

## ADOPTION OF TECHNOLOGICAL TOOLS IN THE RESTAURANT SECTOR IN CUSTOMER SERVICE IN THE CITIES OF MINERAL DE LA REFORMA AND TULANCINGO, HIDALGO, MEXICO

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**Abstract:** Technology has allowed the creation of networks and business opportunities through various digital tools, promoting social and cultural development. The objective of this study is to assess the level of technological adoption in customer service by restaurants in Mineral de la Reforma and Tulancingo, Hidalgo, focusing on the types of technologies used, their extent of implementation, and the factors influencing their adoption. The research focused on a quantitative, descriptive, non-experimental, transactional approach. A survey of 71 Likert-type items was applied to 147 restaurant managers with between six and ten employees. The use of technology was analyzed in three dimensions: technological tools, human resources and physical resources. The data were integrated for analysis and statistical processing. The results obtained show that 97% of restaurants have the Internet, they do not exploit all the advantages that the network offers, they focus on the Facebook tool (81%) without taking into account their customer's profile, and they do not use digital platforms for their promotion. Training staff in technology contributes to gastronomic tourism in Mineral de la Reforma and Tulancingo Hidalgo, known as towns with flavor, favoring restaurants. This sector is one of the most attractive for tourists due to its traditional food, which generates income, jobs and improves the quality of life of the inhabitants.

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## Introduction

The objective of the article is to evaluate the level of technological adoption in customer service by the restaurants in Mineral de la Reforma and Tulancingo, Hidalgo, focusing on the types of technologies used, their degree of implementation and the factors that influence their adoption. This research project seeks to promote technology adoption by managers, thus promoting its evolution and obtaining sustainable competitiveness that drives social development. In general, it is intended that technology can be used effectively to improve customer experience and operational efficiency in the restaurant sector. This study stands out for its innovative nature, since it considers technology as a key factor for business success, optimizing customer service, strengthening gastronomy, generating jobs, attracting more visitors, and increasing the economy of Mineral de la Reforma and Tulancingo, Hidalgo.

In the same way, the article aims to provide findings, collaborate in the advancement of science and contribute to the understanding of certain problems. It also allows other experts in the area to review and validate the results obtained, guaranteeing the quality and credibility of the research.

Food and beverage preparation businesses represent an opportunity for business success if effective strategies are applied to offer differentiated and quality products (Fuentes et al., 2014). In this sense, it is worth highlighting that customer service is decisive for him (Kim & Lough, 2007) and involves aspects such as: the time he must wait to be served, the friendliness of the employee when serving him, hygiene of the infrastructure, the furniture and the workers (Guzmán et al., 2014).

On the other hand, the incorporation of ICT in companies is considered an element that increases their competitiveness through greater productivity, efficiency and profitability of investment. Its effect depends on the characteristics of the technology, the environmental conditions, as well as the internal capabilities. Monetary resources for acquisition and ICT are not a sufficient condition in and of themselves. Therefore, it must be accompanied by a short, medium and long-term strategy, aimed at stimulating the training of workers in the use of specialized tools for the company's activities (Buenrostro & Hernández, 2019).

In Mexico, the Mexican Restaurant Association in 2019 reported that the restaurant industry is the second largest employer nationwide and the first in self-employment; in addition, the majority of businesses and restaurants are made up of Small and Medium Enterprises (Censos Económicos, 2019).

The role of creativity in the socio-business and innovative development of the territories in the state of Hidalgo in the municipalities have great challenges to solve; in the framework of the global and national economic crisis, they are more restricted, which is why innovation and creativity become fundamental for the business sector. It is important that an innovative and creative municipality must work on a strategic

development plan. Considering a strategic plan involves the participation of all companies, citizens in which universities participate, the businessmen and students, that is, achieving a true conjunction of interests in which the common objective is the search for the well-being of the population (Hernández et al., 2018).

The municipality of Tulancingo has been established in such a way that it serves as a social center, a commercial point between the surrounding towns, cities and municipalities. This characteristic has not only generated a valuable economic dynamic on a regional scale, but has also fostered cultural exchange among its inhabitants and has allowed the convergence of large movements from cities in the Gulf of Mexico and the center of the country. Tulancingo belongs to the second socio-economic region of the state of Hidalgo. Linked to this, it is essential to emphasize that the economic sectors of Tulancingo have experienced great changes over the last decade (Noyola, 2016).

Technology is a trend in service companies worldwide; therefore, the research aims to evaluate the level of technological adoption in customer service by restaurants in Mineral de la Reforma and Tulancingo, Hidalgo, focusing on the types of technologies used, their degree of implementation and the factors that influence their adoption. A Likert-type survey will be used among managers (147) of restaurants that have between six and ten employees, which allows them to identify the type of technological tools they use in customer service in their human and physical resources dimensions.

## Literature review

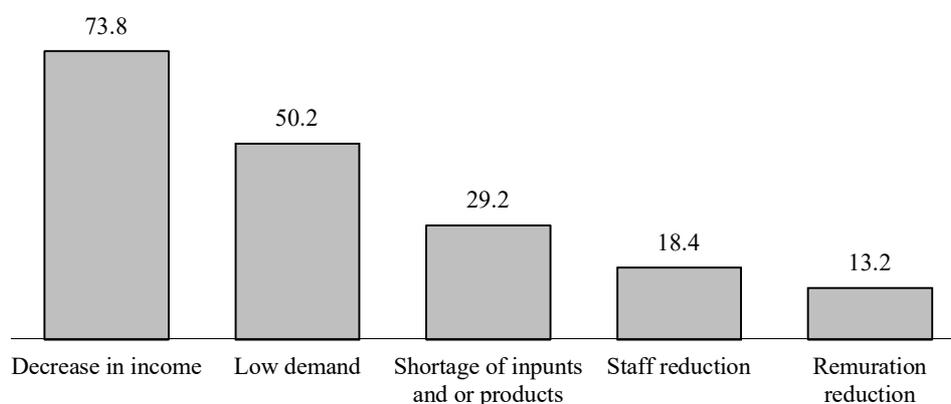
Technology can help the company improve its efficiency and be more competitive; this process must be accompanied by a planning effort and training employees in the use and adoption of technologies (Rojas & Hernández, 2017). Information and communication technologies allow companies to evolve and achieve sustainable competitiveness that allows social development. Therefore, technology and innovation are the key to business success regardless of the type of company or size because these are transversal tools that allow adding value to organizations (Bernal & Rodríguez, 2019).

Tourism is now the fifth source of municipal income, and its growth capacity requires attention from municipal actors who converge in the development of the sector by considering it as a source of income, employment, growth, as well as economic and human development. The geographical location of the municipality contributes to this by remaining a strategic place for passage to entities in the Gulf of Mexico. The dynamism that covers the region and the proximity to the State and Mexico City make Tulancingo a destination that is easily accessible to tourists (Busto, 2019).

Small and medium size enterprises (SME), such as restaurants, have implemented innovation practices in different areas of the company, highlighting process innovation through changes in the way dishes are produced and distributed, implementation

of rigorous health protocols, organizational innovation through business associations, modifications in infrastructure and actions that promote occupational health, marketing innovation, carrying out the promotion, advertising of goods and services through the use of technologies and social networks. From the implementation of these actions, favorable results were obtained, reflected in the following indicators: customer satisfaction, profitability, use of relational capital and occupational health. Innovation in the face of the health crisis is not an eventual necessity but a lifestyle that companies in this sector must adopt as part of their business culture (Cruz & Guillermo, 2021).

The National Institute of Statistics, Geography and Informatics (INEGI) in 2021 measured the impact on companies caused by the COVID-19 pandemic with three statistical exercises for this purpose during April and August 2020, and February 2021. Companies were affected (Figure 1) in the reduction of income by 73.8%; the second greatest impact was the low demand for the products or services offered by companies and, thirdly, the shortage of inputs (Ruiz, 2021).



**Figure 1. Companies affected in 2021 (in percent)**

Source: (Censos Económicos, 2019)

Derived from the aforementioned evidence, the pandemic caused a decrease in income in the restaurant industry, which caused a decrease in services, low demand for service, lack of supplies, as well as staff cuts; some businesses even closed due to the impact of COVID-19.

The total estimated value of the restaurant industry was close to 300 million pesos, and the total annual sale is \$18,992 million pesos. 20% of the Mexican population needs to eat outside the home daily (AMR, 2019). There are 555,122 restaurants in the Mexican Republic, segmented into (AMR, 2019): fast food restaurants, formal, casual and cafeterias. The Federal Institute of Telecommunications, Mexico (2019) carried out a study in which it reported the adoption rate of technology in accommodation and food preparation services by sector and state. Hidalgo is below the average level: by sector with 7.45 (Figure 2) and by state with 10.09 (Reza, 2021).



**Figure 2. ICT Adoption Index by State**

Source: (Censos Económicos y Directorio Estadístico Nacional de Unidades Económicas, 2019)

The average national technology adoption index is 13.5; therefore, Hidalgo has a level of 10.09. On the other hand, the Secretaría de Turismo en Hidalgo (2022) reported that the state of Hidalgo has new towns with a flavor equivalent to 28 towns within which Mineral de la Reforma or Tulancingo is located. In this sense and with the purpose of promoting the culture of flea markets, markets and representative restaurants and recognizing the importance of traditional local gastronomy, as well as promoting tourism that exists in several municipalities of Hidalgo.

On the other hand, according to information from the National Statistical Directory of Economic Units (DENUE, 2022), 62 food preparation services are registered in the Region of Mineral de la Reforma, Huasca de Ocampo and Omitlán, 85 in Acaxochitlán, Cuauhtepc and Tulancingo, considered as flavored towns in Hidalgo, Mexico (Table 1).

**Table 1. Towns with flavor of the regions of Mineral de la Reforma and Tulancingo, Hidalgo**

Towns with Mineral flavor of Reforma and Tulancingo, Hidalgo	Food preparation services
Acaxochitlán	85
Cuauhtepc	
Tulancingo	
Huasca de Ocampo	62
Mineral de la Reforma	
Omitlán	
Total	147

Source: Directorio Estadístico Nacional de Unidades Económicas (DENUE, 2022)

The introduction of information technologies in restaurants, such as a customer-centric service process, staff interaction and personalized services with the customer will continue to play an important role. For example, the customer makes the order by digitizing, with options through the digital screens available. Another option is the tablet used by each waiter in which they digitize customer orders (Estrada & Zavala, 2020).

Digital technologies have meaning as long as users can employ them in an interconnected manner; that is, when they access the Internet, they can take advantage of said resource based on their requirements. For this reason, a series of policies must be generated regarding the Internet access and equipment for proper use (Flores et al., 2020).

The investment of restaurants in software is focused solely on administrative processes; however, investments in the coming years seem to be aimed at perfecting the customer experience, improving mobility and promoting new forms of communication with users in the digital world, thus having an impact on incorporating the use of technological devices in operational processes in the restaurant sector (Méndez, 2020).

The different adoption and implementation mechanisms of digital transformation, indicate that “it can be implemented and adopted through digital strategies, business architectures, reference frameworks, standards, infrastructures, platforms and other organizational governance mechanisms.” At the same time, the way in which digital transformation is formalized is through continuous improvement within organizations (Delgado, 2020).

Digital transformation is a term that has gained relevance in recent years. It refers to a recent concept that understands the evolutionary process as the way in which organizations apply the tools offered by ICT to seek greater profitability and use. 16 Digital transformation is a leverage in the growth of an organization, so much so that, according to Forbes17, 85% of global CEOs say they have a period of 24 months to significantly direct their organization towards digital transformation” (Briebescas et al., 2021).

Business social networks have a great scope to calculate an increase in followers. It is considered that the fact that these followers are integrated into the community of a brand, that the interaction with the social network is permanent, will allow an increase in diffusion of the service to obtain economic benefits, by managing virtual tools in a timely and permanent manner (Ocaña & Freire, 2021).

The introduction of information technologies in restaurants, such as customer-centric service process, staff interaction and personalized customer services will continue to play an important role, so that the customer places the order digitally, with options through the available digital screens; another option is the tablet used by each waiter in which they digitize customer orders (Cruz & Miranda, 2019).

In this sense, social networks can be categorized into several areas, depending on the environment. In this sense, they are an integral part of the technology field, influencing the business relationship. Digital channels are platforms that enable the customer to choose a good product or service, allowing them to have details and

characteristics of what they want to purchase, also when selecting the product or service that gives them satisfaction and quality of life (González et al., 2021).

Customer service is the differentiating factor that influences the end user's decision making. For this reason, it has access to information from both the company itself and the competition through technological tools, basing its decisions on comments of satisfaction or dissatisfaction (Ospina et al., 2019).

## Methodology

This study aims to evaluate the adoption of technologies in customer service processes by restaurants located in Mineral de la Reforma and Tulancingo, Hidalgo. The focus of the research is to determine the types of technologies used, the degree of implementation and the factors that influence the adoption of said technologies.

The research was carried out with a quantitative, descriptive, transversal and correlational approach, with the purpose of analyzing the types of tools used by hotel and restaurant managers in customer service; the technology variable was considered. The data were integrated into the SPSS statistical program for statistical processing and analysis.

147 surveys were applied to restaurant managers in the cities of Mineral de la Reforma and Tulancingo Hidalgo, considered towns with flavor because they encourage the promotion of Hidalgo gastronomy at the local, regional, national and international level.

In the research instrument, a Likert scale questionnaire was developed, which was applied to the managers of the restaurants in Mineral de la Reforma and Tulancingo Hidalgo. This allowed us to know the type of technological tools as a work tool used by staff in customer service.

Table 2 presents the dimensions that describe the survey directed at managers, with the purpose of evaluating the level of adoption of technological tools in the restaurants of Mineral de la Reforma and Tulancingo, Hidalgo. These dimensions aim to analyze the means of communication used with staff and customer service promotion strategies. This allows us to identify the type of technology used within restaurants and the digital channels used to communicate with consumers. Additionally, they help determine the elements of customer service that managers consider important, as well as how they implement customer relationship management.

**Table 2. Table of dimensions of the applied instrument**

Dimension	Question number
Internet connection	3
Website	1
Digital communication	5
Automated programs	3
Artificial intelligence	3

Source: Own study based on research

On the other hand, for the analysis of the reliability of the instrument, Table 3 presents the results obtained through Cronbach's Alpha, with the SPSS statistical tool, in which the questions were grouped considering the technology variable in its three dimensions (technological tools, human and physical resources). It was obtained that Cronbach's alpha is 0.808.

**Table 3. Table of dimensions of the applied instrument**

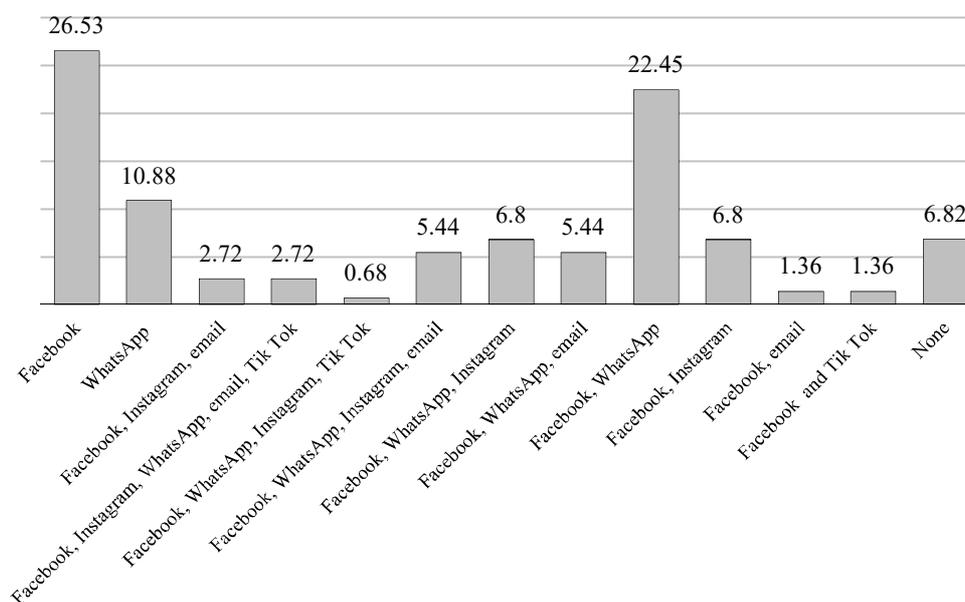
Reliability Statistics	
Cronbach's Alpha	N of Items
0.808	71

Source: Own study based on research, in IBM SPSS Statistics Version 22 program

This demonstrates that the instrument is reliable and has a good level of internal consistency according to the evaluations carried out. This means that the questionnaire items are coherent, and that the respondents' answers are reliable and firm.

## Results

Figure 3 shows the adoption rate of technological tools in the restaurants of Mineral de la Reforma and Tulancingo, Hidalgo, for their operation and customer service. The data shows that 26.53% of restaurants use Facebook, while 22.45% use both Facebook and WhatsApp, thirdly, some restaurants use only WhatsApp. Therefore, these technological tools are the main ones used to promote customer service.



**Figure 3. Digital tools as work instruments (in percent)**

Source: Own study based on research, in SPSS Statistics Version 22 program

In Table 4, one item was considered; 43% of managers responded that they do not use any digital platform as a means of technological dissemination of the service they offer. Simultaneously, 33% of managers use the TripAdvisor platform, which shows that adopting a digital platform will optimize automated processes for the promotion of the service.

**Table 4. Website used in the dissemination of the service**

Item	Website	n	%
Indicate which digital platform you use as a means of technological dissemination of the service you offer.	TripAdvisor	33	22
	Trivago	5	3
	Booking	5	3
	Menu	6	4
	Gastroranking	3	2
	Mexico.towns America	2	1
	Restaurant Guru	36	24
	Youtube	5	3
	None	43	29
	Total	<b>147</b>	<b>100</b>

Source: Own study based on research

In Table 5, 6 and 7, three items were considered. The first demonstrates that 81% of the hotels and restaurants use Facebook as the technological tool in their operations; in the second item, 46% of the managers responded that they do not use an automated service cost program; in the third item, 45% of managers do not use an automated electronic billing program in customer service. This represents that there is a high percentage of managers who use Facebook as a work tool, therefore, it is important that they consider adopting an automated program in order to optimize waiting times in customer service.

**Table 5. Technological tools as a work instrument in restaurant operations**

Item	Technological tools	n	%
Indicate what technological tools you use as a work instrument	Facebook	119	81
	What App	83	56
	email	21	14
	Instagram	40	27
	Tik Tok	7	5
	None	10	7

Source: Own study based on research

**Table 6. Automatic programs for settling service costs in restaurant operations**

Item	Programs for settling service costs	n	%
Indicate which automated service cost program you use	Bistrof	1	1
	ClipStand	2	1.3
	Excel	18	14
	Frondesk	1	1
	Loyvers	6	2
	Maibissne	2	1
	Soft. restaurant	50	34
	None	67	46
	<b>Total</b>	<b>147</b>	<b>100</b>

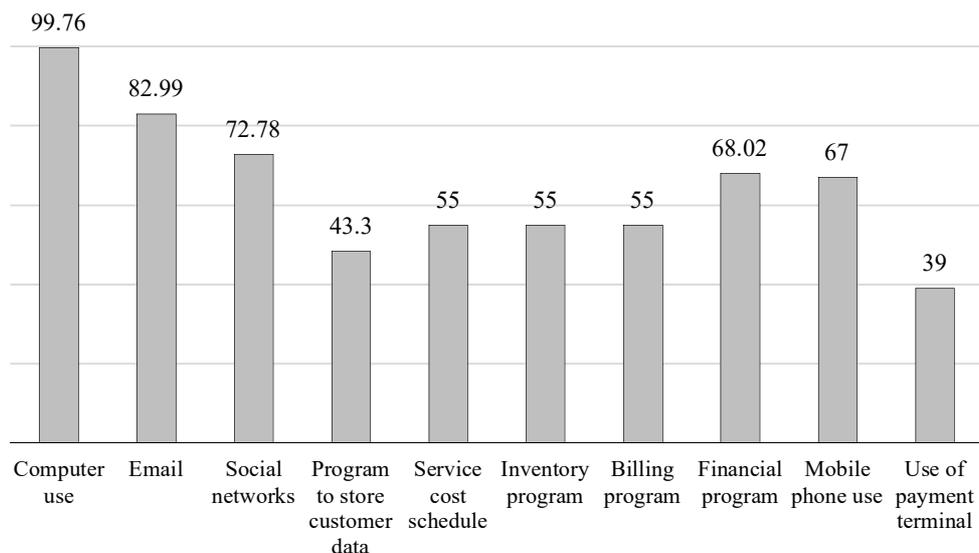
Source: Own study based on research

**Table 7. Automatic electronic billing programs for hotels and restaurants**

Item	Electronic billing programs	n	%
Indicate which automated electronic billing program you use	Aspel	12	8
	Bistrof	1	1
	Clipstand	3	2
	Google online	26	18
	Loyvers	6	4
	Maibissne	1	1
	Soft Restaurant	52	35
	Yezdo	11	1
	None	45	30
	<b>Total</b>	<b>147</b>	<b>100</b>

Source: Own study based on research

Figure 4 presents an overview of the technological tools used by the restaurants in Mineral de la Reforma and Tulancingo, Hidalgo, both for their operation and for the promotion of the service. The data indicates that 99.76% of the staff uses computers, 82.99% uses email, 72.78% uses social networks to disseminate the service, 68% uses an automated financial program, 67% uses mobile phones, 55% implements automated service cost, inventory and billing programs, 48.3% uses programs to store customer data and 39% uses payment terminals.



**Figure 4. Digital tools as work instruments (in percent)**

Source: Own study based on research

Without a doubt, the technological revolution has a significant impact on the restaurant sector. There is a rapid trend towards the adoption of a complete system of technological tools whose influence extends to all aspects of the sector. This transformation represents the digitalization of operational processes, strategically including the customer service in restaurants.

### Impacts and challenges

Hidalgo has important areas and tourist corridors with great potential for the integration and diversification of tourist products and services in favor of local development, due to the great diversity of natural resources as well as cultural traditions in the different regions (Plan Estatal de Desarrollo, 2022-2028).

The transversal agreement for science and technology for development, research, innovation and development (R+I+D) must be complementary, always seeking development and transformation based on a knowledge society and pursuing well-being as an end generalized for the municipality (State Development Plan 2022-2028).

The importance of ICT in organizations lies in the modernization and streamlining of processes, increasing their productivity and competitiveness in such complex markets, becoming the main generators of competitive advantages and innovation in SMEs. On the other hand, they provide a better communication channel, allowing greater accessibility to information which is more reliable; they facilitate decision-making and allow for cost reduction (Saldaña et al., 2021).

Technology is a trending tool for the business sector; it is part of marketing to promote customer service; due to this trend, a large number of people use technology through different digital tools. Digital diffusion is a challenge as technology advances; it acquires constant changes as well as the needs of people, which is why the restaurant managers of the Cities of Mineral de la Reforma and Tulancingo,

Hidalgo considers it important to adopt technology in customer service, before needs, preference, through various technological tools such as: Facebook, WhatsApp, Instagram, Tik Tok, email and web pages, among others. They allow the service to be seen by users, with the challenge of increasing clients and attracting tourists in a way that creates social impact at the state, national and international levels while also driving economic growth.

## Conclusions

It is essential not to lose sight of customer service because it is a necessary tool in any company to strengthen its image, productivity and competitiveness; it would be critical not to have technological strategies aimed at satisfying the expectations and needs of its customers (Bribiescas et al., 2021).

The State Development Plan (2022-2028) mentions transforming tourism to contribute to the generation of new employment opportunities, guaranteeing a balanced development between long-term tourism activities, as well as strengthening social and territorial cohesion. It also recommends publicizing the entity's tourism offer in markets and segments to achieve an increase in tourists and accommodation.

The results of this study in general show that 97% of the hotels and restaurants in the cities of Mineral de la Reforma and Tulancingo, Hidalgo have the Internet; 87% of the managers responded that using social networks is a means of dissemination to increase customers, and 81% indicated that Facebook is the technological tool they use as a work instrument for customer service.

In this sense, it is important that technology is made the most of in the different digital tools so that the client has access and finds the necessary information about the service according to their needs. Another aspect to highlight is the importance of training staff in the use of technological tools in order to increase efficiency and performance to provide better customer service and attract tourists.

Regarding gastronomic tourism in the state of Hidalgo, technological strategies can be developed to highlight the Cities of Mineral de la Reforma and Tulancingo Hidalgo, represented as towns with flavor, benefiting traditional restaurants. The gastronomic sector is one of the most attractive ones because the majority of tourists are attracted by traditional foods and contribute through the restaurant service that allows progress, generates employment and income to improve the quality of life of the inhabitants. These cities also become the main competitive tourist destination at a local, national, and international level in the diversity of restaurants, allowing them to generate economic growth for the benefit of the entities.

Based on the findings and conclusions of this article, it is essential to address the challenge of designing comprehensive policies that include the implementation of

technology in restaurants. These policies must be based on an evolutionary perspective of the patterns of technological change and their relationship with economic growth and social inclusion.

Within the research, several limitations were also identified that presented difficulties during its implementation. One of them was the time limitation, which increased the workload of the project. Additionally, the paucity of recent research on this relatively new topic was a challenge. Due to the lack of time, it was decided to implement a simple methodology, such as the use of SPSS.

Finally, it is suggested that future research can extend this type of study to more restaurants and states, with the aim of obtaining a more global statistical analysis and contributing to the improvement of technology in the operational part worldwide. Likewise, as there is a greater volume of data, it is recommended to implement a more advanced methodology with programs that offer more statistical functionalities for exhaustive control of the data.

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## ZASTOSOWANIE NARZĘDZI TECHNOLOGICZNYCH W SEKTORZE RESTAURACYJNYM W OBSŁUDZE KLIENTA W MIASTACH MINERAL DE LA REFORMA I TULACINGO, HIDALGO, MEKSYK

**Streszczenie:** Technologia umożliwiła tworzenie sieci i możliwości biznesowych za pomocą różnych narzędzi cyfrowych, promujących rozwój społeczny i kulturalny. Celem tego badania jest ocena poziomu adaptacji technologii w obsłudze klienta przez restauracje w Mineral de la Reforma i Tulancingo, Hidalgo, ze szczególnym uwzględnieniem rodzajów wykorzystywanych technologii, zakresu ich wdrożenia i czynników wpływających na ich przyjęcie. Badania koncentrowały się na ilościowym, opisowym, nieeksperymentalnym, transakcyjnym podejściu. Ankiety, składającą się z 71 pytań, skierowano do 147 menedżerów restauracji zatrudniających od 6 do 10 pracowników. Wykorzystanie technologii analizowano w trzech wymiarach: narzędzia technologiczne, zasoby ludzkie i zasoby fizyczne. Dane zintegrowano z oprogramowaniem IBM SPSS w celu przetwarzania i analizy statystycznej. Uzyskane wyniki pokazują, że 97% restauracji posiada dostęp do Internetu, jednak nie wykorzystują one wszystkich zalet, jakie oferuje sieć. Koncentrują się na wykorzystaniu jedynie narzędzi takich jak Facebook (81%), nie biorąc pod uwagę profilu klienta i nie korzystając z platform cyfrowych do swojej promocji. Szkolenie personelu w zakresie technologii przyczynia się do rozwoju turystyki gastronomicznej w Mineral de la Reforma i Tulancingo, Hidalgo, znanych jako miasta ze smakiem, sprzyjające funkcjonowaniu restauracji. Sektor ten, jako że jest jednym z najbardziej atrakcyjnych dla turystów ze względu na tradycyjne jedzenie, generuje dochód, miejsca pracy i poprawia jakość życia mieszkańców.

**Słowa kluczowe:** zarządzanie IT, systemy informatyczne, technologie informacyjne i komunikacyjne

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