

**MSMEs and the use of social networks during the COVID-19 pandemic****MiPymes y el uso de redes sociales durante pandemia COVID-19**

JIMÉNEZ-SANTIAGO, Keyla Dylorien†, JIMÉNEZ-GARCÍA, Martha\* and RÍOS-BOLÍVAR, Humberto

*Instituto Politécnico Nacional – UPIICSA, ESE, Mexico.*

ID 1<sup>st</sup> Author: *Keyla Dylorien, Jiménez-Santiago* / ORC ID: 0000-0002-7023-6049

ID 1<sup>st</sup> Co-author: *Martha, Jiménez-García* / ORC ID: 0000-0002-8556-2955

ID 2<sup>nd</sup> Co-author: *Humberto, Ríos-Bolívar* / ORC ID: 0000-0002-7872-7037

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**Abstract**

The objective was to analyze information technology factors such as WhatsApp, Instagram and the website, among other strategies in micro-enterprises in Mexico City during the COVID-19 pandemic to study their informality and become formal. The methodology consisted of the application of an online survey to collect data from 147 microenterprises in Mexico City for the development of a logistic regression. The descriptive results show that the MiPymes affected by the COVID-19 crisis have a high awareness of social networks and have a greater intention to adopt them to market their products. With the findings found, the following is contributed to science: WhatsApp, use of WhatsApp for product promotion, website and Instagram have a probability of 65.4%, 63.33%, 39% and 10.2% that companies become formal. The study is original for analyzing the use of social networks during the health crisis in MiPymes. It is concluded that government support for MiPymes is necessary through services that facilitate facing the difficulties caused by the pandemic.

**Resumen**

El objetivo fue analizar factores de tecnologías de información como WhatsApp, Instagram y sitio web, entre otras estrategias en microempresas de la Ciudad de México durante la pandemia de COVID-19 para estudiar la informalidad de estas y convertirse en formales. La metodología consistió en la aplicación de una encuesta en línea para recopilar datos de 147 Microempresas de la Ciudad de México para el desarrollo de una regresión logística. Los resultados descriptivos exponen que las MiPymes afectadas por la crisis de COVID-19 tienen una alta conciencia de las redes sociales y presentan mayor intención de adoptarlas para comercializar sus productos. Con los hallazgos encontrados se contribuye a la ciencia en lo siguiente: WhatsApp, uso de WhatsApp para promoción de productos, sitio web e Instagram tienen una probabilidad de 65.4%, 63.33%, 39% y 10.2% de que las empresas se conviertan en formales. El estudio es original por analizar el uso de redes sociales durante la crisis sanitaria en las MiPymes. Se concluye que es necesario el apoyo a las MiPymes del gobierno a través de servicios que faciliten enfrentar las dificultades originadas por la pandemia.

**Econometric, Pandemic, Informality****Económico, Pandemia, Informalidad**

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\*Correspondence to the Author (Email: majimenez@ipn.mx)

†Researcher contributing first author.

## Introduction

Entrepreneurial informality began to gain relevance with Keith Hart's research entitled "Informal Income Opportunities and Urban Employment in Africa", thus causing prominent authors such as Tokman Klein, Loayza, Maloney, among others, to become interested in the subject (Gómez, 2007). Informality is a phenomenon that is generated in marginalized populations with a lack of support and benefits to join the new economic and social models (Herzer *et al.*, 2008), originating as one of its consequences that informal jobs present low productivity, as well as the use of obsolete technologies (Herzer *et al.* 2008).

According to the International Labor Organization, an informal enterprise is considered when it has the following characteristics: 1) it is not registered; 2) it is not constituted as a legal entity separate from its owners; 3) it is under the control of one or more members of one or more households; 4) it is market-based; and 6) it does not have registered employees (ILO, 2014).

In Mexico, there has been the problem that many companies disappeared during the health crisis due to the COVID-19 pandemic, since out of 4.9 million MSMEs, only 3.9 million survived, likewise, a little more than one million of these (20.81%) closed their doors permanently, while 619,443 (12.75%) new MSMEs were created. However, there are many problems why MSMEs do not grow and disappear shortly after their existence, which is worrying since they are a key element in the growth of economies (INEGI, 2020).

The importance of this research is to find the causes of informality related to the use of technologies, in order to contribute to reduce the current problem of survival of MSMEs during the coronavirus outbreak. Since the pandemic health security measures caused closures, confinement and limited movement order, the outbreak of COVID-19 represents a global crisis that has put MSMEs under enormous pressure to survive, forcing them to respond effectively to the crisis (ILO,2020). Nevertheless, SMEs have adopted various digital technologies to cope with the global crisis (Benítez *et al.*, 2020).

Consequently, this research presents as an added value of the use of some information technologies with which a quantitative analysis is made to find predictors of formality.

Considering the above, the objective of this research was to analyze factors of information technologies such as WhatsApp, Instagram and website, among other strategies in microenterprises in Mexico City during the COVID-19 pandemic to study the informality of these and become formal.

The hypotheses proposed are: 1) The use of information technologies influence a microenterprise to become formal, 2) MSMEs used strategies to combat the restrictions caused by the social distancing of COVID-19 to keep their customers and their income.

This work presents the state of the art on aspects of MSMEs and the use of social networks, which helped to find the study variables described in the methodology and with which a predictive model was developed that indicates the probability of the use of technologies that help a MSME to become formal.

### *State of the art*

This section presents the scientific literature related to aspects of informal MSMEs and the use of social networks, as well as survival capacity in times of crisis, called COVID-19.

### *Informal MSMEs and the use of social networks*

Social networks help small and medium-sized enterprises to successfully carry out digital marketing, which leads to growth in the company and in turn leads to economic growth (Mera-Plaza *et al.*, 2022). The main benefits of adopting social networks include reducing costs, increasing productivity, increasing system integration, providing a collaborative environment, and increasing overall competitiveness.

Companies have adopted electronic communications in various e-marketing platforms (Aspasia and Ourania 2014). Also, social networks have replaced marketing activities from conventional to digital (Ndekwa & Katunzi., 2016).

The well-known coronavirus disease, COVID-19, has generated serious impacts for global trade and the businesses that support it, as countries cope with the different phases of confinement, it is being proven that the virus has affected micro, small and medium-sized enterprises (MSMEs).

The report "SME Competitiveness Outlook 2020", generated by the International Trade Centre, presented that there has been a negative impact of COVID-19 on informal MSMEs, international supply chains and trade, thus framing a set of actions to develop the resilience of MSMEs (ITC,2020).

On the other hand, the pandemic has been a danger for the personnel of MSMEs, as they are exposed to the virus and are forced to close their businesses, which negatively affects sales by reducing income (Barria *et al.*, 2022). Something similar happens with strict blockades, which are being a common strategy adopted by countries around the world to try to contain the spread of COVID-19; however, this approach strongly affects most MSMEs, specifically those in services and customer service, making it very likely that the urban poor will experience more challenges as a result (Chirisa *et al.*, 2020).

In the case of emerging economies, Micro, Small and Medium Enterprises, are unaware or lack the technical capabilities to implement the available state-of-the-art technologies (Abdullah, 2002; Amiri & Woodside, 2017; Sookram & Watson, 2008). Considering that the above is a difficult situation for these economies, the crisis has allowed MSMEs to find themselves gradually adopting Internet technologies such as social networks, in order to create successful businesses and develop new business models, thus showing that technological advances can act as both enablers and inhibitors of competitive forces (Omotosho, 2020; Shaltoni, 2017).

The technological revolution can benefit all companies, regardless of company size, industry or operational activities. For example, social computing enables social enterprises, social customer relationship management systems open new and low-cost communication channels (Aceto *et al.*, 2019; Turkina, 2028).

### *Benefits of social media for informal MSMEs*

There are currently many benefits associated with Internet marketing; businesses decide from an extensive catalog of options for adoption, for example, one business may have a state-of-the-art website that allows them to transact online with distributors, while another organization in the same sector may run another type of website that provides basic information about their products. Similarly, some businesses are very active on existing social media platforms, i.e., Facebook, Instagram and WhatsApp, among others, which are updated daily and allow for closer, friendlier and more common contact with the customer, as they are the most occupied media by them (Shaltoni, 2017).

A basic tool for current MSMEs, which seek to remain active in the market, is E-commerce, as it has shown to be fundamental in sales. The COVID-19 pandemic has caused businesses to reinvent themselves thus forcing them to create different strategies to facilitate reaching their customers, with the main purpose of not losing profits in the market, evidencing the urgency of implementing new technologies. Responding to the habits and demand of customers and due to governmental measures of isolation, which has forced both companies and consumers to adopt different mechanisms of access to the fourth technology, to achieve a transactionality that continues with the market and that is safe for both parties.

Digitalization is the answer to the quarantine policy so that SMEs can still market their products. E-marketing makes it easier for SMEs to provide accurate, attractive and useful information to their customers. Unfortunately, many SMEs in Indonesia are still unfamiliar with the use of digital marketing (Arshad & Akram, 2018).

### *MSMEs during COVID-19*

Most policy initiatives to protect economies during the COVID-19 crisis target established corporations, industrial and existing sectors, and strong economies, in doing so, those measures aim to protect employment and the continuation of necessary economic activity (Benitez *et al.*, 2020).

This crisis, as of April 23, 2020 had a devastating effect on the global economy, as 26.5 million jobs were lost in the United States alone (Lambert, 2020), so it is necessary to address the future of the global economy, especially MSMEs, as different countries have been affected by the mandatory implementation of social distancing to prevent the spread of the pandemic and unemployment. Also, it is desirable for the government to offer support to MSMEs to increase their economic income and avoid unemployment (Narula, 2020).

The International Labor Organization mentioned that the COVID-19 has affected small economic entities in a strong way in their operations, income and sales around the world, while the situation faced by MSMEs during the crisis has caused the closure of businesses and workplaces, As a result, as of April 22, 2020, 81% of employers and 66% of self-employed workers live and work in countries affected by workplace closures, with serious negative impacts on income and employment (International Labour Organization, 2020).

On the other hand, the ILO also shows that losses in full working hours have generated high negative percentages in the productivity of MSMEs, since according to the ILO's immediate forecast model, working hours decreased in the first quarter of 2020 by an estimated 4.5%, which is equivalent to approximately 130 million full-time jobs, assuming a 48-hour workweek, compared to the situation prior to the crisis (fourth quarter of 2019) (International Labor Organization, 2020).

The leading role in this pandemic crisis has been taken by MSMEs, specifically microenterprises, as these can represent up to 80% of the population in a developing context. Generally, the small entrepreneur is especially vulnerable to the economic impact induced by the pandemic, as employment as businesses and their wages are affected. Likewise, the COVID-19 crisis in the developed world has altered the situation of the unemployed, the self-employed, temporary workers, wage earners, entrepreneurs and small-scale enterprises, which can be imperfectly described as those individuals and enterprises belonging to the informal sector (Narula, 2020).

It is well true that managing the crisis is the entrepreneurs' own task, through contingency plans, however, the reality exposes that these same expect that existing public policies can reduce their present burden, so it is advisable that government strategies truly aim at strengthening the resilience of small entrepreneurs to support individual crisis management actions (Williams *et al.*, 2017).

## **Methodology**

The methodological design that guides the research is shown below, allowing us to respond to the general objective of the study.

### *Design of the study*

The research conducted was descriptive and predictive, with a transactional design in June 2020, since a characterization of the strategies that affect the resilience of informal microenterprises in Mexico City during COVID-19 was carried out, specifying and describing their characteristics and properties, in order to understand their capacity to implement forms and ways of survival in the market in the midst of an economic crisis.

### *Sample*

The study sample consisted of a total of 147 microenterprises in Mexico City. For its calculation, non-probabilistic convenience sampling was chosen, since it proved to be more viable for Covid-19 reasons, as it allowed access to the samples without violating the restrictions due to the pandemic.

### *Instrument*

For data collection in Mexico City, a survey was used based on questions comprising: 1) General data; 2) Economic data on sales; 3) Socioeconomic level; and 4) Products and strategies with respect to COVID-19. This, since at that time the pandemic situation had already reached the country, so it was applied in the same way remotely through Google forms with the same data and in the same structured manner. This survey formulation was designed with the purpose of getting to know the informal entrepreneurs during the time of crisis in order to arrive at an approximate response.

A pilot test was also applied, and the internal consistency was validated by means of a Cronbach's alpha of 0.79, so that the sample was made up of 147 microentrepreneurs.

Data analysis

For the analysis of the data collected, use was made of Excel software to empty all the answers of the surveys, in order to analyze them numerically by means of SPSS software version 22, in which a Logit model estimation was performed and at the same time allowed establishing correlations based on the variables presented below, thus clarifying, on a larger scale, the data trying to find results of great importance in the research.

Model

In order to treat the data from Mexico City, a generalized linear model was made through a link function with a binary logistic regression, in order to know the behavior of the dependent variable called business formality, since this function adjusts better to the probability predictions that oscillate between the values 0 and 1. Similarly, the independent variables WhatsApp, WhatsApp Promotion, Website, Instagram and Instagram Usage are presented, which are described in Table 1, the theoretical model is represented in equation 1 and the maximum likelihood estimation method was used and the risk indicator was Odds Ratio, an alpha (%error)=5% was used and with the following statistical hypothesis:

$$H_0: \beta_i = 0$$

$$H_1: \beta_i \neq 0$$

$$P(X) = P(Y = 1/X_1, X_2, \dots, X_5) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5)}} \quad (1)$$

Different variables were established, as a dependent variable the business informality situation for each microenterprise and as independent variables: Strategy adopted during Covid-19, businesses that closed permanently during Covid-19, businesses that essentially used WhatsApp, the use of a web page, those that closed temporarily during the crisis, and, finally, the line of business, which are presented in Figure 1 and described in Table 1. The following sections mention and detail the proposed instrument and model.

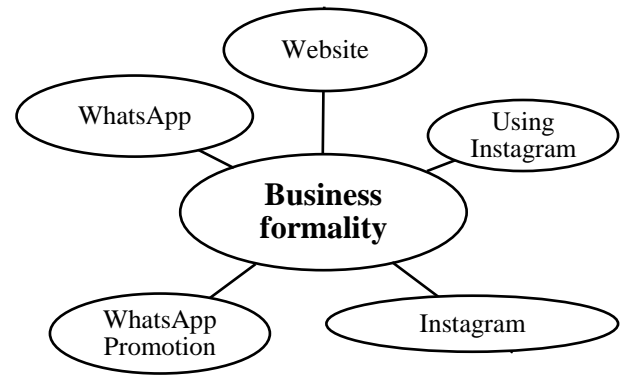


Figure 1 Research variables  
Source: Own elaboration with survey data

Variable	Description
Business Formality (Y)	These are the microenterprises that declare to be in a formal situation by answering the questions What payments do you make to the government? To filter formal and informal microenterprises. Dependent and binary variable with value of formal=1 and informal=0.
WhatsApp (X <sub>1</sub> )	These are the microenterprises that mentioned having WhatsApp and can use it as a resource in their sales. Independent and binary variable with value of Yes has WhatsApp =1 and No has WhatsApp =0.
WhatsApp Promotion (X <sub>2</sub> )	These are microenterprises that use WhatsApp to promote their products and discounts, to reach new customers and position themselves in new market niches. Independent and binary variable with value of If using WhatsApp to promote products=1 and Do not use WhatsApp to promote products =0.
Website (X <sub>3</sub> )	These are the Microenterprises that have a website to show, promote and sell their products or services. Independent and binary variable with value of Yes has website=1 and No has website =0.
Instagram (X <sub>4</sub> )	These are the microenterprises that mention having Instagram as a resource to sell and reach new customers to position themselves in new market niches through this platform. Independent and binary variable with value of Yes has Instagram=1 and No has Instagram =0.
Instagram usage (X <sub>5</sub> )	They are Micro-companies that make use of Instagram, to advertise, sell, offer products and offer promotions and discounts. Independent and binary variable with value of If you use Instagram=1 and Do not use Instagram =0.

Table 1 Description of related variables  
Source: Own elaboration

**Results and discussion**

In this section we present: 1) Descriptive results to see the behavior of the study variables, and 2) Results of the predictive Logit model.

*Descriptive results*

Table 2 shows that there is not enough correlation between variables, and those that manage to show correlation maintain very low levels. Table 3 shows the descriptive statistics, which help to show the data trends and provide the elements for the analysis.

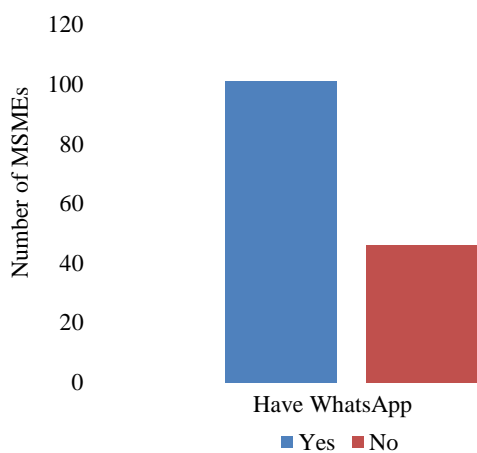
	Business Formality	WhatsApp	WhatsApp Promotion	Website	Instagram	Use of Instagram
Business Formality	1					
WhatsApp	0.11	1				
WhatsApp Promotion	-0.03	0.92	1			
Website	0.18	0.24	0.28	1		
Instagram	0.13	0.06	0.06	0.04	1	
Use of Instagram	-0.14	0.05	0.02	-0.01	0.32	1

**Table 2** Pearson's correlation coefficients  
Source: Own elaboration with survey data

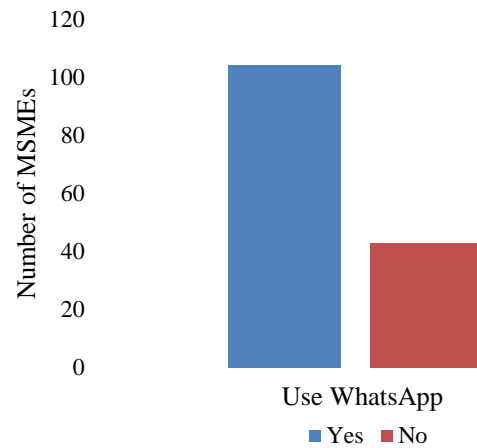
Variable	Mean	Median	D. T.	Min	Max
Business Formality	0.231	0.000	0.423	0.000	1.00
WhatsApp	1.31	1.00	0.465	1.00	2.00
WhatsApp Promotion	0.735	1.00	0.541	0.000	2.00
Website	0.238	0.000	0.427	0.000	1.00
Instagram	0.728	1.00	0.903	0.000	10.0
Use of Instagram	2.83	3.00	2.62	0.000	8.00

**Table 3** Principal statistics  
Source: Own elaboration with survey data: Own elaboration with survey data

Similarly, Graphic 1 shows the total number of MSMEs that have WhatsApp to cope with the situation; information that is complemented by Graphic 2, which contains the total number of companies that use the social network to offer promotions, show products, give information to the client or agree on address, time and delivery of products.



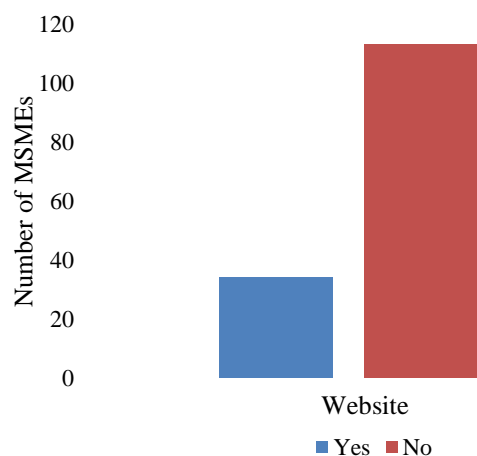
**Graphic 1** MSMEs that have WhatsApp  
Source: Own elaboration with survey data



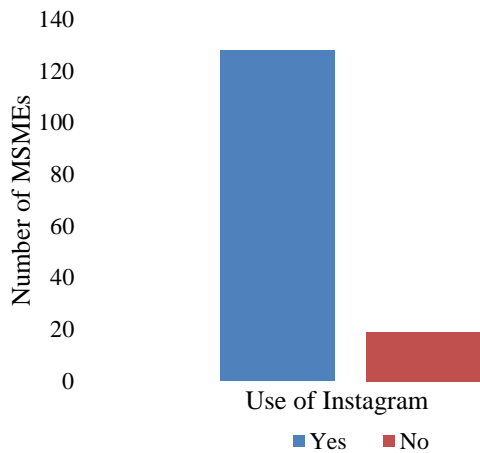
**Graphic 2** MSMEs that use WhatsApp for promotion  
Source: Own elaboration with survey data

In the same line of digital media, graphic 3 shows the number of micro-enterprises that created a website in order to show their products, thus extending their customer base, in this regard, it is noted that the sample clarifies the reality about the low use of websites, so it can be said that currently social networks are more effective than a website, as shown by the results.

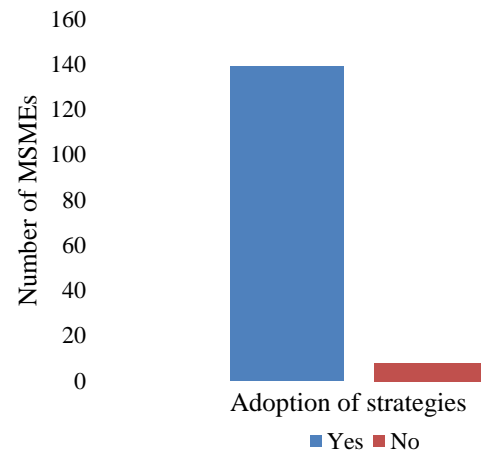
Likewise, graphic 4 shows the MSMEs that make use of Instagram for the same sales purposes, since they are efficient means to cope with the pandemic crisis and attend to the mandatory physical distancing and likewise, graphic 5 shows if the MSMEs have the App to give it the necessary use for their benefit.



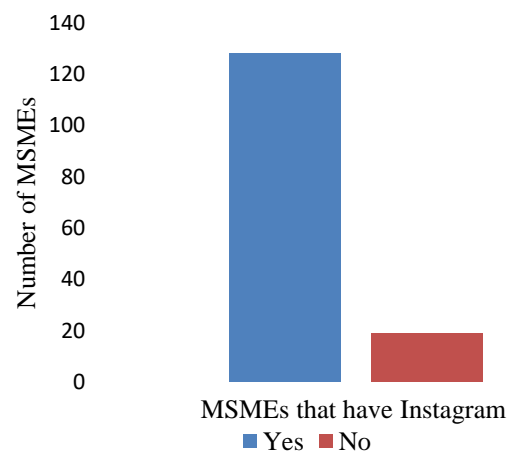
**Graphic 3** MSMEs that have a web site  
Source: Own elaboration



**Graphic 4** MSMEs that make use of Instagram  
Source: Own elaboration with survey data

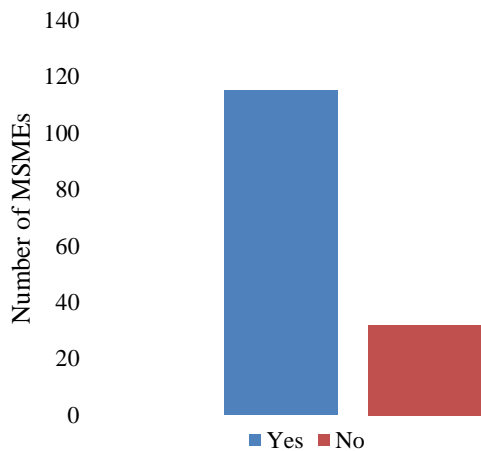


**Graphic 6** MSMEs that adopted strategies  
Source: Own elaboration with survey data



**Graphic 5** MSMEs that have Instagram  
Source: Own elaboration with survey data

Graphic 7 shows the MSMEs that were specifically affected in sales, that is, businesses that experienced a reduction in their income due to the pandemic crisis, it can be observed that 112 MSMEs were affected out of a total of 147, that is, the majority.

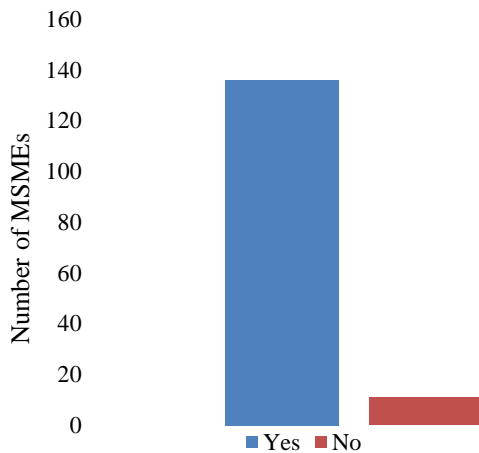


**Graphic 7** MSMEs affected in sales due to COVID-19  
Source: Own elaboration with survey data

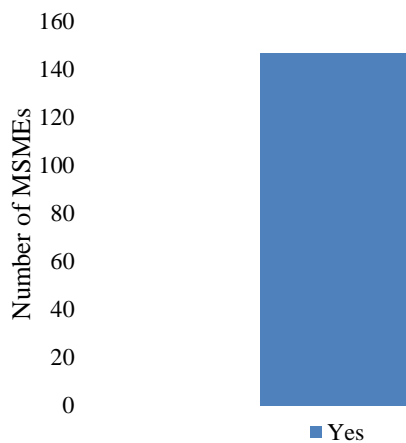
Graphic 6 shows the total number of MSMEs that adopted some strategy, such as home deliveries; use and implementation of social networks; improving the quality of their service or product; 2-for-1 promotions; among others, to combat the restrictions caused by the social distancing that directly affected their businesses with respect to their customers, income and sales. In total, during the COVID-19 crisis, 139 microenterprises adopted at least one of the strategies mentioned above, while only 8 decided to remain without implementing any of them.

Graphic 8 shows the businesses that implemented social networks in the face of the social distancing, in order to continue their sales and maintain their income. According to the survey, these businesses made use, for the most part, of media such as Facebook, WhatsApp and Instagram to maintain communication with their customers and establish contact, some in order to take orders and agree on time and place of delivery for home delivery, which, likewise, was a strategy implemented.

Finally, Graphic 9 shows the businesses that were affected in their schedule, as they took measures to physically distance themselves and reduce their working hours to mitigate the spread of COVID-19, which prevented them from working their full schedule and, by working less time, caused them to lose both customers and sales.



**Graphic 8** MSMEs that implemented social networks  
Source: Own elaboration with survey data



**Graphic 9** MSMEs that were affected by COVID-19 in terms of reduced working hours  
Source: Own elaboration with survey data

*Results of the predictive model*

A Logit model was performed, and Table 4 shows the coefficients of the predictor variables to determine the behavior of the dependent variable called business formality.

Variable	Coef. (B)	Standard error	Exp (B)	p-value	
Constant	-6.80	2.09	0.001	0.001	***
WhatsApp	2.87	1.06	17.654	0.007	***
WhatsApp Promotion	1.72	0.85	5.633	0.043	**
Website	1.22	0.49	3.390	0.013	**
Instagram	1.62	0.70	5.102	0.020	**
Use of Instagram	-0.37	0.14	0.691	0.011	**
Log-Likelihood -68.04679					
Goodness of fit of the model					
Chi-square = 22.9114 Chi-square p-value =0.0004					
Significant at 5%, *** Significant at 1%, **					

**Table 4** Predictive Logit Model, Dependent Variable: Business Formality  
Source: Own elaboration with model data

*Model interpretation*

As the predictor variables WhatsApp, WhatsApp Usage, Website, Instagram and Instagram usage increase by one unit, the variable of interest (business formality) increases for the positive coefficients, so that the variables that influence companies to be formal and get out of informality in these times of pandemic by Covid-19 are those with a positive sign (WhatsApp, WhatsApp Usage, Website, Instagram). On the other hand, the coefficients conducive to informality are those with the negative sign (Instagram usage).

Regarding the Odds Ratio - Exp(B), it is found that a company that has WhatsApp has a probability of becoming formal of 65.4%, and when WhatsApp is used to promote products there is a probability of becoming formal of 63.33%. Similarly, MSMEs that have a website have a probability of becoming formal of 39%, while the lowest probability of 10.2% is found in having Instagram to become formal. Whereas using Instagram decreases the probability of becoming formal.



There is a direct relationship with the dominance of social networks or the use of these media to operate during Covid-19 between formal and informal MSMEs, which is classified as economic and social crisis. In this proposed model to operate the MSMEs, the significance of managing WhatsApp, Instagram and website is noted, along with the use that these entrepreneurs give it, since they mention giving it utility regarding communication with the client, agreement of orders, addresses and deliveries, in addition to showing promotions, among other strategies, in order to remain and survive in the midst of the COVID-19 crisis and the mandatory physical distancing that directly affects them in their income, sales and permanence in the labor market.

The survey of small entrepreneurs shows that their informal situation is not a barrier to seeking strategies for permanence. The preferred options in times of crisis are social networks, since they allow maintaining contact with the customer even remotely; they know the way to face adversity, and although they do not have contingency plans as a formal MSME would normally have, they are aware of the opportunities they have today.

On the other hand, the analysis of the data obtained regarding Instagram for MSMEs during COVID-19, in the midst of a crisis or contingency, agrees with the findings of Huy & Filiatrault, 2006; Salma S. Abed, 2015, who mention that the use of social networks offers MSMEs easy and convenient ways to complete business transactions online (24 hours a day, seven days a week) and that the adoption of e-commerce by SMEs can reduce costs, help improve business processes and achieves a closer relationship with customers (Huy & Filiatrault, 2006; Salma S. Abed, 2015).

On the other hand Kumar et al., 2020, favor the research when they mention that the influence of social media adoption can lead Small and Medium Enterprises towards sustainable growth. This, since, with respect to marketing, the use of online resources such as Facebook and Instagram, can help MSMEs in sustainable growth. By using online resources, SMEs can reach a wider level of audience within their financial capabilities that are shown to be limited.

Similarly, the quantitative results presented in this research are related to the formality of MSMEs, and contribute data to other researches that mention that social networks create successful businesses (Omotosho, 2020; Shaltoni, 2017), as well as business creation and low-cost communication (Aceto et al., 2019; Turkina, 2018), close and friendly customer contact (Shaltoni, 2017), and digital marketing (Arshad & Akram, 2018).

On the other hand, the use of digital technologies helps MSMEs to avoid unemployment (Narula, 2020) and economic activity to prevail (Benitez et al., 2020), in times of the COVID-19 pandemic, as it has caused a difficult situation and businesses have been closed, as well as low productivity of MSMEs (International Labour Organization, 2020).

## Conclusions

The above results lead to the conclusion that informal MSMEs were directly affected by social distancing measures in terms of sales, i.e., their income decreased during a crisis situation such as COVID-19. It is interesting to note how these small economic entities are very vulnerable in times of contingency, so it is necessary to seek strategies according to their situation and areas of opportunity so that they can make their way, for example, with access to the use of the Internet and social networks or training in the generation of contingency plans.

Therefore: 1) It is stated that the management and use of social networks, especially media such as WhatsApp and Instagram prove to be a valuable and very effective resource to survive in times of physical distancing; as WhatsApp, use of WhatsApp for product promotion, website and Instagram have a probability of 65.4%, 63.33%, 39% and 10.2% of businesses becoming formal, which has advantages for both SMEs and the government and 2) A reduction of hours as a measure implemented through the government, is not an effective policy for ventures, as such reduction of hours had an impact on their existence and survival during a contingency such as the COVID-19 pandemic, since entrepreneurs depend on physical space and such a strategy caused them concern and decrease in their sales of products and services.

In conclusion, the use of social networks ends up being effective to cope with a new normality and acts as a successful means of integration, it should be mentioned finally, that the research presents a great contribution to social impact, as it seeks to raise awareness of the use of social networks in order to increase sales during the crisis, as well as it is a contribution to the solution of urban poverty in which entrepreneurs live in Mexico City, thus making visible the situation of the current informal entrepreneur.

### Acknowledgements

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