

Mexican cities in the new normality: interactions between technologies and digital risk

Las ciudades mexicanas en la nueva normalidad: interacciones entre las tecnologías y el riesgo digital

<http://dx.doi.org/10.32870/Pk.a11n21.663>

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Received: June 28, 2021
Accepted: August 16, 2021

ABSTRACT

The article aims to analyze the relationship between digital technologies and the risk associated with digital gaps in some Mexican cities in the context of the new normal. It is based on the premise that Covid-19 has meant a profound social transformation that has implied a greater use of digital technologies, which can translate into greater technological inequalities. The methodology of this research is based on digital ethnography and hypothesizes that the processes of technological implementation were accelerated to try to contain the contagions, mainly through digitalization; however, this type of actions are limited by previous conditions of the characteristics of Mexican cities, which would imply a widening of their technological gaps, as opposed to what is considered a hybrid city model.

Keywords

Cities; digital technology; digital social risk; new normality

RESUMEN

El presente artículo tiene por objetivo analizar la relación entre las tecnologías digitales y el riesgo asociado a las brechas digitales en algunas ciudades mexicanas en el contexto de la nueva normalidad. Se parte de la premisa de que el Covid-19 ha significado una profunda transformación social que ha implicado un mayor uso de las tecnologías digitales, lo que puede traducirse en mayores desigualdades tecnológicas. La metodología de esta investigación se basa en la etnografía digital y tiene como hipótesis que los procesos de implementación tecnológica se aceleraron para intentar contener los contagios, principalmente a través de la digitalización; sin embargo, este tipo de acciones se ven limitadas por condiciones previas de las características de las ciudades mexicanas, lo que implicaría una ampliación de sus brechas tecnológicas, frente a lo que se considera un modelo híbrido de ciudad.

Palabras clave

Ciudades; tecnología digital; riesgo socio digital; nueva normalidad

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Introduction

In recent literature, there are different positions on the relationship between technologies and risk in urban environments. One of these perspectives considers that the capabilities and scope of technology can reduce various social risks. In the case of cities, there are proposals on how to promote, create and expand the use of technological devices integrated into the urban environment with a view to creating hybrid cities, understood as spaces that combine contemporary phenomena that occur between physical conditions and virtuality (Trachana, 2014). This concept has been associated with that of smart cities and open source cities, both of which point towards better and greater integration in terms of safety and comfort.

In the context of the Covid-19 epidemic, technology was presented as an alternative to address the danger of contagion. In an attempt to reduce the spread of the disease and other social risks, technological implementation processes were accelerated. Various public and government agencies put forward the idea of hybrid models, a notion that goes beyond the concept of hybrid city (Trachana, 2014) and implies the convergence of digital technologies with physical spaces as a way of living, education, work and leisure.

This article rescues the different notions of city and the concept of hybrid model, with the intention of proposing that, since the pandemic, in particular, there has been a struggle for the construction of hybrid city models, that is, the construction of spaces between the face-to-face and the digital, resulting from networked interactions that involve habits, routines and a qualitatively different social organization. These models, within this research and in the context of the current health crisis, fundamentally involve the digitalization of processes and the configuration of imaginaries about the city.

Different technological manifestations were added to everyday life, many of which already had antecedents in the world and in Mexico before the arrival of Covid-19, but in the emergency context they accelerated and became “an essential element in the configuration of a new normality” (Ruiz, 2020, p. 18). However, not all cities have the infrastructure or the capacities to implement these innovations, so they face different risks and challenges in this area.

Technology brings benefits, but it also brings some social risks, such as greater inequality in access and use of technologies, obsolescence associated with the speed of technological change, technological unemployment, misappropriation and exploitation of private data, among others (Arntz, Gregory & Zierahn, 2016; Bessen, 2016 and 2019; Brynjolfsson & McAfee, 2014; McAfee & Brynjolfsson, 2017). With this in mind, this article aims to study the relationship between digital technologies and the risk associated with digital divides in some Mexican cities in the context of the new normal.

The paper starts from the following hypothesis: technological implementation processes were accelerated to contain contagions, under the premise of a hybrid city model

based on digitalization, but this could imply widening the technological inequality gaps between Mexican cities. As a methodological strategy we resort to digital ethnography (Bárceñas & Preza, 2019) through the monitoring of news, online reports and publications in social networks during 2020.

The first section discusses the context of the new normality and the relationship with digital risks, in order to address the new use of digital technologies in cities and the idea of the hybrid city model in a broad sense, but with greater emphasis on the Mexican case. Subsequently, some of the technological implementations to manage mobility and reduce the risk of contagion applied in Mexican cities during the new normal are analyzed; and, finally, some of the socio-digital risks and other challenges faced by Mexican cities to address this technological acceleration are reviewed.

New normality and digital risks

According to Beck (1998), the advance of industrial society is always associated with a series of secondary effects that are difficult to foresee. In this sense, the technology that results from this advance is a framework in which, at the same time that it can be a tool to face other threats or problems, it causes certain risks.¹

The appearance of Covid-19 has meant, for humanity, the irruption of a virus that requires technologically developed solutions (vaccines and treatments), which demands time, investment, learning processes and a long road to ensure its reliability. Due to the magnitude of the pandemic, the speed of contagion and the number of people affected, hybrid city models were devised with various containment mechanisms; an example of this is that the authorities of all countries applied restrictions to activities, seeking to avoid agglomerations and promoting a reduction in mobility.

In this context, uncertainty led governments to propose and try to build a social imaginary of certain calm and certainty around the so-called new normality, which implies a different way of living the city. Although this term does not only refer to activities in cities, this research only refers to the city space and its transformations through the use of different digital technological devices, such as cell phones, QR codes or geolocation applications.

The notion of new normality has been widely discussed because, although it was based on the need to return to activities in the context of the pandemic, it is ambiguous due to the conditions of risk and uncertainty inherent to the health crisis. It is not known, nor was it known with precision, whether the aim is to “return to pre-pandemic normality” (Lew & Herrera, 2020, p. 146) or to confront a new way of life in society.

The changes associated with the new normality have brought with them mechanisms of digital segregation, defined as the difference manifested in the access and use of

information and communication technologies (Chaparro, 2007). Digital segregation is a multilevel and multidimensional concept that includes a diversity of variables. Due to the different approaches, this research focuses only on digital divides based on the transformations observed in both the digitization process and the new normality. In summary, it is proposed to consider the concept of risk associated only with digital technologies, especially in terms of use and access to these technologies and the latency of expanding technological gaps.

Digital technologies in cities and the new normality

The relationship of human beings with technology has changed over time in different contexts. The features of this relationship imply a constant feedback, since the human being is an active agent creator of technology at the same time that it has influenced the transformation of its space and social relations.

Although technology has been and is present in many aspects of life, it is from the outbreak of the pandemic that particularly digital technologies have been constantly visible in the relationship they have in various environments. Somehow, digital technologies and the constant flow of information have abruptly violated the right to intimacy, privacy, not to be discriminated against and the protection of information (which follows from all of the above).

Digitization is presented as a productive paradigm that implies an increase in the capacity for communication, data processing and interaction with the environment (Casalet, 2018). The internet of things, the ability to collect large amounts of data (big data), the use of artificial intelligence, the hyper-connectivity of artifacts and communication through the cloud have become present in various spaces, including the configuration of cities.

This article has argued that the hybrid model of city bursts into space as an alternative that seeks convergence between physical and virtual space, in which higher levels of digitization are expected through the use of devices for monitoring, surveillance, provision of transportation services, health (telemedicine), education and government administrative procedures, where connectivity becomes the center of the network. This concept is comparable –to a certain extent– with that of smart cities; however, from this perspective, the hybrid model goes further by aiming at greater integration based on digitization processes.

This hybrid city model aims to create connected communities that combine physical and IT infrastructure, but this presents a number of challenges, ranging from the capacity of governments to organize and support both types of infrastructure, to how to ensure that all citizens have access to these tools. The latter concern runs the risk of creating technological

ghettos or islands that open up inequality gaps between the different social strata by only benefiting certain population groups.

The aspirations of this model also go through another problem: the creation of a new type of digital citizenship (Alva de la Selva, 2020; Gerlero, 2020; Leetoy, Scherer and Sierra, 2019) that should be clearer about the implications of the use of technological devices in different public and social spaces. While digitization is not a new issue, the pandemic resulting from Covid-19 has implied a rapid technological transformation that has led to the emergence of a diversity of digital risks –discussed below– and impending technological inequality.

In addition, the hybrid model has brought a series of implications for different population segments: on the one hand, those segments with a privileged position prior to the pandemic have an entire digital infrastructure, which allowed them to integrate technological solutions because they already had connectivity and resources available; on the other hand, for population segments without the capacity to access and make use of technology –which sometimes make up entire cities– these solutions became another challenge.

To measure these differences on a global scale, it is relevant to recover data such as those offered by the IESE Cities in Motion Index (ICIM), which in its 2020 edition had as a framework the health contingency due to Covid-19; although it is noted that the measurement “does not capture the circumstances of the health crisis [...], it allows identification of those pillars upon which cities can adapt positively to these new adverse situations” (IESE, 2020, p. 7). In the results, London ranks first with 100 points; in Latin America, Santiago de Chile ranks 68th, while Mexico ranks 130th.

The CIMI also measures the technology dimension,² and among its indicators, there are several related to digital technologies. The three cities that lead this dimension are Hong Kong, Singapore and San Francisco. Hong Kong stands out for its high web index and the availability of cell phones per capita, where 99.6% of the population owns at least one and 99.9% has 3G coverage or higher; a similar case to Singapore, where “everything revolves around technology” and there is high-speed Internet coverage throughout the city (IESE, 2020). In contrast, Mexico ranks 153rd, while Caracas (Venezuela), Lagos (Nigeria) and Douala (Cameroon) are the lowest-ranked cities (172 to 174), because Internet access and quality are limited.

These data assume various levels of digital inequality, gaps that open up within cities, between cities and between countries. Those cities that were already vulnerable before the health crisis are likely to remain so, and will find themselves at imminent digital risk in the face of certain alternatives. In this regard, the Covid-19 pandemic made visible social and technological structural fragilities, in addition to aggravating existing inequalities.

The risks and challenges of the new normality in Mexican cities

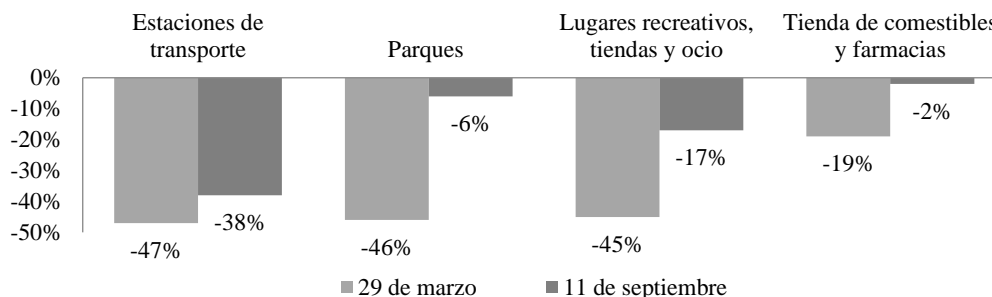
With the objective of analyzing the relationship between digital technologies and the risk associated with digital divides, the methodology was based on digital ethnography, and consisted of the use of primary and secondary sources of information, the monitoring of journalistic notes, publications in social networks and reports from public agencies. Due to the scarcity of updated data for all Mexican cities, it was decided to select those for which similar information exists, which would allow comparison. In cases where the analysis is particularized, the choice was based on the implementation of specifically digital tools in the context of the pandemic.

The analysis was contextualized in the new normal, the start of which was announced on May 17, 2020 with the dissemination of a series of health security guidelines in different environments (Gobierno de la República, 2020). In a broad sense, these included the gradual return to economic activities, seeking to maintain a balance between the economy and health in the absence of vaccination to mitigate Covid-19.

The transition from confinement to new normality meant relevant changes. In the first Mobility Report for Mexico that Google published on March 29, 2020, mobility decreased 35.4% on average, while in the new normal –as of September 11, 2020– the reduction was 13.5% on average and economic activities returned to percentages close to pre-pandemic levels (see figure 1). During the so-called new normality, in Mexico, as in other parts of the world, cities were transformed under the hybrid model. The following pages present those relevant cities that resorted to the use of digital technologies.

In order to reactivate governmental procedures and services, as well as to keep the population at home, digitalization was promoted to allow users to perform as many operations as possible from home through online applications. In Mexico City, “the digitalization of selected procedures and services that can be carried out electronically”³ was proposed (Government of Mexico City, 2020a, p. 31).

Figure 1. Community mobility report in the face of Covid-19



Source: Google Mexico. Community mobility reports against Covid-19.

Likewise, Jalisco proposed a Digital Strategy to face the risks of Covid-19, which considered the installation of a work team for the development of principles for the ethical and responsible use of artificial intelligence techniques, the digitalization of SMEs and cash, as well as the digitalization of government procedures and services (Martínez, 2020). This digitization process started strongly some years ago, but the new normality promoted the “acceleration of a digital government” (Gobierno de la Ciudad de México, 2020a, p. 31), which among other aspects would facilitate people's lives, but above all avoid crowds, one of the risks to be managed.

In accordance with the current of technological accelerationism, the dilemma does not lie in the depressurized advance of technology, but in the fact that we are often not able to “learn, nor apprehend, its speed and impact” (De la Torre, 2018, p. 32), and that is where the risks lie. In the pandemic context, the optimal conditions did not exist to reactivate the different economic activities, but it was deemed necessary to do so, particularly in the face of the scenarios occurring at the national and local levels.

In terms of tourism, hospitality had to be redefined and there was even speculation about its end as we imagined it (Korstanje, 2020). In practical terms, it was agreed that the infrastructure of tourist destinations would operate with a controlled capacity and controls were established with the support of digital technologies. This is the case of Guanajuato, where the use of big data and technological tools to manage tourism was referred to (Government of the State of Guanajuato, 2020). Other tourist cities, such as Cancun or San Miguel de Allende began to receive visitors with the Safe travels seal, a certification that considered the implementation of digital technologies to avoid physical contact.

Among other resources, technologies were enabled to identify the correct use of face masks; in Mexico City, for example, lists were published of the neighborhoods in which they were used the most and the least.⁴ To calculate the daily mobility in public transport, measurements were made with the support of digital technology, data that were presented in the daily report of the city's situation in front of the Covid-19 of the Government of Mexico City. It should be noted that this type of reporting is not done with the same depth in other cities in Mexico because “obtaining this information involves a significant deployment of resources, which is not profitable in low population areas” (IMCO, 2019).

As can be seen, Mexican cities faced a series of risks and challenges in the face of technological implementation processes that accelerated the pandemic context and the new normal. And when comparing the case of Mexico with other cities in the world –the first place in general (London) and the first place in the technology dimension (Hong Kong), for example– Mexican cities are at a disadvantage, as it is evident that there are relevant access gaps (see table 1).

In Mexico, the low percentage of households with Internet access and computer availability, fundamental tools for accessing digital services in the hybrid city model, stands

out. To delve deeper into these inequalities, it is necessary to highlight aspects such as the pre-eminence and characteristics of the cities. It stands out that out of 20 cities evaluated in the Urban Mobility Index of the Mexican Institute for Competitiveness (IMCO) (2019) only seven had privately operated transportation options that were accessible through mobile applications. This figure is relevant to ensure safe mobility both in terms of contagion risk and victimization.

Table 1. CIMI 2020: Technology Dimension, comparison London, Hong Kong and Mexico City

	Londres 1st place ICIM	Hong Kong 1st place technological dimension	Mexico 130th place ICIM 153th place technological dimension
% of households with internet access*	95.2%	94.1%	56.4%
% of households with a computer*	87.5%	77.6%	44.3%
Broadband ratio*	103.39	145.55	76.37
Web index	4	44 (China)	37
Internet speed in Mbps*	39 Mbps	28 Mbps	30 Mbps
# social media users*	48.63 million	n.d.	80.8 million
# of wifi points	12,520	3,110	13,741
% of population with 3G coverage	99.7%	99%	95%
% of the population that uses the internet for banking	62%	45%	17.1%

* Nationwide values for London (UK) and Mexico City (Mexico).

Source: developed by the author with data from the CIMI 2020.

Not all cities have the infrastructure for the digitization of procedures and services, in addition to the fact that within the population there are gaps in terms of internet availability and access to smartphones to integrate digitization into the new normal. The National Survey on Availability and Use of Information Technologies in Households (ENDUTIH, by its acronym in Spanish) of 2019, refers that the technological means of greater availability in households are television and telephony with 92.5%. Far below these are internet connectivity (56.4%) and the availability of a computer (44.3%). It should be noted that in rural environments access is significantly reduced.

Table 2. Percentage of households with information and communications technology equipment, according to the type of equipment in urban-rural areas, 2019

Population	Computer	Internet connection	TV	PayTV	Telephony*	Radio	Electric power
National	44.3	56.4	92.5	45.9	92.5	53.9	99.5
Urban	50.9	65.5	94.6	47.6	95.7	55.5	99.8
Rural	20.6	23.4	85.0	39.8	81.1	48.2	98.4

Nota: proportions with respect to the total households. The sum of the partials does not correspond to the total as it is a multiple choice question. All figures are preliminary and correspond to the month of July 2019 (date of the last available data). *Includes wired and/or cellular telephony.

Source: INEGI (2019).

These differences in access to internet and computers in the context of the Covid-19 pandemic are relevant because they are necessary inputs to contain the risks of contagion, avoid crowding and, at the same time, reactivate the economy in the hybrid city model that has accelerated the processes of technological digitization. This is more visible in cities where technology is involved in various types of activities.

As a sample of this, the ENDUTIH allows us to observe several important aspects. The first is that the main uses of the internet are for entertainment, access to social networks and general information search; while the activities of lesser use are banking operations, internet sales and cloud services (ENDUTIH, 2019). This shows that the general population is at basic levels of internet use, which speaks of the skills and capabilities associated with populations where access to services and operations of greater complexity are the least performed. This raises questions about the real possibilities of promoting and building a hybrid city model that aims at the aforementioned connectivity.

There are also significant gaps in the number of users per area, with users in urban areas outnumbering those in rural areas in all cases. In this sense, it is worth questioning the possibility for rural areas to integrate into online versus physical activities in the context of the pandemic. The hybrid model has restrictions in these areas, since their condition of scarcity of infrastructure and technological equipment undermines the possibilities of the population to stay safe by avoiding face-to-face activities.

Mexican cities also face global challenges in terms of technology in the context of the new normal. According to Lew and Herrera (2020), both 5G infrastructure and increasingly innovative artificial intelligence platforms “will decisively establish global geopolitics and economic control in the post-pandemic new normal” (pp. 147-148). Likewise, the escalation of “cutting-edge technology” companies (p. 147), which for years had begun their expansion (De la Torre, 2018) and which during the new normality made stronger inroads in several Mexican cities to implement technological projects, will continue.

Between cities there are also gaps evidencing other levels of inequality, since the low availability in access –and therefore in the use– of technologies conditions them to even greater lags, for having an unfavorable initial situation that is likely to deepen with the health crisis and technological acceleration.

There are important differences in technological equipment and infrastructure in the different cities of Mexico. The first place in internet use and access, by number of device users, is held by the Metropolitan Zone of the Valley of Mexico; followed by Guadalajara, Monterrey, Puebla, Tijuana, Juárez, León, Toluca, Mérida and San Luis Potosí; in contrast, the cities lagging furthest behind in these indicators are Chilpancingo, Tapachula, Tehuacán, Uruapan and Coatzacoalcos (ENDUTIH, 2018).

In cities, inequality manifests itself in various ways, and individual-level access to digital technologies is one of these (IFT, 2018). Accessing a smartphone and the internet generates costs that impact people's spending, naturally this affects at a higher level in lower income deciles than in higher income deciles. Similarly, there is the possibility that in cities only some areas have the technological infrastructure, which means that there are technological ghettos or islands that exclude the millions of inhabitants who live in the peripheries, on the margins of the technology that evokes the new normality.

In summary, it is the vulnerable populations who suffer the main risks associated with technology (in terms of access to and use of these digital tools) that Mexican cities are facing in the context of the Covid-19 pandemic. It is clear that not everyone has the same opportunities to access the new alternatives proposed by technological acceleration, particularly because “when such a large number of major technological developments occur in a relatively short time, the effects, once massively disseminated, can become exponential” (De la Torre, 2018, p. 61). Many will be left on the sidelines or at risk of contagion for not maintaining the sanitation measures of the new normality, which in turn impacts the exercise of other fundamental rights, related to educational issues, mobility, health, among others.

Similarly, technological infrastructure challenges have been identified that are difficult to overcome, at least in the short term, by governments and private institutions interested in collaborating in this area. At the same time, the market offers more and more alternatives that are difficult for governments to acquire, both because of their financial restrictions and because of their inaccessibility in terms of infrastructure conditions.

In this sense, digital inclusion strategies are relevant to reduce inequalities and provide greater access to the most vulnerable sectors of the population. In the face of the health emergency, digital inclusion is key to manage the risk of contagion, avoiding agglomerations, and to move towards a hybrid city model.

In Mexico, digital inclusion strategies implemented since Covid-19 have resized the problem in the face of the acceleration of digital technologies. This is the case of Jalisco,

whose Covid-19 Digital Plan includes a state digital inclusion campaign (Martínez, 2020), or the federal government's Digital Inclusion Centers, which had been in operation since before the pandemic, but have gradually been dismantled, whose courses⁵ were oriented to the “development of skills demanded by the digital era” (Mentado, 2020).

These types of initiatives should be strengthened to respond to the acceleration of technological digitization that occurred before Covid-19, since the new normality and the hybrid model of the city are imminent. This is one of the ways to address the potential risks of the pandemic, but also to limit the risks of inequality that are accentuated between cities and their inhabitants.

Conclusions

Covid-19 has meant an unprecedented transformation in the global collective imagination and the changes it has implied are not only part of the pandemic conjuncture, but have set precedents in the way we live in society and the way we rethink the design of future cities. As part of this change, digital technologies became a means to manage the risk of contagion.

During the days of more rigid confinement, mobile applications and technological infrastructure in cities allowed for relative control of human mobility. Subsequently, in the new normality, digital technologies played the leading role in the process of technological acceleration that would hypothetically allow coexistence in a hybrid model of city in which agglomerations were controlled at the same time as the economy was given course.

However, in Mexico, technological acceleration revealed multiple inequalities at different levels. Particularly, the technological gap was observed between cities that had greater capacity and infrastructure for the digitalization and management of urban life, through mobile applications and other alternatives. These technological gaps were also present among the inhabitants of the same Mexican cities. While in the technological islands there were connectivity conditions, in the peripheral and more marginalized areas this was practically utopia, people lacked access infrastructure because it had not been provided by the governments and they did not have sufficient resources to cover the cost of joining the acceleration of digital technology.

Thus, in the cities, technological gaps accentuated inequalities while potentially violating fundamental rights, whose fulfillment in the new normality was linked to digital technology, such as the right to education, to safe mobility, to privacy, etc. For the most part, cities showed that they were in incipient stages in responding to the demand for technology in the context of the new normality.

Rethinking Mexican cities from the perspective of the acceleration of digital technology, which evidenced and enhanced the new normal, as well as contextualizing them

in the imminent interactions between technologies and digital risk, is fundamental for the design of the cities of the future. So too is understanding the risks of digital technologies, particularly with respect to inequality as a context and as an effect on society.

The pandemic presents society with a series of consequences that will persist over the long term. In economic terms, the havoc in education, health, leisure –and other aspects– is imminent and will translate, in many cases, into changes in productive organization where the use of digital technology will be inevitable. It is therefore necessary to remember that these changes will also have an impact on the way of living, on the way of appropriating public space and on changes in private space.

There are more questions than answers about the way in which cities will be transformed, but there is an urgent need for public policies that help to reduce the gaps of present and future digital technologies between cities and between those who live in them, as well as various regulations that allow coexistence in an ethical and safe way in all the spaces where it is already present and where it will take place.

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¹ This concept refers to the possibility of future damages as a consequence of particular decisions (Luhmann, 1996).

² It is understood as “part of the backbone of any society that seeks to achieve 'smart' status” (IESE, 2020, p. 23).

³ The Government of Mexico City "accelerated the strategy of mass digitalization of procedures and services to prevent citizens from exposing themselves in public spaces". This implied the massive digitalization of procedures and services, the integration of a digital citizen file for all procedures and services, and an Integral Appointment System that would allow citizens to schedule personalized attention (Gobierno de la Ciudad de México, 2020b, p. 71).

⁴ In the press videoconference of July 22, 2020, the head of government of Mexico City announced the five neighborhoods that used the most and the least cover-ups.

⁵ Among the courses were: cloud services, digital marketing, databases, web development, entrepreneurship and innovation, big data, artificial intelligence and cybersecurity (Mentado, 2020).