two years (Suárez, 2020). Digital marketing is the integration of elements and tools. The Marketing and Advertising Institute of Guanajuato, (IMPROMA, 2015), explains the elements

that are part of digital marketing and that unite the aforementioned concepts (Table. 1) . (Medina & Aguirre, 2017)

Table 1. Relationship of elements vs performance

Elements	Performance
Devices (Hardware)	90% of consumer transactions start and end on a device, that percentage is mostly tablets and smartphones.
Organic Search	Use of search engines by customers, for this point it is necessary to attract and persuade them to the business. It is necessary, and by far, to achieve high visibility and traffic on the website.
Content Marketing	The information provided by the website and/or social networks must be real and consistent with what is offered, so it will be possible to guarantee the return of customers.
Social Media Marketing	In them lies the first step of contact with the customer, an interaction between the brand and the user is established.
E-mail Marketing	A correct E-Mail campaign allows you to close a business with a potential client, for this, it is necessary to have content that I managed to persuade the client.
Advertising campaigns	The medium and the mode of dissemination are decisive in reaching potential customers, it is possible to know the tastes of customers thanks to the data shared by users and reactions to the published content.
Web development	offers this because only the ad is shown on social networks. This point is essential for the business, it allows establishing an identity and recognition among users.
Corporate image	ofrece este debido a que en la redes sociales solo se muestra el anuncio.Este punto es esencial para el negocio, esta permite establecer una identidad y reconocimiento entre los usuarios.
Positioning in Google	A ranking within the search engines will not only give visibility to the brand but will also give confidence and security
SEO (Search Engine Optimization)	The purpose of improving the position of a website in the search engine results for specific search terms that are directly related to the business. It should be noted that it is through organic growth.
SEM (Search Engine Marketing)	Unlike SEO, this is for paid advertising. It allows the site to be displayed when the user searches for a specific need and is displayed first.

Source: Hoyos & Sastoque (2020).

Currently, it is necessary to respond with greater speed to users and consumers because they are connected 24 hours a day. Therefore, social media is a tool that allows information to flow faster and this leads to offering a new model of strategic planning in this era of social media, the internet, smartphones, and more instruments. Therefore, it is not wrong to state that "with globalization and the different trade agreements, and the Covid-19 pandemic that is currently being experienced internationally", companies are forced to implement the correct use of computer tools for the promotion of entrepreneurship initiatives, which allows sustainable competitiveness in the medium and long term, known as Digital Marketing and the main reason why this goal has not been met is that entrepreneurs do not know the added value, which can give them this tool on the

net. There is a great possibility to increase the commercialization and to retain its audiences (Peña, Caicedo & Delgado, 2018).

Companies carry out search marketing strategies that encompass links in search site optimization. "Search marketing can provide an extremely qualified audience for the site, maximize the visibility of the company on the Internet, and mainly increase the potential of visitors to customers." Search engines on the web are based on information retrieval systems stored in digital environments. The specificity of search engines is to search for desired information, adequately and on time (OECD, 2019).

Similarly, the mobile social media strategy allows companies to send location and/or time-specific marketing messages. The excitement that builds from the end date of these marketing messages can result in more effective marketing communication. This concept is similar to price promotions in which it is reflected that raffles and contests generate more value for consumers through their entertainment nature (Bartik *et al*., 2020). That is why digital marketing has become a support tool in SMEs, in the market thanks to the internet, being a fundamental tool for competitiveness at a national and global level.

METHODOLOGY

This research work was carried out through an in-depth review of the specialized literature on digital marketing and an analysis of the current situation of SMEs in Mexico. Reports from the International Monetary Fund (IMF) and the Economic Commission for Latin America and the Caribbean (ECLAC), Organization for Economic Cooperation and Development (OECD), and Federal Telecommunications Institute (IFT) were consulted to obtain revealing data that could provide support and contrast the information of the scientific articles consulted. Once the reports and the bibliography were analyzed, we were in a position to present the conclusions of this research.

THE SITUATION OF SMES IN MEXICO

SMEs are an important factor in the country's economy, providing 52% of GDP, 72% of the workforce. In Mexico, there are approximately 4.1 million SMEs of the total that represent 95.4 percent, of these 3.6 are small and 0.8 are medium. From the notice of the mandatory quarantine declared throughout the country as of March 20 of this year, businesses were mainly affected by the confinement.

In a survey conducted by the National Institute of Statistics and Geography (INEGI), it is estimated that more than half of the companies implemented technical stoppages or temporary closures as prevention measures. 93.2% of the companies registered at least one type of affectation due to the health contingency due to Covid-19. The greatest impact was the decrease in

income, with 91.3 percent. It was followed by the low demand that at the national level was reported in 72.6% of the companies consulted (INEGI, 2020). Most of the companies prioritized the non-dismissal of personnel, over the reduction of salaries and/or benefits with national percentages of 19.1 and 15.4% respectively (INEGI, 2020). During April 2020, 60.2% of the companies implemented operational actions, while 39.8% did not. Home delivery of orders was the most implemented operational action at the national level by 45.0% of companies, followed by special promotions with 33.8%, work at home (home office) with 32.6%, and Internet sales with 29.6%. hundred (INEGI, 2020).

DIGITAL MARKETING TO STRENGTHEN SMES IN MEXICO

In a study carried out by the Federal Telecommunications Institute (IFT), identified that the country's micro, small and medium-sized companies use fixed internet, micro-companies with 60%, small companies with 74%, and medium-sized companies with 80%. In the use of web pages with the business domain or social networks, medium-sized companies predominate with 71.5%, followed by small companies with 57%, and, finally, micro-companies with 44.6%.

The use of electronic commerce is used by micro-companies 63.7%, 62.3% for small companies, and 61% for medium-sized companies. Therefore, these figures allow us to demonstrate that it is important for these businesses to leap the digitization of their businesses (IFT, 2020).

Moschini (2012) explains that the market is dynamic and knowing the tools is not enough, and it is, therefore, necessary to understand the interaction with users. Kotler and Armstrong, (2017), affirm that digital marketing and social networks require the use of resources such as websites, advertisements, mobile publications, and digital platforms that allow them to capture the attention of consumers, bearing in mind their geographical location (Juárez *et al*., 2020).

Digital media are influencing and generating significant changes in people, also influencing their cultural transformation, as well as how people relate to different brands, products, and services (Garello, 2018).

To be part of influential SMEs, it is important to have a good online reputation, because it is an intangible asset of the company related to the perception it has with the public and the interest groups with which it interacts (Flores & Galarza, 2014).

According to Pedraza, Cantillo and Dueñas (2019), the design of marketing strategies and methods not only allows organizations to keep current, but it also allows them to achieve success in meeting their objectives. According to Thompson and Strickland (2012), Durán and others (2018), consider that strategies are a competitive impulse and an important factor for the decisions of managers about resources of the company to satisfy customers. Jones and Hill

(2009), affirm that strategies are the management that the management group carries out to achieve its goals of the company.

Digitization is a very important strategy for SMEs as it allows the survival and internationalization of the business due to the current quarantine. The digital transformation and the application of different strategies are considered very important to offer more physical and digital services and products to be able to enter and survive in national and international markets, with companies in the digital area growing the fastest (Panandiker *et al.*, 2018; MGI, 2017).

According to Panandiker and others (2018), digitization should be used to efficiently penetrate new markets and to adopt new digital business models, which can open up new business opportunities. *La República* (2020) published a study in which it states that, in Latin America, the increase in online purchases increased by 300% during the pandemic, Mexico registers a weekly penetration of digital commerce of more than 500%, with Mexico being the second place in online sales. According to studies by the Mexican online sales association, 6 out of 10 SMEs sell online, showing an increase of 94% compared to 2019. In 2020, 2 out of 10 SMEs that sell online did so as a result of the quarantine (AMVO, 2020).

Digitization can offer platforms with the publication and use of Digital Marketing tools and elements in the value chain, as well as other solutions depending on the industry (artificial intelligence, Block-Chain technology, internet of things, etc. (Bianchi *et al.*, 2017).

One of the many advantages that digital marketing offers is the ROI measurement tool for business since it allows you to adjust the strategy as many times as necessary to achieve your objectives, one of the advantages of this tool is that it is cheaper than other methods, which allows a much more personalized segmentation which allows generating user communities (Vercheval, 2016).

Digital transformation offers many advantages, however, one of the disadvantages is the lack of direct contact to create links between clients and companies (Rintamäki, 2017: 99-101).

McKinsey, in his study estimates between three and five years of digital difference between the most advanced Latin American companies and North American companies of similar size (MGI, 2019: 48), so that Latin American companies must adapt to international levels to compete abroad. from your local or regional market. orienting the focus on Latin American SMEs, which have greater problems in implementing a digitization process due to lack of access to financing, talent, digital infrastructure, or information on successful practices (MGI, 2019: 49). The lack of financing also refers to the fact that SMEs are traditionally excluded from Stock Exchanges as a source of financing (Bonnet, 2018:554).

CONCLUSIONS

Due to the pandemic, a 6% drop in world GDP and a 7.6% drop in the event of a second pandemic wave is expected by the end of 2020, with a double-digit decline in some of the most affected countries, followed by a modest 2.8% recovery in 2021 (OECD, 2020b).

In SMEs, digitization in work processes and tools has been and will continue to be key during this crisis caused by COVID-19. Therefore, SMEs must have the ability to adapt to adverse situations and recognize that there are a variety of future threats that cannot be predicted or measured and, therefore, nor know the effects they may present. Therefore, it is necessary to prioritize the optimization of the company. The systems teach us to optimize the supply chains of the company.

Digital marketing has had significant growth in recent decades, since a large number of companies are investing in these strategies and recognize the reach they have with customers around the world, becoming an important tool for the sales of products. products and services at this time caused by the COVID-19 crisis.

Digital marketing is a series of strategies that allow SMEs to expand national and international trade, this is possible by having a presence on social networks and having a website to have a greater reach with customers. Therefore, it is necessary to strengthen national connectivity, training entrepreneurs with the use of information and communication technologies, and in the regulations regarding Electronic Commerce. Also, SMEs must stand out with a value proposition in the content in digital media, ensuring that they are unique and dynamic, have links to all the information that the client needs to satisfy their wishes and tastes in the different markets.

This article presents the incentives provided by the government for SMEs to have a digital presence, so dissemination through digital media such as social networks, text messages, applications, and web pages are essential for any company that wants to position its brand and maintain or increase your sales.

Social networks give SMEs the possibility to advertise and talk, retain potential customers with corporate values, brand attributes and be able to meet customer needs, allow the promotion of products and services, these qualities being visible and impalpable that the customer acquires when buying.

In SMEs, digitization in work processes and tools has been and will continue to be key during this crisis caused by COVID-19. Therefore, SMEs must have the ability to adapt to adverse situations and recognize that there are a variety of future threats that cannot be predicted and adequately measured and the effects they may present cannot be known. Therefore, it is necessary to

rethink the priorities and optimization of the company. The systems teach us to optimize the supply chains of the company.

This chapter presents the incentives provided by the government so that SMEs can not only count on their fixed businesses but also have a digital presence, so dissemination through digital media such as social networks, text messages, applications, and pages. The web is essential for any company that wants to position its brand and maintain or increase its sales.

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Chapter 6

Failure and Resilience in Family Business

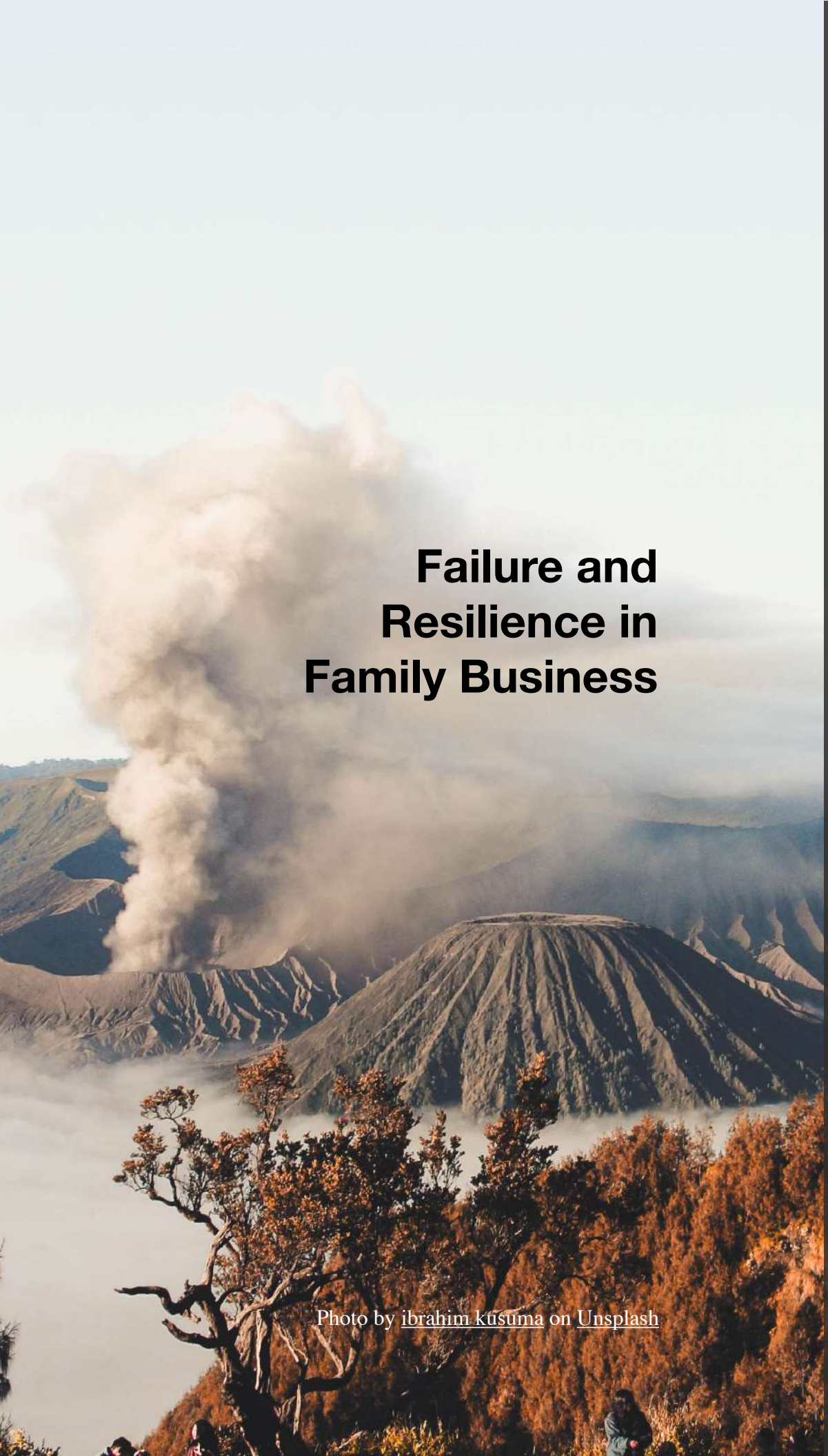

Photo by ibrahim kusuma on Unsplash

Failure and Resilience in Family Business

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Introduction

Family businesses arise from the need to overcome some members of the family (Ward, 1997). Sometimes it is thought that working with the family would be the easiest way to succeed in the company, however, when the required measures are not well planned, these companies tend to fail quickly.

The life cycle for all types of companies is similar to that of a human: they are born, grow, develop and then decay until they die (Davis, Hampton & Lansberg, 1997; Sharma & Salvato, 2011). According to statistical data from previous years, this cycle takes on average of 27 years, although currently with so many changes and adaptation problems, the life cycle of companies becomes shorter (Monsó, 2013).

The auditing company KPMG (2015) reports that around 70% of new businesses do not reach the third year of life. According to Cerón (2009), there are many reasons behind the death of family businesses, which are written below: lack of competitiveness, low liquidity, dissociation of capital, conflicts of interest, problems between shareholders, the parent-child relationship in the company. But the most common is simple: little or no planning in the processes of change generational.

To what degree does failure express little resilience? Can you be resilient by failing? learning about failure helps the individual cope with new and severe

circumstances. Few projects describe the mistakes of companies. Even though mistakes allow you to learn to be more resilient.

With the aforementioned, this research work is justified, which aims to identify the main problems that cause the failure of family businesses in Monclova, Coahuila. The research is constituted as follows: a theoretical framework that shows the bibliography on the subject of the main problems of family businesses, in the methodology section where it is described that the present research was carried out using the case study as a method of investigation, subsequently the sections of results, conclusions and bibliographic references are presented.

FAMILY BUSINESS: CHALLENGES AND PROBLEMS

Family-type companies are those in which the decision-making power is in the hands of the family, the direction, authority, and responsibility are carried out by some of its members and has several members of the second generation working in the business (Sharma *et al*., 2001; Molina, Botero & Montoya, 2016).

If the owners decide that the business remains a family business, it means that control of the business will continue within the same family, inheriting it from one generation to another (Davis, Hampton & Lansberg, 1997; James, 1999; Bjuggren & Sund, 2001; Sharma, 2004).

The family or families that own the company have legal and shareholder control of the company and seek to maintain its sustainability for the next generations. (Le Breton & Miller, 2006; Navarro, 2008; Neubauer & Lank, 2016; Astrachan *et al*., 2021)

"A family business is an organization controlled and operated by the members of a family", *f*rom a different perspective, let's say metaphorically, it is possible to refer to companies with a soul, since the heart of the family is in them, and the vision of the entrepreneur is that it not only remains but also develops together with family integration. (Perret, 2007).

Numerous definitions are found about what is a family business, however, there is a consensus on three basic points of the family business: the property, the business or company, and the family. For this research, it will be defined as a business managed and controlled by the members of one or more families (Handler, 1989; Belausteguigoitia, 2010).

Only 12% of family businesses successfully overcome the incorporation of the third generation into the business. Among other key challenges for the survival of the company, the third generation is in charge of ensuring competitiveness, combine nepotism with professionalism, maintaining family control over the business, and perpetuating family success throughout

generations. (Lansberg, 1999; Jaskiewicz *et al*., 2013; Liu *et al*., 2015; Sangster, 2019)

The family business, by its nature, presents certain challenges that are unique to it, and that do not present companies of other nature. Among them:

1. How do separate family relationships from the business relationship
2. How to maintain healthy relationships in the second and subsequent generations?
3. How to plan the succession and share distribution?

The succession

The most common difficulty in family businesses is succession. Some of the questions asked by family members who are related to companies are, who should be the heir? What will be the guidelines for the selection of the successor? Will tests be applied to the applicants? The same questions should be resolved by the owner in conjunction with family members in a planned and consensual manner, to avoid family conflicts.

Succession not only presents difficulties of assets and resources but sometimes it is also a problem of ability, attitude, aptitude, knowledge, responsibility, and experience in managing a company.

Therefore, the leader of the company must consider that in the future it will be vital for the growth and maturity of the company to cede control to the new generations (Rizo, 2015).

The succession is a long, continuous process that does not end, since the first thing an entrepreneur must do when he takes over the business as successor in full, is to begin preparing your relay (Trevinyo, 2010).

A goal for family businesses is to be passed from one generation to another in a healthy way and optimal conditions. Succession, being such a significant process for the company, must be properly planned and executed. When the time comes for the change of leader in an organization, it will need a correct induction process. This process, through which the new leader of an organization is selected, is known as succession. (Gascón, 2013; Harveston, Davis & Lyden, 1997; Kleiman & Peacock, 1997; Westhead, 1997)

It is not an easy job to raise children who are truly interested in the family business, and it is even more difficult to prepare them for managerial and leadership positions that contribute to the growth of the family business.

According to Carlock & Ward (2010) families that through generations have been successful in the business environment know what development programs and agreements established before the next generation joins the business and they form stronger companies, transitions, successions without problems, and healthier family relationships.

Family conflicts

Bonilla (1998) mentions that conflict is a condition of social, family, couple, or person that puts people in contradictions for various reasons and interests. In this same sense, Jares (2002) defines conflict as the existence of incompatibility between groups or people and refers to both personal and structural aspects, that is, that conflict is generated when there is some incompatible action.

On the other hand, Ander-Egg (1995) maintains that the conflict is a social issue where two or more individuals or groups fight, to exclude the adversary for having interests, objects, and modalities different from theirs. In these definitions, some keywords are mentioned, since the organization is made up of people all with different interests, thoughts, ways of acting, the vision of the future.

It is precisely here where conflicts begin due to the different thought patterns of all the people who make up the organization. This difficulty is made even worse when the people involved in the conflict are family members. It is there that the conflict that distorts attention to what is truly important in the company and impedes the growth and success of the company often arises.

Both problems and differences of opinions, ways of thinking, analyzing, and deciding are part of life, and, because of this, human beings are exposed to face conflicts, both at work and in the family environment. (Cardona, 2008)

From the business point of view, in organizations, there appear inexorably interests at operational, tactical, or strategic levels, which hinder their functioning and generate conflicts. They are also manifest themselves when there is a confrontation or disagreement on the best way to solve a given problem. (Tapies, 2011)

Financial resources

One of the weaknesses faced by small and medium-sized entrepreneurs is to merge personal and business finance, which will generate family and business financial problems. The owners find it viable to finance their businesses with their credit capacity, which with time these advantages are becoming increasingly problematic disadvantages (Steinwascher, 2014).

It is undeniable that no entrepreneur could start his business without contributing his resources, which may come from the sale of personal items or by financing personal loans, which allow him to obtain the resources and working capital he needs to start his operations.

These personal debts should only be used to start the business, but not for its daily operation. Accounting, these initial contributions will make up the capital contributed by the owner as a shareholder of the business, and as the

company generates profits, it will be returned to the owner to pay the personal debts contracted to start-up the business.

The financial aspect is a very important point in family businesses since the company's objectives must be aligned with the family's desire for competitiveness and permanence concerning the company. (Mccann *et al*., 2001; Lambrecht, 2005; Siakas, 2014; Csákné & Karmazin, 2016)

Strategic planning

Planning consists of choosing and setting a goal; developing a project and specifying the steps to follow to carry it out by calculating the risks that could be detected; knowing how to prevent and avoid threats to minimize them; it is continually preparing for good results. Planning should seek to ensure the permanence of businesses because plans, programs, and procedures are formalized so that they operate in a congruent manner in the face of eventualities that arise in the daily life of organizations (Reyes, 2014). Family business planning has traditionally centered on two issues-estate planning and succession. (Carlock & Ward, 2001)

The strategy is a set of actions systematically conceived over time, which must be carried out to achieve a certain goal. The strategy is a choice that involves the entire organization and that consists of selecting from among several alternatives the one that is most convenient, considering all those internal and external factors that surround it: and, based on that choice, make decisions always looking for a better one future position about the current situation. (Reyes, 2014)

For Chiavenato (2011), strategic planning is a process in the organization that is in charge of drawing the guidelines to define the action plans that will generate its competitive advantages and sustainability over time. Strategic planning is the elaboration, development, and implementation of different plans by companies or organizations to achieve the objectives and goals pursued based on the opportunities and threats offered by the environment.

The organizational culture and climate

The different behaviors in this type of company are related to variables such as the culture of the family business, where family members exert a strong influence on the behavior of the company (Adler & Perez, 1993). It is worth mentioning that the culture of the family business is the product of its beliefs, values, and goals embedded in its history and social ties (Hall, Melin, & Nordqvist, 2001).

According to Chiavenato (2007), Organizational Culture is defined as "the way of doing things within an organization, it is the one that distinguishes one

organization from another, making it have its own identity, where systems of meanings are shared between its members".

When we talk operationally about Organizational Culture, we are talking about the physical environment, the interpersonal relations that are generated, the work functions and the way of exercising them, and the formal regulations that affect an organization; the above, together with the working climate and the resulting processes, are the central focuses within a general model of organizational diagnosis. The climate can be constructed as

> "a self-reflection of the members of the organization about their relationship with each other and with the organizational system". (Zamora, 2005; Chirico & Nordqvist, 2010)

Sandoval defines organizational climate as

> "the work environment perceived by the members of the organization and which includes structure, leadership style, communication, motivation, and rewards, all this exerts a direct influence on the behavior and performance of individuals." (Sandoval, 2004)

Goncalves defines organizational climate as

> "a phenomenon that mediates between the factors of the organizational system and the motivational trends that translate into behavior that has consequences on the organization such as productivity, satisfaction, rotation, etc." (Goncalves, 1997)

The communication

Communication plays an important role in daily development to guarantee success in family businesses since the poor performance of this variable can bring to a lot of conflicts. (Dyer Jr & Handler, 1994; Eddleston, Kellermanns & Sarathy, 2008)

According to the article presented by Professor Jofré (2006), the communication consists of an act by which an individual establishes contact with another or others, allowing them to transmit certain information. A person may try to communicate for various reasons or purposes:

- To transmit information.
- To try to influence the behavior of others.
- To express feelings, thoughts, or states of mind.
- To simply execute some kind of action.

When dealing with the subject of communication in companies, (Iman, 1978) makes two statements: 1) there is only one way in which you can be greater: better communication, 2) organizations are favored or limited by the effectiveness of the communication within them.

With these two statements, he allows us to know the concept of communication in terms of its importance and its effect on organizations. Of course, in our view, the first statement could be improved if communication is shown as one of the ways and not as the only one of being greater; while the second would be more adjusted to contemporary reality if the two-way communication of the company with its environment is also included.

Communication offers opportunities for openness and exchange; Not in vain it is admitted that the greatest obstacles to communication are hidden interests, leaving a lot of time without solving problems, and the fear of expressing one's feelings (ACEF, 2000).

FAILURE OF THE FAMILY BUSINESS

The term failure comes from the Latin frangere = which means "break, crash". Likewise, the Dictionary of the Royal Spanish Academy (2001) defines failure as: "1. Failure, an adverse result of a company or business. 2. A pitiful event, unexpected and fatal. 3. Fall or ruin of something with a crash and break".

Different definitions of business failure are distinguished to identify these types of companies. Altman (1961), the initiator of this type of study, considered the failure of a company when it is legally classified bankrupt, and in (Altman, 1988) considered a failure when the company reaches a critical state when it cannot meet its obligations. with their creditors, due to the accumulation of losses, or due to a deficient financial structure (Enguídanos, 1994).

This multiplicity of possible approaches to the concept of failure could be distinguished into three categories that most of these studies use: 1) Inability to pay short-term debts or obligations; 2) when you have negative equity, and 3) the legal declaration of suspension of payments or bankruptcy.

METHODOLOGY

As a research method, the case study consists of the empirical investigation of a contemporary phenomenon within its real-life context to contribute to the management of scientific knowledge (Hancocok & Algozzine, 2017; Yin, 2003). Feagin, Orum and Sjoberg (1991) define this method as an in-depth investigation of a social phenomenon using the qualitative approach. The analyzed phenomenon can be an organization, a role, a process, an event, etc.

The present investigation used the case study as a research method, the benefit of this research method was seen, since the problem object of the study combines the three requirements indicated by (Yin, 2003): the research questions must turn into around the how and/or why of the phenomenon under study. There is no control over the events being investigated, that is, it is not possible to

experiment, and the phenomenon under study is contemporary, rather than a historical event.

For its theoretical contribution, the design is instrumental. Since it gives the possibility of understanding the greater it exposes more in-depth the theoretical explanations of the problems that cause the failure of family businesses, through the study of one or more cases (Hancocok & Algozzine, 2017).

The design is descriptive since its purpose is to present descriptively the main problems that cause the failure of family businesses in Monclova, Coahuila. Determination of the number of cases to investigate (single or multiple): A fundamental decision to consider when using the case study as a research method is to determine whether to choose one case or several. A key factor that influences the decision to choose between a single case or several depending on the purpose of the investigation (De Massis & Kotlar, 2014). For this investigation, five cases of family businesses were selected.

Regarding reliability, (Arzaluz, 2005) adds, "the case studies are not always the same because phenomena are analyzed with social scenarios that are constantly changing". Peña (2009) states that "A case study aims to describe a case and does not seek universally valid knowledge".

This is corroborated by (Arzaluz, 2005) when he states that "case studies cannot define general laws and cannot be used to obtain general patterns, however, the results and interpretation may be sufficient to generate ideas and options for different stages".

In this research, the semi-structured interview was used as a measuring instrument, which was carried out in December 2019 with the owners of the following family businesses: Automotive Paint "T", Miscellaneous "B", Hotel "La F", " V Barber "and" W Gym ". It should be mentioned that this research will be used in fictitious names.

The variables to be measured were established: succession, family conflicts, financial resources, strategic planning, communication, and organizational culture and climate. Table 1 presents the variables, indicators, and items that made up the interview.

Table 1. Variables, indicators, and items

VARIABLES	INDICATORS	ITEMS
Succession	- There is a succession plan. - Identification of a successor.	1. Do I make a succession plan for your retirement? 2. Have you identified your successor? 3. Do you design a preparedness plan for your successor?
Family Conflicts	-There are protocols for selecting personnel. - There is an organizational structure with authority and responsibility in the company. - There is a description of functions. - There is acceptance by family members employed to fulfill their functions.	1. How do family problems affect the company? 2. Do you have a personnel selection process? 3. Do you have an organization chart in the company, where authority, responsibility, and functions are defined? 4. Do the employed relatives experience dissatisfaction with the assigned salary?
Financial resources	-Existence of control of the company's resources. - Existence of control of contracted debt	1. Has your company experienced any financial problems? 2. Does the company have a loan? 3. Do you use the services of a financial advisor or accountant? 4. Do you use financial ratios to find out the financial situation of your business?
Planning strategic	- There is a strategic plan in the company - Mission, vision, and defined objectives. - Action plan to solve problems	1. Do you have a strategic plan 2. What are the mission, vision, and objectives of the company? 3. Do all the employees know the mission, vision, and objectives of the company?
Communication	There is effective communication	1. What is the communication channel you use? 2. How is communication with your employees?Do employees feel heard when communicating an idea?
Culture and Organizational Climate	- There is a good organizational climate - There are distinctions in the treatment of employees for being relatives	1. What is the work environment like? 2. Do you give an incentive for good performance? 3. Is the treatment of employees, whether family or not, the same?

Source: Own elaboration.

BACKGROUND OF THE COMPANIES INTERVIEWED

- Automotive paint "T" this company started its operations in 1996, had a presence for around 22 years, going through only one generation, with a small number of three workers, three children, and the creator of the service company. Everything was going as the founder dreamed it would be, however, a series of problems occurred that slowed the permanence of the business, an erroneous objective that the owner had since it had never been projected in years as a bigger and better business.
- The founder of a trading company named Miscellaneous “B”, which started in 1984. This company has a presence to date, going through 3 generations, with several 10 workers today, 6 of the 10 are family. So far everything is going well, with ups and downs, like any company, but with the mortification that as a family they have, for not having a supermarket the size they had dreamed of.
- The heir to a hotel and buffet company called Hotel “La F” that began in 1980. The company had a presence for around 35 years, going through two generations, with a small number of 14 workers of which 5 are family members, and joint command of the company with his older brother. Everything was going as the father of the F brothers had dreamed, however, a series of problems occurred that slowed the permanence of the business, having a company with two completely different people is very complicated and more if they do not reach agreements.
- The founder of companies, initially family dedicated to providing exclusive hair service to men and spas for both sexes, inherited a branch of barbershop and spa in Monclova, Coahuila to his only son, the companies started in 1990 until 2016, the barbershop named “V Barber” and the spas named “S”, went through two generations, with some 16 workers, four family members between the two companies, the decisions were left to the successor. The companies were going perfectly as it had cost the founder, however, a series of problems due to bad decisions of the successor stopped the permanence of the business, having a person in charge of a company not suitable for the position, marked the end of the branches.
- The successor of a club company called "W Gym", where using a monthly payment he lent the facilities to the members to exercise people of both sexes, a company inherited by his father, the company started in 1995 until 2018 passing only through two generations, with the number of five workers, four of the family. When the father founded the company it was one of the best in Monclova, Coahuila since apart from providing its facilities to exercise, it

offered sports products. The success would last relatively little since a series of problems by bad decisions of successor stopped the existence of the business.

In table 2 they present data such as the start of operations, the number of workers, the generations, and observations commented on by the interviewees.

Table 2. Data and observations of the companies interviewed

COMPANY	PERIOD OF OPERATION	GENERATIONS	WORKERS	OBSERVATIONS
Automotive Paint "T"	1996-2018	1	4 family members	The wrong objective of the owner stopped the permanence of the business. The future was never projected as a bigger and better business.
Miscellaneous "B"	1984-Continues to operate	3	6 family members 4 external	They have the frustration of not fulfilling their dream of being a supermarket.
"V Barber"	1990-2016	2	4 family members 12 external	Bad decisions of the successor son slowed down the success of the business as he was not prepared to fill the position
Hotel "La F"	1980-2015	2	5 family members 9 external	Having a company with two bosses is very complicated and more if they do not reach agreements.
"W Gym"	1985-2018	2	4 family members 1 external	Bad decisions of the successor son stopped the success of the business

Source: Own elaboration.

RESULTS OF THE INTERVIEWS BY VARIABLE

Succession plan

- Of the 5 family businesses interviewed, all mentioned that they did not carry out a succession plan.
- Of the 5 family businesses interviewed, 4 say that their successors are their children, only the Automotive Paint business T did not have a successor since none of their children was interested in continuing the business.
- Of the 5 family businesses interviewed, only 3 survived the transfer to the second generation, one to the third, and the other no longer survived.
- Miscellaneous B has survived three generational changes and continues to operate, while Hotel La F, W Gym, and V Barber no longer survived the second generation and Pinturas Automotriz T no longer continue because the children are no longer interested in the family business.

Family problem

- According to the interviews carried out with family businesses, Pinturas Automotriz T, Hotel La F and V Barber, these mixed their family problems with business ones, which generated conflicts in the organizational climate.
- Miscellaneous B is the only one that has defined the functions of its staff and they know what is expected of them, the rest of the companies interviewed did not have it defined.
- Of the 5 family companies interviewed, 4 did not select personnel, they hired them because they are family members, even if they were not suitable for the position. Only Miscellaneous B is the one that selects its staff.
- Of the 5 family businesses interviewed, 3 were satisfied with their salaries, those that are not Hotel La F because the successor withdrew the compensation they received. In the case of W Gym, the family members received more wages and worked fewer hours, so the rest of the employees were dissatisfied, apart from the fact that they did not have insurance or benefits.

Financial resources

- Of the 5 family businesses interviewed, only V Barber applied for loans and abused them so that they could not pay them later. The rest did not ask for a loan.
- Miscellaneous B is the only one that requested external support from an accountant, the other 4 companies do not consider external assistance necessary.
- Of the 5 family businesses interviewed, only 3 experienced financial problems during their operations. Miscellaneous B a time spent more than he could afford, but he tried hard to work hard to get ahead, V Barber made bad decisions and did not pay attention to his finances, W Gym had clients who did not pay their monthly payment, so they did not It generated a lot of profit to invest.

Strategic planning

- Of the 5 companies interviewed, only V Barber had a strategic plan.
- V Barber had its mission, vision and objectives defined, unlike the other 4 companies that did not have them. Automotive Painting T comments that a nephew told them that it was important to have a mission and vision in his workshop so that they would commit to the company, but the founder and his children never had the interest to listen to him, not knowing how important it would be to have taken into account your comments.
- Of the 5 companies interviewed, only in V Barber did the workers know the strategic plan with clear objectives, strategies, and action plan that the founder instilled in them. The employees were grateful to the founder,

because, even if he was not in the company, they knew the mission, vision, goals, objectives, and values, which were printed and hung on frames to commit more to the staff. The development plans were always present while the founder was there, actions that were not made with his son in charge.

- By not having a strategic plan how to solve their problems: in the case of Pintura Automotriz T, the founder always had a solution to every problem that customers brought to his workshop, for miscellany B, Hotel La F and W Gym mention that they attend to problems as they arise. In the case of V Barber, having a strategic plan with clear objectives, strategies and action plan that the founder instilled in the workers, also, each senior employee was dedicated to transmitting knowledge to the new staff and the results were constantly monitored by the founder, so it was simpler to solve the problems since the founder was in charge of reviewing the results, actions that were stopped due to lack of knowledge and interest in the successor.

Communication

- The communication in Pintura Automotriz T was good because he talked with his children and explained to them how to do things with the process to follow and action plan, which were constantly monitored by the founder. In the case of miscellany B, he listens carefully to his workers, gives them fifteen minutes to talk and they have motivational talks. The communication of the Hotel La F, in general, was a complete disaster since workers rarely contributed opinions, complaints and suggestions stayed with the employees because there was no way to spread the word, and there was no communication with the bosses. At W Gym the founder did not listen carefully to his workers, about their concerns, he was guided only by what his youngest son thought was the right thing to do, even if he had no experience. V Barber, his successor, listened to the concerns of his workers but did not take them into account. Due to his arrogance when problems arose, he did not go to outsiders for support. When bad comments and disagreements occurred between employees, he addressed disrespectfully with those involved.

Organizational culture and climate

- Of the 5 companies interviewed regarding their work environment, only miscellany B has a good work environment; they mention that they work as a team and support each other. In the case of the other four companies, they do not have a good working environment, such as Automotive Paint T the children argued a lot and the father did not intervene which made the work environment very tense, V Barber the successor, his mistake was how closed he was to some opinion of his workers, left them in a bad way in front of

customers, raised his voice. The resignations were constant, which hindered the stability of the staff and their experience, little by little the experienced staff left, leaving people with little experience, which meant that the quality of the service decreased.

- As for providing incentives for good performance of the 5 companies interviewed, only miscellany B gives them an incentive to motivate them to do good teamwork.
- Regarding the distinction in the treatment for being family members, of the 5 companies interviewed Automotive paint T and miscellany B mention that the treatment is the same for all employees, the Hotel La F, V Barber and W Gym there if there is a distinction in the deal because in the case of Hotel La F the relatives do not fulfill their job, but as they are family they know that they are not going to fire them.

Conclusions

There is a long list of micro and small family businesses that, due to some problems in their lives, could not survive. When interviewing five family businesses from Monclova, you can see the problems they faced.

The most relevant problem is considered the lack of a succession plan since all the family businesses that were interviewed, all lacked a succession plan that would guarantee an efficient generational change to the founders, this is precisely one of the reasons why 4 of them do not continue in the market because they did not have the precaution of selecting and preparing their successor, they only decided in all cases that they were their children but without evaluating whether they were suitable to run the business, this coupled with the lack of preparation brought As a consequence of the failure of these companies, the only one that has managed to survive the third generation was miscellany B, which is still in operation. With this result, it is verified what the theory says that there is no succession plan in family businesses.

Another major problem is the failure of these family businesses was mixing family problems with those of the business. Also not having an organizational structure with well-defined functions, authority and responsibility, and selecting staff because they are relatives, which must be according to their abilities and skills to perform the position, as well as a fair remuneration that goes according to their position and not because they are family.

Regarding financial resources, this is a very relevant point since not monitoring the income and expenses of the company is something that easily leads to bankruptcy, which was the case of two of the interviewed family companies, who by not paying attention to the As a consequence, managing their

resources led them to go into debt until they went bankrupt because they could not pay their debts. For this reason, in the family business, the basic rules of family finances must be respected: the company's cash should not be used as family cash and money flows should follow the common rules for all businesses.

Strategic planning is presented as a problem for companies because by not having defined clear objectives, strategies, action plan, mission and vision, they do not know how to deal with the moment a problem arises since they do not have a defined goal and no one knows where the company is headed which caused them to fail.

Another problem that caused these companies to fail is that they did not have effective communication with their employees as their opinions or suggestions were not listened to, which caused a very bad work climate to be generated in the companies, which is the last of the problems that generate the failure of companies since they work with great disunity and in a very tense environment.

According to the results obtained in the interviews conducted with five family businesses, four of which no longer survived the generational change, it is concluded that the problems that make family businesses in Monclova, Coahuila fail are: the main one is that they lack a plan succession, family conflicts, financial resources, strategic planning, communication and culture and work environment. Also with these results, it can be concluded that this research reaffirms what the theory handles to the problems that make family businesses fail, such as the succession variable.

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Chapter 7

Competitiveness and Resilience With Inclusive Business Models

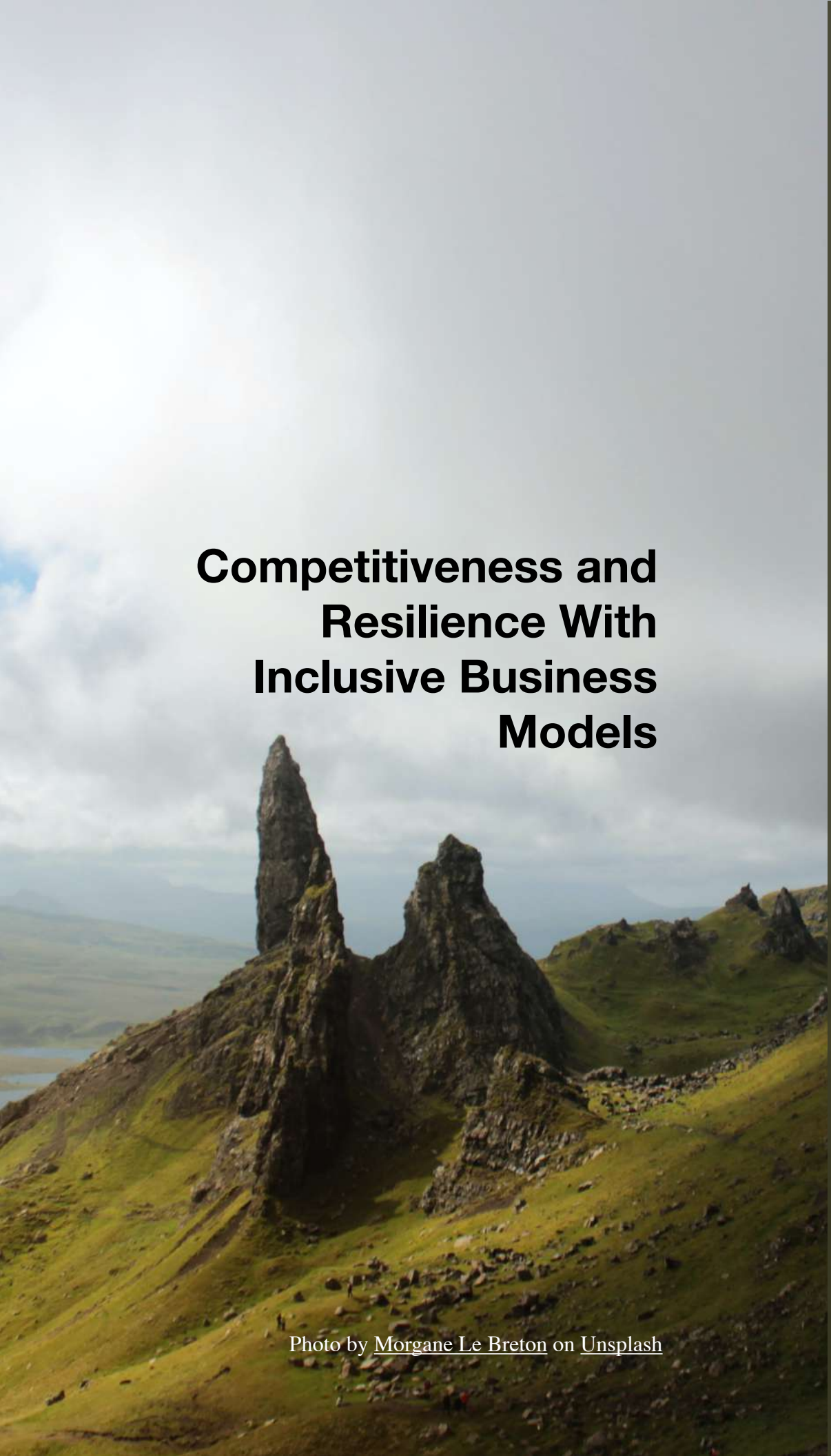

Photo by Morgane Le Breton on Unsplash

Competitiveness and Resilience with Inclusive Business Models

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Introduction

The Agenda 2030 (UN, 2015) announces that the society of the 21st century is in the process of consolidating a global economy that provides business opportunities for low-income groups as companies face the challenge of being inclusive (Martinuzzi & Schönherr, 2019; Martín & González, 2016; Schramade, 2017; Pedersen, 2018; Reyes, 2020).

However, business actors are still not clear about what inclusion means in the business model. This chapter conceptually outlines what it means to move to an inclusive business. Companies are changing the way they operate. Sustainable business models, social enterprises, and hybrid organizations may be overlooked to transform inclusive growth (Haigh & Hoffman, 2011; Hoffman, Badiane & Haigh, 2012; Bocken *et al.*, 2014; Schaltegger *et al*., 2016).

The central argument is that inclusive business models essentially prioritize value creation over value capture for low-income groups (Rosenstock et al., 2020). It also proposes how corporate responsibility boundaries can be defined (Cajiga, 2018), with implications for how inclusive business models should be designed as a source of competitive advantage.

Social and economic marginalization determine the patterns of poverty and inequality, which, added to the health crisis resulting from the SARS 2 COVID-19 pandemic, create a scenario of accelerated growth of the most vulnerable segment of the population for many developing countries is the main challenge to be solved (ECLAC, 2020).

In this scenario, the limits of public intervention are recognized by society and assumed by the Sustainable Development Goals (SDG). Thus, actors' participation from all sectors, commitment, and responsibility are the pillars for constructing a more inclusive society. In this scenario, companies are a vital agent, under the premise that (1) business profitability and social business goals are a binomial for competitiveness (Kramer & Porter, 2011).

Under this assumption, Prahalad and Hart (2002) propose that low-income markets represent profitability for many companies that focus on redesigning business models to generate social value.

The urgency to respond to the needs of the most impoverished population living in Mexico is a task assumed by businesses to fight poverty to face the challenges of the COVID19 pandemic. Under this reasoning, the research question is: what are the characteristics of inclusive business models, particularly for small producers' integration?

Therefore, the objective is to analyze the characteristics of inclusive business models, which seek to increase their participation in the low-income segment, based on three companies operating in Mexico. To this end, we conducted 1) a review of the literature on bottom-of-the-pyramid theory to understand its evolution; 2) the convergent aspects between corporate social responsibility, inclusive business, and competitiveness; and 3) the descriptors of the models of inclusive business; profitability, social value, and inclusion as pillars in the generation of social welfare, in the valuation of the cultural identities of the communities and the operational definition of the role of the stakeholders in the fight against poverty and inequality, as well as in responses to the challenges implied by the context of the regional ones, or the technological capacities installed in the communities.

The work's main contribution lies in the fact that three companies selected to evidence the formulation and implementation of productive projects through social investments and community participation. The inclusive business models are a vehicle to make compatible the integration of the social dimension to the business strategy and the market economy, as a condition to improve the quality of life of the population living in poverty.

Likewise, the study highlights that the line of research on inclusive business models is part of strategic management's research agenda to generate sustainable competitive advantages and increase market participation with low

purchasing power. The results of this research can be useful for small producers in the primary sector to design their business models in the base of the pyramid market and compete profitably.

To this end, the chapter addresses the background of the theory of the base of the pyramid from the business perspective, a conceptual approach to the inclusive business model, then briefly presents the method of research and analysis of the selected companies. Finally, the results are summarized, and the discussed findings give way to the conclusion.

Background to the base of the pyramid theory from a business perspective

The consumption potential represented by the world population at the poverty level has been a relevant issue in the theory of the base of the pyramid, BOP (Landrum, 2007; Simanis, Hart & Duke, 2008; Rivera & Rufin, 2010; Prahalad & Hart, 2010; Kistruck *et al*., 2013; Tasavori *et al*.,2015) and the design of business strategies to take advantage of the consumption potential, known as BOP version 1.0 (Table 1.)

Table 1. Evolution of the Base of the Pyramid Theory

• BoP 1.0 - Find fortune. Define value proposition as potential consumers (Prahalad, 2002). • BoP 2.0 - Creating fortune. Strategic allies that facilitate access to inputs and distribution channels (Michelini, 2012). • BoP 3.0 - Sharing fortune. Participation of the BoP is active in all stages of development, production, distribution and coordinated post-consumption in the value chain (Arora & Romijn, 2012; Reficco, 2012) • BoP 4.0 - Enabling fortune. Joint value creation and value appropriation. Active definition of the role of stakeholders, including duties and benefits. (Borchardt, 2019)
creation of shared value Policies and operational practices that improve the competitiveness of a company while promoting social-economic conditions in the communities in which it operates. (Kramer & Porter, 2011)

Source: Own elaboration.

The second generation of the theory considers the poor not exclusively as consumers, but as business partners, and the relationship extends beyond merely listening to an in-depth dialogue (Michelini, 2012). This relationship between the

company and the community is direct and is not mediated but facilitated by different actors such as a non-governmental organization.

While "Sharing Fortune" is the third generation, it assumes that companies are committed to sharing their wealth and offsetting some of the negative impacts, mitigating risks, improving income and employment creation of the BoP (Arora & Romijn, 2012; Reficco, 2012).

The main point is that the concept of sustainability has been applied to corporations (e.g., using new technologies or practices to save money and conserve natural resources) rather than nations' overall development. The fourth-generation places emphasis on business modeling to "Enable Fortune," under the principle of respecting the rights of communities, their knowledge systems, empowering their resources and local capacities as drivers of the sustainability of fortune generated at the base of the pyramid), giving way to inclusive business models (Borchardt, 2019).

In this regard, Lashitew, Bals, and van Tulder (2020) state that the convergence of fourth-generation BoPs guiding the transition to inclusive businesses. Combining profit with social impact can potentially alleviate poverty alleviation while creating new business and innovation opportunities, offering diverse practices as a source of competitive advantage.

A CONCEPTUAL APPROACH TO THE INCLUSIVE BUSINESS MODEL

The following section presents a brief review of the literature on inclusive business models (IBM), highlighting the fundamental concepts of inclusion from three questions (1) to what? (2) to whom? And (3) to what? Subsequently, the notion of inclusion as a process proposes a characterization. It concludes with a reflection on the critical issues of the research agenda for inclusive business.

Prahalad and Hart (2010) underpin entrepreneurial growth in business opportunities that can be exploited by actively participating in and serving the 'base of the pyramid' (BoP) from the generation of shared value (Sáez & Cabanelas, 1997; Fernández *et al.* 1999). With an emphasis on developing possible solutions to the problems associated with market failures that limit low-income groups' participation in the economy either as consumers, workers, producers, or entrepreneurs (Paradoy, *et al*. 2019).

Applying the base of the pyramid theory, according to Guadarrama and other (2018), the business is inclusive to the extent that the low-income sectors support the profitability objectives in a market composed of producers, distributors, and consumers who access services and products adjusted to their context.

Thus, companies that have an inclusive business model aim (to what?) to create opportunities for sustainable and decent income generation (from whom?)

for lower social groups and include popular initiatives (in what?) solidarity economy (Parody *et al*., 2019; Sahakian & Dunand, 2015; Konda, Starc & Rodica, 2015; Lemaître & Helmsing, 2012).

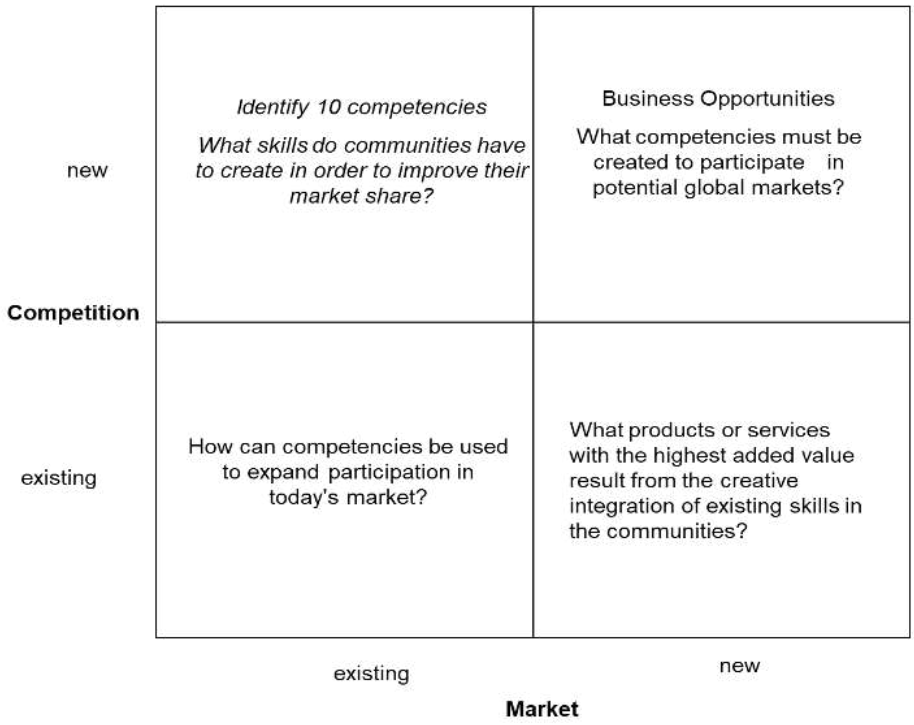
Thus, "inclusiveness refers to strengthening the factors that influence the social and economic integration of vulnerable actors such as small-scale producers, among others, in a sustainable manner" (FAO, 2019, p. ix). Therefore, the architecture of the NIM (Teece, 2010) is characterized by the following descriptors:

- Co-creation of value: the network of value is identified" that articulates the various economic actors working together to co-produce (Ramaswamy, 2009; Gummesson *et al*., 2010; Alves, Fernandes & Raposo, 2016).
- Co-dependence: the relationship between the company and the communities' ecosystem (Jacobides, Cennamo & Gawer, 2018; Radziwon & Bogers, 2019)
- Co-learning: Combination and transfer of knowledge and technology from the base to the top of the pyramid and vice versa. For example, the company trains or provides technical assistance to social producers and can access local knowledge, experience, and ideas. (Ansari, Munir & Gregg, 2012)
- Co-invention: is shared knowledge used to access new opportunities to serve clients at the pyramid base. (Smit, Sheombar & Silvius, 2009; Thota & Munir, 2011; Osborn, 2012)
- It co-exists on a local and global level: a company can take locally produced goods and sell them in non-local markets (Guadarrama *et al*., 2018).

Licandro (2013) adds that "these are companies that increase their income by incorporating the poor into their value chain, whether as partners, consumers, suppliers or distributors" (p.17). According to Gali and others (2020), having a social orientation is beneficial for social and economic performance.

Tools for analyzing opportunities and designing productive projects proposed by Licandro (2013), such as identification of opportunity sectors, the matrix of restrictions and strategies, typology of productive projects determined by their place in value chains, modalities of intervention by the company in the development of the constructive project and map of institutional actors, help in the stages of planning of productive projects; preparation and integration of communities; configuration of the creative process; strengthening of community capacities and resources and execution (Betancour, 2014).

Figure 1. Competence Portfolio to Generate an Inclusive Business Model



Source: Own elaboration.

According to FAO (2019), private sector business actors, large multinationals, and non-profit, non-governmental organizations have been used in inclusive business models. For example, in 2005, the World Business Council for Sustainable Development conceptualized them as an organization that "seeks to contribute to poverty alleviation by including low-income communities in its value chain, without losing sight of the ultimate goal of the business, which is to generate profits" (quoted by Betancour, 2014, p. 17)

- Strategic management,
- Access to market opportunities,
- Coordination between actors and responding to community demands

with the inclusion of small farmers [producers] in value chains, and more generally in markets, (...) when there is a viable business case, poverty is reduced by ensuring viability and competitiveness" (FAO, 2019, p. 6).

METHODOLOGY

Modes of consumption and means of access to services and products, so that clients demand innovation in business models to increase their share of the pyramid market's bottom and the ability to contribute to the significant challenges of 21st-century society and the impacts of the COVID 19.

In this context, to answer the question of what characteristics of inclusive business models are, particularly for the integration of small-scale farmers, it was considered useful to give this research an experimental design divided into two stages.

The literature on the pyramid theory base is systematically reviewed from the business perspective to advance inclusive business models in the first stage. In the second stage, three Mexican companies were selected. The selection of companies for the study of inclusive businesses involves small producers creating and capturing value in a company, based on the 2018 Index of Inclusive Businesses.

Because the emerging field of NMI in the field of strategic management is a driver of innovation for the inclusion of small-scale producers, considering seven axes: vision and strategy; indicators (inclusion, economic, social impact, and competitiveness); people; organization; processes; marketing and communication; communication and inclusive business initiatives.

According to Kramer and Porter (2011), the company gains a competitive advantage by reconfiguring the value chain. Thus facilitating the integration of vulnerable groups (base of the pyramid) in the operation of each of its links to improve their performance in the market, since generating value among the poor and businesses involves risks and costs that are symmetrical for generating profitability social impact.

One way of presenting competitive companies that include NIs and CSR is with the Inclusive Business Index presented by Ramírez (2018, p. 23). This index "uses rigorous indicators aligned with current inclusion standards to quantify participating corporations' progress, including businesses of different sizes and sectors.

DISCUSSION AND OUTCOME: INCLUSIVE COMPANIES IN MEXICO

Nestle Mexico

With a score of 5.0, Nestlé ranked second in the 2018 Inclusive Business Index in the Transformation category. The implementation of the "Creating Shared Value" strategy with corn, cocoa, and coffee sourcing programs. The Corn for Mexico Plan aims to train farmers in environmentally friendly cultivation techniques with a projection of the Mexican product demand in 2022.

In the coffee-growing areas in Chiapas, Oaxaca, Veracruz, and Puebla, technical assistance to guarantee good cultivation and certification practices are included in the Nescafé Plan, which links to inclusion and equity policies. In the results report (2016-2018) of Nestlé's CVC, implemented programs and initiatives promote the well-being of the communities and help build resilient and prosperous communities. Its actions are divided into rural development, respect for human rights, and decent employment.

Toks Restaurants

Toks, as an inclusive company, was rated 5.0 and highlighted in the axis is the sustainability of the company's productive process for its program of inclusive business within the framework of social responsibility. With actions to support small local producers (coffee, chocolate, jam, honey, granola, and mole) and young people in Chiapas and Baja California in vulnerable communities to ensure entrepreneurship opportunities.

This company claims to be committed to generating positive social and environmental impacts both in its business operations and in the value chain, ensuring that its initiatives have benefited thousands of people across the country sustainably and responsibly. With its productive projects such as:

- *Amuzga honey*. Whose purchases amount to more than $4 million, corresponding to 65 tons of product, benefiting more than 57 producers and their families. Contributing to the 98% reduction in community migration, producers sell their products at a fair price without intermediaries and in a safe market.
- Santa Rosa Jam. Whose purchases were reported for more than $7 million, corresponding to more than 115 tons of product. Plus, extra income from cardboard recycling and composting of organic waste.

Herdez Group

Herdez obtained a 3.9 rating for having inclusion strategies aligned with the "Saber Nutrir" program. With this program, Herdez explores different alternatives to improve nutrition with training actions in primary schools in CDMX, Jalisco, Nuevo Leon, San Luis Potosi, and Sinaloa to provide food education.

An addition to the central mission of the Herdez Foundation is "the promotion of food research and development with the scientific, cultural, social and philanthropic meaning" (Herdez, 2020). This is how it supports in-kind marginalized groups, extreme poverty situations, or disaster cases by developing research for food production with high nutritional value while promoting Mexico's culinary tradition.

Table 2. Description of the companies selected for the study

Companies	Description	Market Share	Index of inclusion	Ininclusion criteria						
				Vision and strategy	Metrics	People	Organization	Processes	Marketing and Communication	Inclusive business initiatives
Nestle French	The world's largest food and beverage company, with more than 150 years, has a presence in 190 countries.	International	5	4.8	4.4	4.0	4.8	5.0	5.0	5.0
Talks Mexican	Restaurants with 48 years of tradition and making history in Mexico Currently, there are 208 restaurants in the country, growing and reinventing themselves.	National and local	5	4.1	4.7	4.5	5.0	5.0	5.0	4.5
Herdez Group Mexican	The leading group in the processed food sector with 110 years of existence is one of the top players in Mexico's ice cream category.	International, national and local	3.9	2.0	3.1	3.5	4.1	2.9	3.2	5.0

Source: Adapted from Ramirez (2018).

After the analysis in Tables 2 and 3, it is possible to establish that small farmers have social investment and social project promotion mechanisms. In Nestlé and Toks, generated profits are through flexible commercial arrangements. In Toks, product sales consignment is instrumented and agreements to promote the development of entrepreneurial capacities and skills.

That includes taking advantage of ancestral production techniques and traditional and modern marketing and distribution networks, making it possible to increase the number of actors involved along the sector's value chains and diversify the sources of agricultural producers' income (Betancourt, 2014).

The Herdez group promotes a support system for small-scale producers, particularly about training and the dissemination of actions to improve nutrition based on the states' culinary traditions in which it operates.

In the three companies selected for the study, the priority is to create and appropriate value by implementing social responsibility program instruments that consider the groups' vocations at the pyramid's base. (Borchardt *et al*., 2019) noted the design, production, distribution, and post-consumption of high value-added products in inclusive enterprises' value chain (Figure 1).

Table 3. NIM characteristics according to the selected companies

Principles of competitiveness		*NMI*		
Principle	***Parameters to be evaluated***	***Nestle***	***Toks***	***Herdez***
Strategic management Access to market opportunities	The model generates an appropriate income for small producers	✓	✓	✗
	The margin per product is appropriate.	✓	✓	✗
	The actors earn enough to keep participating.	✓	✓	✗
	It is scalable for producers, a greater volume and the number of producers.	✓	✓	✓
	There are conditions and mechanisms for purchase / delivery that are appropriate to the needs of small producers.	✓	✓	✗
Coordination between actors	Actors collaborate to do business and solve problems.	✓	✓	✗
	Feasible mechanisms exist to improve collaboration among actors.	✓	✓	✓
	Transparent pricing mechanisms are available.	✓	✓	✗
	Facilitate the participation of small producers	✓	✓	✓
	Information exchange among actors (formal or informal mechanisms).	✓	✓	✗
	They recognize their interdependence.	✓	✓	✓
	Collaboration is promoted (better prices, bonus for sales).	✓	✓	✗
Responding to community demands	The model strengthens the capacities of actors to consumer demand	✓	✓	✓
	Actors have access to market information.	✓	✓	✗
	Stakeholders have access to financial services.	✓	✓	✗
	Support services appropriate to the needs of small producers are available	✓	✓	✓

✓ It is specified in the Social Responsibility Report

✗ Not specified in the report

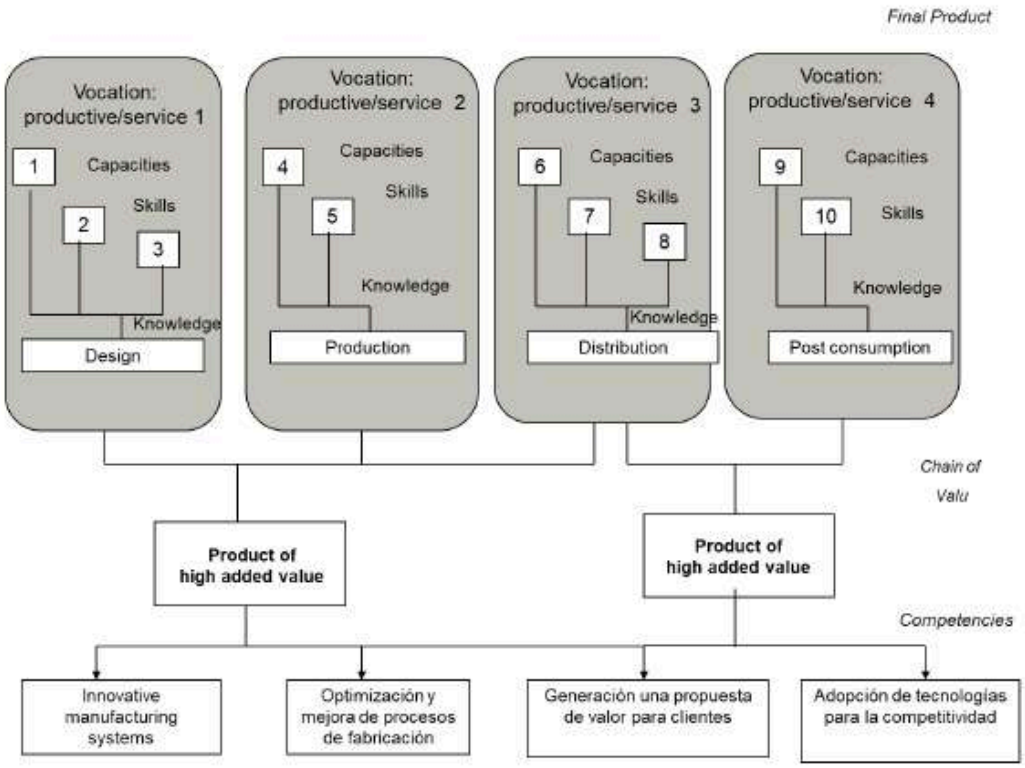
Source: Own elaboration based on FAO, 2019.

Therefore, inclusive business models incorporate vulnerable groups within and outside the company by meeting the community's social demands and incorporating social investment and competitiveness criteria that favor social innovation processes (Lashitew *et al.*, 2020).

Both social responsibility and competitiveness acquired new dynamism in transforming business models and growth rates at the pyramid's base (Licandro, 2013; Musso, 2009). This dynamism is regulated by business policies for social investment and social projects aimed at vulnerable groups.

Hence, the progressive redefinition of social indicators will be a priority task for companies in a post-covid scenario and within the framework of sustainable development principles that, without a doubt, will gradually gain ground in the field of designing business strategies to be competitive (Parody, 2019).

Figure 2. Structure of value creation and ownership in inclusive enterprises



Source: Own elaboration based on Betancur (2014) and Licandro (2013).

In practice, it can reasonably be expected that few companies involving low-income groups will find a solution to market failures. For example, small-scale corn farmers produce and market surpluses enough to monetize their farming activities by joining the Nestlé company's value chain to create and capture value by ensuring adequate access to input, price information, and availability of distribution channels.

The coffee and cocoa producers' groups accumulate their surplus through the collection centers available to Nestlé and receive a fair market payment. The community networks and links with companies are a source of competitive advantage and make inclusion visible (Reficco, 2012). This agricultural value creation system improves small farmers' income and increases productivity, favoring their access to the market, as Paradox points out (2019).

In the structure of the creation and appropriation of the value of business models, as illustrated in Figure 2, a priority measure uses tools for opportunity analysis and design of productive projects such as Licandro (2013).

According to abundant vocations for the identification of opportunity, a matrix of constraints and strategies to establish the typology of productive projects from the creation of value of the constructive project and a map of institutional actors assist the preparation and integration of communities; configuration of the creative process; and strengthening of community capacities and resources (Betancour, 2014).

To promote innovation. Productive systems, optimize and improve processes, generate value proposals for clients at the base of the pyramid, and adopt new technologies that support their competitiveness.

Conclusions

The objective of this review has been to show the evolution of BoP theory from a business perspective. Since the fourth generation of BoP is the main reason companies design or redesign their business models to be inclusive are the poor as clients, an extensive base to increase market share. From the logic of enabling fortune by incorporating native technologies, commitment to the community, and respecting traditions, as crucial components of sustainability.

Inclusive models are characterized by integrating small producers at the base of the pyramid into the value proposition, ranging from the supply dimension to commercial activities and services, transformed to personalize and make the delivery of products and services more flexible. Finally, we identified multiple sizes concerning social responsibility. Cajiga (2018) indicated that the poor's inclusion requires that the strategy's execution be supported to improve businesses' competitive position in promoting scalable social projects at the commercial level and social investment.

In this sense, it is not enough to know the market, the product, or the service. Still, it is necessary to understand the context of consumption, the benefit of which is to guarantee the personalization, adaptation, and flexibility to access and dispose of these at the base of the pyramid. In this scenario, one of the main challenges a company faces is to design social responsibility programs that incorporate the social dimension, knowledge, and critical competitiveness factors to encourage the reconfiguration of business models under the principles of legality, equity, and inclusion.

To make visible the companies' answers to face the challenges that constitute the social exclusion, the market failures, the availability of technological infrastructure, and the need for training of the small producer in topics of cultivation: technical aspects of production and commercial management, converge the efforts that support their transformation, with the definition of new agendas for implementing productive projects and contemporary coordination dynamics to incorporate the pyramid's base in the businesses.

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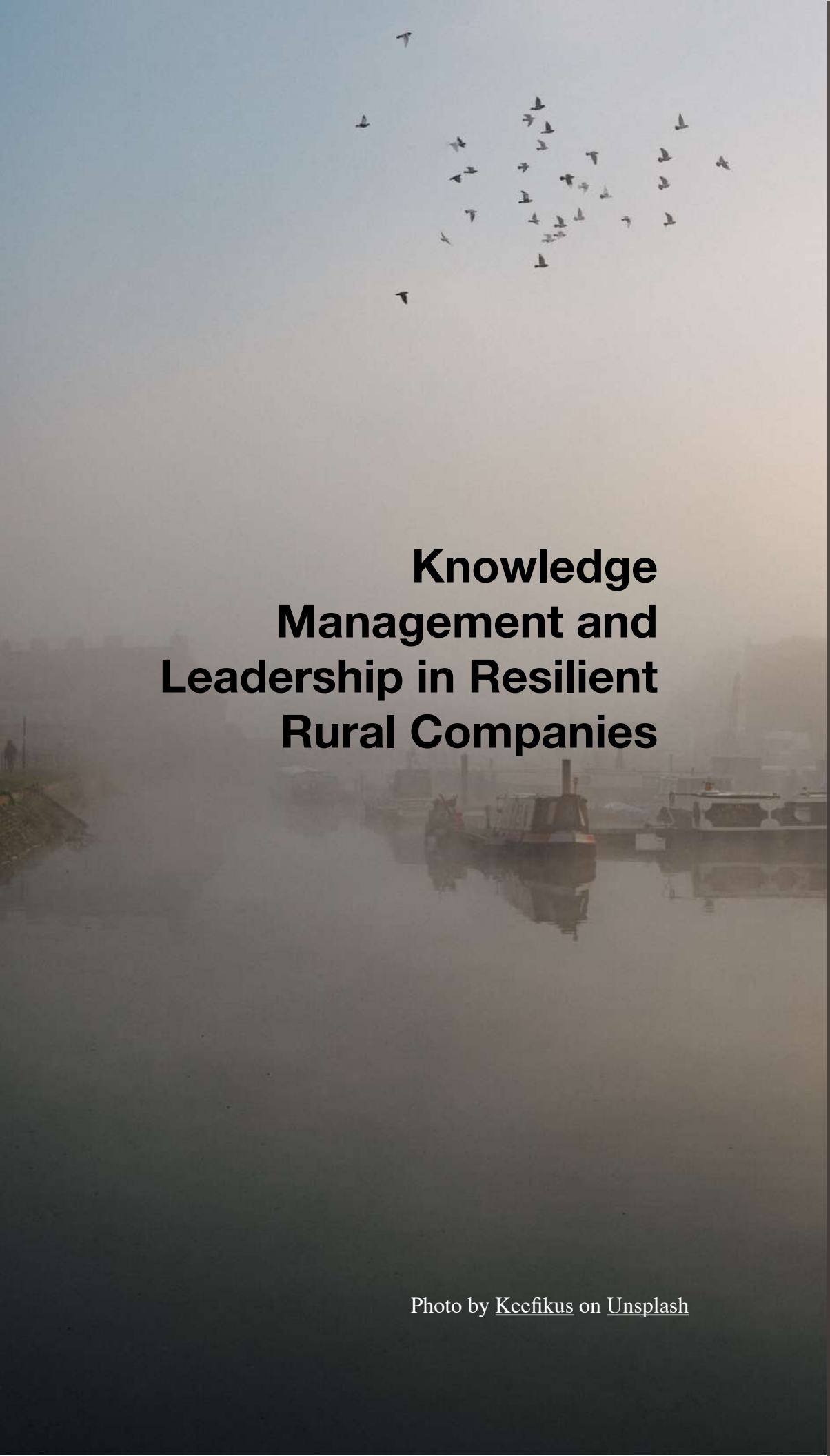

Chapter 8

Knowledge Management and Leadership in Resilient Rural Companies

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Knowledge Management and Leadership in Resilient Rural Companies

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Introduction

Some companies have shown resilience in the most unfavorable circumstances. These companies are located in rural Mexican areas. The commercial opening and the abandonment of the Mexican countryside led to each economic agent located in rural areas being left to their own devices. After 3 decades or more, Mexican rural companies are considered highly resilient.

This study establishes the need to relate leadership and knowledge management variables around competitive culture. Emphasis is placed on rural enterprise, which is detonating for the development of the community where it is inserted.

The central question was to look into how knowledge management and leadership affect the competitive culture of rural enterprises? Which leadership style has the most statistically significant relationship with the competitive culture of rural enterprises? and finally What is the relationship between knowledge management and leadership in the competitive culture of rural enterprises? Therefore, the objective of the research is to identify whether there

are statistically significant relationships with knowledge management and leadership style in competitive culture in rural enterprises in the municipality of Ameca, Jalisco.

In the current area, companies are going through situations of change generated by many internal and external factors, especially because of the need to modernize their competitive strategies. However, the culture that permeations in organizations, is one of the challenges that can jeopardize the growth of them, so more and better leaders are required, people with a broad vision and with great confidence in themselves, without those people there is no way that there is prosperity in companies (Gómez, 2008:160), that is, it is insufficient to have a good company, we need to have effective leaders, that increase the potential of people and improve processes and decision-making.

In the field of a so-called knowledge economy, knowledge management has become one of the main topics of research and, in the management paradigm par excellence, in the field of the organization and management of business institutions (Rodríguez, 2006:26).

Thus, knowledge management can become a tool that allows to accumulation of the learnings achieved empirically, by each of the members of the company, and that also ensures that knowledge is shared and used to improve the performance of the organization.

Under this framework, leadership, knowledge management, and culture represent in recent years important fields of research, in the review of literature, several studies were found highlighting Ogbonna and Harris (2000), who identified that certain types of culture lead to good financial performance.

Also, they highlight the results of Viswanathan and others (2019), by identifying on the one hand, that employees with potential prefer to work with the style of transformational leadership, and on the other hand, that if the leadership style is transactional, employees will have a sense of belonging to the organization. Therefore, leadership style plays an important role in employee engagement.

The work is organized in three sections, in the first, related to the revision of the literature are addressed theoretical approaches to approaches and styles of leadership; models and the process of knowledge management are exposed; the organizational culture is analyzed, and this describes the competitive culture, finally, the rural company variable is explained.

The second section includes methodological design and correlation results. In the third section, the deductive inference of the inputs of the authors consulted and contrasted with the implications in rural enterprises, emphasizes the importance of leaders as drivers of transformation and adequate knowledge

management for the development of a competitive culture, as well as the conclusions of the research.

Transactional and transformational leadership

Leadership has been the subject of study of disciplines and perspectives such as history, psychodynamic theory, psychology, organizational development theory, and sociology (Gaynor, 2003). Leadership is defined as. fitness to influence a group towards achieving a vision or setting goals (Robbins & Judge, 2009).

Besides, it is conceived as a social and relational phenomenon, the product of the interaction between people (Contreras & Castro, 2013). Being a complex construct, it must identify and describe the different variables that may be linked, such as cognitive, behavioral, or personality (Lupano & Castro, 2008).

Some authors consulted in the literature review (Vroom & Jago, 2007; Robbins & Coulter, 2005) agree that most leadership definitions share the idea that it implies influence in a group to guide them in achieving goals. The most complete leadership definition includes five key parts, emphasizing Pariente (2010:180) and are: the interpersonal process of influence; the relationship between a person (leader) and a group of (followers); delimited cultural environment; particular situation and achievement of a common purpose as a criterion for the effectiveness of the process.

The complexity of defining leadership has led to a diversity of approaches that seek to explain this phenomenon. To identify the leader within the organization and understand what the functioning of his role is like, approaches have been proposed, which can be grouped into four (García, 2015:63): an approach to personal traits: it focuses on distinguishing characteristics such as social, physical or intellectual traits that differentiate leaders from followers; behavioral approach: study the behaviors that individuals who are leaders have and those who are not; situational or contingency approach: considers that the effectiveness of leadership depends on the situation in which it took place and the emerging approach, is facilitated when leaders transform their followers. The latter approach receives more research, based on input from House (1971) and Burns (1978) on leadership styles.

However, the leadership style establishes the model of conduct distinguished by others, as well as the perception of itself, regarding the position and performance of the leader, which mobilizes followers to do what they have been asked to do (Guillen, Mayo & Korotov, 2015) through the personal influence and power, energies, potentials and activities of a group, to achieve a common goal to transform both the company and the people who collaborate in it (Castrillón, 2011). There are several ways to classify leadership styles; however, the dominant perspective distinguishes between transactional leadership,

transformational leadership, and laissez-faire (Furtner, Baldegger & Rautlman, 2013).

Ozer and Tinaztepe (2014:779) identify three leadership styles: transactional, transformational and paternalistic, the latter arises when the superior behaves in such a way that he creates a family environment in the workplace and establishes individualized relationships with his subordinates.

This research focuses on the first two styles, transactional leadership is characterized by a variety of transactions or exchanges between the leader and followers, the leader motivates his followers towards goals aimed at achieving his tasks.

Transformational leadership, on the other hand, is a link that arises in a context of crisis or social need that is shared by members of a group. Transformational leadership is one of the most studied, where the theory was developed by Bass (1985) based on the original ideas about the charismatic and transformational leadership of House (1977) and Burns (1978). House (1977) established charismatic leadership, and in this theory are important the attitudes and perceptions that followers have with their leaders since they not only trust and respect their leader but magnify him as a trust with exceptional characteristics.

Burns (1978) says that most of the relationships between leaders and their followers are develop in a transactional way; this is based on meeting the needs of the following subjects, and through transactions, a link is established that unified the subjects with their leader.

Bass (1985) describes transformational leadership, based on the leader's effects on his followers. Leaders with transformational characteristics cause changes in their followers, from raising awareness of the importance of performing their tasks. The author states that the two types of leadership are not exclusive and that leaders can employ both types, according to the different situations presented to them.

In the study of Nungky and others (2020) the effect of transformational and transactional leadership on the performance of small and medium-sized enterprises was analyzed, the results showed that transformational leadership is more important to improve performance than transactional leadership.

For Kargas and Varoutas (2015) there has been an ongoing debate about the relationship between leadership and organizational culture for more than three decades, this is because they are two of the defining organizational elements for companies to compete successfully and gain a sustainable advantage. Also, Ogbonna and Harris (2000) claim that the impact of leadership on a company's performance is mediated by organizational culture.

In short, it is inferred that transformational leadership is positioned as a trigger for the competitiveness of organizations, by taking advantage of the motivation of followers and work teams. In this sense, it is significant that leaders foster respect for followers, to access committed work teams.

KNOWLEDGE MANAGEMENT

Knowledge refers to the mixt of information, context, and experience; information is composed of organized data and facts, knowledge consists of truths and beliefs, perspectives and concepts, judgments, expectations, and methodologies (Zorrilla, 1997; Paredes *et. al.*, 2017:478).

When knowledge is used to solve problems, it is individual knowledge, but when it is shared with others in the organization, it is transformed into organizational knowledge, and consequently, it is necessary to seek the flow of knowledge from individual learning to organizational learning to improve organizational performance (Salleh & Choo, 2011).

Knowledge is a key resource for establishing and maintaining the competitive advantage of companies and consequently, companies will adopt appropriate organizational and management practices to identify, manage, share, leverage and transfer knowledge developed internally and/or externally acquired to support their competitiveness (Alavi & Leidner, 2001; Natalicchio *et. al.*, 2017).

The term "knowledge management" was first used by Karl M. Wiig in 1986 mentioned by Benavides and Pedraza (2018:178), who defined it as a systematic construction, renewal, and explicit and deliberate application of knowledge to maximize effectiveness related to a company's knowledge.

Knowledge management consists of organizational routines and practices related to the management of knowledge of its creation or external acquisition, its internal use, and integration throughout the system organization (Natalicchio *et al.*, 2017).

For Bueno (2000) knowledge management, it is the process that continuously ensures the development and application of knowledge in an organization, to improve its problem-solving capacity and thus contribute to the sustainability of its competitive advantages.

Also, they emphasize Tarí and García (2013) which is a dynamic process of creating, storing, and transferring knowledge, to improve the performance of an organization. From these definitions, common elements can be extracted on the way to facilitating and applying knowledge in the actions of organizations.

Knowledge is now seen as a key component in the competitive advantage of any organization because, as an asset, it has multiplication properties when shared and can be the source of the dynamics of other resources (Drucker, 1998).

Wenger (2001) cited by Varas (2017:12) shares this conception, emphasizing that knowledge management is how the organization obtains, shares, and generates competitive advantages from its intellectual capital, which in turn represents the value of knowledge and experience of the workforce and the accumulated memory.

There are several models for knowledge management, Rodriguez (2006:26) groups them into three types which are:

- Storage, access, and transfer of knowledge: models that focus on storing, without difference knowledge of information and data.
- Sociocultural: models focused on the development of an organizational culture suitable for knowledge management processes.
- Technological: outstanding models in developing and using technology systems and tools for knowledge management.

The review of Nabeel and others (2020) reveals evidence of the constant and positive effect of transformational and transactional leadership on the knowledge management process. Similarly, Nam and Mohamed (2011) focus on recognizing the influence of transformational and transactional leadership behaviors on knowledge management, and the moderating effect of organizational culture on this relationship.

Pellegrini and others (2020) conducted a bibliometric analysis on the subject of knowledge-leadership management, on 488 articles published between 1990 and 2018. The authors discovered the existence of four polarized groups: human and relational aspects, systematic and performance aspects, contextual and contingent aspects, and cultural and learning aspects.

According to this theoretical approach and as a conceptual complement, the three stages that comprise the process of knowledge management within an organization are presented below, proposed by Pedraja and others (2006:574):

1) Create knowledge: it is done by exploring and combining new knowledge with existing ones or with interactions with other people in an organization,
2) Sharing knowledge: it is generated by exchanging and transferring knowledge to others and
3) Applying knowledge: it is achieved by transforming knowledge into beneficial products for the organization. The incident factors are the people, the technology, the internal processes, and the management models implemented in the organizations, in such a way that it allows members to share the practical knowledge that they may possess (González & Alvarez, 2019).

It follows, therefore, that, to survive and grow in the competitive environment, organizations must be able to facilitate, combine and employ organizational knowledge.

COMPETITIVE CULTURE

Organizational culture is how the company has learned to manage its environment, a complex mix of assumptions, behaviors, stories, myths, metaphors, and other ideas that define what it means to work in a particular organization (Schein, 1985). Organizational culture can be seen as a "resource" to achieve goals, and if that resource adds value, is different from the culture of other organizations, and is not easily imitable by competitors, it can become a competitive advantage and a "strategic asset" that underscores success (Barney, 1986).

For Febles and Oreja (2008:13) there is evidence that there is a relationship between culture and business strategy, as proof of this, in recent years emphasis has been placed on the variable culture as a key to success and development of strategies.

It can therefore be said by agreeing with Schein (1985) that culture influences the development of the strategy, being something present in the minds of managers. The measurement of organizational culture was adopted from Ogbonna and Harris (2000) who relied on the work of Cameron and Freedman (1991), Deshpande and others (1993), and Quinn (1988).

There is no doubt the importance of distinguishing between different types of culture within an organization and in this regard Ogbonna and Harris (2000) present below the classification, which has been validated by later works (Xeniouku & Simosi, 2006; Jung & Takeuchi, 2010):

- Innovative culture: it is characterized by promoting creativity and initiative, in a framework of autonomy to take risks, as well as new challenges to generate innovations.
- Competitive culture: is oriented in the fulfillment of tasks and goals, as well as, by the realization of actions that generate strategic or economic value, in a context of dominance over other companies.
- Bureaucratic culture: emphasizes both policies and rules, involves formalization and structure; as well as, a focus on operational efficiency.
- Community culture: oriented in achieving cohesion in the organization, in a context of commitment and loyalty, where importance is attached to people in the company.

On the other hand, in organizational culture, the company is reflected, so it can be considered as an important factor to achieve its good competitiveness, as long as they establish and promote in the different sectors and levels of the

company, values, and principles that promote the desire to overcome and to carry out each process correctly, with ethical and normative principles (Cantillo & Daza, 2011).

Also, Guerrero (2020) mentions that among the common aspects that characterize the organizational culture of companies are norms and policies, values, leadership and incentives, and image. Which frame the criteria for analyzing the elements that favor organizational culture after the application of philosophical, organizational, and normative guidelines being this, a consequential in business competitiveness.

In this sense, all the efforts of organizations to develop strategic plans, promote values and culture, increase their responsiveness and decrease times, create advantages over their competitors, and point to improvements in their corporate image, adds Molano (2016).

The measure of competitive culture was used for this study, which it considers to be fundamental elements; goals, tasks, the dominance of competition, and strategic and/or economic value. It is important to value this type of culture because, to succeed in global competition, an open and powerful climate is needed in the organization, a closely defined competitive culture (Schuler, 2000). Also, Lado and others (1997), Jung and Takeuchi (2010:1935) affirm a culture of competitiveness must incorporate and coexist with cooperation, which is created through solidarity leadership and community culture.

RURAL BUSINESSES

According to FIFONAFE (Fideicomiso Fondo Nacional de Fomento Ejidal, 2010), the Rural Business is an entity focused on wealth creation, consisting of one or more production units that organize and draw on resources for the production of a good or service with an added value that allows the generation of profits and remuneration for the work carried out.

Starting a company in rural areas involves integrating physical, biological, economic, and human resources, which must be combined on time to achieve its objective. A company must also comply with the commitment to generate and promote the development of its ejido and/or community, so it must gather characteristics such as competitiveness, market orientation, value-added generator, appropriation, business sense, capacity for change, and technology and financing, among others.

Coincidentally Parra (2000:8) states that it is a permanent unit of production of goods or services that seeks profitability in its operation, in the minimum sense of obtaining an economic result above the costs of inputs, work and machinery, and a unit equipped with a minimum of modern technology and

business organization, which works for the market based on the competitiveness that those guarantee it.

Also, rural companies are tools that allow rural development, in a territory composed of social actors who have a characteristic culture and a physical scenario that generates natural resources that can be used by social actors to meet their needs (Pérez & Jofre, 2000).

However, they say Toiber and others (2017), that micro, small and medium-sized rural enterprises face a very unfavourable economic and social environment, causing most of them to fail in the early years. The challenges these companies face are diversifying production, improving internal organization, adapting technology to their needs and budgets, and improving the quality of their product.

Table 1. Types of rural organizations

Trade union or representative organizations	The universal and integral nature of the ends they pursue.
	The actions carried out affect the entire sector and not only the affiliates of the organizations
	Their messages contain an explicit ideological message, express the interests of their affiliates, and can be:
	Territorial: they are defined by the geographic space or locality in which they are located and their criteria are territorial.
	Functional: they are defined by the specific tasks that they address in their actions.
Professional or corporate organizations	Its objective is the development of its members as agricultural producers, wage earners or rural inhabitants.
	Within the set of facets of the affiliate, it favors those that are more typical of the group.
	They do not have an explicit ideology beyond pursuing the welfare of their members.
Economic or instrumental organizations	Carrying out very specific tasks related to the productive-economic sphere of the individuals who make them up.
	Generally, they are linked to the production, transformation and commercialization of agricultural products.
	The aims they pursue are exclusive and particularistic.
	The actions they carry out affect only the members of the organizations
	their approaches lack an ideological dimension.

Source:Own elaboration (Gomez, 2000, p. 46).

According to Gómez (2000:46), there are three types of rural organizations and the criteria for differentiating them are: the purposes they pursue, the scope of action they cover, and the formulation of their more generic approaches, and the three types are referred to as follows, according to Table 1.

The identity of each community will be the fundamental pillar, the mobilization of the population an essential condition, and the adoption of a comprehensive development approach a central element. On the other hand, Narváez and others (2008:84-86) identify some elements that they consider essential for business activities to be generated, among which are:

- Competition. This is characterized by the existence of contests between the different companies that try to gain competitive advantages facing different rivals, where products and procedures are created and improved.
- The business culture of cooperation. Cooperation is revealed as a strategy that maximizes economic potential in industrial sectors and the economy, resulting in increased efficiency and greater benefits in general terms.
- Teamwork. A system of working relationships and connections between them should be established that is partly part of a social culture that strengthens over time.
- Purposes, objectives, and agreements (shared vision). The local economic development strategy is based on the existence of common economic, social and political purposes and relations between companies and actors.
- Location-proximity. It requires a local context that is constituted in an environment capable of promoting the stimulus of the business organizations that are based in it.

From the above, it is determined that the practice of rural business activities is based mainly on the commercial relations they develop with each other, which allows them to generate greater competitiveness and productivity, as a result of the proximity they have territorially benefiting from the exchange of information and more effective communication, requiring cooperation and teamwork perfectly defined.

This research aims to identify whether there are statistically significant relationships with knowledge management and leadership style in competitive culture in rural enterprises under study.

Hypothesis

H1: Knowledge management has a positive impact on the competitive culture of rural enterprises.

H2: Leadership has a positive impact on the competitive culture of rural businesses.

METHODOLOGY

The municipality of Ameca, the subject of this study, is a city in the State of Jalisco, Mexico; head of the municipality of the same name and seat of the Valles Region. The municipality of Ameca is located in the west center of the State of Jalisco, adjacent to the north with the municipalities of Etzatlán and Ahualulco de Mercado; to the east with the municipalities of Teuchitlán and San Martín Hidalgo; to the south with the municipality of Tecolotlán; to the west with the municipalities of Mixtlán, Guachinango and the State of Nayarit.

According to the latest figures from INEGI (2015), the municipality of Ameca has a population of 60,951 inhabitants and an area of 837.81 km2. And also, according to the INEGI Population and Housing Census (2010), this municipality is composed of 59 rural towns.

Research design

This study responds to research with transectional non-experimental methodological design of a correlational type, by seeking to obtain information about the impact of knowledge management and leadership on competitive culture in rural enterprises.

Population and sample

The population is the managers, managers or owners of rural companies, understood as entities focused on wealth creation, consisting of one or more production units that are organized and close to resources for the production of a good or service with an added value that allows the generation of profits and remuneration for the work carried out and that is located in a community or ejido of rural type, obtaining a list of these from the database provided by the Directorate of Rural Development and Agricultural Development of The City of Ameca, Jalisco, the result of its last census and diagnosis carried out in the Municipality. To obtain the sample has applied the formula proposed by Hernández, Fernández and Baptista (2010:178-179):

$$n = \frac{pq}{\frac{\epsilon^2}{Z^2} + \frac{pq}{N}}$$

Where: ***n*** s sample size; ***p-*** level of acceptance; ***q-*** rejection level; ***Z-*** confidence level; ***N-*** population size; ***ε*** degree of error. Assigning the following values: acceptance level: 50%; rejection level: 50%; confidence level: 95% which is equivalent to a z of 1.96; degree of error: 5%.

Table 2. Variables and dimensions of the instrument

Variable	Dimension	Items	Reliability
Knowledge management	Knowledge creation	The company has an efficient internal and external information exploration system.	Cronbach α = 0,768 Factorial: 1 factor Explained variance: 68,9% Sig. Bartlett: 0,000 KMO: 0,687
		The information obtained from various sources is efficiently processed and integrated within the organization.	
		The company has a system that allows you to identify important findings for your work from both internal and external sources.	
		Company executives create new knowledge considering the exploration system, finding detection and information integration.	
		The managers of the organization interact with each other favoring the creation of knowledge.	
	Sharing knowledge	The organization's executives exchange knowledge with each other.	Cronbach α = 0,756 Factorial: 1 factor Explained variance: 67,3% Sig. Bartlett: 0,000 KMO: 0,692
		The organization's executives transfer knowledge to each other.	
		The company's executives share knowledge.	
		The organization's executives apply the knowledge generated and shared.	
		Managers make decisions based on the application of previously generated knowledge.	
	Knowledge application	Company executives apply the knowledge generated and shared.	Cronbach α = 0,732 Factorial: 1 factor Explained variance: 68,1% Sig. Bartlett: 0,000 KMO: 0,672
		Managers make decisions based on the application of previously generated knowledge.	
Leadership Styles	Transformational leadership	The leader shares the mission and vision with his followers.	Cronbach α = 0,803 Factorial: 1 factor Explained variance: 71,9% Sig. Bartlett: 0,000 KMO: 0,687
		Followers enthusiastically share and follow the leader's goals.	
		Followers enthusiastically share and follow the leader's long-term vision.	
		Followers enthusiastically share and follow the professional challenges posed to them by the leader.	
		Followers enthusiastically share and accept their role in playing in the organization.	
	Transactional leadership	The follower understands and agrees with the reward system in the organization.	Cronbach α = 0,664 Factorial: 1 factor Explained variance: 61,4% Sig. Bartlett: 0,000 KMO: 0,597
		Followers understand and share the power system in the organization.	
		The leader promotes individual and collective negotiation processes with his team.	
		The terms of exchange are decisive for the relationships and development of long- and short-term work.	
Competitive culture		The fulfillment of the tasks entrusted is a central focus of the actions of the members of the organization.	Cronbach α = 0,732 Factorial: 1 factor Explained variance: 67,9% Sig. Bartlett: 0,000 KMO: 0,629
		Members of the organization make their best efforts to meet the assigned goals.	
		The creation of strategic and economic value gives an essential meaning to the work of the company.	
		The company and its members bet on being successful and better than the competition in the market.	

Source: own elaboration.

It resulted in a sample of 38, but only 29 rural companies could be interviewed, as the others still insistently refused to participate in the survey. The instrument used to obtain the information was the Structured Likert-Type Questionnaire on a scale of 1 to 7, integrated with a total of 30 reagents and divided into four parts.

The first part consists of 5 questions to obtain the characterization of rural companies and interviewees such as seniority, number of employees, as well as age, sex and schooling of the respondent (for the latter element, it was determined to allocate 1 if he had undergraduate studies onwards and 0 in the rest of the cases).

The second structured part for the collection of information with respect to variable knowledge management, adapted from the instrument used by Pedraja and others (2008), which divides the variable into three dimensions: knowledge creation, knowledge sharing and application of knowledge, giving a total of 12 reagents for this variable.

The third part consisted of 9 reagents with respect to the leadership variable, with the questionnaire used by Rodríguez (2010), divide into two dimensions, transformational leadership and transactional leadership, and finally, the fourth part was formed for the variable competitive culture using also the instrument of Rodríguez and others (2008) consisting of 4 reagents. The data collection technique was the personal interview conducted in January and February 2020.

To determine the reliability of the measuring instrument in each variable and dimensions, Cronbach Alpha was used, the results of which are shown in Table 2, along with the dimensions and items of each variable.

In addition to corroborating the validity of the instrument, a factorial analysis was performed where Bartlett's factorial loads, KMO coefficient and sphericity test project sufficient results to validate the instrument.

Results

Among the findings found, in the characterization part, it was identified that out of the total managers surveyed 26 were men (89.65%) and 3 women (10.35%), showing that the participation of men in such enterprises is very high and almost zero the participation of women.

In addition, it could be seen (Table 3) that the average age of companies is 16 years since its establishment, indicating that these companies are practically young in general without forgetting that by their characteristics they are very vulnerable and that it is very likely that many of them have not managed to survive; in terms of the number of employees the results reveal that on average they have 4 workers, a significant amount by the type of company and by the means where they develop; the age of the respondents fluctuates on average in

42 years and it is highlighted that almost 50% of them have university training, demonstrating that they are managers in constant preparation and professional and business updating.

Table 3. Characterization of rural enterprises surveyed

Characterization elements	Average	Standard deviation
Antique	16.6	10.5
Average number of employees	4.1	17.2
Average age of managers	42.0	9.6
Manager's university education	48.9	5.8

Source: own elaboration.

In consideration of the hypotheses raised in this study, the following regression equation was implemented:

> Competitive culture = A + B1 Knowledge creation + B2 Sharing knowledge + B3 Knowledge application + B4 Transformational leadership + B5 Transactional leadership + Ei.

Where, A is the constant of the model, B1, B2, B3, B4 y B5, is the weighting factor for knowledge management types and leadership styles, Ei, residual model error (Lind *et al*., 2012).

In applying this equation, information was obtained to show that the competitive culture of rural companies is mostly influenced by the first transformational leadership styles, followed by the transactional one employed by the sample managers.

Now of knowledge management, it was shown that the variables of sharing and applying knowledge also have a significant impact on competitive culture and the variable creation of knowledge is not statistically relevant to influencing competitive culture, as shown in Table 4.

Table 4. Result of regressions

Dependent variable	Independent variables	Beta	R2	Significance of F
Competitive culture	Knowledge creation	0.211	0.666	0.000
	Sharing knowledge	0.544	0.410	0.000
	Application of knowledge	0.503	0.400	0.000
	Transformational leadership	0.792	0.690	0.000
	Transactional leadership	0.679	0.616	0.000

Source: own elaboration.

Hence, in this study competitive culture is explained by the direct impact of the two leadership styles and by the indirect impact of sharing and applying knowledge. To confirm the findings it was chosen to implement the canonical correlation technique which is a non-parametric correlation to determine the incidence of independent variables on the dependent variable (Lind *et al.*, 2012):

$$Y1 = X1 + X2 + X3 + X4 + X5$$

Where:

Y1 represents the competitive culture
X1 represents knowledge creation
X2 represents sharing knowledge
X3 represents the application of knowledge
X4 represents the style of transformational leadership
X5 represents transactional leadership style

The results obtained are shown in Table 5.

Table 5. Results of ordered structural correlations

Creating knowledge	(.301)
Sharing knowledge	(.602)
Application of knowledge	(.583)
Transformational leadership style	(.781)
Transactional leadership style	(.690)

Source: own elaboration.

It should be noted concerning the findings obtained in Table 5, that there is complete coincidence with the results produced with this technique for those obtained in Table 4 where again the variable that reflects a greater direct relationship with the competitive culture of rural enterprises is the style of transformational leadership with a coefficient of .781 and the variable that has the least direct relationship with the competitive culture of rural enterprises was that of knowledge creation.

The results obtained in Table 4 and 5 make it possible to determine that H 1 and H2 hypotheses were proven to have shown that leadership has a positive impact on the competitive culture of rural enterprises, and even though the impact of knowledge management on competitive culture was partial, it can be inferred that it was regularly positive.

CONCLUSIONS

Effective knowledge management occurs only if the people involved in the process are directed, engaged, and motivated throughout the process (Natalicchio *et al.*, 2017). For this reason, leadership represents being one of the leading facilitators of implementation and success for the processes of creation, acquisition, use, and integration of knowledge (Pellegrini *et al.*, 2020).

As a result, organizations are interested in knowledge management to drive the efficiency of their processes, increase their productivity and quality of their services, and achieve solutions for their customers (Nam & Mohamed, 2011).

According to the literature review, transformational leaders have a stronger effect on the company's performance by creating a clear picture of the future that is both optimistic and achievable, encouraging others to raise their expectations, reducing complexity to key problems, and using simple language to convey the mission in competitive markets (Ozer & Tinaztepe, 2014).

The results allow us to infer that the style of transformational leadership first and the transactional approach followed, are the ones that mostly affect the competitive culture of rural companies, in following what Burns (1978) emphasizes, about the leader's effect on his followers from raising awareness of the importance of the performance of his activities or tasks and, through transactions, strengthens the link between the two sides, becoming clear that the leadership exercised is fundamental to building and developing a competitive culture (Ogbonna & Harris, 2000; Schein, 1985; Pedraja *et al.,* 2018).

The similarity is shown to the research of Nabeel and others (2020) in terms of the positive effect of transformational and transactional leadership on knowledge management, they, therefore, invite organizations to use a combination of those styles to maximize organizational performance. Also, there

is consistency with Nam and Mohamed (2011), contributions which suggest that both transformational and transactional leadership are positively related to knowledge management practices.

On the other hand, the findings regarding knowledge management, specifically about sharing and applying knowledge, resulted in a greater impact on the competitive culture of rural enterprises, which coincides with Salleh and Choo (2011), Tarí and García (2013), Drucker (1998) by asserting that when knowledge is shared in the organization it becomes organizational knowledge, active and in applying it generates competitive advantage (Wenger, 2001, quoted by Varas, 2017:12; Drucker, 1998; Bueno, 2000) and to create knowledge with a very low incidence. This implies a regular ability for leaders to share and apply knowledge and a minimal ability to create it.

Rural enterprises represent a trigger for development in their environment so it is a priority for managers to strengthen their efforts around knowledge management, it is necessary to generate a broad and consistent dynamic in obtaining information from different external sources as internal, processing it, and integrating it into its work, sharing it and applying it, which would allow them to grow and live in the competitive environment, in concordance with what they assert Molano (2016) y FIFONAFE (2010) in the sense that rural companies need to develop their capabilities, foster their culture and generate business competitiveness.

Finally, the competitive culture of rural companies has allowed these, from the leadership styles exercised, not only to survive, but it has opened up possibilities in the face of a very competitive environment to generate strategic and economic value, deploying a great effort on the part of the whole organization, betting on being recognized and better than the competition in the market, what comes to confirm what some authors support (Ogbonna & Harris, 2000; Febles & Oreja, 2008; Cantillo & Daza, 2011) who claim that the company's resources, values, and actions should focus on the success and development of strategies.

From this research, new lines or approaches are opened for subsequent studies such as the impact of knowledge management in Higher Education Institutions. Other lines could be ta competitive culture and its impact on SMEs managed by women. And finally, one last proposal would be the focused leadership and knowledge management styles and their effect on social responsibility companies.

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Technologies and Innovation for the Adaptive Systems

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Chapter 9

Technologies and Innovation for the Adaptive Systems

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Introduction

Innovation and technology create the perfect link for an adaptive system. Mainly, when it comes to exporting companies. Keeping products on the international market requires constant transformation. So these companies must constantly innovate. The use of technology facilitates the administrative activities necessary to fulfill commitments abroad. Companies, through innovation and technology, get new advantages that not only allow them to adapt but also help them increase their competitiveness.

The product and/or service generators that conveniently supply the population's demand on time and form according to likes, preferences, and needs, are the enterprises. The latter can be classified by the offered products or services or its size.

Mexico's Exporting MSMEs

Along with the Organization for the Economic Co-operation and Development (OECD) the Micro, Small and Medium Enterprises (MSMEs), are not part of another enterprise nor subsidiaries, but they are independent firms where the maximum number of employees is 250 for most of the countries and the minimum of 5 people (OECD, 2005).

In the OECD MSMEs annual report from 2019, these represent 60% of employment and between 50% and 60% of the added value, being the principal driving force behind productivity in many regions and cities; for this reason, the MSMEs should be one of the principal targets behind public politics to help them find answers to the challenges arising from globalization and digitalization, as

the smallest enterprises face large data barriers to overcome severe corporate conditions or to access strategic resources.

Exportation is essential to the economy as it means not only the business growth but the companies' growth and the creation of more employment opportunities. There are many ways to get involved in exportation, since directly selling products to the market or selling them to commonly multinational agents for the product or service to get to the consumer.

In Perspectives 2019 about Small and Medium Enterprises (SMEs) and entrepreneurship (OECD, 2019), it is mentioned that "the SMEs represent a 60% of employment and between 50% and 60% of the value-added. And even though, the small enterprises face large data barriers to overcome severe corporate conditions or to access strategic resources".

According to numbers from the 2014 Economic Census carried out by the Instituto Nacional de Estadística y Geografía (INEGI), the MSMEs in Mexico represent 99.8% of the total enterprises, supply 74% of the total job positions, and contribute with around 52% to the national GDP (Gross Domestic Product).

Despite having 99.8% of enterprise participation, the MSMEs have a low percentage of participation in exports, given that their contribution is 4% to their income. Exporting MSMEs is also important for the economy, although there are not many, they are the potential to expand the market and products that allow the corporate economic strengthening; nevertheless, their competitiveness should be boosted so at an international level they can get better results.

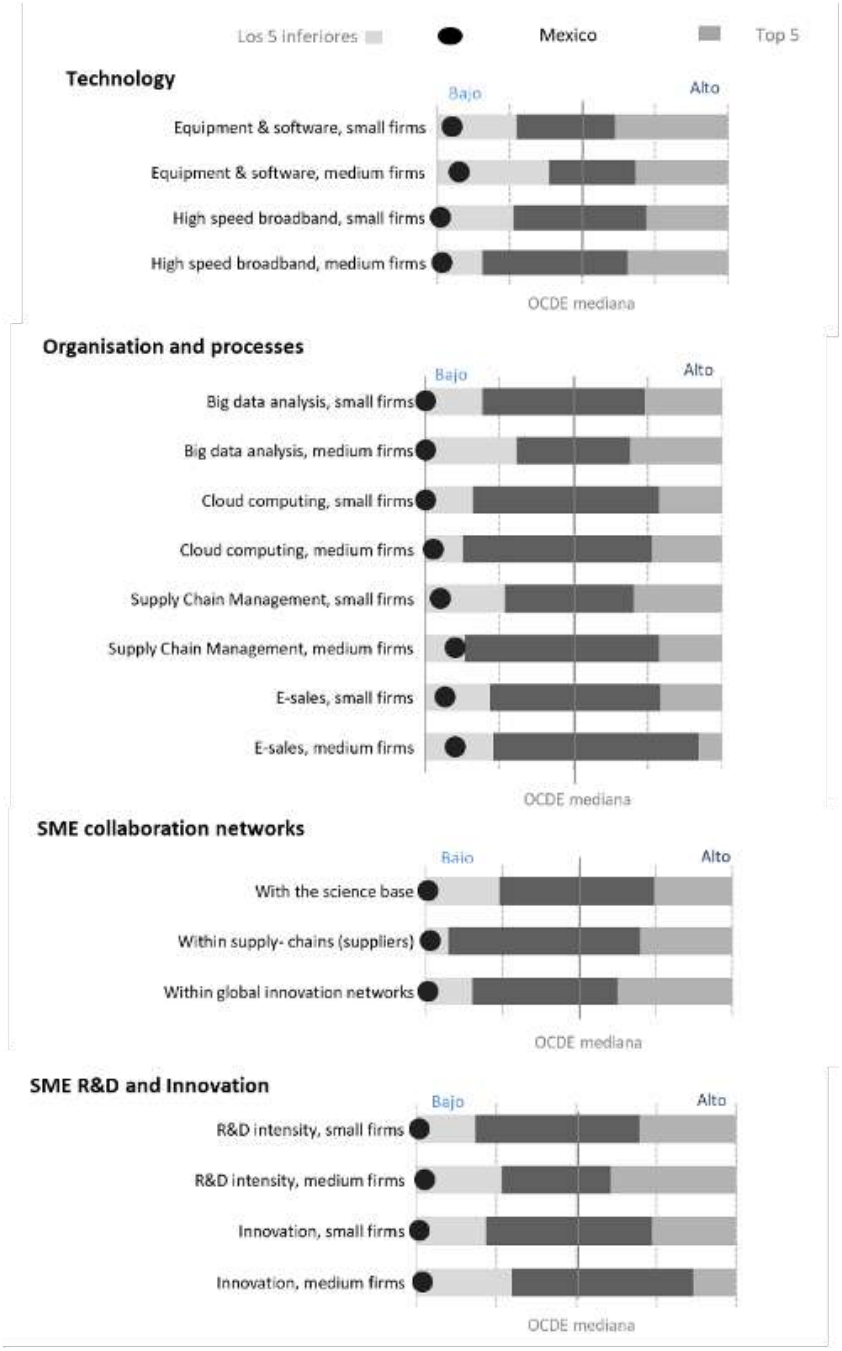
For the INEGI (2018) 38.9% of enterprises make use of computer equipment and 41.20% make use of the Internet. The same survey shows that the level of technological maturity, according to frequency, is present only in about 16% of the enterprises; meaning that more than 5 times a year they acquire licenses, adapt or modify technologies for their processes, they generate or develop their technology, they register a patent for products or technologies, they sell their developments to other enterprises. A 36% of the enterprises do the latter on a 2 to 5 times a year frequency (Table 1).

Table 1. MSMEs description/National enterprises number

Enterprise Size	Total of enterprises
Total	4,170,755
Medium	18,523
Small	94,513
Micro	4,057,719

Source: INEGI (2018).

Graph 1. Mexico's Innovation Aspects



Source: OECD (2019).

Innovation is also important in corporate competitiveness nowadays, impacting it and having better local and international results; it is internationally measured as an indicator by the World Economic Forum (WEF).

For the OECD (2019), Mexico is under the mean marked by innovation aspects, among which items such as technology, organization and processes, MSMEs collaboration with networks and the I&D together with the innovation they realize, are evaluated. The graph presented below shows Mexico's situation according to OECD data.

Based on the presented information, the existing problem is the low inversion on ICT's and on corporate innovation in Mexico which has had an impact on the exporting MSMEs' national competitiveness. For the latter reason, the present research poses the following question: How the ICTs and innovation influenced Mexico's exporting MSMEs competitiveness?

The subject of study is Mexico's Exporting MSMEs. The competitiveness of such enterprises will be measured as well as the impact of ICTs and innovation on their competitiveness.

The most recent survey from the INEGI, the ESIDET was carried out to a national level for 5,430 enterprises. The ESIDET survey was considered for some questions about ICTs as well as for innovation. As the survey was made to enterprises in general, filtered data was requested to the INEGI to obtain only the object of study for this thesis.

It was considered those with many employees higher than 0 but lower than 250 so they fit the MSMEs range, as well as their income per abroad activity be higher than 0, so they can be exporting enterprises.

In the survey, ENAPROCE (INEGI, 2018) focused on the MSMEs competitiveness and productivity, carried out by the INEGI, a total of 26,997 enterprises were surveyed.

The quantity of exports filter was used to consider the enterprises belonging to the object of study, which is the country's exporting MSMEs. The question about exports is in the survey, for that reason the pertinent filter could be applied. Data was taken from the mentioned survey for the three variables: competitiveness, ICTs, and innovation.

The number which corresponds to the sample concerns 1,000 enterprises that are Mexico's exporting MSMEs, being the latter number, the result of the filters applied to the mentioned surveys. According to surveys from the INEGI, such enterprises represent about 3% of the total surveyed enterprises.

Theoretical Framework.

Competitiveness consists of: "The capacity to maintain and increase the participation in the international markets, with a parallel rising of the population

standard of living. The only solid way to achieve it is based on the productivity increase." (Porter, 1990).

Competitiveness plays an important role at a microeconomic and macroeconomic level, as it allows that not only one entity gets benefited with it, but it impacts its surrounding and all of those involved, being in this way a boost to the development of each of them.

At a macro-economic level, there are different competitiveness definitions. Chesnais (1981) refers to competitiveness as a country's capacity to face worldwide competence. It includes whether the country's capacity to export and sell in the external markets as its capacity to defend its domestic market for an excessive penetration of exports.

The latter definition establishes a relation in which competitiveness is the result generated from the international business through its commercial yield, the balance of payments, exchange rate performance, etc. According to the OECD

> "The competitiveness reflects the extent to which a nation, in a free trade system and under equitable market conditions, can produce goods and services which meet the standard of the international markets, at the time that maintains and increases the real long-term income of its population". (OECD, 1996, p.3)

This definition is related to that one of Chesnais (1981) leading to believe that competitiveness by the nation's free trade should allow that at both a microeconomic and macroeconomic level the nation can keep its market and get to other markets, notwithstanding the barriers they could face, as well as to keep in mind that the impact should be realized in a short, medium, and long term for all the parties involved.

At a macroeconomic level, most of the authors who talk about the competitive advantage of an enterprise, concur that this advantage is the ability to low costs in the products and services differentiation and its capacity to synchronize each enterprise's activity to achieve its goal which is the client's satisfaction.

Enterprises competitiveness is not only to take into account the enterprise's environment, its players in the market, it is necessary to go further and look for new knowledge in different areas of the enterprise, as it is mentioned by the following author: "The capacities to generate, acquire, adapt and use new knowledge are a growing strategic factor in the evolution of the organization's competitiveness levels". (Lugones, 2014, p.8)

To the competitiveness concept, it is considered Abdel and Romo's contribution,

> "Corporate competitiveness derives from the competitive advantage that an enterprise has through its production and organizational methods (reflected on the price and quality of the final product) about the ones of their specific markets competitors." (Abdel & Romo, 2004, p.203)

According to Suñol (2006, p.196), the enterprise environment, which at the same time determines its competitive capacity, also have influence: the infrastructure, the financial markets, the consumers' sophistication, the national productive structure, the investment rate and structure, the scientific and technological infrastructure, and other no less important elements as education, the institutions and culture. However, this environment cannot become competitive, but the enterprises located in it.

The theory of absolute advantage is related to the global production patterns in the international business from which a country will be able to export goods or others based on its productivity.

Adam Smith (1776) proposes the Theory of the Absolute Advantage and emphasizes the importance of free trade to increase the nations' wealth so to obtain the absolute advantage the country should produce goods or services smaller in terms of work units concerning other countries which demands such product or service, achieving to specialize in the goods or service that has higher efficiency (Appleyard & Field, 2014).

The theory of comparative advantage refers to the concept of productivity in economics, according to which every nation should specialize and export what they know how to do best. David Ricardo's idea about international business is based on technology. If the country is able and manages to manufacture better goods than other countries, it should specialize in those goods and export them.

For Ricardo the work provides value to the goods, if there are significant savings in labor it means there is the possibility of producing goods with higher value. The specialization David Ricardo refers to causes a general benefit for the country and international business. (Polanco, 2012)

The great difference between both is the supporting point on which they are based. While Adam Smith (1776) and the absolute advantage highlight that a nation should only concentrate on what they know how to do better than the rest, on a more productive way, lower cost, more knowledge, and efficiency, David Ricardo says every nation or subject should promote and export those goods or sectors which within its economy are more productive.

Another theory is Leontief's paradox which is based on the fact that if labor is conceived not as uniformed goods but by categories, industrialized countries will dispose of plenty of well-educated labor supply or qualified workforce (in which a high capital investment has been done) than other countries.

The paradox was formulated while its author was investigating the Hecksher-Ohlin economic model (first presented by Eli Hecksher and then reformulated by Bertil Ohlin), according to which in the developed countries' exports the capital intensive goods prevail contrary to the less developed countries which especially export intensive goods in labor. (Brecher & Choudhri, 1982)

Appleyard and Field (2014) share that the cycle of the product theory was developed in 1966 by Raymond Vernon and that it has to do with the life cycle of a typical "new product" and its impact on competitiveness as well as on international business. In the former, the new product stage, the product is made and consumed only in the United States (USA).

The product and the production process characteristics are subjected to changes during this stage while the firms become familiar with the product and the market. There is no international business. The second is called the stage of product maturation. In this stage, some general rules for the product and its characteristics start to emerge and massive production techniques start being adopted. With higher standardization in the production process, scale economies start being obtained.

The final stage is the one of the standardized product. At this point of the product's life cycle, the characteristics of the product itself and the production process are well known:

1. The product is familiar to the consumers and the production process to the productors.
2. Vernon supposed the fact that productions can be moved to countries in development.

The Product Life Cycle Theory (PLCT) postulates a dynamic comparative advantage for the country's source of exports is changed through the product life cycle.

The competitive advantage attempts to explain further than the absolute and comparative advantage. It was developed by Porter (1985) and states: A nation's competitiveness depends on the capacity of its industry to innovate and improve. The enterprises obtain advantages before their best competitors around the world due to the pressure and the challenge. They are benefited from having strong domestic opponents, aggressive national suppliers, and demanding local clients.

Porter (1985) tries to point out the fact that the context in which the enterprises develop affects the national competitiveness as well as he highlights that the enterprises are the motor to reach the national competitiveness. To explain in more detail the corporate context, Porter (1985) presents "The national advantage diamond" which explains the attributes that individually and as a

system constitute the national advantage. According to Porter (1985), "the basis of the development on the average in an industry is the sustainable competitive advantage".

The Value Chain theory is used to decompose everything into the activities that are part of it and its goal is to facilitate strategic decision-making locating the enterprise before its clients, suppliers, and competitors. The significance of this analysis is to create strategic ideas that generate competitive advantages. The Value Chain theory was developed by Porter in the year 1985.

The activities of value are divided into two segments: primary and support. The former are the ones that intervene in the physical creation of the product, its sale, and its transfer to the client, as well as the assistance posterior to the sale.

The support ones back up the primary ones and vice versa, by offering raw material, technology, human resources, and diverse global functions. It is possible to associate the acquisitions, the technology development, and the administration of human resources to certain primary activities and at the same time, support the entire chain.

MODELS AND MEASURING FOR CORPORATE COMPETITIVENESS

There are several corporate competitiveness indicators made by different authors. Molina (2013, p.7) focuses on the corporate competitiveness that uses "parameters of profitability, liquidity, and financial and ecological sustainability to reinforce the MSMEs to achieve financial sustainability through time, using innovation principles, productivity, competitiveness and financing access to facilitate establishing management skills".

On the other hand, Rubio and Aragón (2006, p.103) carried out a study to determine corporate competitiveness indicators based on the literature about the competitive strategies in MSMEs and examine "how the resources and capacities cataloged as strategic contributors to the competitive success of the MSMEs".

For their part, De la Cruz, Morales and Carrasco (2006) in regard to the indicators construction to determine the corporate competitiveness focus on the development of capacities in a sector and the enterprises that participate in such sector encourage not only the enterprise's competitiveness but the corporate context.

Martínez and others (2009) suggest external competitiveness indicators to the enterprise, based on the fact that the corporate competitiveness can be decomposed into a systematic element (exogenous variables such as quality, innovation, and internationalization) and a random element (not observable because of stochastic nature).

There is a proposal about a mathematic model to determine the corporate competitiveness by Quiroga (2003) in which key internal and external variables are determined to impact the MSMEs corporate competitiveness. It is one of the most used proposals by several researchers who desire to measure corporate competitiveness.

The INEGI has a thematic coverage according to the following (INEGI, 2015): Economic and operational characteristics, Labor force participation and training, Management capacities and entrepreneurship, Business environment and regulation, Financing sources and governmental support, Global value chains, Information and communication technologies.

THE THEORETICAL FOUNDATION OF THE ICTS AND INNOVATION VARIABLES

Information and Communication Technologies (ICTs) have become an alternative of efficiency in a corporate development environment and a resource of competitive advantage. In this sense and according to the Information Technology Association of America (ITAA), nowadays enterprises from different sectors and sizes are relying on ICTs to change their ways, transforming the way of doing business, including processes, improving productivity and the 31 relationships with the collaborator enterprises.

The Supply Chain has not been external to the ICTs' impact which has positively influenced its functioning, due to the latter operating in a globalized and highly changing environment where the opportune and qualified information turns into the best ally.

There are six key theoretical contributions to the ICTs variable, which are the following:

1. Paramount relationship between economic development and technological advance. (Smith, 1776)
2. Technological knowledge to explain the socioeconomic evolution. (Marx, 1984)
3. Paradigm-technology-product-transformation change. It is to say technology and product should not only be related but should go further and look for the transformation of processes, organizations, enterprises, environments through the technology to obtain a better benefit and impact on competitiveness. (Freeman, 1994)
4. IT implementation in enterprises-impact-productivity and competitiveness (Taylor & Todd, 1994). The reason why they reached this result is that in their research they concluded that those enterprises with IT have better internal and external activities synchronization, it improves the communication with the

participants in the supply chain and it allows them can better respond to the demand as well as to the needs of their clients.

5. ICTs impact when there are synergies among the corporate activities. It is mentioned that (Scheel, 2005): the ICTs most effective economic impact on the development of an enterprise is achieved when the technologies are used to enable synergies among the principal corporate activities of the enterprises, when industrial activities and external driving forces are supported, all of the latter under a holistic framework and a common strategy that leads to a highly competitive execution.
6. Adoption of ICTs in MSMEs. In their research, it is determined that the adoption of ICTs by MSMEs has 3 stages: "1) ICTs contribute to generate and improve the register's management. 2) The crux is to analyze the registers information, and 3) Focused on making sure that these tools enable an interactive work between the enterprise internal and external agents" (Peirano & Suárez, 2005).

In the Oslo Manual (OECD, 2015) innovation is defined as the introduction in the market of a product or a new process or significantly improved or the development of a new organization or commercialization technologies. In the same manual, it is mentioned that innovation at a corporate level can be done in any area, process, and activity that has an internal or external impact on the enterprise. There are five principal contributions to the Innovation variable in the present research:

1. Talking about the strategy to innovate-technology-new methods. (Porter, 1985).
2. To introduce strategic variety in a competitive industry. It is to say, "innovation in the enterprises is to introduce strategic variety in a competitive industry going further than increased innovation and to achieve a complete innovation of the business". (Hamel, 2000)
3. Innovation System (Vilá & Muñoz, 2007) in which the following elements are combined: leadership, strategy, people and organization management, enterprise's key assets management, innovation of new products and services process, results and learning.
4. Innovation indicators measuring (Lugones, 2014). In his work done for the Inter-American Development Bank (IDB) that deals on measuring innovation indicators, he states: the Innovation Activities which involve both the effort to try to generate new knowledge and to acquire, adapt or develop existing knowledge, as well as, in general, the diverse forms of increasing the

productive and technological capacities of the enterprise, whether it is in its equipment or its human resources staff.

5. Innovation consists of a product, process, organization, and marketing (OECD, 2015)

Measuring at ICTs and innovation variables level

The Inter-American Development Bank (IDB), which counts with a rate to measure the ICTs at a national level, shown in the chart below, manages to measure the countries through advance in ICTs indicators. Its main objective is to display an outlook that permits the identification of the challenges and make better decisions from the particular to the general since according to its studies using ICTs influences national corporate competitiveness at a macro and micro level (Table 2).

Table 2. ICTs advance indicators

Indicator	Periodicity
Internet users	Annual
Introduction of landline and mobile broadband internet	Annual
Computer users	Annual
Homes with computers	Annual
Homes with an Internet connection	Annual
The proportion of urban and suburban homes with a broadband Internet connection	Annual
Mobile phone subscription	Annual
Digital Community Centers from the e-Mexico System	Annual
The proportion of urban and suburban schools with broadband Internet access	Annual
The proportion of public health school with Internet access	Annual
Kilometers of fiber-optics network	Annual
The proportion of localities: urban and suburban connected to a high-speed network	Annual
The proportion of businesses that use computers	N.D.
The proportion of businesses that use the Internet (enterprises with 20 or more employees)	N.D.
Position of the Availability Network Positioning	Annual
Investment in telecoms (public and private)	Annual
The proportion of city council with web page	Biannual
The proportion of city council's web pages that allow to performing transactions	Biannual
Position of the E-Goverment Survey (2010)	Annual

Source: IDB (2013).

The ECLAC (2005) together with the UN (2005) have worked side by side to establish the indicators which permit to know the ICTs usage at a corporate level by country (Table 3).

The INEGI (2015) administers the data-gathering instrument used by the ESIDET (INEGI, 2014) to provide information related to human and financial resources destined to activities of investigation and technological development (IDT for its initials in Spanish) and innovation in the productive sector, to satisfy Mexico's statistical needs of information in this matter, and to provide with a statistical outlook which contributes in decision making about the country's

public politics and allows to know the performance and advances of the scientific and technological activity. The INEGI has the thematic coverage (INEGI, 2015) on Information and Communication Technologies.

Table 3. Enterprise ICTs indicators

Indicator/Author	ECLAC (2005)	UN (2005)
Proportion of enterprises which use computers	X	X
Proportion of employees who use computers	X	X
Proportion of enterprises which use the Internet	X	X
Proportion of employees who use the Internet	X	X
Proportion of enterprises with presence in the web	X	X
Proportion of enterprises with Intranet	X	X
The proportion of enterprises that receive orders via the Internet.	X	X
The proportion of enterprises that place orders via the Internet.	X	X
The proportion of enterprises that make use of the Internet classified by kind of access	X	X
The proportion of enterprises with Local Area Network (LAN).	X	X
The oroportion of enterprises with extranet.	X	X

Source: Own elaboration (ECLAC 2005; UN,2005).

Alderete (2012) considers indicators to measure the ICTs in services enterprises from Colombia and a rate to measure ICTs impact on corporate development is constructed. Below is presented a summary of the ICTs indicators at the corporate level according to the revised authors and previously mentioned in the present section (Table 4).

Table 4. ICTs indicators at the corporate level

Indicator/Author	**INEGI (2015) ESIDET**	**Alderete (2012)**	**INEGI (2015) ENAPROCE**
Outdoor Investigation and technological development (IDT)	X		X
Indoor Investigation and technological development (IDT)	X		X
Human Resources in indoor IDT	X		
Infrastructure to do indoor IDT	X	X	
Expectations in indoor IDT	X		
Biotechnology	X		
Nanotechnology	X		
Science and Technology Education	X		
Expenses in scientific and technological services	X	X	
Technology transfer	X		
Governmental supplies	X		
Enterprise's technological maturity	X		X
% employees who make use of intranet		X	
% employees who make use of the Internet		X	X
Use of technologies to innovate		X	
Use of computer equipment			X

Source: Compilation made with data from the previously mentioned authors (2018).

The Global Innovation Index, which the corresponding breakdown can be consulted in table 5, presented by the World Intellectual Property Organization (WIPO), Cornell University, INSEAD, and other organisms, classifies the capacities and results in the innovation of 126 economies, in its 2018 edition they measure 7 pillars of innovation by country, that at the same time are subdivided.

Table 5. Global Innovation Index

Pillar	Subdivision
Institutions	Political Environment/ Regulatory Environment/ Business Environment
Human Capital and Investigation	Education/ Tertiary Education/ Investigation and Development
Infrastructure	ICTs/ Infrastructure in General/ Ecological Sustainability/
Market sofistication	Credit/ Investment/ Trade, Competency and Market Scale
Bussines sofistication	Employees' Knowledge/ Innovation Links/ Knowledge Absorption
Knowledge and Technology Products	Knowledge Creation/ Knowledge Impact/ Knowledge diffusion
Creative sources	Intangible assets/ Creative Products and Services/ On-line Creativity

Source: GII (2018).

According to the OECD (2017), the innovation that impacts enterprises is measured by the indicators shown in the chart below. Such measuring involves some aspects both internal as external which have an impact on enterprises and therefore should be considered (Table 6).

Table 6. Innovation that impacts enterprises

Indicator	Measure
Business Investigation and Development	% of GDP spent in I&D
Principal Players of Investigations and Development	Investment in I + D per patent from the principal corporation investors
IP Packages	% of total patents in ICTs corresponding to patents of IP5
ICTs and Innovation	% ICT equipment % information services
Combination of different Kinds of Innovation	% of innovation only in product % of innovation only in the process % of innovation only in marketing
Incentives in Investigation and Development Taxes	% from GDP that the Government awards as financing % from GDP the Government awards in taxes incentives
Political Environment and Innovation Demand	% from GDP destined to Risk Capital Investment

Source: Own elaboration (OECD, 2017).

For its, the OECD (2015) also administers a series of indicators at the corporate level together with the ECLAC, they consider innovation indicators that have an external and internal impact on the enterprise, but they do not take into account the relationship between enterprises and/or other agents.

The INEGI (2015) administers a data-gathering instrument used by the ESIDET 2014 to provide information related to human and financial resources

destined to the activities of investigation and technological development (IDT) and innovation in the productive sector, to satisfy Mexico's statistical needs of information in this matter, and to provide with a statistical outlook which contributes in decision making regarding to the country's public politics and allows to know the performance and advances of scientific and technological activity.

The INEGI has its ENAPROCE, it has a thematic coverage (INEGI, 2015) in Information and Communication Technologies and under this section, it has the corporate innovation indicators. A comparison of the indicators at an innovation corporate level can be observed in the table 7.

Table 7. Innovation Indicators at Corporate Level

Indicator/Author	**Lugones (2014)**	**OECD (2015)**	**INEGI (2015) ESIDET**	**INEGI (2015) ENAPROCE**
Experimental Investigation and Development		X		
Activities for Product and Process Innovations	X	X	X	
Activities for marketing innovation	X	X		
Design, Development and software usage in innovation activities	X	X	X	
Indoor and outdor investigation	X	X	X	X
Support		X	X	X
Sources for public instruments financing and use	X		X	
Obstacles	X			
Appropriation	X			
Introduced Innovation	X		X	X
Innovations range and impact	X		X	
Enterprise quality management	X			
Absorption and technological capacities	X		X	
Innovative efforts target	X			
Connections and Cooperation with other agents	X		X	
Information Resources of Innovation	X			
Consultancy and technical assistance contracting	X		X	
Machinery and equipment acquisition	X		X	
Hardware Acquistion and software Acquisition	X		X	
Acquisition of not-integrated Technology	X			
Science and Technology education			X	
Expenses in Innovation Projects				X

Source: Own elaboration.

Variables Diagram

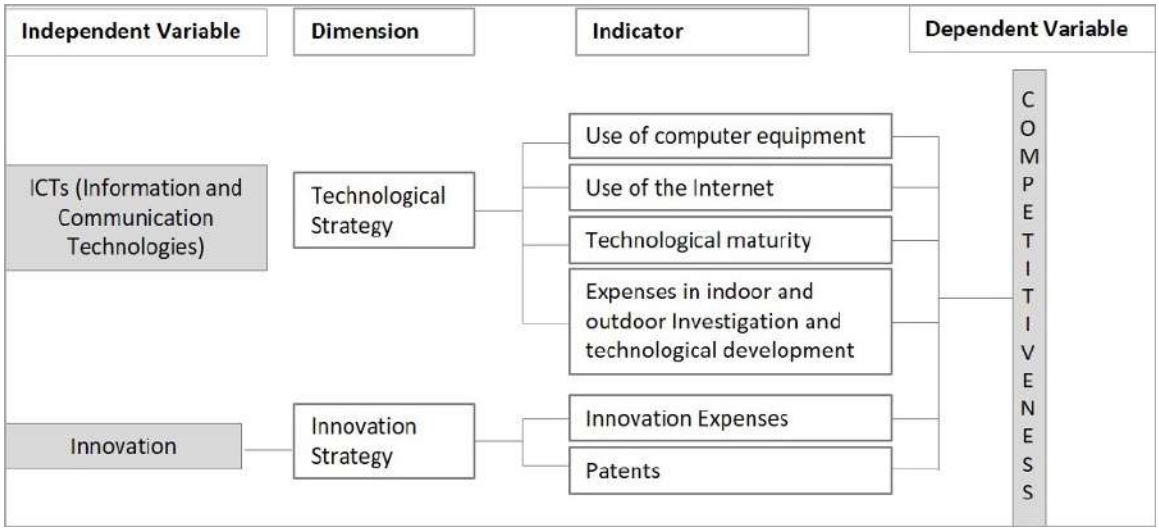
The model describes the relationship between ICTs and Innovation, which are presented as independent variables, and Competitiveness as the dependent variable, and the latter are presented in a summarized form in the variables diagram in Graph 2. The following are the general and specific hypothesis:

H1: ICTs and Innovation had a positive impact on Mexico's exporting MSMEs competitiveness.

H2: ICTs had a positive influence on Mexico's exporting MSMEs competitiveness.

H3: Innovation positively contributed to Mexico's exporting MSMEs competitiveness.

Graph 2. Variables Diagram



Source: Own elaboration.

METHODOLOGY

The present research will be done under the scientific method, as well as with a quantitative focus which makes use of the collection of data analysis to answer the investigation questions to come to their confirmation.

The research is based on a cross-sectional design, using the most recent data from the survey ESIDET, ENAPROCE conducted by the INEGI with data from the OECD.

Correlational because it is expected to know the relationship between variables, without proposing a causality. With the most recent data obtained from the surveys, I continued with the statistical processing and interpretation of the variables, due to the Pearson correlation coefficient was used. Since this coefficient is used to analyze the relationship between two measured variables at a p interval ratio level.

The limitations are that the gathered data is the most recent one managed by INEGI in its surveys ENAPROCE, ESIDET, and the OECD for its part.

The results reach are that it can reinforce studies on Mexico's exporting MSMEs competitiveness, strengthening the analysis for decision making with an impact on enterprises.

Questionnaire

The data to evaluate Mexico's exporting MSMEs competitiveness, as well as its impact on ICTs and innovation, is taken from the survey ESIDET (INEGI, 2014, 2017) and ENAPROCE (INEGI, 2015, 2018) conducted by the INEGI; being the most recent data useful to process and do the corresponding tests. It is also considered the data from the OECD (2019) in its section about innovation and information and communication technologies for MSMEs.

For the ENAPOCE survey, the available data is from 2013, 2014, 2016, and 2017 being the latter the most recent and such survey has the aim to provide information principally from 2017 related to the sources and conditions of financing access, the global productive chains, technological and innovation capacities, business environment and its regulation, as well as the knowledge on governmental supplies, among other topics.

Regarding the data from the OECD, the available data are from 2013, 2014, 2016, and 2017. In its SMEs and Entrepreneurship analysis, there is a chapter by country, in which Mexico is under the average established for the innovation aspects, among which items such as technology, organization and processes, SMEs collaboration with networks, and Investigations & Development are evaluated.

RESULTS

In the following chart, a final indicator by variable dimension is shown: competitiveness, ICTs, and innovation. It was attempted to homogenize the indicators into percentages to have the same terms for each dimension and at the same time variables, so when processing and analyzing the data it could be easier to be in the same terms for each one.

General results for the dependent variable

The analysis of Mexico's exporting MSMEs competitiveness was achieved based on the results shown by the data matrix obtained by variable from the surveys ESIDET (2014), ENAPROCE (2015, 2018), and based on the data from the OECD (2019) about MSMEs, resulting as follows in the table 8.

The obtained result from the four years in respect to the competitiveness was that the average of Mexico's exporting MSMEs are located at 516.79 points (competitiveness average) since the median is 521.05 and they are under such measure. They have also deviated from the average 45.39 points (standard deviation). Regarding the data dispersion (variance) was 2060.87 points. The values tend to get closer in the right part of the average as they have an asymmetric value of -.195. There is a low-value concentration (platykurtic) because the value is lower than 0 (Table 8).

Table 8. Central Tendency Measures and Competitiveness Variability

		Competitiveness
Descriptive statistics	N	4
	Range	90.83
	Minimum	467.11
	Maximum	557.96
	Addition	2067.17
	Median	521.05
	Average	516.79
	Standard Deviation	45.39
	Variance	2060.87
	Asymmetry	-0.195
	Kurtosis	-4.751

Source: Own elaboration.

General results of the independent variables

The main objective of the investigation was to determine the competitiveness variables and in what proportion the ICTs and innovation have an impact on Mexico's exporting MSMEs competitiveness. Therefore, the following is reported: the competitiveness variables according to the information from the Theoretical Framework, it was perceived that the causing competitive variables mentioned more frequently by institutions such as the OECD, INEGI, as well as by investigators as Porter (1985, 1990), Quiroga (2003), Molina (2013), De la Cruz, Morales and Carrasco (2006), Rubio and Aragón (2006) was: Investigation and Development, Human Resources Management, Negotiation, Performance, Financing, ICTs, and Innovation.

Table 9. Central Tendency Measures and causing competitive variables variability

	ICTs	Innovation	HR management	Negotiation	Performance	Financing	I&D
N	4	4	4	4	4	4	4
Range	25.28	0.23	5.74	11.36	1.01	4.37	48.53
Minimum	55.18	0.18	103.21	44.87	56.16	5.24	198.80
Maximum	80.46	0.41	108.95	56.23	57.17	9.61	247.33
Addition	271.27	1.15	424.69	202.26	226.66	29.31	911.80
Average	67.81	0.29	106.17	50.56	56.66	7.32	227.95
Median	67.82	0.28	106.26	50.58	56.67	7.23	232.84
Standard Deviation	14.59	0.110	2.36	6.25	0.481	2.194	23.40
Variance	212.94	0.012	5.612	39.122	0.232	4.818	547.923
Asymmetry	0.000	0.186	-0.225	-0.001	0.000	0.086	-0.615
Kurtosis	-6.000	-4.253	0.958	-5.925	-4.375	-5.135	-2.552

Source: Own elaboration.

The independent variables that are the object of study for the present thesis are ICTs and Innovation, therefore the analysis will be done only for these variables.

About the CTs variable, the obtained median was 67.82 points. The average was 67.81 (ICTs), which indicates that the enterprises are, to ICTs, the same as the median. Likewise, they deviate from the average with 14.59 points. The data dispersion (variance) is 212.94 points. The asymmetry is .000 which suggests that there is the same number of values on both sides of the average. The kurtosis is -6.00 which indicates that it is platykurtic, there is a low concentration of values.

In the innovation variable, it is presented a value of .28 points. The variable average was .29, though the enterprises were beyond in innovation regarding the median, the difference is minimal. The values deviation regarding the average is .11. The data dispersion (variance) es .012 points. The kurtosis is -4.253 and it suggests a low concentration of values.

For the rest of the dimensions which are part of the competitiveness, there is similar data; their average is very close to the median, the asymmetry close to 0 suggests there is the same number of values on both sides of the average. Being the kurtosis under 0 suggests there is a low concentration of values per dimension.

Multivariate Analysis

It is done by the Linear Regression with a significance level of 95% of reliability, in which the following function was established:

$$Y_i = \beta_{1+} \beta_2 x_2 + \beta_3 x_3 + u$$

Where Y_1 is the dependent variable of Competitiveness
x_2 is ICTs
x_3 is Innovation
u is the error

The latter linear regression suggests the correlation between the independent variables with the dependent is very high having the result of R of . 979. The determination coefficient from the R square model suggests there is a high variation proportion of the Competitiveness variable explained by the variables ICTs and Innovation having the result of .959, therefore it is explained in 95.9% by such independent variables.

There is no autocorrelation between the variables, due to the test Durbin-Watson has 2.1000 and to get through such a test it should be in the range

between 1.5 and 2.5. The table of coefficients says the formula would be as follows:

Competitiveness = 326.554 + 2.475 (ICTs) + 77.234 (Innovation) + 15.92042 (error)

Such construction leads to conclude the competitiveness will increase an average of 2.475 percentual point destined to the existing incomes the exporting MSMEs have for the ICTs, and there will be an increase of 77.234 percentual point destined from the exporting MSMEs to Innovation. The T-test is insignificant for the model being over .05. Nevertheless, the implementation of such variables (ICTs and Innovation) has no immediate effects but the long-term effect for the Competitiveness variable, which explains the T-test results in the linear regression model.

The obtained data when applying the Pearson correlation coefficient (r), as well as the determination coefficient (r2) in the present investigation, shows the following relations: about the Pearson correlation coefficient. The correlation of the ICTs variable with the Competitiveness variable is very high, very significant having a value of .978, especially when it is at 0.05 2 tails level. The ICTs determination coefficient to competitiveness is .956, which is high, and suggests that the competitiveness variation is explained by ICT's in .95.6%.

The innovation variable for competitiveness in correlation has a .959 value which is also very high, very significant, especially at a 0.05 level of 2 tails. Innovation explains the variability of competitiveness in 92%.

As observed above, the one with a higher influence is ICTs, followed by Innovation. Consequently, the obtained result from the general hypothesis is that the ICTs and Innovation had a positive impact on Mexico's exporting MSMEs competitiveness, and the two specific hypotheses which are: ICTs had a positive impact on Mexico's exporting MSMEs competitiveness and innovation positively contributed to Mexico's exporting MSMEs competitiveness are validated.

CONCLUSIONS

The conclusions obtained after developing the scientific investigation in Mexico's exporting MSMEs are the following:

1. Regarding to the Theoretical Framework, the international business theories were studied (classic theory, neoclassic, and the Michael Porter competitive advantages), which talk about the competitiveness at a macroeconomic and microeconomic level, besides considering the evaluation criteria from the OECD, INEGI, researchers, and research institutions. The theory behind each independent variable was investigated, from where their dimensions and indicators were extracted

to carry out the present study; subsequently and based on data from the surveys ENAPROCE, ESIDET, and OECD, a matrix of the variables data with its corresponding dimensions and indicators was elaborated.

2. It was concluded that Mexico's exporting MSMEs are competitive for the variables considered for this study are the ones more frequently mentioned in the Theoretical Framework (Investigation and Development, Human Resources Management, Negotiation, Performance, Financing, Information and Communication Technologies, Innovation).
3. Based on the central tendency measures and the variability of the competitiveness variable we conclude that: the enterprises are under the median which has a value of 524.05 points since the average is 516.79, therefore the competitiveness is average for not having a differentiation range between the median and the average. The average deviation is of 45.39 scale units, based on which it is confirmed the average competitiveness since if it were under 475.66 points then the competitiveness would be bad, and being above such number it is concluded it is average.
4. It was determined that the independent variables (ICTs and Innovation) are strongly related to competitiveness since there is a high positive correlation between the independent variables and the dependent variable, the result of the multivariate analysis between the dependent variable and the independent ones. The linear regression carried out suggests that the correlation between the independent variables and the dependent one is very high having an R result of .979. The determination coefficient from the R square model says there is a high proportion of variation of the Competitiveness variable explained by the ICTs and innovation variables having a result of .959, therefore it is explained a 95.9% by such independent variables. Consequently, an investment increase in such independent variables will raise Mexico's exporting MSMEs competitiveness. There is no variable correlation since the Durbin-Watson test has 2.1000 and to be approved it should be between the range 1.5 and 2.5.
5. As a consequence, it is confirmed the impact of the previously described variables is the following: the ICTs impact on the competitiveness in a 0.978; the innovation in 0.959. As observed, the one with a higher influence is ICTs, followed by Innovation. Thus, the result obtained for the general hypothesis is that the ICTs and innovation had a positive impact on Mexico's exporting MSMEs, and the two specific hypotheses which are: ICTs had a positive influence on Mexico's exporting MSMEs

competitiveness and Innovation positively contributed to Mexico's exporting MSMEs competitiveness are validated.

6. The present work answered the investigation question which arose from the existing problem of low investment in ICTs and innovation in Mexico's exporting MSMEs, which has impacted the MSMEs of the latter, moreover, it also fulfilled the general objective which was to describe in what way the ICTs and innovation influenced Mexico's exporting MSMEs competitiveness and the two specific objectives which are: identify how the ICTs influenced Mexico's exporting MSMEs and to acknowledge how the innovation influenced Mexico's exporting MSMEs in the sense of contributing with concrete results supported by the present investigation.

RECOMMENDATIONS

1. There should be a higher investment in ICTs and innovation to drive Mexico's exporting MSMEs competitiveness. To obtain higher tools that allow the mentioned enterprises to improve their commercial relationships at an international level, as well as to have a broader impact on the country's economic development.
2. Regarding the ICTs, businessmen require information and training on the impact they have on their enterprises' competitiveness, benefits, and programs which they could apply to have resources and to implement them. If there is a higher percentage of incomes destined to the I&D, enterprises could significantly increase enterprise competitiveness. Using the Internet for the enterprises could boost the supply chains' synchronization from which they are part and in that way be able to obtain more participation and make the process more efficient; apart from that, trying to be part of the electronic business could be a good strategy for them to position their enterprise in the national and international market.
3. The innovation for exporting MSMEs is important, for that reason the businessmen should recognize the benefits of making innovations and destining incomes for this sector. Strategies to implement innovation into the enterprise as processes, products, services, and marketing would be of great help for the exporting MSMEs.
4. The Negotiation and Financing dimensions also have an important impact on competitiveness, hence strategies should be implemented to boost MSME's improvement in such sectors. Both dimensions have an impact on competitiveness and ICTs and innovation so a posterior investigation line could be applied in which the latter dimensions are taken into consideration.

5. Regarding to the Negotiation, so the enterprises can directly export, training is required in fulfilling tariff and non-tariff regulations so they can export their products and services. Also, to sell to multinational or foreign enterprises, the products should fulfill certain requirements, and the required investment is important for the MSME's income, so it should be worked together with the Financing part.
6. Nowadays, negotiations at an international level are done in great part through electronic commerce, therefore the ICTs play an important role to carry it out, if the exporting MSME's invest in ICTs the negotiations dimension can improve.
7. The Financing dimension for the enterprises requires firstly knowledge from the businessmen and secondly, training in filling up documents, which can also be filled up electronically via and make the process more efficient.

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Chapter 10

Trade Incentives, Competitiveness and Their Measurement: Mexican Brewing Industry

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Trade Incentives, Competitiveness and Their Measurement: Mexican Brewing Industry

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Introduction

In the current dynamics of globalized trade, identifying an economic activity's competitive nature and measuring its competitiveness are key issues in strategic decision-making for its permanence and growth in the market. Competitiveness has many definitions and ways of being measured that result from different methodological approaches.

The concept of competitiveness has its backgrounds in the Classical Theory of International Trade, which starts from the study of absolute and comparative advantages identified in economic activities in different countries; other theories also consider in their analysis, factors such as innovation, the product cycle, the development of economies of scale, product differentiation, the existence of imperfect markets, intra-industrial trade, technological development, factor productivity, the environment, corporate social responsibility and the value chain in which it participates, among other possible elements of analysis.

When seeking to determine the competitive position of industrial activity, its comparative advantages are measured. Many of the data involved in their determination are costs (of inputs, labor, production processes, or services, among others). The traditional way of measuring comparative advantage is with relative prices; however, for industries located in emerging countries and producing mature products (such as beer), the prices of various inputs they use often have distortions that limit their usefulness.

They have developed alternative methodological proposals based on trade flow data (exports and imports) to measure competitiveness because of this situation. With this commercial or market approach, competitiveness is characterized as the capacity of a local industry to successfully face competition in the domestic market and achieve presence in the external market by commercializing its products. From this perspective, two methodological proposals are analyzed for measuring competitiveness, using trade flow data, the Export Performance Index and the Revealed Comparative Advantages Index.

The objective is to identify the explanatory possibilities of the trade flows in the measurement of an industrial activity's competitiveness through the proposed indices and, of these, which explains with greater precision the competitive behavior of the industrial activity. The Mexican Brewing Industry was selected as a case study. The choice was based on their economic performance.

During the period 2013-2019, the activity was the world's leading beer exporter. At the national level, the value of its production (at constant 2013 prices) grew at rates higher than those of the GDP, and its share in the latter rose from 0.48 percent to 0.66 percent, it also increased the number of its employees by 28. 9 percent. The value chain in which it participates was of great importance in employment and the localities development where inputs are produced or production facilities are located.

The work is structured in four sections. In the first one, a framework is elaborated that explains two linked theoretical-methodological fields, the main ideas of economic theory that explain the incentives to trade and competitiveness and, the measurement of competitiveness.

The second one, as a case study, describes and analyzes the behavior of the main productive and commercial variables of the Mexican Brewing Industry in the period 2013-2019. In the third one, the Export Performance Index and the Revealed Comparative Advantages Index are used to measure the competitiveness of the Mexican Brewing Industry. In the fourth one, the results are discussed. In addition to comparing, analyzing, and interpreting each index's final results, it is identified that the analysis of its factors gives

additional information that explains the competitive behavior of the activity. Finally, conclusions are drawn.

The work was done with official information. For the Mexican Brewing Industry, data was taken from the National Institute of Statistics and Geography. For global information, figures from the World Trade Organization and the United Nations Industrial Development Organization were used.

TRADE INCENTIVES, COMPETITIVENESS AND THEIR MEASUREMENT

The development of international trade has created the need to know and measure the competitiveness of economic activities. Their knowledge allows companies to make strategic decisions to stay and grow in the market. There are different theories, schools, approaches, and models in the economic literature that analyze competitiveness from different perspectives. This section presents some of the main theoretical underpinnings of international trade and competitiveness.

The concept of competitiveness has its antecedents in the Classical Theory of International Trade developed by Adam Smith and David Ricardo. These economists raised that trade operates based on the economic laws of Absolute and Comparative Advantage. Adam Smith presented that the wealth of nations could be maximized if countries specialized in sectors where they had advantages in exporting and importing those goods that were cheaper abroad (Smith, 1977), that is, nations should export only goods with absolute advantages. He also noted that such a pattern of specialization and free international trade would allow for the efficient allocation of resources and generate gains for all participating nations.

David Ricardo proved that the benefits of international free trade could be greater. In his Comparative Advantage Theory, he mentioned that even if a country produces two goods at lower prices in absolute terms than those produced in another country, it can benefit even more from international trade if it concentrates its production in the one with the highest comparative advantage and that in which it has the lowest comparative advantage buys (Ricardo, 1994).

In this way, each country will export the good whose relative production cost is lower than in the other country. The comparative advantage materializes the differences in relative labor costs. From that perspective, a country will export the good where labor productivity is higher than the other country, which will generate differences in prices and determine trade.

In 1933 Eli Heckscher and Bertil Ohlin developed the Heckscher-Ohlin model, which became the orthodox neoclassical explanation of international trade. This model establishes differentiated supply and demand conditions

between countries to carry out the exchange, maintaining the comparative advantages validity (Chacholiades, 1992, pp. 73-97).

It is pointed out that the differentiated factor endowment between countries is the cause of inequality in production costs and prices of goods. These differences lead to a trade. It is argued that countries should specialize in industries in which they have comparative advantages, in those that are relatively cheap factor-intensive, export the goods, and import those in which they have comparative disadvantages.

There are several criticisms of the model, one of which refers to the rigidity of its assumptions (for example, it assumes a static technological level that prevents analysis of the impact of innovation on production, prices, and trade), another for not explaining the growing trade between countries with equal factor endowments, yet another for not including factors that impact international trade in its analysis, and that impact on business competitiveness such as transportation costs, tariffs, and subsidies, all of which generate additional differences in the prices of goods and impact international trade. Finally, it is noted that there is a continuous change in consumption patterns that negates the assumption that countries regularly trade the same basket of goods as the model assumes.

In the absence of realism in traditional theories assumptions, new theories of incentives for international trade and competitiveness have emerged. Most are complementary approaches to the traditional ones. Their arguments focus on issues related to the advantages obtained by developing economies of scale, the existence of imperfect markets, intra-industrial trade, technological development, and factor productivity, among others.

For example, Paul Krugman proposes a model in which economies of scale and product differentiation play an important role in generating trade (Appleyard & Field, 1995). Its model is based on two assumptions that differ from the neoclassical theory, economies of scale and monopolistic competition. It considers that the first exists and that work is the only factor of production; therefore, duplicating production does not require duplication of work.

It assumes that the second occurs in markets where many companies are producing differentiated goods, and each incorporates a certain level of consumer loyalty to the brand via marketing. In the short term, companies with differentiated products have high profits; with new competitors' entry, there are substitutes, and prices are reduced.

In the long term, increased production leads to economies of scale; reducing the cost per unit brings down the price. If this happens in another country, there will be incentives to trade; both will benefit from economies of scale because the prices of goods are reduced and generate a real increase in workers income.

The quantity and variety of products available increases. The model allows for trade analysis between countries with equal factor endowments, even of similar goods from the same industry (intra-industry trade). This type of trade is not conceived in neoclassical theory since it considers that the exchange only occurs with differentiated goods (Chacholiades, 1992, p. 117).

Michael Posner pointed out that with innovation or the appearance of a new product on the market and its imitation by other countries, a technological gap emerges that impacts trade, changing a country's advantage in world trade. In the beginning, the innovating country has an absolute advantage; as the product is imitated, the gap narrows, and the innovating country loses the absolute advantage. This process stimulates him to look for a new gap in another good. The continuous development of new products leads to the formation of temporary monopolies that derive from this absolute advantage (Posner, 1961).

In 1966 Raymond Vernon generalized the technological gap in his theory on the Product Cycle (Vernon, 1970). It explains the changes in the comparative advantages of the technology gap concerning the product cycle. It defines three stages: the new product, the mature product, and the standardized product.

When a product is new, the innovative company has an absolute advantage. By operating in a market of imperfect competition, you have the opportunity to set the price and export. As the product is imitated, the absolute advantage begins to disappear. With the emergence of more competitors, the advantage moves from absolute to comparative.

In this theory, the selection of resources throughout the industrial development of a product is fundamental due to the change in comparative advantages. When the product is new, the company requires innovation, research, and skilled labor. When it is mature, the need for capital increases, and less skilled work is required.

When the product is standardized, the technical level is stabilized, the technological differences between companies tend to disappear. According to the needs of resources, the advantages can change from a country with high qualified personnel requirements to another where new resources are gaining importance.

In 1991, Michael E. Porter argued in his Competitive Advantage Theory that factor productivity of production is the key to explaining the competitive advantages of nations in world trade (Porter, 1991). It points out that this is also the main determinant of a nation's standard of living.

He stresses that productivity depends on the permanent improvement of the value systems of the economic environment of a nation and that it is in this environment, which he calls "diamond", that competitive advantages are generated. It points out that levels of competitive advantage are determined by product differentiation, brand awareness, customer relationships, continuous investment and efforts to innovate value systems.

At the company level, it synthesizes the process of improving productivity through a system of elements that it calls the "diamond" determinants. This last one is characterized as a dynamic system (Porter, 1991, p. 139) that needs to be fully addressed in order to promote the competitiveness of enterprises in the context of globalized trade.

The differences in productivity, technology, quality and competition mechanisms of companies are factors that determine the commercial behavior of their products. They result in a fractionated development due to the take-off of some products and even of companies that carry out parts of the production process in the same industry.

The segmented nature of industrial development encourages companies to compete with global strategies that translate into major operations at the international level. For Porter, the idea of a competitive nation disappears, the nation is just the place where a business or industry is established. It is mainly these, not the nations, that compete in the world market.

From different theories, approaches, and models of economic theory, it is necessary to measure its comparative or competitive advantages to determine the competitiveness of an activity. Many of the variables involved in their calculation, such as costs (of inputs, labor, production processes, services, or logistics, among others), or relationships such as productivity of production factors, require relative prices for their calculation.

However, for industries that produce standardized products (such as footwear, common clothing, manufactured foods for mass consumption, and beverages such as bottled water, soft drinks, and beer, among others) and, which are located in emerging countries, the prices of several of their inputs, although they can be quoted on the international market, often have regional or local variations, which make their prices imprecise, particularly those of raw materials that are obtained domestically and even locally.

Given this situation, alternative methodological proposals have emerged to measure industries' competitiveness using trade flow data (exports and imports). The analyses of these proposals focus on industries' ability to market their products in the international marketplace.

They assume that their products' trade patterns or their aggregates at the class or industry level reflect relative costs and differences in factors such as quality and service. Under this perspective, competitiveness has a market or commercial focus. It can be defined as the capacity of a local industry to successfully face external competition both in the domestic market and to dispute its presence in the external market by selling its products.

A methodological proposal of this type, which frequently appears in the competitiveness studies of the United Nations Industrial Development Organization, is that of the indices, Export Performance Index (EPI) and the Revealed Comparative Advantages Index (RCAI). Table 1 shows the structure of these indices.

The competitiveness of an activity can be measured with export and import data or with export data only. When only export data is used, the Export Performance Index is usually used. This is calculated as the ratio of the share of exports of the country's industry (xi) in world exports (w) of the same industry (xi) to the corresponding share of the country's total manufacturing (Xj) in world manufacturing (Xw). This export share ratio is taken as an indicator of revealed comparative advantage or disadvantage. (UNIDO, 1982, p. 24)

Table 1. Two indices using trade flow data to measure competitiveness

Export Performance Index [a/]	Revealed Comparative Advantages Index [b/]
$EPI_{i,j} = \frac{\frac{x_{i,j}}{x_{i,w}}}{\frac{X_j}{X_w}}$	$RCAI_{i,j} = \frac{(x-m)_{i,j}}{\left(\frac{X+M}{2}\right)_j \frac{\left(\frac{x+m}{2}\right)_{i,w}}{\left(\frac{X+M}{2}\right)_w}}$

Where:

X	is the total export value of the manufacturing sector.
M	is the total import value of the manufacturing sector.
x	is the export value of the good, class or branch.
m	is the import value of the good, class or branch.
i	represents the good, class, branch or industry.
j	indicates the country.
w	refers to the world total.

Source: Own elaboration with information from: a/ (UNIDO, 1982, 1985).

Table 2. Economic relations that make up the RCAI

A	B	C
$A = (x - m)_{ij}$	$B = \left(\frac{X + M}{2}\right)_j$	$C = \frac{\left(\frac{x + m}{2}\right)_{iw}}{\left(\frac{X + M}{2}\right)_w}$
Trade balance of the good or industry.	Average manufacturing trade flow in the country.	Relative weight of the average world trade flow of the good or industry in that of world manufacturing.

Source: Own elaboration with information from (UNIDO, 1985).

When using export and import data, you can use the Revealed Comparative Advantages Index (Table 1). This index was developed by the United Nations Industrial Development Organization (UNIDO) in 1985 (UNIDO, 1985, p. 107). It calculates the comparative advantage of an established industry in a country, such as the ratio of its trade balance, between the value of the product formed by the average flow of the country's manufacturing trade and the relative weight of the average flow of world trade in that industry in manufacturing. The RCAI is integrated by three economic relationships. Table 2 shows the three index relationships.

Relationship A is the balance of the trade balance of the good, class, branch, or industry that is analyzed; B is the average trade flow of the manufacturing sector of the country, and C, is the relative weight of the world trade of the good, class, branch or industry analyzed in the world trade of manufactures. The value of the RCAI is positive or negative according to the trade balance of the good or industry under study. With a surplus, it is positive; with a deficit, it is negative; in the first case, it reveals a comparative advantage level, in the second one, a level of comparative disadvantage. The use of these indices is exemplified below with the calculation of the Mexican Brewing Industry's competitiveness during the period from 2013 to 2018.

The Mexican Brewing Industry (MBI)

According to data from the National Institute of Statistics and Geography (INEGI), in 2013 the value of production of the MBI, at constant 2013 prices, was $77,528 Million Mexican Pesos (MMP), representing 0.48 percent of Gross Domestic Product (GDP) that year (Table 3). In 2019 it was $122.396 MMP and represented 0.66 percent of the value of GDP. In all years of the 2013-2019 period,

the value of the MBI's production grew at rates higher than those of the GDP. In 2019 it was 4.15 percent, while GDP contracted by 0.30 percent.

Table 3. Mexico. Value of MBI production, growth rate and share in GDP. 2013-2019

	Production (P)		Employed (E)		Productivity (P/E)	
Year	(Millions of liters)	Growth rate (%)	(Employees)	Growth rate (%)	(Thousand liters per employer)	Growth rate (%)
2013	8,460		10,151		833.42	
2014	9,145	8.10	10,664	5.05	857.56	2.90
2015	9,715	6.23	11,419	7.08	850.78	-0.79
2016	10,432	7.38	13,135	15.03	794.21	-6.65
2017	11,178	7.15	13,730	4.53	814.13	2.51
2018	12,163	8.81	12,980	-5.46	937.06	15.10
2019	12,450	2.36	13,087	0.82	951.33	1.52
Period						
2013-19		47.2		28.9		14.15

Source: Own elaboration (INEGI, 2020b, 2020a).

Table 4. MBI. Quantity of beer produced, Staff employed and Productivity. 2013-2019

Year	GDP[a/]		Value of MBI production (MBIP)[b/]		Participation
	(MMP at constant prices of 2013)	Growth rate (%)	(MMP at constant prices of 2013)	Growth rate (%)	MBIP/GDP (%)
2013	16,277,187		77,528		0.48
2014	16,741,050	2.85	81,883	5.62	0.49
2015	17,292,358	3.29	88,876	8.54	0.51
2016	17,747,239	2.63	101,912	14.67	0.57
2017	18,122,261	2.11	106,428	4.43	0.59
2018	18,521,324	2.2	117,523	10.42	0.63
2019	18,465,007	-0.3	122,396	4.15	0.66

Source: Own elaboration with information from INEGI (2020c).

Table 5. World. Beer: Exports (X), Imports (M) and Average Trade Flow (ATF) in Value. 2013-2019

	Value (Millions of US$)			Growth rate (%)		
Year	X	M	ATF	X	M	ATF
2013	13,545.7	12,579.9	13,062.8			
2014	13,516.9	13,421.2	13,469.1	-0.2	6.7	3.1
2015	12,758.0	13,070.8	12,914.4	-5.6	-2.6	-4.1
2016	13,092.5	13,858.1	13,475.3	2.6	6.0	4.3
2017	14,290.1	14,701.2	14,495.7	9.1	6.1	7.6
2018	15,338.1	15,834.5	15,586.3	7.3	7.7	7.5
2019	10,883.4	10,482.2	10,682.8	-29.0	-33.8	-31.5

Source: Own elaboration with information from UNITED NATIONS (2020c).

From 2013 to 2019 the volume of beer, in Millions of Liters (ML), produced by the MBI increased, in 2013 it produced 8,460 ML, in 2019, 12,450 ML, resulting

in a growth rate of 47.2 percent (Table 4). Between those years, their number of employed and their productivity also increased, the first by 28.9 percent, and productivity went from 833.42 thousand liters per worker in 2013 to 951.33 thousand liters per worker in 2019.

In the period 2013-2019, the world beer market shrank. In 2013 its Average Trade Flow (ATF) was 13,062.8 Million of US$ (MUS$), in 2014 it registered a growth of 3.1 percent, in 2015 a drop of 4.1 percent, in the three following years it had growth of between 4.3 and 7.6 percent and finally, in 2019 it registered its biggest drop, 31.5 percent. Table 5 shows the behavior.

For the MBI, the X's behavior in the period 2013-2019 was contrary to the world; their X grew. The only exception occurred in 2019 when they had a slight fall preceded by significant growth in 2017 and 2018. Table 6 shows the behavior. On the other hand, the M had a predominantly decreasing behavior that, added to the X's increasing behavior, made their Good Balance (GB) positive and practically doubled between 2013 and 2019. Although before 2013, the MBI already had an international presence, this increased when national private capital companies FEMSA CERVEZA and GRUPO MODELO became owned by foreign companies with a global presence; their positioning improved even more in the world market, which increased to the X.

The activity is currently highly concentrated in two large foreign brewery groups, which divide the Mexican market. One of them, before FEMSA-CERVEZA, now owned by HEINEKEN (Netherlands), has a 41 percent stake, and the other, GRUPO MODELO, is currently owned by ANHEUSER-BUSCH INBEV (Belgium-Brazil) has a 57 percent stake (Sánchez, 2020)

Table 6. Mexico. Beer: Exports, Imports and Good Balance (GB). 2013-2019

	Market value (Millions of US$)			Growth rate (%)		
Year	X	M	GB	X	M	GB
2013	2,211.2	154.9	2,056.3			
2014	2,349.0	151.2	2,197.8	6.2	-2.4	6.9
2015	2,481.3	225.1	2,256.2	5.6	48.9	2.7
2016	2,677.9	200.1	2,477.8	7.9	-11.1	9.8
2017	3,605.3	187.1	3,418.2	34.6	-6.5	38.0
2018	4,217.2	202.6	4,014.7	17.0	8.3	17.4
2019	4,173.4	79.4	4,094.0	-1.0	-60.8	2.0

Source: Own elaboration (UNITED NATIONS, 2020d).

In terms of the World beer export market (X), four of the five countries that occupied the top five places in 2013 retained, with changes in their positions, their presence in 2019. Table 7 shows the movements and values. Mexico remained in the top spot, and its share increased from 16.3 percent in 2013 to 38.3 percent in 2019. Belgium moved from third place in 2013 to second place in 2019,

Germany also improved its position from fourth to third place in 2019 but, unlike Mexico and Belgium, the value of its X's dropped. This table also shows that the value of the World beer export market was concentrated. In 2013, twenty countries accounted for 87.7 percent of the export supply. In 2019 the same number of countries accounted for 98.7 percent.

Table 7. World. Beer. Value of Exports by Country in 2013 and 2019

Year/ Position by value	Countries	Value (Millions of US$)	Value (%)	Accumulated value (%)
2013				
1	Mexico	2,211.2	16.3	16.3
2	Netherlands	2,037.5	15.0	31.4
3	Belgium	1,550.4	11.4	42.8
4	Germany	1,372.6	10.1	52.9
5	United Kingdom	985.0	7.3	60.2
6-20	15 following countries	3,724.6	27.5	87.7
21-140	120 remaining countries	1,664.4	12.3	100.0
Total	140 countries	13,545.7	100.0	
2019				
1	Mexico	4,173.4	38.3	38.3
2	Belgium	1,935.5	17.8	56.1
3	Germany	1,345.9	12.4	68.5
4	United States	805.9	7.4	75.9
5	United Kingdom	639.0	5.9	81.8
6-20	15 following countries	1,847.1	17.0	98.7
21-45	25 remaining countries	136.6	1.3	100.0
Total	45 countries	10,883.4	100.0	

Source: Own elaboration with information from UNITED NATIONS (2020a).

Table 8. World. Beer. Value of Imports by Country in 2013 and 2019

Year/Position by value	Countries	Value (Millions of US$)	Value (%)	Accumulated Value (%)
2013				
1	United States	3,906.8	31.1	31.1
2	United Kingdom	678.8	5.4	36.5
3	Italy	645.6	5.1	41.6
4	France	638.7	5.1	46.7
5	Canada	627.8	5.0	51.7
17	Mexico	154.9	1.2	
The rest	157 countries	5,927.3	47.1	
Total	163 countries	12,579.9	100.0	
2019				
1	United States	5,852.90	55.8	55.8
2	United Kingdom	663.5	6.3	62.2
3	Italy	639.3	6.1	68.3
4	Canada	546.5	5.2	73.5
5	Germany	519	5.0	78.4
13	Mexico	79.4	0.8	
The rest	43 countries	2181.6	20.8	
Total	49 countries	10,482.20	100.0	

Source: Own elaboration with information from UNITED NATIONS (2020b).

Concerning the market value of World beer imports (M), the countries that occupied the first three places in 2013 retained their position in 2019, but their behavior was different. The United States remained in the first place, and its share increased from 31.1 percent in 2013 to 55.8 percent in 2019. Table 8 shows the movements and values. The second and third places were for the United Kingdom and Italy, respectively, increasing their market value in percentage terms in 2019 but reduced their amounts compared to 2013. Mexico ranked 17th in 2013 and, although it improved its position in 2019 by ranking 13th, it reduced the value of its M from 154.9 million US$ in 2013 to 79.4 million US$ in 2019.

Calculation of MBI's Competitiveness

In order to analyze the competitive behavior of the MBI in the period 2013-2020, two values of its competitiveness per year were obtained, one with the EPI and another with the RCAI. As both indices use national and global manufacturing trade flow data -of X in EPI and of X and M in RCAI- the first task was to collect the information. Table 9 shows the data and relationships of good balance and average trade flow.

Table 9. World and Mexican Manufacturing Industry: Export (X), Import (M), Good Balance (GB) and Average Trade flow (ATF). 2013-2018, (Millions of US $)

	World [a/]			Mexico [b/]			
Year	X	M	ATF	X	M	GB	ATF
2013	11,859,117	12,389,170	12,124,144	285,247	301,565	-16,318	293,406
2014	12,287,237	12,770,291	12,528,764	309,085	316,657	-7,572	312,871
2015	11,330,715	11,962,490	11,646,603	311,791	320,269	-8,478	316,030
2016	11,139,789	11,793,289	11,466,539	306,191	312,731	-6,540	309,461
2017	12,116,430	12,911,676	12,514,053	332,539	330,324	2,215	331,432
2018	13,157,224	13,996,171	13,576,698	362,608	357,490	5,118	360,049

Source: Own elaboration with information from WTO (2020b, 2020a)

Since trade operations are decided at current (market) prices, the indices' calculation was made with data at current prices in millions of US dollars. Those of the X and M of beer were taken from tariff fraction 220300 -beer made from malt- of the United Nations' Contrade Database and, those of X and M of manufactures from Mexico and the world of the World Trade Organization's Database Inventory. After homogenizing the information, the indices were calculated.

Each annual value of EPI was obtained by dividing the share of exports of the activity (data in Table 6) in world exports of the same activity (data in Table 5) by the share of the country's manufactured exports in world manufactured exports (data in Table 9). Table 10 presents the results.

Table 10. Mexican Brewing Industry. EPI and RCAI Indexes. 2013-2018

	EP Index				
	Export (Millions of US$)				EPI (Units)
Year	Mexico		World		
	Beer [a/]	Manufacturing industry [b/]	Beer [c/]	Manufacturing industry [d/]	
2013	2,211.2	285,247	13,545.7	11,859,117	6.79
2014	2,349.0	309,085	13,516.9	12,287,237	6.91
2015	2,481.3	311,791	12,758.0	11,330,715	7.07
2016	2,677.9	306,191	13,092.5	11,139,789	7.44
2017	3,605.3	332,539	14,290.1	12,116,430	9.19
2018	4,217.2	362,608	15,338.1	13,157,224	9.98
	RCA Index				
	Good Balance	Average Trade Flow			RCAI
Year	(Millions of US$)				(Units)
	Mexico		World		
	Beer [a/]	Manufacturing industry [b/]	Beer [c/]	Manufacturing industry [d/]	
2013	2,056.3	293,406	13,062.8	12,124,144	6.50
2014	2,197.8	312,871	13,469.1	12,528,764	6.53
2015	2,256.2	316,030	12,914.4	11,646,603	6.44
2016	2,477.8	309,461	13,475.3	11,466,539	6.81
2017	3,418.2	331,432	14,495.7	12,514,053	8.90
2018	4,014.7	360,049	15,586.3	13,576,698	9.71

Source: Own elaboration.

In the case of the RCAI, each annual value was obtained by calculating its three economic relationships ( ); that is, the annual balance of the Good balance of the MBI (data in Table 6) was divided by the value that resulted from multiplying the Mexico's average manufacturing industry trade flow (data in Table 9) by the relative value of the world beer industry in world manufacturing. The latter relative value was obtained by dividing the average beer industry trade flow (data in Table 5) by the average manufacturing trade flow worldwide (Table 9). Table 10 shows the results of those indexes. In all years of the 2013-2018 period, the EPI results and the RCAI were positive, revealing that MBI is a competitive activity (Table 10).

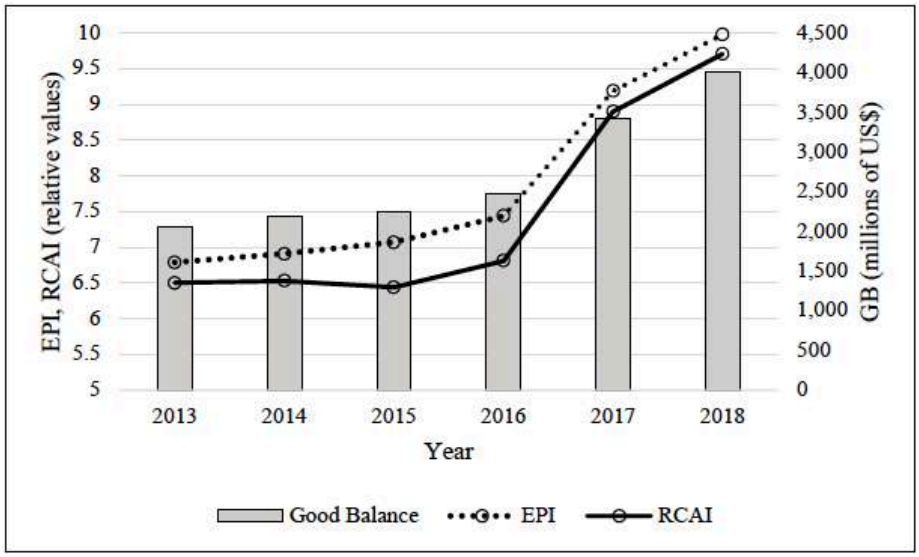
INTERPRETATION AND ANALYSIS OF RESULTS

The study showed that EPI and Good Balance's values had similar behavior, increasing competitiveness during the period. They also showed that this increase had two stages: a slow growth stage between 2013 and 2016 and a fast growth stage between 2016 and 2018.

Graph 1 shows the behaviors. In the case of the RCAI, although it also showed competitiveness growth in the period with similar slow and fast growth trends, it revealed a fall in the competitiveness of the MBI between 2014 and 2015 that was not detected by the EPI and Good Balance. What explained the drop in

competitiveness? Furthermore, why did not the EPI and the Good Balance record it?

Graph 1. Mexican brewing industry (MBI). Good Balance (GB), EPI and RCAI indexes, 2013-2018



Source: Own elaboration.

To answer what explained the fall in the competitiveness of the MBI between 2014 and 2015, the percentage variations between the RCAI components for those years were analyzed. The procedure consisted of calculating the percentages of increase in the numerator and denominator of the RCAI formula from 2014 to 2015. It was identified that the trade surplus of the MBI (numerator) grew less (2.65 percent) than the world reference (denominator) (4.18 percent), which indicated that between those years, the world beer market grew at a higher rate than net exports of the Mexican beer industry did. This explains the drop in the RCAI in 2015, even though the surplus of the Good Balance of the activity in that year was greater than in 2014. This explains why the commercial competitiveness of the MBI will decrease in 2015.

The explanation of why the EPI and the Good Balance did not record the fall in competitiveness in 2015 is that, in the former's case, although, the export data lead to a determination of the position of the MBI in world trade, which reveals its comparative advantage. It is not an accurate measure of competitiveness since it does not consider the effect of net exports. In the case of the second, it is a relationship of absolute data (X-M) that does not establish a comparison with the weight of the activity's world trade, nor with that of the country's or world's manufactures, and therefore does not reveal the comparative advantage of the activity.

The use of the two trade flow indices presented in this paper allowed the identification of their explanatory powers to analyze competitiveness. It showed that RCAI is more accurate than EPI. It also proved that the indices' total results should be considered, and that the analysis of their components is essential to understand the competitive position of activity.

The RCAI showed that the MBI increased its competitiveness by 3.21 units between 2013 and 2018. The result allows us to assume that the competitive strategies adopted by the MBI were successful since they allowed it to maintain and grow in the market. This was also revealed by the increases in other variables of the activity that were obtained when comparing the values of 2013 and 2019: productivity (14.15 percent), production (47.2 percent), employment (28.9 percent), the value of the participation of beer exports from Mexico in the world (from 16.3 percent to 38.3 percent) the trade surplus (99.1 percent).

CONCLUSIONS

Competitiveness has its background in the concepts of absolute and comparative advantage of the Classical Theory of International Trade. According to this theory, a country will benefit more from international trade if it concentrates its production on the good that has the greatest comparative advantage and buys it with the least comparative advantage. In this way, each country will export the good whose relative production cost is lower than in the other country.

This theory points out that determining an activity's competitiveness requires measuring its comparative advantages employing relative costs and prices. Other economic theories also use relative costs and prices to determine a comparative advantage. In Krugman's model, economies of scale use relative prices. In Porter's Theory of Competitive Advantage, the productivity of production factors (a fundamental piece to explain the competitive advantages of countries' economic activities in world trade) is obtained with relative labor and capital costs, among other variables. In this way, the use of prices and relative costs has become the raw material identified by several economic theories to determine the comparative advantages of world trade activity.

However, for many industrial activities that produce mature products and operate in emerging countries, the prices of several of the inputs they use have local variations, which make them imprecise. In response to this problem, UNIDO implemented an alternative methodology to measure and compare countries' industrial activities' competitiveness. UNIDO proposed indices that would reveal the competitiveness of the activities by using export and import data. From this perspective, competitiveness is analyzed with a market focus. The indices reveal local industries' capacity to face external competition both in the domestic market and in the world market through the sale of their products.

This methodology assumes that industrial activities' trade patterns reveal relative prices and costs of inputs and factor differences in quality and service.

This paper tested the accuracy of two indices that UNIDO constructed with this alternative methodology to measure competitiveness, the EPI and the RECAI, the first using only export data, the second using net export data. As a case study, the competitiveness of the Mexican Brewing Industry was analyzed.

The study showed that the RECAI generates more accurate results, as it recorded between 2014 and 2015 a fall in the competitiveness of the activity not detected by the EPI. The technical explanation for this fall in competitiveness was obtained by comparing the percentage changes between the components of the RCAI of those two years, empirically showed that between 2014 and 2015, the world market for beer grew faster than did the net exports of the Mexican Brewing Industry. Except for the above, in general, the two indices showed similar behavior.

The analysis of the economic behavior of the activity in the period 2013-2019 produced results that supported the competitiveness calculated with the indexes. Thus, it was concluded that the activity was competitive, since, in addition to maintaining first place in the world market as an exporter, it improved its values both in that market and in the national one. Other indicators that confirmed its competitiveness were: the growing importance of its trade surplus, the increase in its productivity, and the generation of employment.

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Organizational Change and Competitiveness in Commercial Organizations

Chapter 11

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Organizational Change and Competitiveness in Commercial Organizations

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Introduction

Change is part of our reality and it is invariably present. Today, a sequence of variables converges and has some impact on the performance of companies. An example of all this can be seen in how the pandemic produced by COVID 19, has caused a significant change in the way companies work, as well as the habits of consumers.

For these reasons, carrying out a study of the change process in business is essential, since it must have appropriate organizational management. As already indicated, the world is always changing, so markets and companies are part of such changes.

For this motive, the change process must be studied, to understand correctly what the dynamics of this change process are like, and what are the factors or aspects that cause it. Also, it is very useful to know the factors that influence an organizational change procedure.

The approach of Organizational Design's perspective of study, reveals that changes are a kind of metamorphosis that the company presents, which is planned, consists of several dimensions, it is an intermittent change, of quality and radical, that causes a change of model.

Theoretical Framework

How an organizational change is carried out involves a lot of work, since any change must face a series of problems that make it difficult to implement those changes. Hence the importance of conducting this kind of research. Just as the world is in constant change, companies also change for the aforementioned

reasons. Therefore, how companies change and the reason for these changes must be understood.

To implement a strategy that makes a company more efficient and competitive, it must have a comprehensive orientation on how to design work processes, skills that the employees must have, values, corporate culture; and an organizational design and organizational structure, according to the challenges that the market demand.

Among the authors who examine organizational change from the perspective of Organizational Design: Delgado, Vargas, Rodríguez and Montes (2018), Adda, Natsir and Rossanty (2019), Badruddozza and Magnus (2018), Iljins, Skvarciany and Gaile- Sarkane (2015), Parra and Del Pilar (2009), Hodge (2003), Villegas, Montes and López (2016), Heckmann, Steger and Dowling (2016), Andhika (2018), Hall (1996), Rico (2004), Stabile, (2019), Mondo and Musungwini, (2019); who were analyzed in this study.

Organizational change is any change in person or worker, in the structure of the company, or technology (Robbins & Coulter, 2009). In this regard, Badruddozza and Ramage (2018), found that Information and Communication Technologies have a great implication in organizational change in different social and material aspects of companies. While Adda, Natsir and Rossanty (2019), say that organizational change requires the involvement of leaders, employees, structures, and business systems, as a strategy to anticipate the future, and adapt to change.

For Szelągowska-Rudzka (2018), changes in the organizational context require that they be adapted through a process of change in the company. Szelągowska-Rudzka indicates that low worker participation does not improve their attitudes to change and does not neutralize negative comments in the form of resistance.

For their part, Macías, Tamayo and Cerda (2019), point out among the sources of rejection to change, when in the change procedure there is no good communication; lack of leadership is another cause of resistance to change. While Delgado, Vargas, Rodríguez and Montes (2018) indicate that resistance to change, public awareness, and the commercialization of innovations, are the most common obstacles, because personnel training, the development of an organizational design, organizational structure, and culture-oriented to innovation are the challenges that companies face. In this regard, Werkman (2009) indicates that the most bureaucratic companies with mechanical structures can hinder a change in the organization, causing resistance to change in personnel, due to the size and inflexibility of the company. (Rosenberg & Mosca, 2011).

According to Rico (2004), Organizational Design is a process by which the structure of an organization is founded or changed, to achieve the planned goals. For Hodge (2003), organizational design is how jobs, activities, and workers are integrated into the company, thus seeking to make the company more efficient and effective. Hodge (2003) also says that through organizational design it is sought to achieve a structure and configuration in the company that enables the best mix of integration and differentiation, and that helps the organization to adjust as best as possible to the environment.

For Hall (1996), organizational design is the selection that a company makes about how it is going to structure the company, and it focuses on 2 approaches: strategic selection, and the institutional model of the organizational structure.

The organizational design is the process by which managers make decisions about how the most suitable organizational structure should be for company strategies and the environment in which company members put these strategies into action. Therefore, the organizational design makes managers have at the same time 2 perspectives: towards the inside and outside of the company.

The organizational design includes, in addition to the organizational structure, the following variables or processes: the size and how the units are grouped; centralization and decentralization; planning and control systems; decision-making procedures; and formalize behaviors. (Parra & Del Pilar, 2009).

On the other hand, Krishnan (2018), discovered that the redesign of the organizational structure and effective communication are two factors that contribute to the preparation of the company for organizational change; Krishnan points out that the structure of the company must be changed to ensure that the organizational change process is successful. While according to the research carried out, it has been found that different organizational structures are associated with different patterns of change. (Arora, Belenzon & Ríos, 2014).

The organizational design and the structure of a company that is intended to be part of the future organizational state may be different from the structure that the company used during the process of organizational change (Laughlin, 1991). A company that designs a structure that is based on functions, does well in a stable environment, but a structure based on work teams would obtain better results in this process of organizational change (Lyons *et al*., 2011).

Therefore, an organizational structure must be designed for the change process, which includes a change team with the authority to be in charge of planning and executing organizational change (Laughlin, 1991). In such change teams, it is necessary to incorporate the change agent, middle managers and workers, so that they work in coordination, in work teams in such process of organizational change.

Therefore, these change teams are part of the change design and structure and work in continuous feedback with the leadership team. Therefore, these teams of organizational leaders can use an organizational structure and effective communication to ensure a process of change. Therefore, business leaders must adapt their management style and design an organizational structure that is more appropriate to have a successful organizational change process (Gilley, Gilley & McMilan, 2009).

About this, Ford Motor Company turns out to be an example of how organizational change can be achieved by changing leadership, designing a new structure in the company, and producing a change in strategy. So leaders must react to external forces to change, forming a company that is prepared to absorb such change.

To revitalize the activities of the innovation process, it is necessary to use collaboration strategies with both external and internal agents, who intervene in the structure of the company and the workers, being external support, and a way that the ability to innovate can be shown with organizational resources, such as organizational structure, employees, as well as work networks with third parties (Villegas, Montes & López, 2016).

These elements allow changing resources and skills in the search for organizational competitiveness. Through these collaboration networks, it is pursued to improve the functioning of the organizational design, its structure, and personnel, developing skills oriented towards innovation.

For their part, Augustine (1997), and Goss, Pascale and Athos (1993) agree that companies must reinvent themselves, developing something that does not exist. They establish that executives know how to set up cross-functional work teams, how to innovate operational processes to improve the organization's performance; but all this only achieves a progressive change. If management wants a radical change in the capabilities of their businesses, they must not improve it, they must reinvent it.

For there to be a transformational change; the values, beliefs and attitudes of the organization must be redesigned before changing its structure, its processes, and its systems (Chapman, 2002). Companies must readapt their strategy to keep up with a changing environment and affect the structure of the company so that it fits with the model mentioned by Kral and Kralova, (2016).

These authors indicate that successful companies develop products following the needs of customers, therefore, when the external environment changes, the structure of the company must be redesigned (Kral & Kralova, 2016). About this, Lewin's theory of change (1947) establishes that a company would seek to establish itself in the new state of equilibrium with an

organizational structure, culture, and innovative internal communication methods that develop a new balance.

Therefore, companies that can respond quickly and restructure their internal resources, perform better in the process of organizational change, even better than businesses that could achieve technical perfection (Ogbonna & Harris, 2003). Also, innovative organizational structures give an advantage by reducing the weakness that characterizes traditional structures. As companies grow, they must design a distributed organizational structure where decisions are made in response to the interaction between different groups (Pichault, 1995).

According to Stabile (2019), architecture is the organization of a system, which includes its components, the relationship between them, and the principles that govern its organizational design and evolution. At the same time, it indicates that Business Architecture is a conceptual map of the organization, which seeks to understand the company's operation, align the strategic objectives with the elements that allow their achievement, analyzing the role of each one and what is the link between them, to devise and design the organization as a system. Its main elements are Strategic Objectives, Organizational Structure, Critical Factors, Business Processes, Regulations, Business Models, and Performance Indicators.

While referring to Enterprise Architecture: He mentions that aspects of computer technology are added to the Business Architecture, usually data, as well as computer applications for the company. Among the benefits of Enterprise Architecture, he points out: shared global visualization, identifying the degree of alignment between business management and information technology, and this serves to implement and guide the process of change.

To this complexity must be added the speed with which changes of all kinds occur: technological, cultural, and social; which cannot be approached without establishing an architecture, organizational design, and organizational structure that allows facing change projects. This composition of elements is established in the organizational architecture, thus making it possible to understand the scope of any project on the linked elements, and thus be able to establish the impact that the change of some element has on the others. For their part, Gouillart (1996), Nadler and Tushman (1999), handle similar concepts such as vision, personnel, and corporate structure. Gouillart (1996), talks about the "genetic architecture of the corporation", which is achieved by working with the 4 dimensions of transformation. While Nadler and Tushman (1999), explain that "organizational architecture" is a way of developing a competitive strategy aimed at the design of work methods, organizational structure, organizational philosophy, and personnel skills, uniting these elements into a dynamic whole.

It is essential to design organizational systems and structures that are part of the processes of the new organizational system and design. This implies that workers know what their role is, and how the change efforts will transform them, so they must know the change management areas, as well as the specific critical areas that are fundamental to carry out an organizational change (Mondo & Musungwini, 2019).

On the other hand, Rian (2018) indicates that adhocracy is also known as the structure of a modern company, being an innovative organization that can adapt to a changing environment. Therefore, companies must start with a new strategy that ensures that they plan and create an organizational structure and a hierarchy, that helps develop competencies in the company, in the process of organizational change (Gallo & Burton, 2012).

Summarizing; according to the researchers from the organizational design study perspective, changes should be made in the company's management and its organizational systems only when required. Also, they indicate that businesses have to evolve until they can reinvent themselves, which implies that what already exists is not modified, but that something new must be created, which does not exist.

Therefore, managers must also reinvent themselves and their companies, thus developing a new environment that governs their members, so that they accept a new future that was supposedly not possible. Besides, another scheme formulated by this study perspective is to provoke a kind of revolution within the company, so that all its shortcomings and failures emerge. In turn, according to the point of view of the perspective of organizational design, it is beneficial to have external support, carried out by agents of change that come from outside the organization.

METHODOLOGY

This work consists of 3 facets: 1) a theoretic one, where the theoretical part of the subject in question is investigated; 2) a bibliometric study about the relationship of organizational change and organizational structure, and 3) the empirical study. To obtain the information for this project, a structured questionnaire was developed, which served as an instrument for this research, in which the response alternatives for each question were shown.

As part of this work, a bibliometric study was also made of the results obtained from the literature review on the relationship between organizational change and organizational structure, a search was made in the Scopus database since according to Bar-Ilan (2008), Kulkarni and others (2009) is one of the most widely used databases to perform bibliometric analyzes (Olczyk, 2016).

The study was carried out having as search criteria articles, book chapters, book reviews, early accesses, without placing restrictions such as publication dates, type of document, nation, area of knowledge. On December 4, 2020, a basic search was made on organizational change and organizational structure. To perform the search in the Scopus database, the keywords used were: "organizational change" AND "organizational structure", the search was carried out in the following fields of the publications: Title, keywords, and abstract.

Unit of Analysis

For this research, business firms whose characteristics were: 1.- Being Small and medium-sized firms (from 1 to 250 workers). 2.- Commercial companies and 3.- That are in the AMG (Guadalajara, Tlaquepaque, Tonala, and Zapopan), were analyzed.

Sample

A non-probabilistic sampling was used for this study, applying the questionnaire that was prepared, to 78 people who were part of the workforce of the 78 MSMEs in the commerce sector, who were considered as part of this research, and who went through an organizational change. According to the SIEM, in Mexico, 69% of the companies are part of the commerce sector, while 21% are service companies, also, there is 7% of the industry-manufacturing sector, and finally, only 1% of the companies are part of the agricultural and mining sector.

Operationalization of Variables

For this work, the variables were operationalized through the use of graded questions using the Likert Scale. This scale uses statements that reveal an attitude, either positive or negative, towards each question. The individuals selected to answer the questionnaire were asked to express their level of agreement or disagreement with each question, to know how favorable or unfavorable their opinion was, about the topics analyzed.

Problem Statement

This project seeks to determine the causes and effects related to organizational design, which intervene in the consummation of an Organizational Change in commercial organizations, within the AMG. For this project, the research questions asked are:

- What causes related to the organizational design intervene in an organizational change in AMG businesses?
- What effects does organizational design have on an organizational change in AMG businesses?

Research objectives

- To determine which elements of Organizational Design influence an organizational change in commercial companies of the AMG.

- To establish how an organizational change affects the organizational design of a company in the AMG.
- To make a bibliometric analysis that shows the research trends on the relationship between organizational change and organizational structure and thus have a better understanding of the development of that study topic.

Hypothesis

- H1: The structure of the organization as part of the organizational design contributes to organizational change in companies in the AMG commerce sector.
- H2: Coordination of activities within the organizational design favors an organizational change in companies in the AMG commerce sector.
- H3: The work teams help to implement organizational change and improve the performance of companies in the AMG commerce sector.

Collection and processing of information

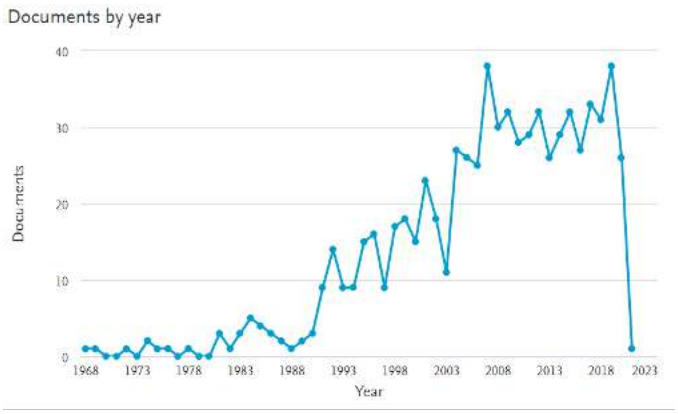
For this study project, the research instrument used was a questionnaire prepared according to the information from the examined bibliography, and with which it was intended to establish what factors related to the organizational design, intervened in an organizational change in commercial entities of the AMG. For this reason, a questionnaire with closed questions was devised, which would make it possible to distinguish these factors. After obtaining the information, the results obtained were examined and classified.To check the reliability and consistency of the instrument used in the research, Cronbach's Alpha was obtained. Additionally, the KMO Sample Adequacy Measure and the Bartlett Test were determined to verify that the variables are correlated and that it is feasible to carry out a factor analysis.

For the empirical analysis of this work that seeks to determine how organizational design influences an organizational change, the degree of significance of the analysis of variance: "ANOVA" was obtained, by relating variables belonging to the organizational design, with the effects that they can have on the organizational change, as well as with certain factors that help or hinder the achievement of the organizational change.

Results and discussion

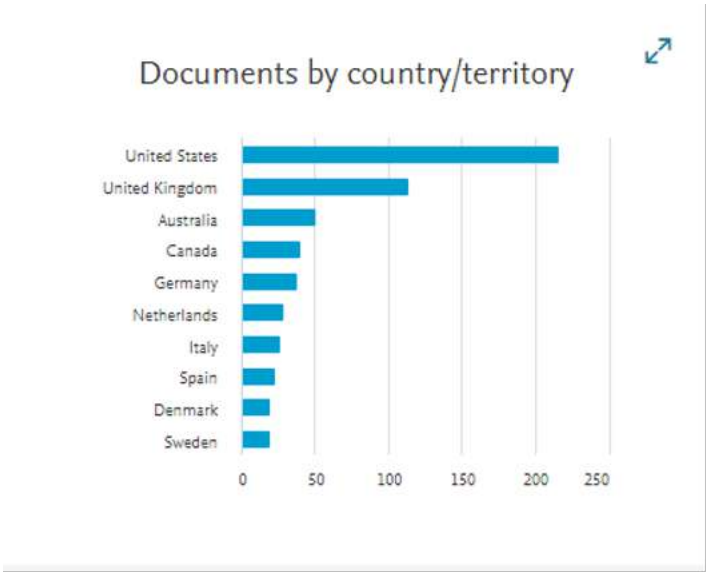
Regarding the bibliometric analysis, firstly, the results obtained show the own analytics that the Scopus database throws up. In the search for articles that address the issue of the relationship between organizational change and organizational structure, 728 documents were found in the Scopus database with production from 1968 to 2021. As shown in graph 1, a significant increase in the publication of articles in 2007, with an irregular increase until 2019.

Graph 1. Scientific production on organizational change and organizational structure in Scopus



Source: Own elaboration based on Scopus statistics.

Graph 2. The 10 main countries of scientific production on organizational change and organizational structure



Source: Own elaboration based on Scopus statistics.

The United States leads scientific production on the relationship between organizational change and organizational structure, followed by the United Kingdom, Australia, Canada, and Germany, among the five most productive countries.

On the other hand, the main articles, taking as a reference for this classification the number of times they were cited. The most cited article is "Information technology and the structuring of organizations" which has 708 citations and was published by the Information Systems Research Journal in 1991, by the authors Orlikowski and Robey who develop a theoretical framework in which the development and deployment of Information technology in organizations is a social phenomenon, and in which the organizational consequences of technology are the product of both material and social dimensions.

The second most cited article is: "Intrapreneurship: Construct refinement and cross-cultural validation" with 491 citations, by authors Antoncic and Hisrich, published in 2001 in the Journal of Business Venturing, this work indicates that the companies that nurture the Organizational structures and values that drive intra-corporate activities are more likely to grow than organizations that have few of these characteristics.

The third most cited article with 349 citations is by the author Suddaby, published in 2010 in the Journal of Management Inquiry and is entitled "Challenges for institutional theory" and seeks to understand how organizational structures and processes acquire meaning and continuity beyond their technical goals.

Table 1. Most cited articles on organizational change and organizational structure in Scopus.

Author	Article title	Year	Number of citations
Orlikowski & Robey	Information technology and the structuring of organizations	1991	708
Antoncic & Hisrich	Intrapreneurship: Construct refinement and cross-cultural validation	2001	491
Suddaby	Challenges for institutional theory	2010	349

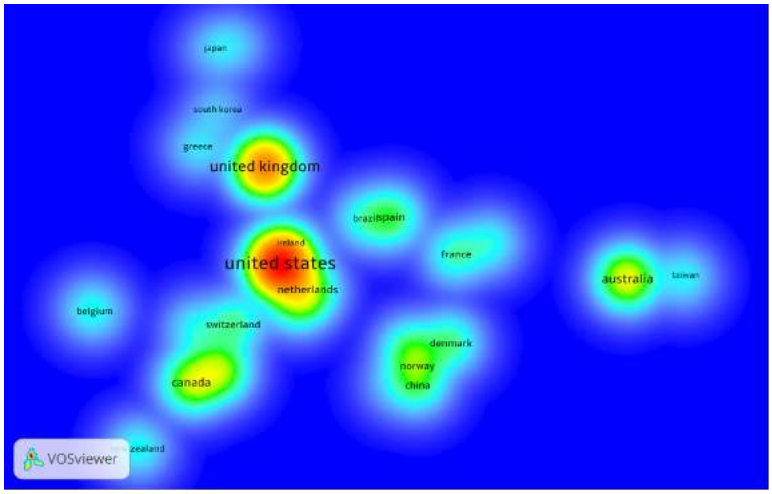
Source: Own elaboration based on Scopus statistics.

On the other hand, within the second part of the bibliometric study; It should be noted that to carry out the analysis, the 728 documents were processed in the VOSviewer program, which generated the maps based on the bibliographic data, and the criteria for creating the maps were determined.

Regarding the study of the relationship between organizational change and organizational structure, it was found that there are 8 research clusters, the first of which is made up of Austria, Canada, Germany, New Zealand, South Africa, and Switzerland; the second cluster is made up of China, Denmark, Finland, Norway, and Sweden; cluster number 3 is made up of France, Italy, Russia and Brazil; the fourth cluster is made up of Australia, Poland, and Taiwan;

the fifth cluster is made up of Spain, Holland, and Ireland; in the sixth cluster are the United Kingdom, Japan, and Turkey; cluster number 7 is led by the United States and is accompanied by Greece and South Korea. And in the eighth cluster are Belgium and Slovenia. (Figure 1).

Figure 1. Density map by countries



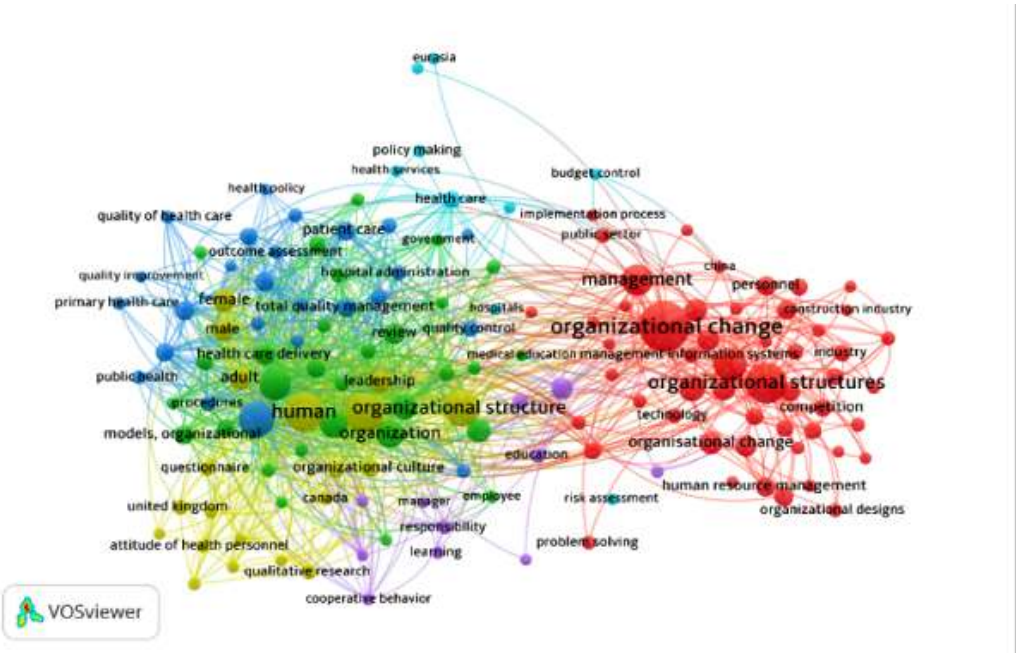
Source: VOSviewer 2020 software.

On the other hand, network maps are used to graphically interpret which are the research topics, since the keywords with the most co-occurrence are shown by labels, the size of the label being an indication of their importance in the topic research, and allow a more detailed analysis (Fergnani, 2019; van Eck & Waltman, 2010). The following bibliometric map shows the groups generated by the Scopus database, which were processed with the VOSviewer software.

Figure 2 shows that the keywords with the highest co-occurrence are: "organizational change" and "organizational structures" which were the keywords used for this research. In this way, on the map, you can see how the words are grouped, and they are indicated with colors to which group or cluster they belong.

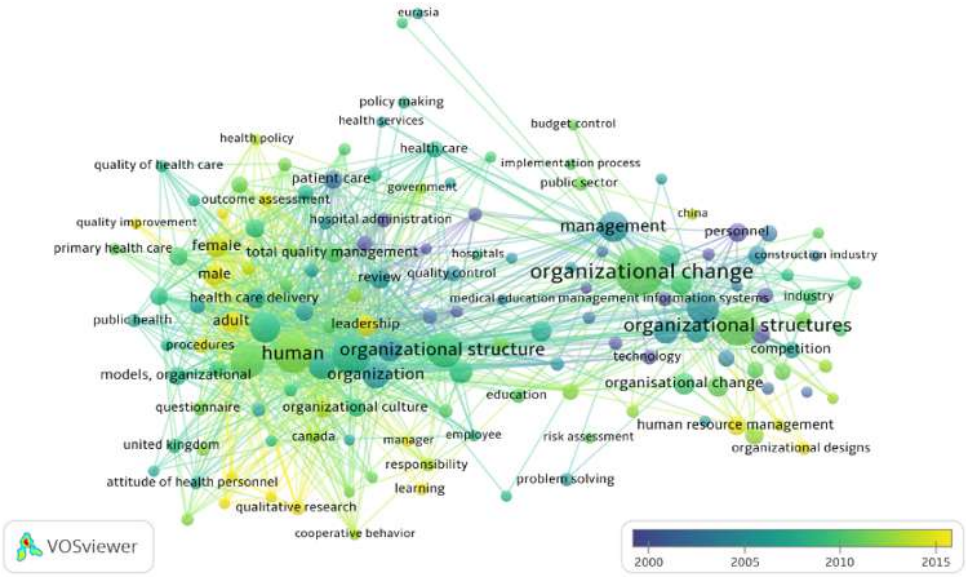
On the other hand, the overlay visualization map shows which topics have been worked on overtime, and indicates which ones remain current. The years are symbolized by different colors. The topics investigated in the last 5 to 8 years appear in red, orange, and yellow, and the themes with more than 10 years are shown in green and blue (Fergnani, 2019).

Figure 2. Network Map by indexed keywords



Source: VOSviewer 2020 software.

Figure 3. Overlay visualization Map by keywords



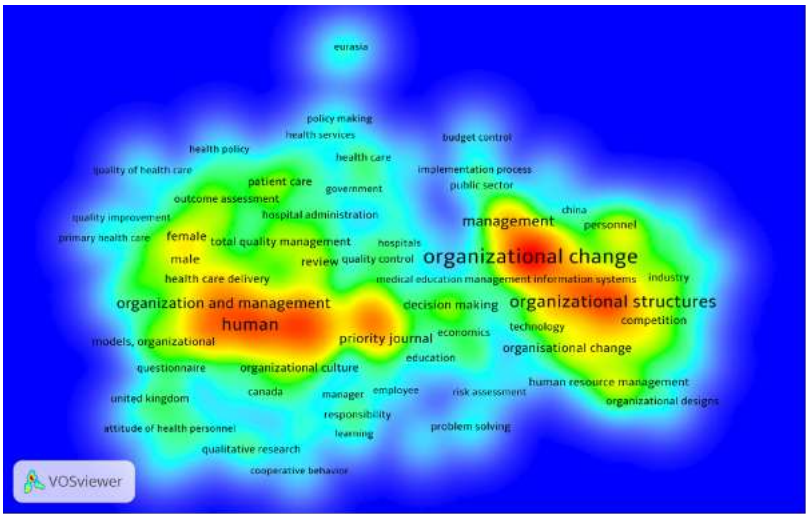
Source: VOSviewer 2020 software.

Figure 3 shows the keywords network again, but with a timeline perspective that reflects how the study of organizational change and organizational structure has evolved, the data obtained from the Scopus database show research results between 2000 and 2015.

The topics of study shown in Figure 3 that are trending in recent years are "adult" and "leadership." On the other hand, "organizational change" and "organizational structures" are topics that have been studied for a long time, but are still being studied today, while in the case of the term: "organization" their study takes longer.

In the density map, the VOSviewer program shows the work intensity of the keywords according to the number of times they appeared in the consulted documents. The colors indicate which are the most used keywords, in red are those with the greatest intensity and in blue those with the least amount of research, exposing the information in this way allows one to see which are the most important topics on the map. (Fergnani, 2019; Van Eck & Waltman, 2010).

Figure 4. Density Map by Keywords



Source: VOSviewer 2020 software.

Figure 4 shows the density map of the keywords that have more relevance depending on the number of publications in which they appear, in which, once again, it is noted that the most relevant are "organizational change" and "organizational structures", followed by the word: "human."

Field Research Results and Conclusions

In this study, the organizational design was analyzed as a perspective that examines the change process in organizations. Therefore, as part of the instrument used, certain questions that study the organizational change from this perspective were taken into account. This research was carried out through personal surveys with employees of the analyzed businesses. The applied questionnaire served to verify the hypotheses stated. In turn, the Cronbach's Alpha, the Bartlett test, and the KMO were determined:

Table 2. Cronbach's Alpha of the Organizational Design variables
Reliability statistics

Cronbach`s Alpha	Number of Elements
0.926	29

Source: Own elaboration based on the results of the SPSS.

According to the statistical result of the reliability obtained, Cronbach's Alpha is highly consistent, 92.6% of reliability, which proves a high level because the approximation of the statistic is close to 1.00, in turn, the variables included in the questionnaire were applied consistently, that is, the correlations and general trends can be to describe in depth-through multivariate analysis, for this, the level of adjustment between groups must be understood according to a KMO factor analysis and Bartlett's Test.

KMO and Bartlett's Test- Organizational Change and Organizational Design

Table 3. KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy	0.752	
Bartlett sphericity Test	Chi-square approximate	1143.800
	gl	378
	Sig.	0.000

Source: Own elaboration based on the results of the SPSS.

If. Sig. (P-value) <0.005, H0 (null hypothesis) is accepted> factor analysis can be applied.

If. Sig. (P-value)> 0.005 H0 is rejected> factor analysis cannot be applied.

The results obtained show that the level of significance achieved by being zero is representative because the closer it is to zero, the test is more satisfactory.

The most significant variable is Management Involvement, followed by Good human resources, other aspects of great importance are the Frequency with which Teamwork and Feedback are presented; On the other hand, Personnel's

Education is also a very important variable to organizational design; Thus, these elements are required to promote organizational change in companies, when the organizational design is taken as the starting point of the change process.

Table 4. Communalities

	Group 1	Group 2	Group 3	Group 4
Management involvement	0.830			
Good human resources	0.821			
Frequency with which teamwork influences	0.815			
Frequency with which feedback influences	0.804			
Personnel's education	0.800			
Directors' commitment		0.790		
Adequate available information		0.790		
Adaptation		0.772		
Trained and competent workforce		0.769		
Team learning		0.752		
Employee training		0.747		
Intensity of the Feedback influence		0.742		
Access to relevant information		0.729		
Coordination of activities		0.726		
Intensity with which teamwork influences		0.724		
Accept taking calculated risks		0.722		
Intensity of the influence of the positive attitude of the direction		0.716		
Optimistic executives		0.713		
Frequency with which the positive attitude of management influences		0.713		
Teaching and training together		0.701		
Anticipate the future and its changes			0.699	
Adjust to changes			0.687	
There is a learning approach within the organization			0.687	
Actions are carried out to develop in employees an attitude of openness to change			0.622	
Forecast future market evolution			0.608	
Coordination of activities				0.597
The organization has values that reinforce its identity				0.596
The proposed goals of organizational change were satisfactorily met				0.591
As a consequence of the change, personnel developed new capacities and abilities				0.586

Source: Own elaboration based on the results of the SPSS.

Among the questions asked to the respondents, they were asked their point of view regarding whether they consider that the organizational design and the structure of the company favored organizational change; since in the structure of any company all its members have certain responsibilities and functions that they must perform, so it is necessary for the good running of the company that there is suitable coordination of activities in the personnel, having to work as a team when performing their work since in this way the processes required by the company will be carried out correctly. In the questionnaire used, certain questions and hypotheses that analyze the process of organizational change were considered, taking organizational design as a study perspective:

H1: The structure of the organization as part of the organizational design contributes to organizational change in companies in the AMG commerce sector.

Table 5. The organization's structure favored the organizational culture change

ANOVA		Sum of squares	gl	Mean quadratic	F	Sig.
The company had an adequate culture to effect organizational change	Between-groups	11.750	3	3.917	7.640	0.000
	Within -groups	29.734	58	0.513		
	Total	41.484	61			
The personnel was trained to perform their functions in the new organizational culture scheme	Between-groups	13.723	3	4.574	7.026	0.000
	Within -groups	37.761	58	0.651		
	Total	51.484	61			
Conflicts	Between-groups	11.525	3	3.842	6.804	0.001
	Within -groups	32.749	58	0.565		
	Total	44.274	61			
Personnel's education	Between-groups	8.269	3	2.756	4.548	0.006
	Within -groups	35.150	58	0.606		
	Total	43.419	61			

Source: Own elaboration based on the results of the SPSS.

According to the results of the investigation, it was discovered that there is a relationship between the organization's structure favored the organizational culture change with: The company had an adequate culture to carry out the organizational change; The personnel was trained to perform their functions in the new organizational culture scheme; Conflicts, and Personnel's education. This indicates that these factors concerning the organizational structure and organizational design favor an organizational change.

According to Adda, Natsir and Rossanty (2019), organizational change encompasses all kinds of change in workers, the structure of the company, or its technology (Robbins & Coulter, 2009). The ability of a company to carry out organizational changes in a sustainable way lies largely in the way in which managers address those changes (Heckmann, Steger & Dowling, 2016). To face a change in organizational culture, people with leadership are needed, to be authentic agents of change and to adapt the organization's structure to be more productive and efficient (Iljins, Skvarciany & Gaile-Sarkane, 2015).

For Adda, Natsir and Rossanty (2019), employees perceive the organizational change in terms of organizational structure, operational systems, and human resources; which has prompted them to work with greater dynamism and efficiency, regardless of the different degree of change they perceive. Then, H1: The structure of the organization as part of the organizational design contributes to organizational change in companies in the AMG commerce sector, is accepted.

H2: Coordination of activities within the organizational design favors an organizational change in companies in the AMG commerce sector.

Table 6. Coordination of activities. ANOVA

		Sum of squares	gl	Mean quadratic	F	Sig.
Teamwork	Between-groups	8.219	3	2.740	5.231	0.003
	Within -groups	30.378	58	0.524		
	Total	38.597	61			
Good human resources	Between-groups	10.071	3	3.357	5.006	0.004
	Within -groups	38.897	58	0.671		
	Total	48.968	61			
Positive attitude of the Management	Between-groups	11.903	3	3.968	11.744	0.000
	Within -groups	19.597	58	0.338		
	Total	31.500	61			
Adequate available information	Between-groups	10.535	3	3.512	4.920	0.004
	Within -groups	41.400	58	0.714		
	Total	51.935	61			
Management involvement	Between-groups	14.691	3	4.897	9.317	0.000
	Within -groups	30.486	58	0.526		
	Total	45.177	61			
Team learning	Between-groups	10.699	3	3.566	5.514	0.002
	Within -groups	37.511	58	0.647		
	Total	48.210	61			
Feedback	Between-groups	14.995	3	4.998	12.745	0.000
	Within -groups	22.747	58	0.392		
	Total	37.742	61			
Anticipate the future and its changes	Between-groups	13.700	3	4.567	6.668	0.001
	Within -groups	39.719	58	0.685		
	Total	53.419	61			
Personnel's education	Between-groups	14.558	3	4.853	7.970	0.000
	Within -groups	35.313	58	0.609		
	Total	49.871	61			
Adaptation	Between-groups	8.119	3	2.706	5.425	0.002
	Within -groups	28.930	58	0.499		
	Total	37.048	61			
Shared vision	Between-groups	11.456	3	3.819	7.759	0.000
	Within -groups	28.544	58	0.492		
	Total	40.000	61			
As a consequence of the change, personnel developed new capacities and abilities	Between-groups	5.682	3	1.894	5.356	0.003
	Within -groups	20.511	58	0.354		
	Total	26.194	61			
After the change, there was liking for work	Between-groups	6.749	3	2.250	4.707	0.005
	Within -groups	27.719	58	0.478		
	Total	34.468	61			
Employees are given authority to make decisions they believe are correct	Between-groups	13.777	3	4.592	7.917	0.000
	Within -groups	33.642	58	0.580		
	Total	47.419	61			
The organization has values that reinforce its identity	Between-groups	9.578	3	3.193	7.464	0.000
	Within -groups	24.809	58	0.428		
	Total	34.387	61			

Source: Own elaboration based on the results of the SPSS.

According to the results obtained, it was found that there is a relationship between the Coordination of activities, and: Teamwork; Good human resources; the Positive Attitude of the Management; the Adequate available information; the Management involvement; the Team learning; Feedback; Anticipating the future and its changes; Personnel's Education; Adaptation; Shared vision; As a consequence of the change, personnel developed new capacities and abilities; After the change, there was liking for work; Employees are given authority to make decisions they believe are correct, and The organization has values that reinforce its identity. This shows that those factors related to organizational design favorably influence the implementation of an organizational change. Therefore, H2: Coordination of activities within the organizational design favors an organizational change in companies in the AMG commerce sector, is accepted. (See Table 6).

To this point, it can be indicated that adequate management of an organizational change is a process of forecasting and executing changes in the company to improve its efficiency and maximize the added value of the company (Rebeka & Indradevi, 2015). Therefore, the company needs the design of an organizational structure created to ensure that the company works in coordination towards the desired state, which is the approach developed by the change team. (Krishnan, 2018). Also, the new perspective of the company must be designed with an organizational structure that allows feedback throughout the process of organizational change. (Judge & Douglas, 2009)

H3: The work teams help to implement organizational change and improve the performance of companies in the AMG commerce sector.

On the other hand, according to the results of the research, it was discovered that there is a relationship between Teamwork with: The organization has values that reinforce its identity; Good human resources; Adequate available information; Personnel's education; Adaptation; Accepting to take calculated risks; There is a learning approach within the organization; Actions are carried out to develop in employees an attitude of openness to change; The proposed goals of organizational change were satisfactorily met; As a consequence of the change, personnel developed new capacities and abilities; Uncertainty; Team learning; Feedback; and Coordination of activities.

To this, it can be affirmed that organizational change requires committed executives, capable human resources, who know how to work in a coordinated team, a good organizational design, and have relevant information and values, being fundamental that the company has the openness to changes, so, it can adapt faster to those changes. The importance of the perception of employees to organizational change, as an effort to provide better service to customers, is associated with a leadership behavior so that they are trained to work in a

coordinated team, and optimally. (Adda, Natsir & Rossanty, 2019). In the process of organizational change, companies that have a solid vertical structure will be able to employ project teams that are in charge of communicating the objectives efficiently to the entire company (Frohman, 1997). Therefore, companies that have a vertical structure must create a structure based on work teams, to ensure a successful organizational change process (Judge & Douglas, 2009).

Table 7. Teamwork. ANOVA

		Sum of squares	gl	Mean quadratic	F	Sig.
The organization has values that reinforce its identity	Between-groups	8.081	3	2.694	5.939	0.001
	Within -groups	26.306	58	0.454		
	Total	34.387	61			
Good human resources	Between-groups	13.500	3	4.500	7.359	0.000
	Within -groups	35.468	58	0.612		
	Total	48.968	61			
Adequate available information	Between-groups	11.449	3	3.816	5.467	0.002
	Within -groups	40.487	58	0.698		
	Total	51.935	61			
Personnel's education	Between-groups	11.038	3	3.679	5.495	0.002
	Within -groups	38.833	58	0.670		
	Total	49.871	61			
Adaptation	Between-groups	8.364	3	2.788	5.637	0.002
	Within -groups	28.684	58	0.495		
	Total	37.048	61			
Accept taking calculated risks	Between-groups	888.994	3	296.331	471.63	0.000
	Within -groups	36.442	58	0.628		
	Total	925.435	61			
There is a learning approach within the organization	Between-groups	4.645	3	1.548	6.328	0.001
	Within -groups	14.193	58	0.245		
	Total	18.839	61			
Actions are carried out to develop in employees an attitude of openness to change	Between-groups	7.144	3	2.381	6.200	0.001
	Within -groups	22.276	58	0.384		
	Total	29.419	61			
The proposed goals of organizational change were satisfactorily met	Between-groups	5.746	3	1.915	6.016	0.001
	Within -groups	18.464	58	0.318		
	Total	24.210	61			
As a consequence of the change, personnel developed new capacities and abilities	Between-groups	6.655	3	2.218	6.585	0.001
	Within -groups	19.539	58	0.337		
	Total	26.194	61			
Uncertainty	Between-groups	9.362	3	3.121	5.085	0.003
	Within -groups	34.371	56	0.614		
	Total	43.733	59			
Team learning	Between-groups	11.205	3	3.735	5.854	0.001
	Within -groups	37.004	58	0.638		
	Total	48.210	61			
Feedback	Between-groups	7.726	3	2.575	4.976	0.004
	Within -groups	30.016	58	0.518		
	Total	37.742	61			
Coordination of activities	Between-groups	7.159	3	2.386	4.842	0.004
	Within -groups	28.583	58	0.493		
	Total	35.742	61			

Source: Own elaboration based on the results of the SPSS.

Therefore, according to the results obtained, H3: The work teams help to implement organizational change and improve the performance in companies in the AMG commerce sector, is accepted (table 7).

Conclusion

Changes in our environment and the world are always present and are part of daily life. Also, competition is increasing between business firms, while consumer expectations are increasingly greater, for this reason, companies must streamline their operations to meet customer expectations before and better than their competitors.

The changes that occur in the world and in business cause companies to adapt to this uncertain environment, therefore, changes are made both in the company, in its processes, and its organizational culture; so that they adjust to the new requirements of this business world characterized by reigning uncertainty; and thus improve their performance.

As mentioned, the changes that occur in the business world show the situation of uncertainty that prevails in business. This forces changes to be made in companies, and in their operational processes. Companies cannot simply be witnesses of how the world changes, they must have an active role, since, if they only assume the role of spectators, their competitors will take advantage of the situation to impose themselves on the market.

An aspect that characterizes the most audacious companies is the fact that they are constantly innovating, this class of companies is the ones that generate and induce changes in their industries, forcing their competitors to be the ones who have to react to these changes. Thus, carrying out an organizational change is very complex, but the benefits outweigh the costs when done properly, as the company improves its performance and competitiveness.

In turn, according to the perspective of organizational design, companies to be more efficient and competitive must have a comprehensive approach towards the design of their work processes, which allow the coordination of activities and teamwork, for which Personnel training, organizational structure, and organizational culture must be taken into account.

It is worth mentioning that, as a result of the investigation carried out, it is concluded that the 3 hypotheses stated are accepted. The hypotheses raised were:

H1: The structure of the organization as part of the organizational design contributes to organizational change in companies in the AMG commerce sector.

H2: Coordination of activities within the organizational design favors an organizational change in companies in the AMG commerce sector.

H3: The work teams help to implement organizational change and improve the performance of companies in the AMG commerce sector.

The results of this research reveal, that the organizational design is fundamental, so there must be good coordination of activities among the members of the company and that they work as a team, so it is necessary to have an appropriate division of the functions.

In conclusion, it can be affirmed that, according to the perspective of organizational design, change is an evolution that occurs in the company, being planned and at various levels; being discontinuous, radical, and/or qualitative.

From the perspective of organizational design within the factors or aspects that favor an organizational change are the coordination of activities, teamwork, and team learning, good and educated human resources, the involvement and positive attitude of Management, Adequate available information, feedback, adaptation, and anticipation of the future and its changes, values, accepting to take calculated risks, organizational learning approach. and an open attitude to change.

This shows that, according to the results obtained, the companies met the goals set for the organizational change, and workers developed new capacities and abilities as a result of the change.

The human resources of any organization are its most valuable capital, so they are a fundamental part to achieve organizational change, since good and educated human resources better coordinate their activities, by working and learning as a team, and they are the ones who carry out change in the company, therefore greater attention should be given to personnel's training and education so that they are capable of taking risks and have an attitude of openness to change and thus develop new capacities and abilities, as the company has an organizational learning orientation.

We cannot know what the future will be like, but we can plan and prepare for what that future brings. If an organization is well prepared, this will allow it to face the challenges of that future.

Finally, it is suggested for future research projects to carry out case studies in companies that are characterized by going through a process of organizational change. Since it is necessary to carry out an organizational change to stay in the market.

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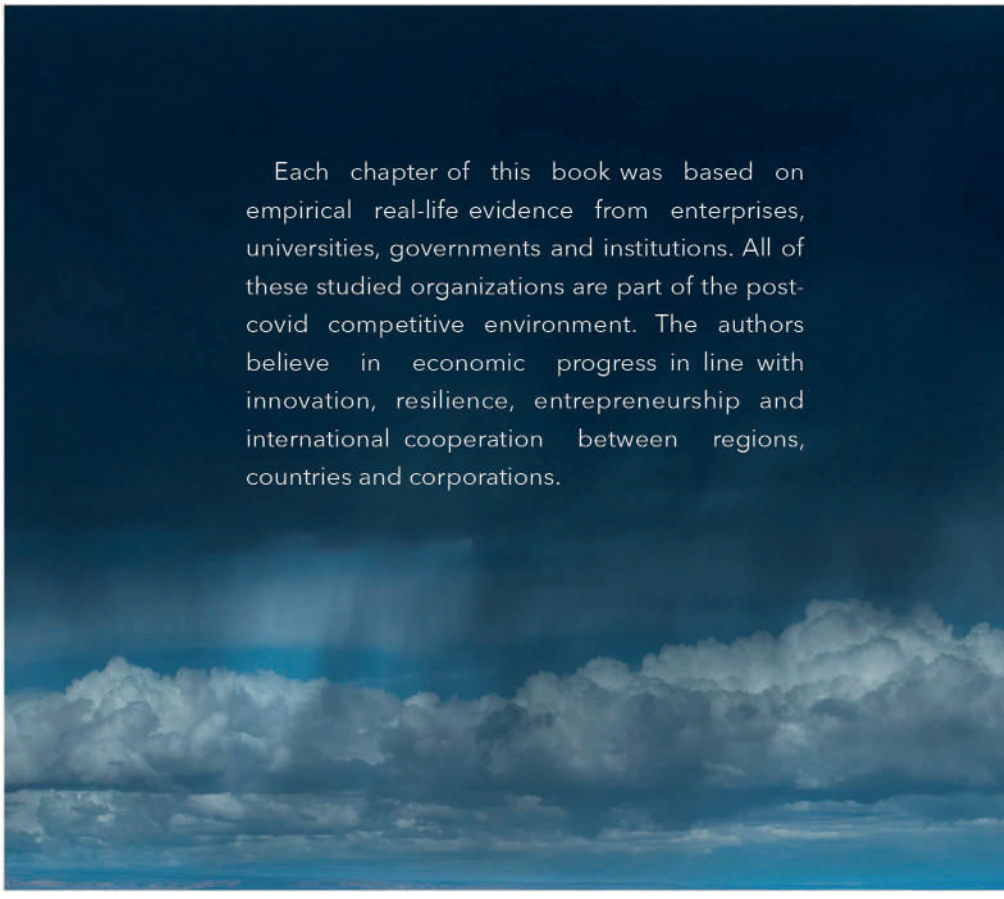

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