

Main Uses of Artificial Intelligence in Digital Marketing Strategies Linked to Tourism

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ABSTRACT

Migratory movements and tourism in general, together with the improvement of new technologies, have meant an increase in terms of accessibility and ease of information linked to tourism. At the same time, the use of artificial intelligence has opened new horizons in which digital marketing strategies linked to tourism can improve the industry, thus offering multiple possibilities in the short term. This new business ecosystem can analyze and extract large amounts of data for use in their marketing strategies. In this study, a systematic literature review (SLR) is conducted using the Web of Science (WOS) database. The main objective of this review is to identify the main uses of artificial intelligence in digital marketing strategies to understand the decision-making processes of future tourists, destination selection, automation of decision-making processes, and actions developed by tourists in the destination itself. In this context, through the applied methodology, 24 potential results have been identified, which have been classified in: (i) data-driven learning for decision support, (ii) decision support systems, (iii) social data analysis, (iv) artificial intelligence algorithms, and (v) artificial intelligence strategies for the improvement of the user experience. Finally, theoretical and practical implications are identified to support companies that want to develop data-driven digital marketing actions and, from the applied perspective, to help future authors who want to make new academic contributions.

KEYWORDS

Digital Marketing, Artificial Intelligence, Tourism, Machine Learning, Big Data Marketing

ARTICLE HISTORY

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1. Introduction

The attraction factors of a certain place make people want to visit it in person, being seduced by certain factors such as the climate, infrastructures, monuments, social or family environment, economic factors, among others (Huete, 2009). Public entities and private companies know which characteristics attract the attention of the external public and shape marketing actions to impact them and generalize an intention to purchase services to get them to stay in that particular place (Kitchen & Proctor, 2015). In addition, these actions are related to a directly digital approach, managing to impact a large number of users for a not so high cost, compared to some more conventional marketing actions (Agapito & Lacerda, 2014; Katsikeas et al., 2019; Saura et al., 2021).

This is why companies reserve a large part of their investment for digital marketing strategies aimed at persuading a certain place and getting a greater number of tourists (Bassano et al., 2019). With the advancement of new technologies, digital environments and platforms continue to develop or create new ones. Therefore, there are a large number of different actions that can be carried out in the digital sphere, from actions on a social network, PPC strategies or influencer marketing (Kerdpitak, 2022).

However, before carrying out a marketing strategy, it is positive to carry out a basic analysis, often based on data (Barbosa et al., 2020). The extraction of large amounts of data is one of the main actions that for years has become a basic strategy for many companies internationally (Amado et al., 2018). Before making a decision on specific actions, it is preferred to analyze data in order to be able to make a more suitable choice based on accuracies made by artificial intelligence (Mariani et al., 2018; Bertello et al., 2022).

This has changed the way companies make decisions about marketing strategies (Chu & Yong, 2021). Previously, decisions were made on the basis of a managerial decision, in relation to previous experiences or based on, for example, competitor actions (Agapito & Quelhas Brito, 2020; Kitchen & Proctor, 2015). However, the application of artificial intelligence methods has improved and increased the possibility of achieving a greater number of results depending on the campaign to be carried out (Belo et al., 2014; Saura, 2021a).

Therefore, the objective of this research is to analyze which artificial intelligence strategies can be applied in digital marketing actions aimed at the impact of tourists who are directly or indirectly looking for a new destination to travel to for a long or short period of time. The research question of the study Q1) is: What artificial intelligence methods and actions can be applied to digital marketing strategies related to tourism?

To answer the research question, a Systematic Literature Review (SLR) will be conducted following the studies conducted by Burr et al. (2020). The structure of the article is as follows: After the introduction, the theoretical framework is conducted by reflecting on the perceptions of tourists before embarking on a trip and how they cope with digital advertising. Then, the methodology is developed, specifying the steps that have been carried out to extract potential SLR items. In the next place, the results obtained are classified and shown. Then, by means of the discussion, the results obtained are commented on the basis of academic references. Finally, the main practical and theoretical implications of the research are discussed.

2. Theoretical Framework

Leaving for a new destination on a temporary or extended basis often involves a lengthy decision-making process (Nadalipour et al., 2019). A person may want to travel to or see a certain place for any reason. However, the process of deciding to make the trip in most cases tends to be lengthy, whether for financial, employment or other reasons (Lee et al., 2020). On the other hand, there are also people who have decided to travel but are undecided about the place they should choose (Ojo & Yusof, 2019; Ostic et al., 2021).

The rise of new technologies and the improvement of artificial intelligence in recent years has led to the existence of different methods so that, among many other objectives, data can be extracted and analyzed in order to choose an ideal target audience linked to the interests of a company (Sigala et al., 2019). Once the target of a digital marketing campaign has been chosen, it is time to establish what actions can be carried out (Rather & Hollebeek, 2020). Some of the digital marketing strategies aimed at attracting tourists can be found in Table 1:

Table 1. Digital Marketing Strategies

Strategies	Definition
Search Engine Marketing (SEM)	This type of digital advertising allows ads to be added to SERPs. The main objective is to increase visibility in search engine queries by targeting traffic to a website (Nyagadza, 2022; Sholichah et al., 2022).
Search Engine Optimization (SEO)	Organic positioning of websites with the objective of increasing the position of a given query in search engines and thus achieving higher traffic (Bhandari & Bansal, 2018).
App Search Optimization (ASO)	Organic positioning through the app shops of the different existing mobile operating systems. The main objective is to achieve a better position when a user makes a specific query (Karagkiozidou et al., 2019).
Social Media Marketing (SMM)	Marketing strategies that are mainly carried out in social networks or environments. Their main purpose is to impact a target audience with defined interests and behaviors through advertisements (Lal et al., 2020).
Email Marketing (EM)	Sending mass emails with the aim of reaching a specific audience with a specific piece of information (Singh, 2019).
Programmatic Advertising (PA)	Purchase of advertising space on selected websites to insert banner advertisements (Samuel et al., 2021).
Influencer Marketing (IM)	Actions between a brand and a public figure with a large number of followers in social media interactions (Campbell & Farrell, 2020).

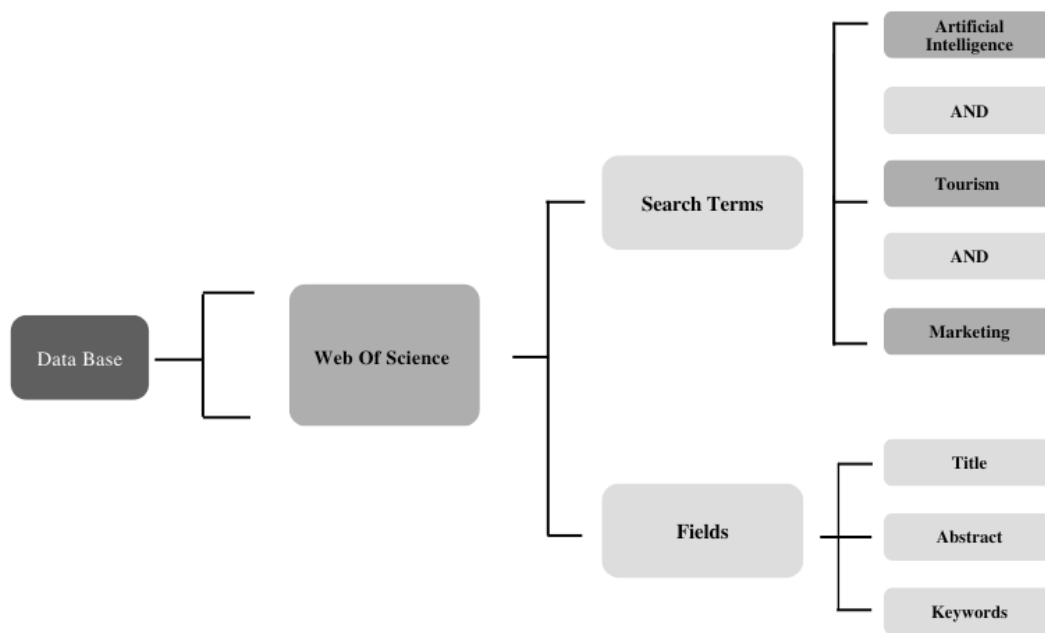
Source: Own Elaboration

However, the choice of one of these strategies can make or break the success of a campaign. This is why the use of large amounts of data can even predict what is likely to happen (Kopalle & Lehmann, 2021). In parallel, there are also learning systems that improve the performance of a campaign based on the interactions that are being achieved (Roscher et al., 2020). In addition, post-campaign analysis can also determine success through remarketing or geolocation actions (Ekelik & Şenol, 2021).

For all of the above, this article proceeds to find out what different uses can be applied to artificial intelligence to improve digital marketing strategies aimed at impacting potential tourists.

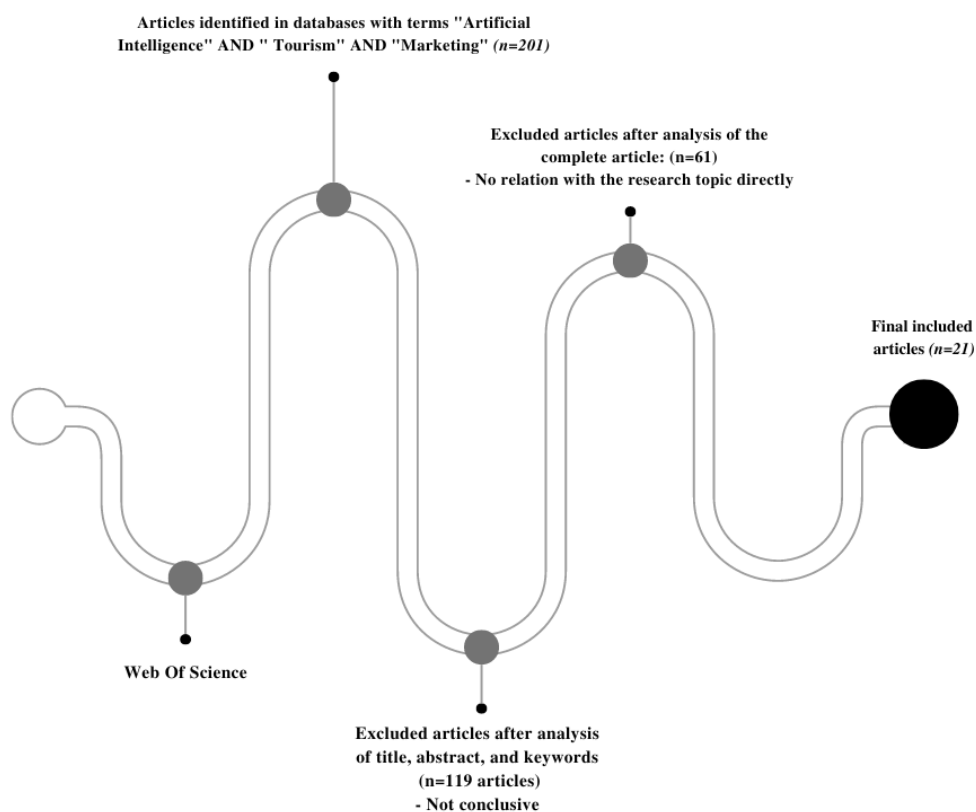
3. Methodology

In this research, a Systematic Literature Review (SLR) is carried out. The aim of this methodology is to answer the research question posed through the search for academic contributions made by other authors (Saura et al., 2022). For this research, a search was carried out in the Web Of Science (WOS) database. The use of this database is based on the objective of obtaining potential articles thanks to its impact factor. Figure 1 below shows the process carried out to search the database (Nedjah et al., 2022).

Figure 1. Search Terms and Fields Chosen

Source: Own Elaboration

The WOS database has been searched for three terms: Artificial Intelligence AND Tourism AND Marketing. Next, the following fields were analyzed: Title, Abstract and Keywords looking for potential research results. Figure 2 below shows the following steps that have been carried out to extract the potential articles from which the results of this study have been extracted.

Figure 2. Realization of the SLR

Source: Own Elaboration

Figure 2 shows the overall process of the methodology developed in this research. Firstly, WOS has been chosen as the main database. Secondly, once the different keywords were chosen, a total number of 201 contributions were obtained by searching for Artificial Intelligence AND Tourism AND Marketing. Next, 119 articles were eliminated by analyzing the title, abstract and keywords. Finally, the remaining articles were completely analyzed and 61 were eliminated as they were not related to the research objective. In the end, the potential articles were 21. Table 2 below shows the results of the methodology according to the authors, journal and the category to which they belong.

Table 2. Potential Articles Drawn from the Methodology

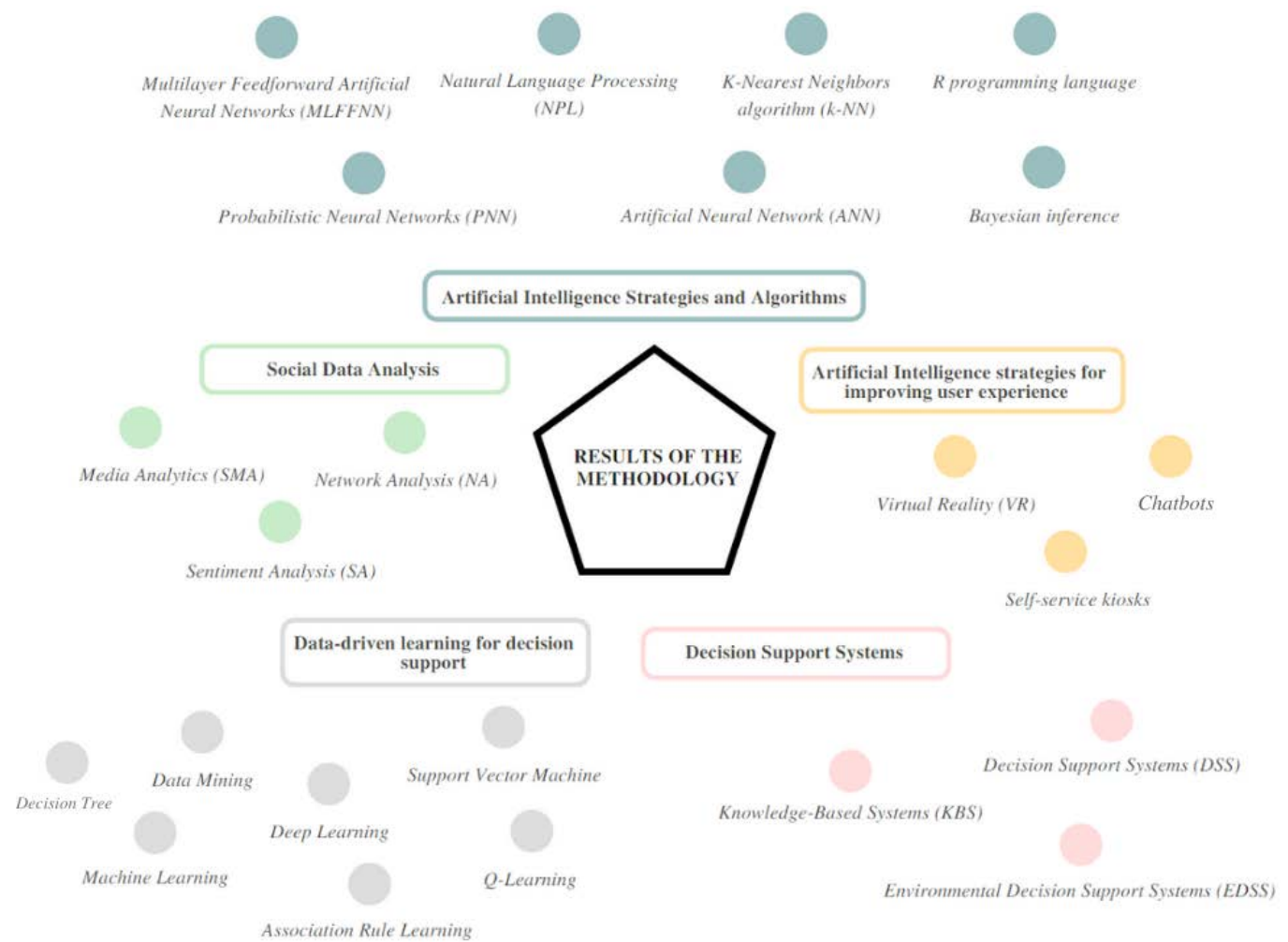
Authors	Journal	Category
Duvnjak et al. (2020)	Management Research and Practice	Business & Economics
Li et al. (2022)	Wireless Communications and Mobile Computing	Computer Science
Kirtil & Aşkun (2021)	Advances in Hospitality and Tourism Research (AHTR)	Social Sciences
Prentice et al. (2020)	Journal of Hospitality Marketing & Management	Business & Economics
Samara et al. (2020)	Journal of Hospitality and Tourism Technology	Social Sciences
Li & Cheng (2022)	Advances in Meteorology	Meteorology & Atmospheric Sciences
Sánchez et al. (2020)	Tourism Management Perspectives	Social Sciences
Xie & He (2022)	Mobile Information Systems	Computer Science
Wang et al. (2020)	Journal of Destination Marketing & Management	Social Sciences
Topal & Uçar (2019)	IEEE Access	Computer Science
Martin et al. (2020)	Journal of Destination Marketing & Management	Social Sciences
Schiessl et al. (2021)	Journal of Marketing Analytics	Business & Economics
De Carlo et al. (2021)	Journal of Business Research	Business & Economics
Hui et al. (2021)	Journal of Hospitality Marketing & Management	Business & Economics
Lee et al. (2021)	International Journal of Contemporary Hospitality Management	Social Sciences
Kim et al. (2018)	Expert Systems with Applications	Computer Science
Yu et al. (2007)	International Journal of Engineering Intelligent Systems	Computer Science
Csáji et al. (2006)	Advanced Engineering Informatics	Computer Science
Ameri & Patil (2012)	Journal of Intelligent Manufacturing	Computer Science
Chang & Lin (2011)	ACM Transactions on Intelligent Systems and Technology	Computer Science
Veit et al. (2002)	Applied Artificial Intelligence	Computer Science

Source: Own Elaboration

4. Analysis of the Results

The research results have been categorized according to the insights that can be applied to the chosen digital marketing actions (Kumar et al., 2020; Saura et al., 2022a). They can also be developed in advance, in order to know which strategy can be more successful based on predictions developed with large amounts of data.

A total of 24 results have been classified into five different categories: Data-driven learning for decision support, Decision Support Systems, Social Data Analysis, Artificial Intelligence Strategies for Improving User Experience and Artificial Intelligence Strategies and Algorithms. Figure 3 below shows the different results obtained, separated by colour.

Figure 3. Results of the Methodology

Source: Own Elaboration

Table 3 below shows the results related to this subdivision and the basic definition of each of the results.

Table 3. Data-driven Learning for Decision Support

Results	Definition
Machine Learning (ML)	Big data learning with the ability to make predictions, identify patterns and learn from data.
Data Mining (DM)	Gathering large amounts of data through machine learning, databases and the use of statistics to aid decision making.
Deep Learning (DL)	Use of neural networks and algorithms with the aim of learning how to use these large amounts of data to make one's own decisions.
Support Vector Machine (SVM)	Machine learning by means of a set of algorithms to solve two-group classification problems.
Q-Learning	Automatic learning that allows a set of rules determined by actions indicated by an agent to be achieved.
Association Rule Learning (ARL)	Machine learning is related to the discovery of rules based on variables from large amounts of data.
Decision Tree (DT)	Non-parametric machine learning with the aim of providing answers to classifications and predictions.

Source: Own Elaboration

Table 4 below shows the results linked to Decision Support Systems.

Table 4. Decision Support Systems

Results	Definition
Decision Support Systems (DSS)	A system that helps to make decisions based on the analysis of large amounts of data.
Knowledge-Based Systems (KBS)	A system that understands the knowledge of a human and helps him or her by means of AI to make decisions.
Environmental Decision Support Systems (EDSS)	A system that helps to make decisions related to environmental modeling with the help of a graphical user interface (GUI).

Source: Own Elaboration

Table 5 below shows the definition of the results related to Social Data Analysis.

Table 5. Social Data Analysis

Results	Definition
Social Media Analytics (SMA)	The process by which large amounts of data are collected from users on different social networks. It is then analyzed to help make decisions.
Sentiment Analysis (SA)	Use of the NPL to analyze user-generated text on the internet in order to identify opinions and emotions (positive, negative and neutral).
Network Analysis (NA)	Analysis of social structures through social interactions by means of data collection using matrices.

Source: Own Elaboration

Table 6 below shows the results related to the improvement of the User Experience.

Table 6. Artificial Intelligence Strategies for Improving User Experience

Results	Definition
Virtual Reality (VR)	Simulation of an environment created by computer technology achieving an immersive experience for the user.
Chatbots	Software that simulates a human conversation with the aim of interacting with another human in a common way.
Self-service kiosks	A device that allows a service to be performed directly by means of software.

Source: Own Elaboration

Finally, table 7 below classifies the results most closely linked to strategies based on the use of algorithms.

Table 7. Artificial Intelligence Strategies and Algorithms

Results	Definition
Natural Language Processing (NPL)	A set of algorithms for solving problems in terms of classification of natural language processing, image and speech recognition.
k-nearest neighbors algorithm (kNN)	Algorithm to find a given number of best-fit examples for a query.
Multilayer Feedforward Artificial Neural Networks (MLFFNN)	Neural network that uses its calculations and data with the aim of flowing in the same direction.
Probabilistic Neural Networks (PNN)	One-way neural network commonly used to solve classification and pattern recognition problems.
Artificial Neural Network (ANN)	A group interconnected by technologies that manages to provide computers with artificial intelligence inspired by the structure of the human brain.

R programming language	Open source programming language. It is used as a tool for analyzing large amounts of data and as statistical software.
Bayesian inference	A type of statistical inference in which the probability that an already stated hypothesis is correct is obtained by means of a study.
Data Cleaning (DC)	Removal of large amounts of data by means of certain filters.

Source: Own Elaboration

5. Discussion

Data learns by itself and is able to provide a solution by making predictions, as Li et al. (2022) discuss in relation to the term Machine Learning (ML). In this way, the collection of large amounts of data through ML allows an answer to be given with the use of statistical sets and databases by means of Data Mining (DM). These considerations are provided by different authors in their respective academic contributions (Duvnjak et al., 2020; Hui et al., 2021; Li et al., 2022).

The use of ML helps tourist-oriented digital marketing strategies with the use of large amounts of data, which can be extracted by multiple options such as data analysis of websites, interactions on websites or social networks, user-generated content (UGC) in forums, etc (Tiago et al., 2021).

Data analysis offers solutions or help. For example, choosing a digital marketing strategy to be carried out with the aim of getting a tourist to perform one action or another. This coincides with the results proposed by Hui et al. (2021) in which they mention the use of neural networks and algorithms that allow the understanding of large amounts of data, a strategy known as Deep Learning (DL).

Authors such as Martin et al. (2020), Sánchez et al. (2020, Chang & Lin (2011) also mention the use of ML to solve classification problems between two groups, a concept known as Support Vector Machine (SVM). Also, there is Q-Learning that uses ML to reach a set of rules determined by an agent, a term discussed by (Yu et al., 2007) in their research.

On the other hand, if the use of ML is related to the discovery of rules based on variables of large amounts of data, we can call it Association Rule Learning (ARL) as detailed by Xie & He (2022). On the other hand, there is the non-parametric ML that aims to respond to different classifications and predictions, this concept is called Decision Tree (DT) also commented by Xie & He (2022).

This group of concepts and techniques are grouped into a system, which is mainly to support decision making based on large amounts of data, called Decision Support Systems (DSS). If the system comprises knowledge of a human and is aided by an AI in decision making, it is called Knowledge-Based Systems (KBS). Also, we found a system that helps to make decisions related to environmental modeling with the help of a GUI, called Environmental Decision Support Systems (EDSS) (Duvnjak et al., 2020).

In the social sector the process by which large amounts of user data are collected and then analyzed to help make strategic decisions in tourist-oriented digital marketing campaigns is referred to as Social Media Analytics (SMA) as discussed by Wang et al. (2020). In relation to social environments, data mining based on social interactions by means of matrices is called Network Analysis (NA) mentioned in their research by Schiessl et al. (2021).

AI strategies can also be used to enhance the tourist experience, both in digital or traditional marketing strategies. It is in this case when Samara et al. (2020) point out that different AI methods can be found such as Virtual Reality (VR) which creates a simulated environment to offer an immersive experience to the user. Authors such as Prentice et al. (2020) also comment on a strategy linked to the improvement of the user experience, commenting on the use of Chatbots that simulate a human conversation by means of software. In relation to the improvement of the user experience, the authors comment on self-service kiosks that allow services to be offered to the public in a more direct way through the use of software.

The last classification made on the results of the research is the use of algorithms. Authors such as Prentice et al. (2020) comment on the importance of the Natural Language Processing (NLP) strategy, which is defined as a set of algorithms for solving language, image and speech recognition problems. NLP is used for example in data mining methodologies such as Sentiment Analysis (SA) which uses this strategy to analyze texts to identify opinions and emotions of users on the internet. This methodology of

text analysis can allow, for example, to know the positive, negative or neutral emotions of a certain place depending on the season of the year.

In relation to algorithms, the authors Topal & Uçar (2019) mention the K-Nearest Neighbors algorithm (kNN), which allows finding a specific number of examples that relate to a specific query. They also mention Multilayer Feedforward Artificial Neural Networks (MLFFNN) which is a neural network that uses computation and data with the goal of flowing in the same direction. If the direction is unidirectional, Probabilistic Neural Networks (PNN) are commonly used for solving classification and pattern recognition problems. In the same line of research, the authors De Carlo et al. (2021) comment on the importance of maintaining an Artificial Neural Network (ANN) that manages to provide computers with an AI inspired by the structure of the human brain.

Finally, the authors Kirtil & Aşkun (2021) highlight the use of the R programming language, which is used as a tool for analyzing large amounts of data. The authors Xie & He (2022) highlight on the other hand the Bayesian inference that obtains the probability that a hypothesis already posed is correct through a previous study and for the elimination of large amounts of data the authors Hui et al. (2021) comment on the Data Cleaning (DC) strategy.

6. Conclusion

This research provides an overview of the current state of the theoretical literature on artificial intelligence, tourism and marketing. Constant innovations in terms of technology allow for the development of new improvements in terms of marketing actions impacting people who aim to travel and experience new places.

The process of choosing to travel is sometimes complex, where multiple factors can be triggered. However, the advancement of artificial intelligence even makes it possible to create predictions based on critical and reflective thinking as if it were a human thought. Therefore, the use of big data to develop more accurate digital marketing actions is already a reality in the business world.

The results obtained in this study respond to research question Q1 thanks to the SLR methodology developed, thus achieving 27 potential results divided into different classifications. In the classification corresponding to data-driven learning for decision support, the results have been: *Machine Learning, Data Mining, Deep Learning, Support Vector Machine, Q-Learning, Association Rule Learning* and *Decision Tree*. Regarding the group related to Decision Support Systems, we find: *Decision Support Systems (DSS), Knowledge-Based Systems (KBS) Environmental* and *Decision Support Systems (EDSS)*. In next place, in the classification of the results related to Social Data Analysis, are: *Social Media Analytics (SMA), Sentiment Analysis (SA) and Network Analysis (NA)*. Consequently, related to Artificial Intelligence Strategies for Improving User Experience: *Virtual Reality (VR), Chatbots* and *Self-service kiosks*. Finally, linked to the last classification, the results were: *Natural Language Processing (NPL), K-Nearest Neighbors algorithm (k-NN), Multilayer Feedforward, Artificial Neural Networks (MLFFNN), Probabilistic Neural Networks (PNN), Artificial Neural Network (ANN), R programming language, Bayesian inference* and *Data Cleaning (DC)*.

6.1 Theoretical Implications

The results obtained from this research foster the understanding of other academic contributions allowing to categorize and study the relationship between the tourism field, digital marketing and artificial intelligence. The results of this research can be complemented with new initiatives and improvements, achieving new quantitative and qualitative approaches that seek to answer new research questions.

6.2 Practical Implications

This research can help public entities and private companies to understand the different ways of analyzing, extracting and using large amounts of data to improve their investments in digital marketing actions. From this perspective, marketing departments of agencies will be able to know what use can be directly applied to tourism marketing strategies by means of artificial intelligence.

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