

Complexity and post COVID resilience in times of war and impact on Mexican organizations

Complejidad y resiliencia post COVID en la época de guerra y afectación sobre las organizaciones mexicanas

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DOI: 10.35429/JSR.2022.21.8.1.11

Received January 10, 2022; Accepted June 30, 2022

Abstract

The international context of post COVID war is presented; where US treasury bonds fall, the gold standard rises, the barrel rose to \$100 per barrel, with problems with the commercialization of Russian metals such as the titanium used by Boeing; that it fell in its shares as well as in most of the stock markets worldwide, and the strategic factor in fertilizers, where Morocco plays the fundamental role due to phosphate; because Ukraine produces approximately a third of the world's wheat precisely in the area that is being attacked from the beginning, with the possibility of occupied areas with Crimea leaving Ukraine without access to the Black Sea, which would cause a weakening of its capacity to commercialization of the grain and a general increase in prices, also in relation to the loss of value of the peso, and the increase in energy, in a complex and interrelated way, would cause an increase in prices by small retailers in Mexico; this is causing an increase in interest rates. Organizational resilience is proposed as a strategic element to support the leadership of organizations.

Resumen

Se presenta el contexto internacional de guerra post COVID; donde Los bonos del tesoro de EUA bajan, el patrón Oro sube, el barril subió a los \$100 por barril, con problemas con la comercialización de metales rusos como el titanio usado por Boeing; que cayó en sus acciones así como en la mayoría de las bolsas a nivel mundial, y el factor estratégico en los fertilizantes, donde Marruecos juega el papel fundamental por el fosfato; debido a que Ucrania produce aproximadamente una tercera parte del trigo a nivel mundial justamente en la zona que está siendo atacada de inicio, con la posibilidad de zonas ocupadas con Crimea dejando sin salida al mar negro a Ucrania lo que provocaría un debilitamiento de su capacidad de comercialización del grano y un incremento generalizado de los precios, también en relación a la pérdida de valor del peso, y el incremento de los energéticos, de forma compleja e interrelacionada, provocarían, incremento en los precios por los pequeños minoristas en México; esto está provocando un incremento en las tasas de interés. Se propone la resiliencia organizacional como elemento estratégico de apoyo a los liderazgos de las organizaciones.

Complexity, Resilience, Post COVID, Organizations

Complejidad, Resiliencia, Post COVID, Organizaciones

Citation: GUERRERO-SÁNCHEZ, Pablo, PÉREZ-MAYO, Augusto Renato, GUERRERO-GRAJEDA, José and ROMERO-TORRES, Fernando. Complexity and post COVID resilience in times of war and impact on Mexican organizations. Journal of Social Researches. 2022. 8-21:1-11.

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Introduction

To understand complexity from organizational studies it is necessary to understand its preceding theoretical structure; the various multidisciplinary theoretical contributions are considered from the complexity of the study of organizations (Tovar, 2021); (Guerrero-Sánchez, Guerrero-Grajeda & Perez Mayo, 2021), considering a beginning in the theory of organization from, the school of scientific administration (Ballina, 2021), human relations (Tunque, 2021), bureaucracy (Flores, 2021), behavior (Simon, 2021), decision making, contingency (Zambrano, 2021), and new human relations (Triana, 2021); to consolidate a critical vision, and an openness to new applications, and new types of organization in a postmodern and complex context, with technology, for interpretation, subjective, not only mathematical, but for non-linear contexts (Lapicki, 2021), using elements of complexity; interpretative, linguistic theory (Kronfly, 2021), organizational anthropology (Gravano, 2021), the New sociological, political and economic institutionalism (Valencia, 2021) in a post-structural way, using as basis culture, power, language, and psychoanalysis of organizations (Abril, 2021), in an ambiguous, changing context, with new forms of communication, and political structures, and diverse logics and interactions at macro, medium and micro levels, in this sense we focus on the school of contingency for the events that alter the complex behavior of the system.

Development

Strategies and complex system problems at the macro level

The interrelation of supply chains, as well as the lack of strategies such as having inventory; as a consequence of the hegemony of the Just In Time system, part of the Total Quality Management scheme, have caused crises and price increases due to the complexity of the supply chains, particularly in relation to chips, as a function of the interdependent relationships of these chains. The effect on the system is a turbulent system, explained by the Navier Stokes equations to understand the complexity of the financial system at a global level;

$$\nabla \cdot \vec{u} = 0$$

$$\rho \frac{D\vec{u}}{Dt} = -\nabla p + \mu \nabla^2 \vec{u} + \rho \vec{F}$$

This effect caused by the time of the pandemic generated a shortage of supplies and goods on the supply side while the pandemic restrictions were being lifted and demand was rapidly restored, especially in European countries, which produced worldwide inflation, together with the strategy of countries such as the United States to curb the crisis by issuing cash, which was not spent during the pandemic and increased the volume of savings, but which soon led to a devaluation of several currencies and a greater increase in inflation; As a strategy, central banks decided to raise interest rates, making loans to retailers more expensive, particularly in Mexico.

Unexpected effects of the declaration of war

Within a context of ambiguity and uncertainty, a series of turbulent implications are recorded, complex analysis can produce positive and negative, repelling and attracting loop effects in terms of market strategies to retailers that can be explained by a construction of the interrelation of political, psychological, media, social, cultural, historical, and economic elements that affect each other as in the construction of a system of structural equations, which will have maximum likelihood through the use of least squares.

Let us consider the characteristics of a complex system to be able to interpret the relationships and consequences in local organizations in this global context

1. Complex systems have a large number of elements.
2. The elements interact dynamically.
3. Interactions are rich, any element in the system can influence or be influenced by any other.
4. The interactions are not linear.
5. Interactions are typically short-range.
6. There are positive and negative feedback loops of interactions.

7. They are open systems.
8. They operate under conditions of low equilibrium.
9. They have histories.
10. Individual elements usually ignore the behavior of the whole system where they are¹.

It is necessary to make a clarification with respect to these elements, first that there is not yet a current consensus on the concept of complexity, however this seems to be the most appropriate for the understanding of complexity in organizations, although it has two fundamental shortcomings the first is; it is not mentioned that there must be a strong dependence on the initial conditions of the system, for example in the case of the geographical relationship between Ukraine and Russia, and its production of grains and metals, or the proximity between Taiwan and China, and the production of chips, while it is true that the individual elements for example retailers in Mexico do not understand the relationship of the whole system and the relationship with the supply chains, in its complexity of interactions, but if they feel its effects on the increases in fuel prices and semiconductors, ie another missing element in this list is; the lack of understanding of attracting and repelling elements; which would reflect the adaptation or resilience to the complex dynamic, non-linear, ambiguous, and chaotic system, in the face of an asymptotic equilibrium.

Complex consequences of the invasion

Economic punishment; in the swift system, of financial interaction of banking; which causes division among NATO member countries, because the lack of interaction would produce transaction problems for themselves.

Shortage in the supply of metals necessary for industrial development and production; not only the lack of corn, because Ukraine is one of the world's largest exporters and will cause an increase in prices for retailers in Mexico, producing inflation, but also in aluminum, cobalt, copper (exported to Asia and Europe, as well as oil and gas Russia es el principal proveedor de fertilizantes -ya sean nitrogenados o con componentes de fósforo, potasio y nitrógeno- del país. Entre 25 y 30 por ciento de los abonos que México importa son de origen ruso. Los otros grandes proveedores son China, Indonesia y Chile that crosses the pipeline between Russia and Europe), nickel, palladium and platinum, gold (which was the first to become more expensive with the invasion), titanium (supplies Boeing and Airbus), Russia produced 27,000 tons and Ukraine 5,400 in 2021, steel (mainly to Europe), diamonds (exported to Belgium, India and the United Arab Emirates) and fertilizers:

Russia is a major producer of potash, phosphate and nitrogen-containing fertilizers, i.e., nutrients for crops and soil. It produces more than 50 million tons per year of these fertilizers, 13% of the world total.

It should be noted that Morocco has 70% of the world's phosphate reserves, and that dependence on this non-renewable element implies the sustenance of the seven billion people on the planet, in fact, in 2021, the price was raised but in the last days of December even before the invasion of the Ukrainian area with access to the Black Sea.

The international fertilizer market continued to show strong rises in recent weeks. Thus, in the Black Sea, urea reached 924US\$/t, an increase of 192US\$/t compared to the October quotation. Monoammonium phosphate rose to 715US\$/tonne, up 30US\$/tonne in the last 30 days.

Combined with Russia, one third of the world's grain is produced by both Russia and Ukraine, but both pass through the Black Sea, and the military intervention was initially intended to stifle Ukraine's trade outlet.

¹ Steve Maguire, Bill McKelvey, Laurent Mirabeau y Nail Öztas, "Complexity science and organization studies", en Clegg, Hardy, Lawrence y Nord (eds.). The Sage handbook of organization studies, vol. 1, núm. 5, 2006, SAGE Publications, pp. 165-214.

The case of trade with Russia

Russia is the country's main supplier of fertilizers - whether nitrogenous or with phosphorous, potassium and nitrogen components. Between 25 and 30 percent of Mexico's fertilizer imports are of Russian origin. The other major suppliers are China, Indonesia and Chile.²

Another negative effect is the fall of stock markets³ this is a repellent effect of the system, as complex behavior, however, after the announcement of economic sanctions on Russia, Nasdaq and S&P 500 had a rise, that is, not only shows the interrelationship of markets, but, the volatility of an open system, and a social behavior, when one runs all run.

That is to say that the relationship between the supply systems under the tension of the interdependent elements of the system affect as an operator in systems of differential equations that explain the complexity of the open nonlinear system and that start from the basis of a close initial state; the political economic factors affect the financial system in a complex way with diverse resultants with negative loops explaining the behavior in the form of instability in the interdependent system, as explained under the equations of Mandelbrot as a fractal that repeats the behavior.

One point $c \in \mathbb{C}$ is a point of \mathcal{M} if

$$\lim_{n \rightarrow \infty} \|z_{n+1} = z_n^2 + c\| \neq \infty, \quad z_0 = 0$$

Or, to put it another way,
 $\mathcal{M} = \{c \in \mathbb{C} : |z_n| \nrightarrow \infty\}$ being z_n the sequence defined by
 $z_{n+1} = z_n^2 + c; \quad z_0 = 0$

Thus affecting the interrelated and dependent supply chains, and thus affecting the economy as for example it will happen with the lithium needed for the creation of batteries for the production of electric cars, the dependence of the production of Chips from China, Taywan and South Korea (TSMC) by the low countries as the production depends on the company ASML, so we have repellent elements that are currently related to the war and political elements between China Russia, and NATO, in this case we have the element of Nimbo Sousan which imports most of the things exported by China which is the port that handles 29 million containers and at the end of August last year before the collapse due to the Ukrainian Russian war had more than 50 ships waiting to dock.

These vacuum spaces between the elements of the system are full of energy with chaotic fluctuations of chaotic behavior between retailers in each country, so to change the behavior of the system requires a lot of energy, as has happened with the markets due to the current war. being an unstable behavior where any disturbance would push to that vacuum, that is, under normal conditions the economic system and interactions have a relatively stable behavior but when it is altered from the force or energy said system the field of action alters its concrete action, without retailers understanding the reason for the behavior of the whole system, politically not economically due to that vacuum of international power that is exploited by a single agent or actor.

The behavior of the system can be explained by the butterfly effect where a small element of the system can cause indeterminate effects, and it has to do with how well the economic actors can predict the future; let us imagine the following; that we can know all the actors both retail and wholesale of the financial system and their behavior and direction so we could define both future and past actions of the system, however when we try to determine under dynamic systems where we could define the final state if there is an attractor; however when we face the Poincaré conjecture, i.e. the chaos

$$S^1 = \{(x_1, x_2) \in \mathbb{R}^2 | x_1^2 + x_2^2 = 1\}$$

$$S^2 = \{(x_1, x_2, x_3) \in \mathbb{R}^3 | x_1^2 + x_2^2 + x_3^2 = 1\}$$

² <https://www.elfinanciero.com.mx/economia/2022/03/02/y-a-todo-esto-mexico-que-le-compra-y-le-vende-a-rusia/>

³ <https://www.forbes.com.mx/wall-street-se-hunde-mas-de-1-tras-invasion-de-rusia-a-ucrania/>

$$S^3 = \{(x_1, x_2, x_3, x_4) \in \mathbb{R}^4 \mid x_1^2 + x_2^2 + x_3^2 + x_4^2 = 1\}$$

$$S^4 = \{(x_1, x_2, x_3, x_4, x_5) \in \mathbb{R}^5 \mid x_1^2 + x_2^2 + x_3^2 + x_4^2 + x_5^2 = 1\}$$

explained in terms of the changes in atmosphere under the Lorenz idea

$$x = \frac{x' + vt'}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$t = \frac{t' + \frac{vx'^2}{c^2}}{\sqrt{1 - \frac{v^2}{c^2}}}$$

Where every small difference in initial conditions can have indeterminable effects; this is what is called sensitive dependence to initial conditions, in this sense, the movements of the elements that can be extrapolated to organizations that the loop is not always repeated, but the elements are never placed in the same state again, where even though countries and organizations have similar trajectories, they will have totally different trajectories, both in behavior and strategies, human behavior depends for its dynamic behavior is also dependent on psychology and society or groups. Let us consider that differential equations explain the behavior of economic organizations under a turbulent and chaotic scheme such as war, supply chain crises, however, we can understand that social behavior, as well as organizational and financial behavior has to do with the behavior of the environment, news and can be explained as persecution curves.

$$\frac{(u-x)x' + (v-y)y'}{\sqrt{(u-x)^2 + (v-y)^2}} = 1$$

Which, on a large scale, would imply the so-called synchronization effect of the system, different from the second law of thermodynamics which says that everything tends to disorder, because we can see that there are sequences of spontaneous order in the behavior of organizations, as well as in the markets.

Where the synchronization model is called the Kuramoto model.

$$\dot{\theta}_i = \omega_i + \frac{K}{N} \sum_{j=1}^N \sin(\theta_j - \theta_i)$$

Thus the natural frequency of movement of the retail organizations which is a coefficient related to how far it is from the rest of the organizations seeking to survive the turbulent conditions of the war pandemic and supply chain crises and the size of the organized action is determined by the strength of coupling and this is what explains the interdependence i.e. each of the individual elements of the system under similar initial conditions has effect on each other, this is what we would call isomorphism the problem is that too much synchronization could cause a crisis in the entire financial system.

The effect of the above would be an overload to the supply chain which could be considered as an attractor operator of the system of differential equations; changes in Chinese food import laws, or Russian metals, creating an entropic system; accelerated by war, which can be explained as Brownian motion.

Where it is fulfilled:

- 1.- The process starts at value 0.
- 2.- It has a continuous trajectory
- 3.- It has independent increments
- 4.- For any time with $0 \leq s < t$,

The increment $B_t - B_s$ has normal distribution with mean 0 and variance $\sigma^2 \cdot t - s$

$$\text{That is; } B_t - B_s \sim N(0, \sigma^2(t - s))$$

Where the movement of organizations in particular in Mexico, retailers have the same probability of action within the system, which is favorable cases among total cases, but depends on the configurations of the actions as combinatorial; where, the behavior is explained from the magnitude that measures the number of equivalent microstates for the same microstate of a system; where a system evolves to its most probable configuration which is the one that occurs with more microstates and coincides with the one with the highest entropy and that can also be interpreted as a measure of the information lost by the evolution of a system. In the case of retail organizations, information is always incomplete (the individual elements never know the behavior of the whole), where the system is made up of many parts and also has an element of randomness.

We can thus define the system as an ecology of elements or organizations with an expectation within a given time under uncertainty, and it is under these conditions of uncertainty that we can finally explain behaviors such as the big resignation in different countries as a decision making under uncertainty, under inflationary pressures, the Evergrande debt problem, and by the 900 billion high speed trains, and the behavior in Germany in front of the shortage of materials, where German factories are investing in warehouses to store raw materials, as a response to the Just-in-Time model that has caused a lack of inventory crisis in the production of aluminum that has skyrocketed since the relationship with Russia, then retailers and producers in Germany are changing their business model, reinventing the logistics chain, but that is something that SMEs in Mexico do not have the capacity to do.

SMEs in Mexico find themselves as an open system with a high number of interdependent elements within the macro system in an environment of uncertainty, firstly due to the crisis in the supply chain and the complexity, particularly those related to technology, another element is the crisis of containers, and the increase in price, i.e. inflation due to the increase in demand; the issuance of currency, with the consequence of higher inflation and the increase in interest rates to try to control it, which is also the effect of market self-regulation, but now under a system of imbalances, which are affecting both the quantity of oil, due to the war, and of supplies and food.

The effects derived from the conflict in Mexico if the war is prolonged will be the exchange rate, price of grains, fuels and risk of disruptions in the automotive sector not only for the lack of chips but in this case for the nickel needed for the production of cars; while in the case of retailers they are making resilience strategies of online sales but depending on deliveries although under an instability of institutions and violence, as well as the rise of corruption. A possible solution would be the creation of a supply system for the poorest neighborhoods as Brazil has done by working with local respect teams with logistics training. There is still uncharted territory in Mexico that could be met with technology such as drone delivery, drone planting, drone spraying, surveillance and fire response.

In the case of Europe and in particular Germany, the cancellation of the nord stream 2 gas pipeline from Russia to Europe implies diversification using liquefied gas transported in ships and not pipelines and the production and supply from Norway (but that hits the Russian company Gasprom that invested 5 billion euros) which is a sale of 55 billion cubic meters per year, in the case of Russia, sanctions such as the blockade to the swift system has caused a collapse of the ruble and therefore increased inflation and the intervention of its central bank. While European risk premiums have risen, making financing difficult, while Russia has a trillion in liquid reserves in the central bank, however the lack of dollars coming from Russian transactions to the eurozone is what increases risk premiums, so the U.S. Federal Reserve will be forced to print money; while Russia needs dollars to buy the products needed by its population, for which it will sell its gold to China in Yuan loans to curb inflation and curb internal social instability (this is the operator effect of the loosely coupled) complex inter-organizational system. The reason why the Asian stock exchanges have risen is that with the elimination of the Swift payment system the only way out is to move to the Chinese payment system with two major settlement systems, the European-American and the Russian-Chinese. This puts at risk the role of the dollar as reserve currency; thus the SP500 will move between 4260 and the resistance of the 4400 zone, since being interconnected and interdependent, each actor in the system is not interested in the stock markets sinking. Thus the brake is the quotation of high yield bonds, with the Bank of America index, with a much lower quotation than even with the covid 19, that is to say that in reality it is a war of financial systems and interdependencies as explained with the dynamic systems, where the interdependency is not only in oil and gas but of rare earths (for a fighter plane 13 kilos are required) these are exported by China and Afghanistan; these elements are also necessary for the production of green energies, among other things to end the dependence on Russian oil and gas. The problem of the Western system is that it has deficits greater than its production, so that the debt is increasing all the time.

The problem is that they are two different and opposite strategies, printing dollars on the one hand and raising interest rates to lower inflation, this can affect the exchange rate in Mexico and transactions in retail organizations. If we understand that the war is actually targeting the dollar, in this sense it is this variable that as an operator will cause an influence on the system and effects on Mexican retail organizations.

Another problem is the legitimacy of the conflict based on propaganda and information warfare and social networks; as it is known China have blocked and controlled western social networks and have their own social networks; which have not been well aware of what is happening in Ukraine but express things like; "It would be interesting to mention that China bought from Ukraine 5% of its arable land for 2.6 million dollars since 2013, this land produces food sent to China".

This is the real problem; food, which is the type of inflation that in Mexico reached 73% in the basic food basket on March 1st. Not only because Russia and Ukraine produce more than one third of the world's cereals, but also because Russia produces a large percentage of the fertilizers needed to avoid a world famine that would probably produce a world war, not only because of the 70% of phosphate reserves in Morocco, but because the markets pay attention to the news that Powell as representative of the Fed indicated that his only instrument is to raise interest rates to try to reduce demand and therefore inflation, but interest rates do not control the production or quantity of food that is produced, that is to say, the supply.

The complex strategic response of the system is that; China is winning with the war because Russian banks are switching to the Chinese card system (unionpay) by establishing visa and Mastercard sanctions, while walstreet is pouncing on cheap Russian corporate debt in danger of default because it speculates that the CDS credit default swaps that would occur along with the Russian state bankruptcy would have to be paid off at the same time so American banks buy for high net worth clients against the risk of Russia going bankrupt; Evraz Plc, Gazprom PJSC, or Russian railways; in response Putin orders a list of countries that have taken unfriendly actions, while sanctions contract the European economy and production Sanchez (Spain) and Vom Der Leyen (Germany) are betting on energy independence, but leaving aside the sunflower oil crisis, and a lot of speculative activity. Due to the fact that the dependence of the USA on Russian oil is 7.4% while the EU is 27% and in gas it is 41%, so the losers of the war are Ukraine and the EU.

More strategic moves

The dollar rises against the euro, sinking the ruble generates inflation in Europe, there is a shortage of dollars in Europe, if the euro rises it is harmful to economies such as Spain, also affecting Latin America, so the real enemy of the central bank is actually the bitcoin. Russia's branches are raising rates to make it more attractive to have rubles, and Blogger to companies to operate in rubles to exchange currencies, and purchase of Russian central bank treasury stock by buying rubles with promises of future payments in dollars and gold.

It collocated of events; flood of dollars from Russia until the closing of the swift and trade, so the European banks do not have access to the amount of dollars in the market, while USA had stopped the printing to lower inflation, by increasing the value of the dollar reduces the competitiveness in particular in transactions with Mexico and retailers, so the beacon is degraded in the short term, so every day is paid more than 1500 million euros per day to Russia (imports and exports and trade with Mexico become more expensive).

The economic war was of classical economic theory and the behavior was also of this type collapsing some sectors of the Russian economy but the Russians have managed to cushion the effect; by exchanging rubles for bitcoins, since it grew by 10% those who have exchanged rubles not only did not become poorer, but became 10% richer, thus the block Change does not need neither banks nor intermediaries. In this way, the world's exchange flows are increasing, and central banks are trying to make Russia's money come out in the form of bitcoins. If the cryptocurrencies were to be regulated and closed, this would affect not only Russia but also Ukraine, which has received 51 million.

The behavior of the stock markets is given from reports such as the US in conjunction with UK where they claim restriction of imports of Russian gas and oil, so the price of oil soars to \$ 150 per barrel, and in stock exchanges such as the Ibx bounces from the report in Brussels on the intention to invest in renewables. While there is a corporate exodus among them McDonalds. Cyberwar as a Brownian motion of turbulent flow



Figure 1

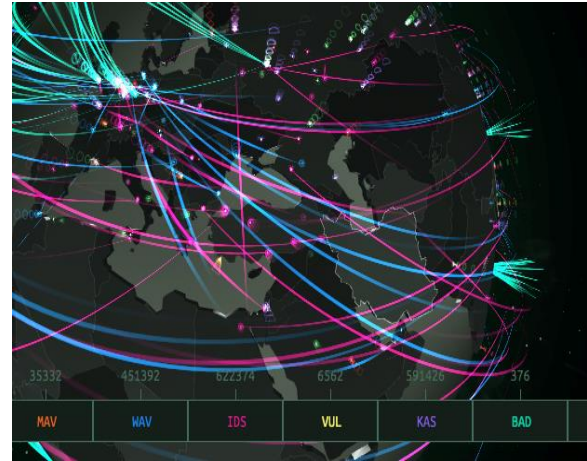


Figure 2

Meanwhile, BNP Paribas has isolated its Russian workforce from its internal IT systems as it seeks to bolster its defenses against any potential hacker attacks, in another sign of how the conflict is affecting Western financial institutions.

The French bank, which is believed to be the first major lender to have shut staff in Moscow off from its technology networks, has also put employees elsewhere on high alert for cyber threats emanating from Russia⁵. In response to the global climate, hundreds of Asian companies have arrived in Mexico.⁶

Finally, the response of Mexican companies to the turbulent flow of the organizational environment is based on strategies of organizational resilience or resilient leadership.

Organizational resilience

In 2020, the COVID-19 International Small Business Study, developed by Yale University, Princeton and UCL, reveals that 47% of Small and Medium Enterprises (SMEs) in Mexico have a probability of bankruptcy greater than 50% in the next six months, or 60,283 SMEs. The aforementioned study yields three other results of great importance such as:

1. 53% of SMEs in Mexico have laid off at least one employee due to the health crisis, compared to 55% of companies of the same size in Latin America.

⁴ <https://cybermap.kaspersky.com/es>

⁵ <https://www.forbes.com.mx/bancos-europeos-revelan-miles-de-millones-de-dolares-en-exposicion-de-riesgo-a-rusia/>

⁶ <https://www.forbes.com.mx/una-centena-empresas-asia-eu-han-llegado-mexico-parques-industriales/>

2. 65% of SMEs in our country think they will have to lay off an employee in the next 60 days, three percentage points more than the rest of Latin America.
3. 80% of these companies think that their business will fully recover in the next two years, only one percentage point higher than that reported by SMEs in the rest of the region, but 9% higher than the expectations of SMEs in the USA. <https://covid19sbs.org/>

In view of this, Pérez Mayo et al. (2021), like many others, state that in the face of the health catastrophe, first and then the organizational, financial and other catastrophes, resilient leaders were forced to make very quick decisions with very little information and maximum emergency and uncertainty; the absence or lack of knowledge of the theories of the organizations on the part of the leaders, increased this reality. The only constant is the complex emergency and uncertainty integrated into our daily lives, they became the only certainties.

From now on, these two indicators must be taken into account and integrated into our analysis and strategic plans on a constant, permanent and lifelong basis. Organizational acceleration depends on the leader. This acceleration will allow the organization to adapt and evolve. The pandemic highlighted the structural problems of organizations, and in saying this, reference is made even to research organizations such as universities that were obsolete to explain and intervene in the face of such a phenomenon, until today, which do not mark the directions to direct the path of organizations and their human resources. The theories, the schools of organizational behavior, the theoretical designs, the paradigms, the disciplinary matrices in charge of explaining what happens with people in the companies, were absent in their major representatives: the leaders, the top management (Pérez Mayo, Roque Nieto, Romero Torres and Guerrero Sánchez, 2021). These leaders, absent of knowledge for the most part, of small and medium enterprises in Mexico (SMEs), had to lead people, ignorant of what was happening and even of what is happening, anxious about the present and the future. For this reason, the relevance of the most human part of leadership, resilient leadership, has become evident.

From the perspective of the sociology of organizations, leadership in a charismatic Weberian typology (Weber, 1992), implies a type of organization or a type of leadership in which authority derives from the charisma of the leader. This leadership is something given to us by others, who decide to follow the leader voluntarily, because they share his purpose and values.

The pandemic forced leaders to build a true narrative, capable of providing job security and psycho-emotional security, hopeful futures, making systematic decisions, managing the short term, solving the present, but with an elevated view, always looking to the horizon, to the medium and long term. The existence of successful management and interventions carried out before and during the pandemic by leaders published by the main media in the world and in those countries, such as New Zealand, Finland or Taiwan, and cases of resounding failure such as the USA or Brazil or the case of Mexico. It can be said that populist, manipulative or denialist leaderships have failed in the management of the pandemic, on the other hand, leaders who have acted with sincerity, humility and determination have come out stronger. Leaders with resilient characteristics. Women leaders around the world have succeeded in managing this health phenomenon, such as Jacinda Ardern, Prime Minister of New Zealand; Sanna Marin, Prime Minister of Finland; Tsai Ing-Wen, President of Taiwan; Angela Merkel, Prime Minister of Germany or Katrín Jakobsdóttir, Prime Minister of Iceland, among others. And the question is, why have they managed the crisis better than their male counterparts? Surely their leadership styles, pure and simple.

Conclusions

The international situation characterized by the post Covid war is analyzed from the complexity, to the organizations, finding findings such as:

- The interrelation of supply chains, as well as the lack of strategies such as having inventory; as a consequence to the hegemony of the Just In Time system.

- The US treasury bonds fall, the Gold standard rises, the barrel rose to \$100 per barrel, with problems with the commercialization of Russian metals such as titanium used by Boeing; which fell in its shares, as well as in most of the world stock exchanges.
- The strategic factor in fertilizers, where Morocco plays a fundamental role for phosphate; due to the fact that Ukraine produces approximately one third of the world's wheat precisely in the area that is being attacked from the beginning, with the possibility of zones occupied with Crimea leaving Ukraine without an exit to the Black Sea, which would cause a weakening of its capacity to commercialize grain and a generalized increase in prices.
- The loss of value of the peso, and the increase in energy prices, in a complex and interrelated manner, would provoke an increase in prices for small retailers in Mexico; this is causing an increase in interest rates.
- Social, as well as organizational and financial behavior has to do with the behavior of the environment.
- Crisis and increase in prices due to the complexity of supply chains, particularly in relation to chips.
- The system as an ecology of elements or organizations with an expectation within a given moment under uncertainty.
- The dollar rises against the euro, sinking the ruble generates inflation in Europe, there is a shortage of dollars in Europe, if the euro rises it is harmful to economies such as Spain, also affecting Latin America, so the real enemy of the central bank is actually the bitcoin.
- Russia's branches are raising rates to make it more attractive to own rubles, and forcing companies to operate in rubles to exchange currencies, and buying the Russian central bank's own portfolio by buying rubles with promises of future payments in dollars and gold.
- The alternative of organizational resilience (resilient leadership) as an alternative to overcome this crisis.
- We find then the paradox of self-reference, as a theorem of incompleteness in autopoietic systems, and organizational dynamics as open systems, loosely coupled, organized anarchies full of rationalized myths, and dissipative structures that tend not only to chaos, but to the interdependence of complex elements indeterminable but explainable through complex dynamic systems; since any formal system is unable to prove its own consistency, being the characteristics of the system of axioms according to Alan Turing undecidable.
- To modify the system at the organizational level requires energy that at the micro level reflects the fundamental state and the first excited state that we will call the spectral gap, so some systems do not have enough energy to cross the spectral gap (at the neuronal level the synapse) and at the individual level the change in the system, and at the organizational level the change in the environment for being too small and this is the undecidable factor, this is what can generate or not the organizational resilience in a strategic behavior of maximum benefit but of limited rationality.
- Even a complete and perfect description of the microscopic interactions between individuals or organizations in a turbulent system of negative loops between the behavior of managers and the reactions of operational workers is not always sufficient to deduce their macroscopic properties in the interaction in the population ecology between organizations.

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