Impact of ICT in the Tourism Sector: Ecuadorian Case.

M. L. Rodriguez[1], M. F. Pazmiño[2], O. A. López[3], J. M. Gómez[1], L. A. Mendoza[4], M. M. Arteaga[5], A. A Martínez[2] and C. L. Iza[3]

[1]*Facultad de Ciencias Administrativas y Económicas. Universidad Técnica de Manabí, Portoviejo, Manabí, Ecuador.*
Email: *Autanaes@gmail.com*
[2]*Instituto de Admisión y Nivelación. Universidad Técnica de Manabí, Portoviejo, Manabí, Ecuador.*
[3]*Facultad de Ciencias Informáticas. Universidad Técnica de Manabí, Portoviejo, Manabí, Ecuador.*
[4]*Facultad de Ciencias Básicas. Universidad Técnica de Manabí, Portoviejo, Manabí, Ecuador.*
[5]*Facultad de Ciencias Humanísticas y Sociales. Universidad Técnica de Manabí, Portoviejo, Manabí, Ecuador.*

Abstracts: The rapid development of Information and Communication Technologies (ICT) has profoundly impacted international tourism. This research analyzes the utilization of ICTs in the Ecuadorian tourism sector, specifically within micro, small, and medium-sized enterprises (MSMEs). The study employs an exploratory, descriptive, and bibliographic methodology, including a questionnaire distributed to 378 tourism experts representing Ecuadorian tourism MSMEs. The objective is to examine the relationship between ICTs and current tourism practices. The findings demonstrate that ICTs support 80% of MSME activities in the Ecuadorian tourism sector. They also provide benefits such as improved access to information about Ecuadorian tourist sites, enhanced communication between companies and tourists, and increased ease of tourist mobility.

Keywords: Tourism; ICT; Immersive Tourism; Marketing; Traveling Society.

1. INTRODUCTION

Information and Communication Technologies (ICTs) have transformed contemporary societies by revolutionizing information management through technological devices. Within this digital revolution, ICTs have significantly impacted the tourism industry, which serves as a major economic driver in several Latin American countries. These countries possess abundant natural and cultural wealth, creating value and opportunities to achieve economic and social objectives.

Tourism is a crucial component of economic development for countries rich in cultural, ethnic, and territorial resources, as emphasized by Ramirez et al. [1]. It generates foreign exchange, and capital, and contributes to the growth of the gross domestic product (GDP). Recognizing its potential, Latin American governments have strategically focused on tourism to improve living conditions within communities.

In Ecuador, tourism is regulated by Tourism Law No. 97 enacted in 2002 (Garcia [2]. Since then, various strategies, including the National Development Plan of Ecuador (2009) and its subsequent update as the National Plan for Good Living, have been implemented to enhance tourism activities. The recognition of tourism as a cross-cutting sector within the popular and solidarity economy further underscores its significance.

While the importance of tourism in the Ecuadorian economy, particularly in communities, is widely acknowledged, this research specifically examines the impact of ICTs within the Ecuadorian tourism sector, particularly in micro, small, and medium-sized enterprises (MSMEs). Furthermore, according to López & López [3] ICTs play a pivotal role in enhancing competitiveness and expanding user reach within the tourism industry. However, this requires skilled professionals proficient in utilizing ICTs for effective administrative and productive activities.

The significance of ICTs in tourism has gained attention from international and national organizations, and Latin

American countries, including Ecuador, have prioritized it on their agendas. In Ecuador, there are existing projects aimed at promoting tourism activities. This research aims to provide a fresh perspective on the utilization of ICTs in MSMEs within the tourism sector. Data for the study is collected through a validated instrument developed by López & López [3] and administered to 50 professionals currently working in tourism organizations in Ecuador.

1.1. Economic Twins: Tourism and Icts

According to Gordon [4], tourism has ancient roots, with nomadic tribes traversing vast distances to explore different places, cultures, and tribes. It emerged as a formal industry in the 1950s and 1970s when mass tourism became a global phenomenon. However, the term "tourism" gained widespread recognition in the early 20th century.

While tourism has become a monetized activity, it has brought both positive and negative impacts to Ecuadorian society, as highlighted by Ramirez et al. [1]:

POSITIVE IMPACTS

- Tourism has improved medical facilities in recreational areas, coastlines, rural regions, and more. It has also spurred the development of essential infrastructure, including lighting, waste management, Internet connectivity, and financial institutions in tourism-centric areas.

- Tourism has stimulated a renewed interest among citizens to explore their own culture, traditions, festivals, and customs.

- Sustainable tourism practices have delivered benefits to both the environment and local communities, enhancing their overall quality of life.

NEGATIVE IMPACTS

- Poorly planned tourism can lead to deculturation, endangering the cultural heritage of indigenous communities and others. Developing countries are particularly vulnerable, as residents may perceive visitors as disruptors of their customs, traditions, and beliefs.

- The excessive commercialization of local traditions through the Internet, accompanied by altered meanings and origins, can contribute to deculturation and the eventual destruction of unique tourist attractions.

1.2. Tourism in Ecuador

In Ecuador, the Ministry of Tourism (MINTUR) takes a leading role in promoting the thriving tourism sector. Among its notable endeavors is the "Emprende Turismo" project, aimed at fostering innovation and encouraging entrepreneurial ventures. These initiatives undergo validation under the Law of Productive Development, which streamlines the process of incorporating companies within the country. Micro, small, and medium-sized enterprises (MSMEs) engaged in tourism can reap substantial benefits, including a generous 20-year exemption from income tax. To qualify, these enterprises must have at least one project related to tourism activities, encompassing areas such as food, hospitality, tourist transportation, or the implementation of smart tourism utilizing information and communication technologies (ICTs) [5].

Ecuador has been the recipient of various international projects focusing on tourism, with the renowned "ALL YOU NEED IS ECUADOR" campaign, initiated by MINTUR in 2014, standing out prominently. This comprehensive digital campaign spanned national and international platforms, targeting 19 cities around the globe. It provided a compelling showcase of how ICTs have played a pivotal role in propelling Ecuadorian tourism to new heights. By scanning QR codes strategically placed on promotional materials across different countries, foreign citizens gained access to the MINTUR web portal. There, they were immersed in a captivating visual journey, exploring a rich

tapestry of photographs depicting the country's diverse and captivating tourist destinations, breathtaking natural landscapes, indigenous flora and fauna, delectable traditional dishes, vibrant cultural attire, and the vibrant tapestry of customs and traditions practiced by Ecuador's myriad ethnic groups.

THE IMPACT OF ICTS IN THE TOURISM SECTOR

The tourism sector has embraced Information and Communication Technologies (ICTs) as integral components of business strategies. These technologies are used to disseminate tourism content through websites, social networks, print advertising, and mobile applications. ICTs have given rise to new forms of tourism, with the emergence of applications and services that provide customers with crucial trip information more seamlessly [6].

Latin America, renowned for its rich tourist heritage, has captivated the interest of many first-world nations. Unique attractions, such as the Galapagos Islands in Ecuador, contribute to the region's development. Tourism in Latin America offers various modalities, including cultural experiences, community-based tourism, eco-tourism, adventure sports, entertainment, fishing, and relaxation[7].

ICTs should be accessible to all MSMEs in the tourism sector, as they play a crucial role in promoting tourism sites effectively. It is important to professionally publish information while respecting the essence of local communities [8].

The widespread adoption of ICTs is facilitated by the Internet, which serves as the foundation for various technological solutions [9]. The Internet offers users access to diverse digital content, including web portals, offline and online applications, augmented reality projects, and virtual tours of destinations worldwide [10].

E-commerce has become a vital tool for tourism businesses, enabling online sales of travel tickets, tour packages, and related products. This transition to ICTs represents a shift toward a modern Information Society, streamlining manual processes with sophisticated digital systems. The impact of ICTs on tourism can be observed through:

- Emergence of new production models.

- Optimization of services to enhance efficiency.

- Increased accessibility to tourist destinations in previously unknown geographical areas, facilitated by GPS applications such as Google Earth, Google Maps, Waze, Here WeGo, and Maps.ME, and Citymapper.

- A broader international reach in terms of attracting tourists.

- Rise in travel demand due to the availability of affordable packages.

- Emphasis on social responsibility and ecosystem protection.

As ICTs continue to reshape the tourism industry, it is important to explore related concepts that are crucial in the context of modern tourism.

1.3. Traveling Society or Wanderlust

Every day, new generations embrace a more adventurous spirit, influenced by technological advancements such as social networks, mobile applications, and the vast array of online platforms. Young people no longer desire to remain confined to one place; instead, they yearn to explore the world and seek out new experiences beyond their everyday lives. This growing phenomenon is commonly referred to as the Traveling Society or "Wanderlust" [11].

The term "Wanderlust" has its roots in the German language, combining "wander," meaning to walk, and "lust,"

representing passion. Thus, it encapsulates the passionate desire for exploration and travels that young people possess, seeking out new adventures and enriching experiences through tourism.

1.4. From the Social Point of View

The traveling society has become an international trend, driven by the digital era, so it has caused the adoption of a new lifestyle, where all immersed people are willing to tourist adventure, open to the unknown, intend to be digital nomads and live their life to the fullest [12].

1.5. Social Media Marketing

According to Gil [13], social media marketing plays a crucial role in promoting and sharing information about various tourist destinations and services, including accommodations, transportation, and other related services. Through effective marketing strategies, travelers are provided with a more transparent and comprehensive understanding of the services they can expect to receive.

1.6. Immersive Tourism

According to Fabbroni [14], immersive tourism arises from the integration of ICTs, enabling interactive experiences at tourist sites. This fosters sustainable heritage preservation by digitally showcasing the real geographical environment and promoting cultural dissemination, eliminating the need for physical immersion in local communities. Consequently, this digital approach impacts the GDP, reducing foreign exchange and expenses incurred by tourists during in-person visits.

Immersive tourism encompasses various technologies that enhance its operations. These seven technologies are considered pivotal advancements in the tourism sector.

Table 1. Technologies used in tourism.

TECHNOLOGIES	DESCRIPTION
Mobile Technology	45% of tourists use their smartphones to search for information about tourist destinations, according to the TripAdvisor web portal.
Augmented Reality	Applications like EVEREST VR enable virtual visits to various locations worldwide, utilizing augmented reality technology.
Internet of Things	It is a branch of Computer Science that allows the interconnection of devices through the Internet; within this category are presented sensors, routers, software, and other tools.
Voice Assistants	Popular virtual assistants such as Alexa, Siri, and Watson Assistant, equipped with artificial intelligence, are capable of providing tourists with relevant answers to their inquiries.
Big Data	Data analytics is extensively employed in mobile and desktop applications for information analysis purposes. In the tourism sector, government agencies and MSMEs are increasingly utilizing this technology.

Source: prepared by the authors based on Vidal [15].

2. MATERIEL AND METHODS

Tourism has become a vital economic asset for MSMEs in Ecuador, greatly benefiting various communities and enhancing their overall quality of life. This positive impact stems from several factors, including increased international investments, job opportunities for local community members, and the development of essential infrastructure such as health centers, hotels, and community police units. Notably, these facilities are strategically positioned near popular tourist attractions, ensuring convenient access for visitors and maximizing their utility.

The present research is rooted in an exploratory and descriptive study that builds upon the findings of previous authors who have examined the influence of ICTs on the country's tourism industry. Following the approach outlined

by Hernández, Fernández, and Baptista [16], a comprehensive questionnaire consisting of 10 questions has been devised to assess the significance, utilization, and impact of ICTs. Additionally, it seeks to identify the specific technological tools and social networks employed by tourism MSMEs in their daily operations.

The questionnaire employed in this research is adapted from the work of López and López [3]. To ensure the validity and reliability of its content, an expert evaluation and pilot test were conducted. The instrument's reliability was assessed using Cronbach's α coefficient, which serves as a correlation indicator ranging from 0 to 1. A coefficient value exceeding 0.8 is generally considered reliable, values surpassing 0.96 indicate a high degree of reliability, and a coefficient of 1 represents absolute reliability.

Values falling below 0.8 indicate the presence of heterogeneous variability, which may lead to erroneous conclusions. Following the pilot test conducted with experts, Cronbach's α index for questions 3, 8, and 9 yielded the following results: 0.82, 0.81, and 0.96, respectively. These values surpass the 0.8 thresholds, affirming the reliability of the collected data. Table 2 presents the questionnaire items in detail.

Table 2. Questions of the questionnaire applied.

VARIABLES	INDICATORS	QUESTIONS
1. PRESENCE OF THE COMPANY ON THE INTERNET.	Internet presence time.	*1- How long has the company been present on the Internet?* - Less than one year. - From 1 to 2 years. - From 2 to 3 years. - From 3 to 4 years. - From 4 to 5 years. - More than 5 years.
	The economic vision of the company on the Internet.	*2- How do you understand the presence of your organization on the Internet?* - As a necessary expense. - As a profitable investment. - As an investment with doubts about the effectiveness of the return. - As a development option. - Other.
	The degree to which the company's presence on the Internet is considered important.	*3- Rate the degree of importance, for your company, of the following aspects (1 being the lowest and 5 the highest).* - Increase sales. - Build a brand. - Build customer loyalty. - Promotion. - Marketing. - Company growth. - Prestige and social recognition. - Other.

2. TOOLS USED IN THE COMPANY FOR E-COMMERCE AND INTERNET MARKETING.	Digital tools used in Internet marketing and commercialization.	*4- Of the following digital tools, identify which one(s) your organization uses.* - Website. - Social networks. - Blogs. - Apps and other tools such as specialized tourism networks. - Videos, photos, and slideshows (Youtube, Flickr, others). - Forums. - OTA (Online Travel Agencies). - E-mail. - Other.
	Digital tools used in Internet marketing and commercialization.	*5- In which social networks does your company have a presence?* - None. - Facebook. - Twitter. - LinkedIn. - Youtube. - Google+. - Flickr. - Other.
	Frequency of updating of the tools used.	*6- How often do you update each of the tools you use? Double-entry matrix with the same tools as in question 4 on the Y-axis, and the X-axis options as follows:* - Daily. - Several times a week. - Several times a month. - Several times a year.
	Maintenance of the tools used.	*7- Who is in charge of updating the information in the tools of the previous question?* - Internal personnel. - External personnel.
3. CHANGES IN ORGANIZATIONAL MANAGEMENT DUE TO THE USE OF ICT.	The extent to which online marketing tools influence sales.	*8- According to your perception, for each of the tools you use, could you rate from 1 to 5 the degree to which each one influences your company's sales (1 = lowest value and 5 = highest value)?* - Website. - Social media. - Blogs. - Apps and other tools such as specialized tourism networks. - Videos, photos, and slideshows (Youtube, Flickr, others). - Forums. - OTA (Online Travel Agencies). - E-mail. - Other.
	Influence of the use of ICT in the company.	*9- For the following aspects, to what degree (from 1 to 5) do you consider that the use of ICT has influenced your company (1=lowest value and 5=highest value)?* - Increased efficiency. - Increased productivity. - Increased competitiveness. - Easier access to the target public. - Diversification of the offer. - Greater knowledge of the company. - Other.

		10- Do you consider that the changes in your company's infrastructure to have a presence on the Internet have been: - None - Very low - Low - High - Very high

Source: own elaboration based on López & López (2018).

2.1. Population and Sample

The population for the present study is taken from the Tourism Registry of Ecuador, presented MINTUR [17] through the Tourism Law (Law 97 of 2014) so that all natural persons providing tourism services, are registered with obligatory registration. MSMEs registered in the system are 23217 establishments MINTUR [17]. Of these, 4620 (19.89921178%) are lodging and accommodation companies, 14630 (63.01417065%) food and beverage companies, 42 (0.17659474%) community tourist centers, 1920 (8.2698023%) travel agencies, 1214 (5.22892708%) tour operators, 213 (0.91743119%) stable attraction parks, and 578 (2.48955507%) tourist transportation companies.

The sample is calculated using the following parameters [16]. Display Table 3.

Table 3. Parameters of the finite sample formula.

VARIABLES	DESCRIPTION	VALUES
N	Population.	23217
Z	Confidence level.	95% → 1,96
P	Probability of occurrence of the studied event (success).	50% → 0,5
Q	The probability that the studied event does not occur (failure).	50% → 0,5
E	Maximum accepted estimation error.	5% → 0,05

Source: prepared by the authors based on Hernández et al (2010).

2.2. Sample Size

$$n = \frac{N * Z^2 * p * q}{e^2 * (N-1) + Z^2 * p * q} \qquad (1)$$

$$n = \frac{22,297.6068}{59.0004} = 377.92 \approx 378$$

Finally, the sample is 378 representatives of Ecuadorian tourism MSMEs, the survey is conducted online.

3. RESULTS AND DISCUSSIONS

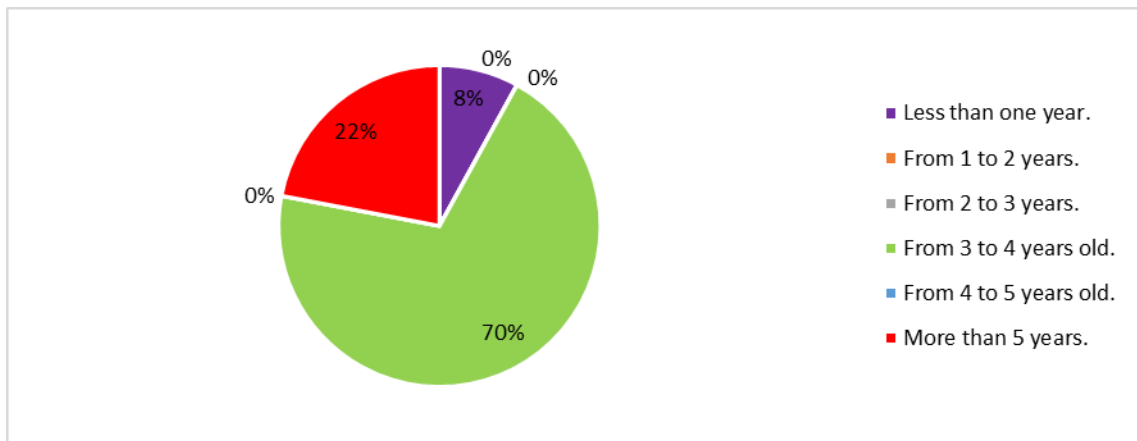After applying the survey virtually, using Google Forms, the following results were obtained:

Figure 1. Time spent on the Internet.

Concerning the presence of companies on the Internet, 70% have been using it as a work tool for between 3 and 4 years, and 22% have been using it for more than 5 years. On the other hand, 8% have been using it for less than 1 year.
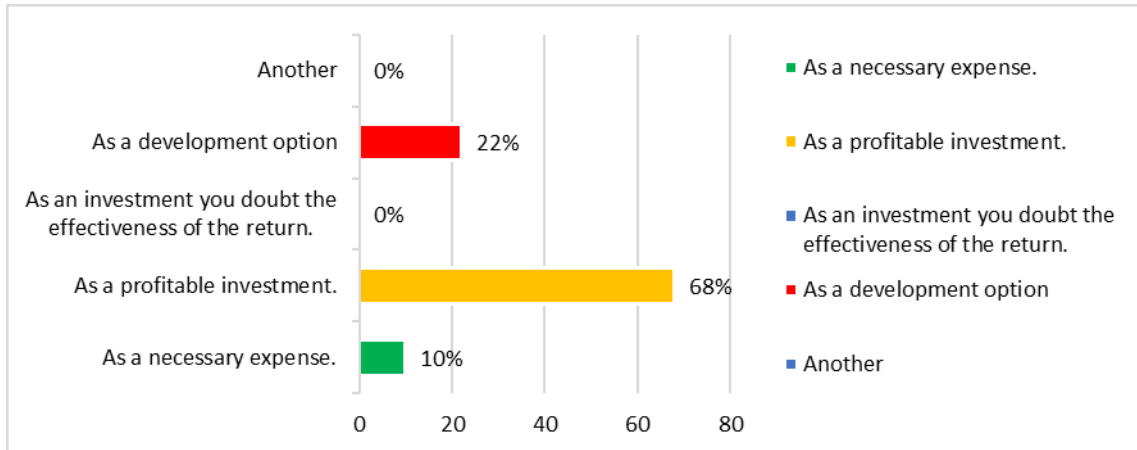

Figure 2. The economic vision of the company on the Internet.

The findings revealed a clear trend among MSME representatives: 68% view the online presence of tourism organizations as a lucrative investment, 22% perceive it as an avenue for development, and 10% consider it a necessary expense. This highlights the significance placed on utilizing the Internet to promote tourism services and packages.
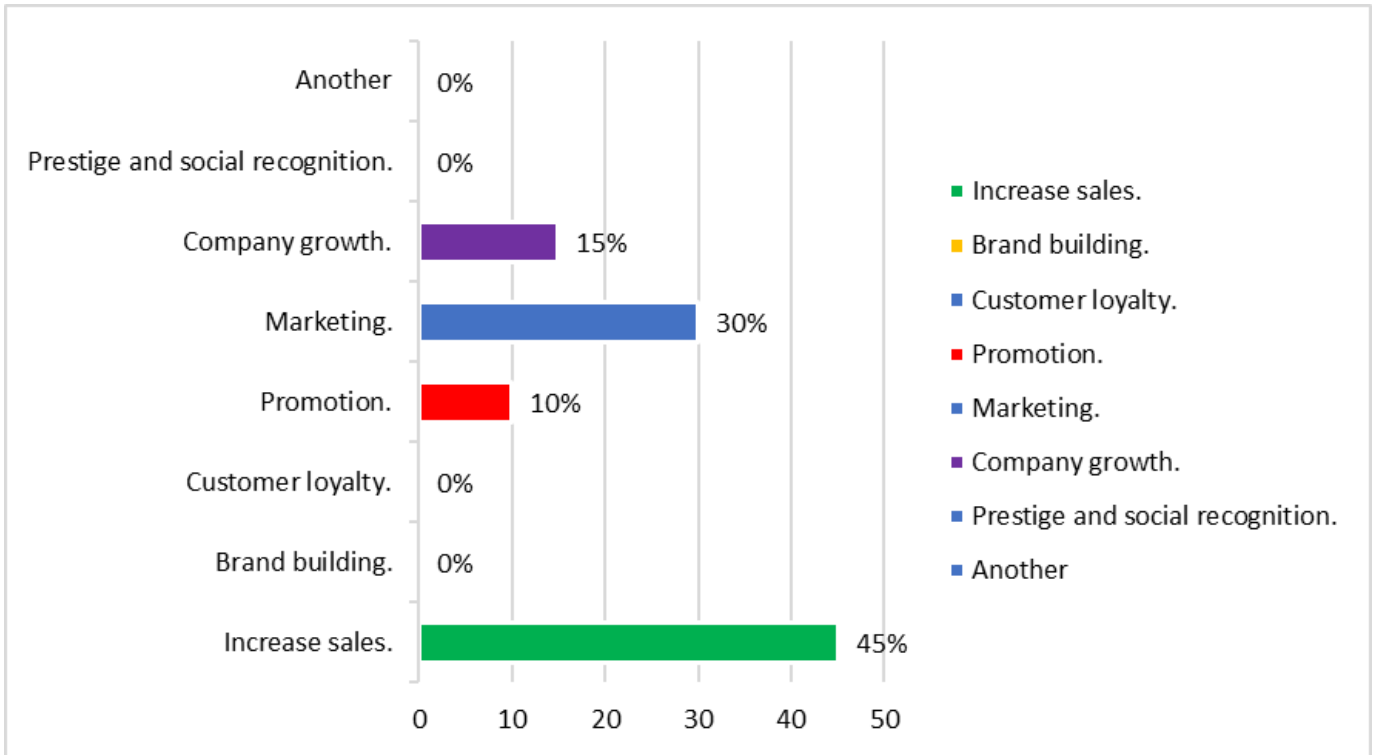
Figure 3. The degree to which the company's presence on the Internet is considered important.

When evaluating the importance of the company's online presence, 45% attribute it to increased sales, 30% emphasize easier marketing of tourism services, 10% highlight promotional benefits, and 15% recognize its potential for exponential growth.
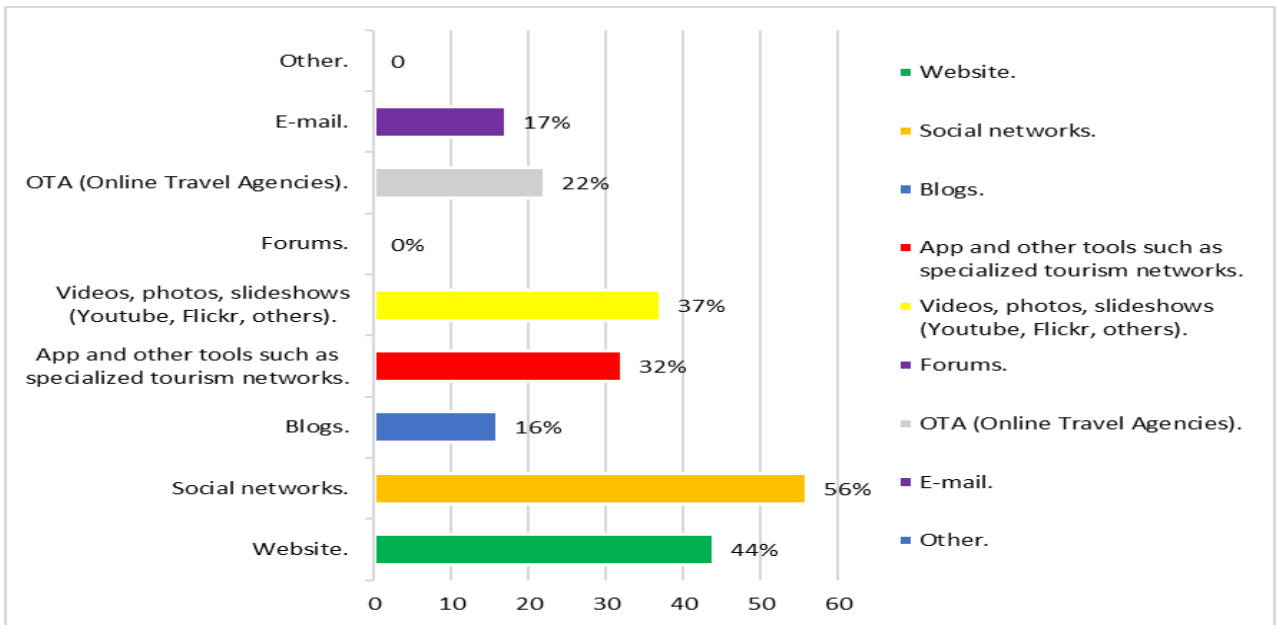

Figure 4. Digital tools used in Internet marketing and commercialization.

Regarding the most used ICTs (digital tools) in MSMEs, the following percentages were identified:

- 56% manage their operations through social networks like Facebook, WhatsApp, Instagram, TikTok, and others.
- 44% rely on their website.
- 37% share information through platforms like YouTube, Flickr, or Pinterest, using photos, slideshows, or videos.
- 32% utilize specialized mobile or web applications for tourism.
- 16% maintain a blog on platforms such as Blogger or Wix.
- 22% make use of Online Travel Agencies (OTAs) for travel bookings and other specific activities.

Lastly, 17% employ email for promoting tourist packages and internal/external communication.
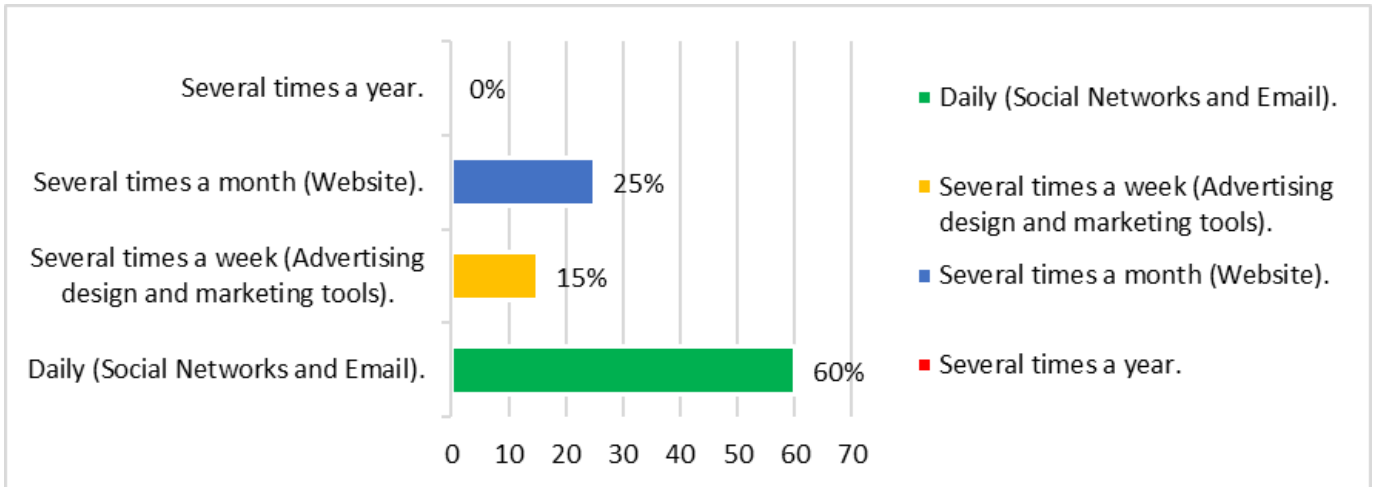

Figure 5. Update the frequency of the tools used.

In terms of maintaining contact with the end user, the tools employed by MSMEs were as follows:

- 60% of companies utilize social networks and email daily.
- 25% update their website multiple times a month.
- 15% make use of advertising design and marketing tools such as Canvas, Photoshop, Pinterest, TikTok, and others, although they do not consider them as their primary strategy.
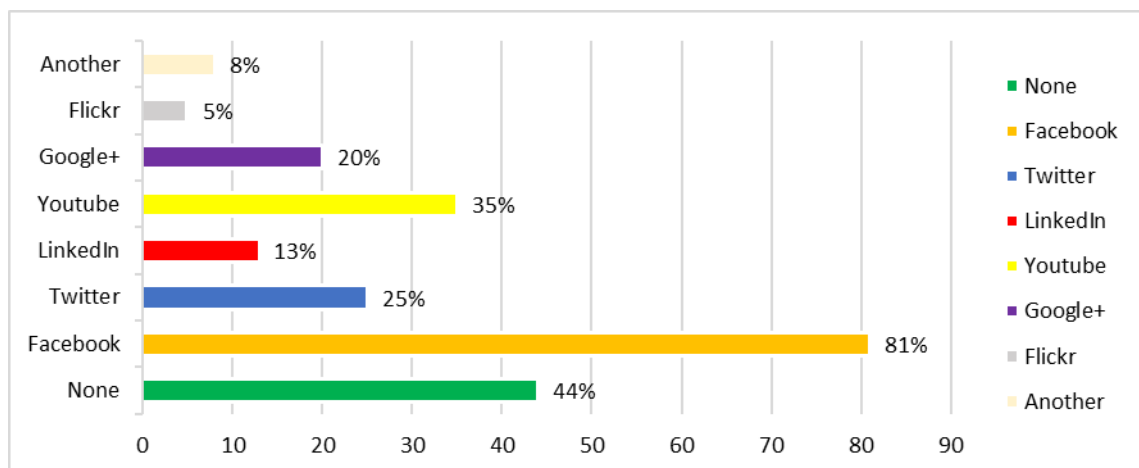

Figure 6. Social networks are most used by tourism MSMEs in Ecuador.

In summary, the study found that the most widely used social networks among MSMEs are as follows:

- Facebook, 81%
- Instagram, 35%
- Twitter, 25%
- Google+, 20%
- YouTube, 35%
- LinkedIn,13%
- Flickr, 5%
- Others, 8%

The "others" category includes platforms such as Pinterest, Snapchat, TikTok, Reddit, messaging apps like WhatsApp, Telegram, and Facebook Messenger bots, as well as Kwai, among others.
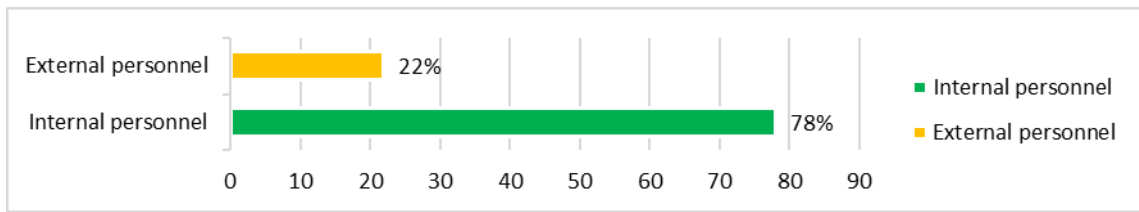

Figure 7. Maintenance of the tools used.

According to hiring personnel dedicated to maintaining the tools used, 78% of the companies have internal staff, while 22% opt for hiring services from third-party organizations. This indicates that the majority of MSMEs in Ecuador have trained personnel in graphic design, business marketing, and the development of technological services, including mobile, web, or desktop applications.
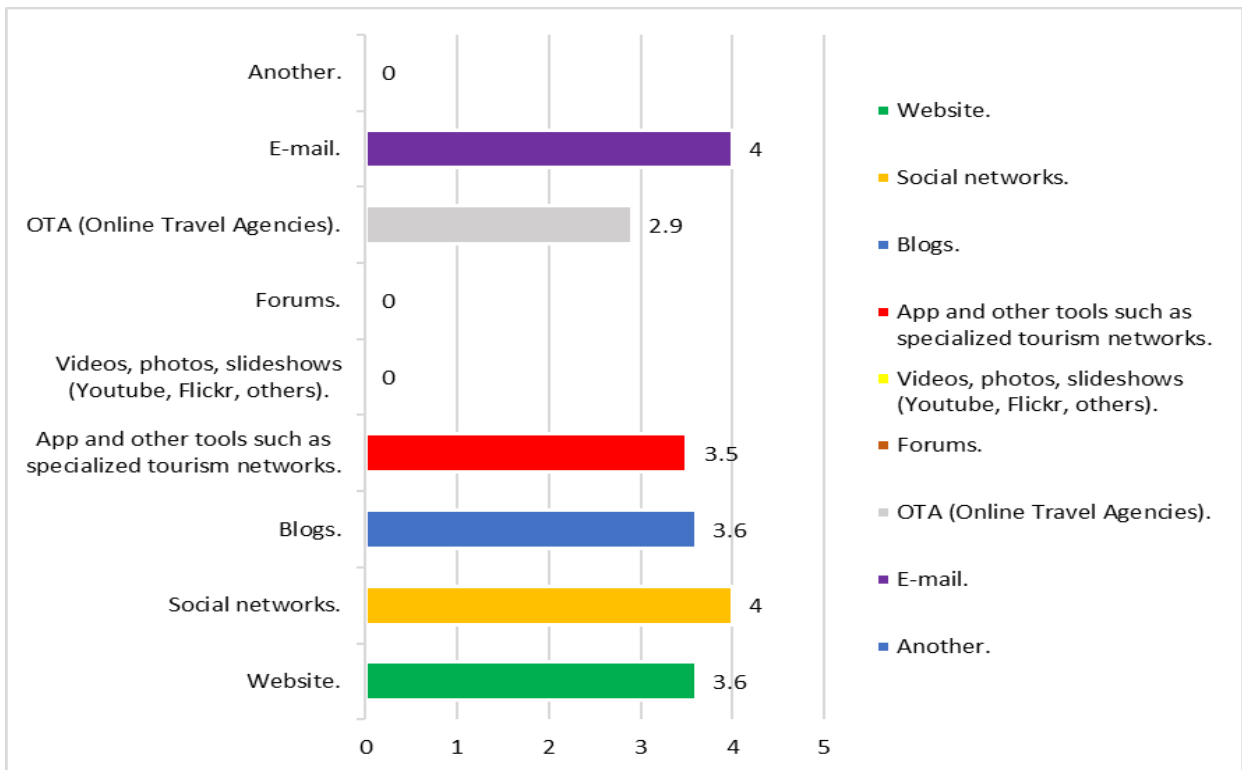

Figure 8. The degree to which online marketing tools influence sales.

ICTs in MSMEs received an overall rating of 4/5, with 70% of organizations noting improved accessibility to the public. Key aspects include increased sales through websites, social media advertising, blogs, and email, rated between 3.6/5 and 4/5. Specialized tourism apps scored 3.5/5, while OTAs scored 2.9/5.
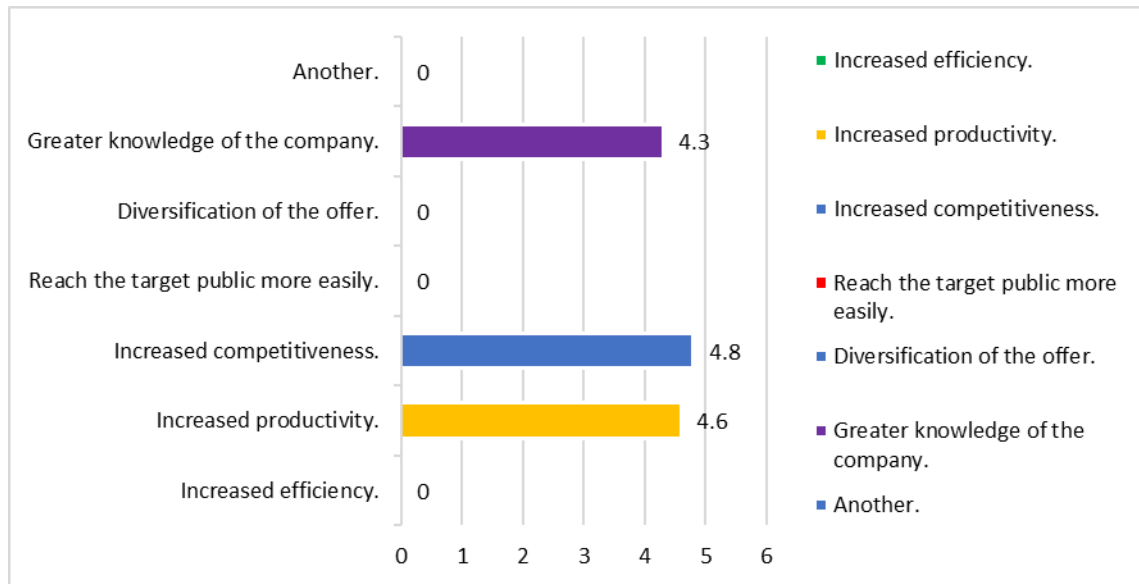
Figure 9. Influence of the use of ICTs in tourism MSMEs.

The MSME representatives confirm that ICTs significantly boost competitiveness, scoring it at 4.8/5. Moreover, they attribute a rating of 4.6/5 to increased productivity and a rating of 4.3/5 to improved company knowledge and promotion.
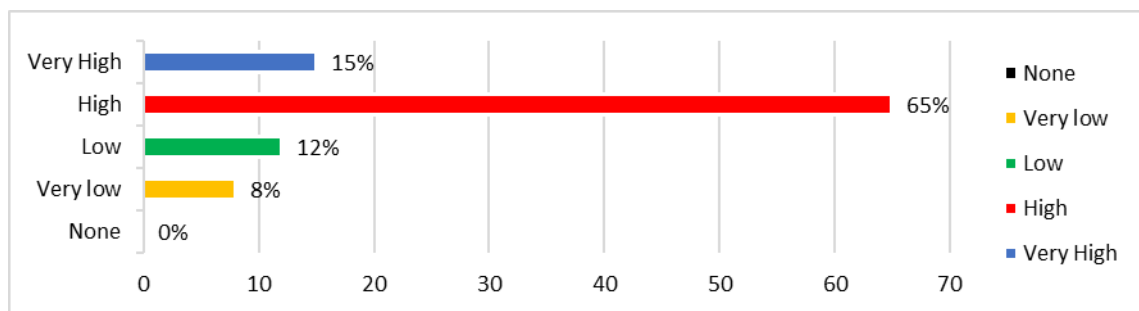
Figure 10. Degree of implementation of technological infrastructure in tourism MSMEs.

According to question 10, the majority of representatives (65%) perceive the changes in infrastructure required for establishing an online presence as high. Additionally, 15% describe them as very high, 12% as low, and only 8% as very low. These findings indicate that significant changes have been implemented in most MSMEs, leading to improvements in administration and positive impacts on economic growth, information optimization, and enhanced promotion of services and tourist packages, among other aspects.

The exploratory review of information sources revealed a high level of interest in the use of ICT tools in the tourism sector (Table 4).

Table 4. Statistics on the use of ICT in tourism.

Statistics	Data
Percentage of travel bookings made online	70% of travel bookings are made online (Source: World Tourism Organization).
Users of mobile travel applications	It is estimated that there are more than 800 million mobile travel app users (Source: Statista).
Growth of social networks in the travel industry	65% of travelers use social media to search for information and share experiences (Source: TripAdvisor).
The economic impact of online tourism.	Online tourism generates more than $1.2 billion annually (Source: ITC).
Jobs generated by online tourism	It is estimated that online tourism has created more than 10 million jobs worldwide (Source: World Travel and Tourism Council).
Use of Virtual and augmented reality in Tourism	70% of travelers are interested in using virtual or augmented reality to explore destinations before booking (Source: Booking.com).

Table 5 shows how the effective use of ICTs has improved efficiency and reduced costs in the tourism industry, and how this has led to economic growth in the sector and generated employment.

Table 5. Impacts of ICTs in the tourism sector.

Area	Improvements and Benefits
Marketing and Advertising	- Reduction of print and traditional advertising costs.
	- Greater reach and segmentation through digital campaigns and online advertising.
	- Personalization of messages and offers to attract specific audiences.
	- Increased visibility and promotion through social networks and travel websites.
	- Generation of greater demand and attraction of tourists through digital strategies.
	- Data and metrics analysis to optimize marketing strategies.
Hotel operations optimization	- Automation of reservation and check-in/out processes.
	- Use of hotel management systems to optimize room and resource allocation.
	- Implementation of home automation solutions to improve energy efficiency and comfort.
	- Use of chatbots and virtual assistants to provide information and services to guests.
	- Improved internal communication and coordination between hotel departments.
Improvements in the management of tourist destinations	- Online information and reservation systems to attract and manage tourists.
	- Use of data analysis to identify visitor patterns and trends.
	- Real-time tracking tools to improve security and tourist flow.
	- Development of apps and digital tourist guides to facilitate destination exploration.
	- Promotion of sustainability and responsible tourism through the use of ICTs.
Economic Impact and employment generation	- Reduced operating costs and increased profitability for tourism businesses.
	- Increased demand for tourism services, which generates employment in the sector.
	- Growth of the local economy by boosting the tourism sector.
	- Stimulation of job creation in areas related to technology and tourism.

4. DISCUSSION

Tourism in Ecuador has undergone substantial growth in recent years, emerging as a crucial contributor to the country's income and economic development. According to the Central Bank of Ecuador (2020), the tourism sector generated approximately $1.552 billion in revenue in 2019.

One of Ecuador's primary attractions lies in its remarkable natural diversity. With ecosystems ranging from the Galapagos Islands to the Amazon rainforest and the Andean highlands, the country offers a wide array of natural

wonders. Ecuador's geographic and biological diversity plays a pivotal role in the development of its tourism industry (Herrera, 2016).

In addition to its abundant biodiversity, Ecuador is renowned for its cultural heritage. The city of Quito, for instance, has been designated as a UNESCO World Heritage Site due to its impressive colonial architecture. This prestigious recognition has contributed to an increased influx of international tourists to the city (UNESCO, 2019).

To promote tourism, the Ecuadorian government has implemented various policies. These include the establishment of protected areas and the promotion of community-based tourism, which aims to preserve the country's natural and cultural heritage while generating economic benefits for local communities.

However, despite the progress made in the tourism sector, there are still challenges that need to be addressed. The lack of tourism infrastructure in certain regions can hinder tourism development. Investment in infrastructure and essential services is required to enhance the overall tourist experience and foster sustainable growth in Ecuador's tourism industry.

Tourism in Ecuador has witnessed significant growth and has become a vital source of income and economic development. The country's natural and cultural diversity, along with effective tourism promotion policies, have contributed to this success. However, addressing challenges such as infrastructure gaps is crucial for sustaining and furthering the growth of the tourism sector.

4.1. Tourism around the World

At a global level, Information and Communication Technologies (ICT) have revolutionized the tourist experience by offering real-time access to information, personalized services, and convenient booking options. These technological advancements have greatly improved customer satisfaction and service quality in the tourism industry. One notable example is how ICT has transformed the way tourists explore and enjoy their trips.

One of the most evident ways in which ICT has transformed the tourist experience is through travel mobile applications. These apps provide travelers with instant access to a wide range of information and services. From trip planning to destination exploration, these applications provide information about flights, accommodations, tourist activities, restaurants, local transportation, and much more. Prominent examples include apps like Airbnb, Booking.com, TripAdvisor, and Kayak, among many others. These apps allow tourists to compare prices, read reviews, make reservations, and organize their itineraries quickly and conveniently, all from the comfort of their smartphones.

Another significant advancement is the introduction of virtual assistants in hotels. These assistants, such as Amazon's Alexa or Google Assistant, have been integrated into hotel rooms worldwide to provide a more interactive and personalized experience for guests. Virtual assistants can answer questions about hotel services, provide local recommendations, control room lighting and electronic devices, and even request additional services like room service or transportation. This not only provides convenience but also creates a more enjoyable and personalized experience for guests, thus enhancing their satisfaction and loyalty.

Digital tourist guides have also played a fundamental role in transforming the tourist experience. Traditional printed guides have largely been replaced by apps and websites that offer detailed information about tourist destinations, attractions, activities, recommended routes, and useful tips. These digital guides enable tourists to explore and discover new places, access up-to-date information about schedules, prices, and events, and customize their experience according to their interests and preferences. Furthermore, some digital tourist guides

utilize technologies such as augmented reality to provide immersive experiences, combining real-time information with a live view of the environment, further enriching the tourist experience.

In addition to mobile apps, virtual assistants, and digital tourist guides, many other technological innovations have improved customer satisfaction and service quality in the tourism sector. For instance, self-service kiosks at airports and hotels allow travelers to perform quick check-ins and obtain relevant information without having to wait in long queues. Mobile payment systems have facilitated the process of conducting transactions in stores, restaurants, and tourist attractions, eliminating the need to carry cash or physical cards. Moreover, social media and online review platforms have allowed tourists to share their experiences and recommendations, which in turn has helped other travelers make informed decisions and improve the quality of services offered.

These elements demonstrate that ICT has radically transformed the tourist experience globally by providing real-time access to information, personalized services, and more convenient booking options.

From travel mobile apps that facilitate planning and booking to virtual assistants in hotels and digital tourist guides offering a more interactive and personalized experience, these technological innovations have enhanced customer satisfaction and service quality in the tourism industry. As technology continues to advance, we can expect even more developments that will improve and enrich the tourist experience in the future.

4.2. Challenges and Opportunities in the Tourism Sector with the Use of ICT

The integration of Information and Communication Technologies (ICT) in the tourism sector presents both challenges and opportunities. To fully embrace the expanding use of ICT, it is crucial to address key aspects such as cybersecurity, tourists' data privacy, the digital divide in certain destinations, and the need for enhanced technology training for tourism professionals. Furthermore, exciting prospects are emerging, including artificial intelligence, blockchain, and the Internet of Things (IoT) applications in tourism.

A primary challenge associated with ICT integration in tourism is cybersecurity. With the increasing volume of personal data and online transactions, there is a greater risk of cyber-attacks for both tourists and businesses. Implementing effective security measures becomes imperative to safeguard confidential tourist information, such as credit card data and electronic passports. Tourism companies must invest in advanced security technologies, raise awareness among their staff, and provide training to mitigate the risks associated with cybercrime.

Data privacy for tourists is another critical challenge. As personal data is extensively collected and utilized to personalize the tourist experience, ensuring compliance with privacy and data protection standards becomes essential. Tourism companies should adopt clear privacy policies, obtain informed consent from tourists, and guarantee the security and confidentiality of collected data. Additionally, tourists should be informed about data usage and given control over their privacy choices.

The digital divide poses challenges for certain tourist destinations. While ICT has greatly enhanced the tourist experience, disparities in access to and adoption of technology persist across different regions. Some destinations face limitations in infrastructure, connectivity, and technological skills.

Addressing this challenge requires increased investment in information technology infrastructure, connectivity, and digital literacy programs in less-developed tourist destinations. This approach will help reduce the digital divide and foster equitable participation in the digital economy of tourism.

Technology training is vital for tourism professionals. As ICT becomes increasingly pervasive, professionals in the sector need to acquire technical skills to maximize the potential of available tools and solutions. Technology training should be an integral part of the education of tourism professionals, enabling them to adapt to technological changes, provide high-quality service, and stay up-to-date in a constantly evolving digital environment.

Nevertheless, alongside the challenges, the integration of ICT in the tourism sector presents significant opportunities. Artificial intelligence can enhance the personalization of tourism services, provide more accurate recommendations, and enable more natural interactions with tourists through chatbots and virtual assistants. Blockchain technology can improve transparency and security in transactions, as well as streamline reservation and payment processes within the tourism industry.

The Internet of Things (IoT) offers the possibility of creating connected and personalized tourism experiences, where smart devices and sensors interact with each other and with tourists to provide customized services and enhancements.

This work underscores that the growing integration of ICT in the tourism sector brings forth significant challenges and opportunities. Addressing cybersecurity, data privacy, the digital divide, and technology training is crucial to ensure the effective and secure utilization of ICT in tourism. Simultaneously, prospects offered by artificial intelligence, blockchain, and the Internet of Things hold the promise of transforming the tourist experience by delivering personalized, secure, and connected services. By placing the appropriate focus on these aspects, the tourism sector can harness the advantages provided by ICT to enhance customer satisfaction and service quality.

5. CONCLUSION

Ecuador, a South American country blessed with abundant natural, cultural, and ethnic riches, has recognized tourism as a vital contributor to the economic well-being of various communities. This article draws the following conclusions:

ICTs have had a positive impact on 80% of Ecuadorian micro, small, and medium enterprises (MSMEs), empowering them to enhance their competitiveness, efficiency, promotion, and information management in tourism-related activities.

The significance of tourism as an economic sector in Ecuador is firmly established, with support from both public and private sector organizations. These entities, through projects or strategies, aim to strengthen emerging economic sectors and generate benefits for communities preserving tourist areas in the country.

The research highlights the accessibility of ICTs for MSMEs, provided they are utilized responsibly without compromising the integrity of communities and tourist sites. Such controls are regulated by competent agencies. Internet connectivity has become a fundamental service for Ecuadorian society, particularly for MSMEs, as they have transitioned from traditional practices to optimizing information through fast and modern ICT solutions.

In conclusion, a remarkable influx of new tools is revolutionizing the tourism sector. The introduction of artificial intelligence (AI), smart maps, virtual tour guides, augmented reality, virtual reality, and the metaverse presents opportunities for tourism MSMEs to leverage advanced applications and sophisticated tools for their businesses.

This study identifies research gaps that warrant further exploration, such as "The Metaverse and Its Applications in Tourism," "Virtual Reality and its Impact on Tourism Mobility," "Augmented Reality as a Strategy for Tourism Research," and "Smart Cities and Their Impact on Tourism."

By enhancing our understanding of these topics, we can continue to advance the field of tourism and unlock its full potential.

In Ecuador, the challenges in the tourism sector represent an opportunity for economic growth, the development of employment sources, and international competitiveness. Therefore, it is necessary not only to invest capital but also to provide training to those involved to offer better service quality, enhanced customer attention, and improved spaces for tourists. This is done to achieve an international vision and competitiveness compared to other tourism sectors in the region.

REFERENCES

[1] C. Ramírez, M. Centeno, F. Vinueza & M. Aizaga. Panorámica del uso de las TIC en la industria turística a nivel latinoamericano y del Ecuador, Innovare: Revista de ciencia y tecnología, vol. 2, n.º 1, pp. 32. 2019. [En línea]. Available:https://www.researchgate.net/publication/

[2] C. García. Turismo comunitario en ecuador: ¿Quo Vadis?. Estudios y Perspectivas en Turismo, 25(1), pp. 597-614. 2016. [En línea]. Available: http://www.scielo.org.ar/pdf/eypt/v25n4/v25n4a11.pdf

[3] A. López & S. López. Impacto de las TIC en el turismo: caso colombiano. Cuadernos de Turismo, 41(1), pp. 399-418. 2018. [En línea]. Available: http://dx.doi.org/10.6018/turismo.41.327081

[4] B. Gordon. El turismo de masas: un concepto problemático en la historia del siglo XX. Revista Historia contemporánea (25), pp. 125-156. 2002.

[5] C. Campaña & E. Méndez. Uso de las TICs para desarrollo publicitario en el turismo del cantón de Santo Domingo. [Tesis de bachiller inédita]. Universidad Regional Autónoma de los Andes "Uniandes". 2019. [En línea]. Disponible: https://dspace.uniandes.edu.ec/bitstream/123456789/10643/1/PIUSDSIS025-2019.pdf

[6] J. Minda, D. Ortiz & T. Palomeque. Promoción turística a través de las TICs en el Cantón Antonio Ante Provincia de Imbabura. Tierra Infinita, 7(1), pp. 45–58. 2021. [En línea]. Disponible: https://doi.org/10.32645/26028131.1092

[7] L. Loor, N. Plaza & Z. Medina. Turismo comunitario en Ecuador: Apuntes en tiempos de pandemia. Revista de Ciencias Sociales (Ve), vol. 27(1), 2021. [En línea]. Disponible: https://www.redalyc.org/journal/280/28065533022/28065533022.pdf

[8] J. Freire & M. Lozada. Plan estratégico de marketing turístico para las parroquias rurales de Santo Domingo de los Tsáchilas: Monterrey, Plan Piloto, Las Villegas, Valle Hermoso Y San Jacinto del Búa. Santo Domingo – Ecuador. 2016.

[9] Andalucía. Turismo y Nuevas Tecnologías: Tendencias 2019 y Recursos TIC para el impulso de un sector clave. 2019. [En línea]. Available: https://www.blog.andaluciaesdigital.es/turismo-y-nuevas-tecnologias/

[10] A. Huertas, D. Setó & M. Miguez. Comunicación de destinos turísticos a través de los medios sociales. Profesional de la información, pp. 15-22. 2015. [En línea]. Disponible: https://revista.profesionaldelainformacion.com/index.php/EPI/article/view/epi.2015.ene.02

[11] T. Ostelea. ¿Qué es y qué significa Wanderlust?. 2017. [En línea]. Disponible: https://www.ostelea.com/actualidad/blog-turismo/tendencias-en-turismo/que-es-y-que-significa-wanderlust

[12] C. Criado & M. Viglino. Wanderlust: Plataforma inteligente de experiencias únicas. [Tesis de bachiller inédita]. Universidad de San Andrés. 2019.

[13] M. Gil. Diseño de un plan de marketing para la agencia de viajes Aires y Destinos. Universidad de la Salle. 2017.

[14] M. Fabbroni. Tecnologías inmersivas y destinos turísticos: diseño de experiencias interactivas. Estudio de caso: Sendero Interpretativo Parque Nacional Lanín. VI Congreso Internacional y XVII Congreso nacional de investigación y servicio. 2020.

[15] B. Vidal. Turismo y tecnología: cómo la tecnología revoluciona el sector turístico. 2023. [En línea]. Disponible: https://www.wearemarketing.com/es/blog/turismo-y-tecnologia-como-la-tecnologia-revoluciona-el-sector-turistico.html

[16] R. Hernández, C. Fernández & P. Baptista. Metodología de la investigación. 5ª. Edición. México D.F., McGraw Hill, 2010.

[17] MINTUR. base de datos de MIPYMES turísticas en Ecuador. Obtenido desde: Sistema SITURIN ECUADOR. 2023. [En línea]. Disponible: https://servicios.turismo.gob.ec

[18] Banco Central Del Ecuador. Cuentas Nacionales del Ecuador. 2020. [En línea]. Disponible: ttps://contenido.bce.fin.ec/documentos/PublicacionesNotas/SectorReal/ActividadEconomica

[19] W. Herrera. Plan de desarrollo turístico para la zona de amortiguamiento del páramo de muertepungo. 2016. [En línea]. Disponible: http://www.dspace.uce.edu.ec/bitstream/25000/10300/1/T-UCE-0004-10.pdf

[20] UNESCO. Historic Center of Quito. 2019. [En línea]. Disponible: https://whc.unesco.org/en