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Multichannel Digital Marketing Optimizations through Big Data Analytics in the Tourism and Hospitality Industry

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Abstract: The tourism sector increasingly relies on technology to acquire new clients in a world overflowing with information. So, the main question that needs to be answered is: What digital marketing strategy should be adopted to attract customers and build digital brand name by incorporating websites and social media big data? The authors of this research utilize web analytics and big data to build an innovative methodology in an effort to address this issue. After the data collection, statistical analysis was implemented, followed by a fuzzy cognitive map and an agent-based simulation model in order to illustrate the usage of social media and user experience in multichannel marketing. The findings suggest that, in contrast to the websites of other industries, such as logistics, where customers want to finish their inquiries as quickly as possible and leave the webpage, it is advantageous for tourism websites to keep customers' attention more on their website in order to increase visibility. Additionally, the research further highlights the importance of personalization and user-engagement content to e-WOM, suggesting to tourism businesses to encourage posts made by customers and employees.

Keywords: tourism; hospitality; big data; web analytics; social media; digital marketing; advertising; multichannel; e-WOM; brand



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1. Introduction

The Internet has changed the way that tourism companies conduct business [1]. The main lead generation of bookings derives from tourism websites and social media through advertisements or social media influencers [2–4]. The amount of information being produced across high-traffic platforms and popular applications is thrilling. Every single minute, Facebook users' share 240k photos, Twitter users' post 575k tweets, Instagram users' share 65k photos, Google conducts 5.7m searches, and 6m people shop online [5]. Moreover, according to Statista, online users spend an average of 147 min per day on social media platforms [6]. Nowadays, travelers search online to choose their travel destination, accommodation, and restaurant based on online reviews, indicating that social media platforms are able to affect users' booking process [7]. For example, the crowd-sourced site TripAdvisor reached one billion reviews and opinions in 2021, a fact that demonstrates that travel inspiration happens through reviews, which is a factor that validates their booking process [8]. These impressive numbers lead to the conclusion that consumers are heavily engaged with social media platforms, and therefore, growing business and increasing traffic is more likely to happen online [9,10]. Customers seek information through various sources, leading businesses to carefully consider various touchpoints in their customers' journey mapping. As multiple marketing channels make the way into our daily lives, making the buying process an intuitive procedure is the key to ensure that businesses' limited resources will be efficiently allocated to reach customers and deliver personalized, hassle-free experiences [11,12].

Undoubtedly, social media platforms come along with multiple trust issues. According to the Edelman Trust Barometer [13], the major information sources are not considered as trustful, with the level of trust in social media at only 37%. Online users receive information from social media platforms with skepticism [14]. However, within the travel and tourism industry, social media should be seen as the gold mine of trust-building by evaluating reviews and opinions from multiple social media platforms. According to recent research, social media postings are considered unbiased and objective, with travelers relying more on them rather than on official tourist websites [15]. Moreover, millennials tend to have the highest levels of trust on social media platforms, since they represent the majority of social media postings [16]. In addition, social media influencers [17] and brand awareness [18] positively influence the booking process of users and augment trust levels within the tourism industry. According to Statista, 49% of the respondents claim to “somewhat trust” review sites, indicating that online reviews have become the new e-WOM [19].

In the digital era, where there is a shift to an information-based economy, leveraging the power of popular social media is a powerful way to facilitate communication and achieve branding goals [20]. Internet-based channels create new opportunities for companies to obtain a 360-degree view of customers, with the intention to mold a personalized image as a first step to improving business accessibility and visibility. Indeed, the current trend in business marketing fends off traditional marketing tools to employ social media approaches, which add greater value to the product or service on offer [21]. From retargeting campaigns to personalized advertising, multichannel marketing approaches prove to be important in understanding the market pulse, driving in traffic, and predicting future trends.

Increasingly seen as a successful one-way path to customers’ purchasing intention [22,23] and brand loyalty [24,25], advertising in social media has attracted the attention of multiple researchers. Knoll conducted an empirical review in 51 studies to conclude that the use of advertising in social media is one of the seven emerging themes [26]. Similarly, Alalwan et al. state that promotional and advertising efforts are one of the predominant themes and trends for the academia, suggesting further research [27]. The digital transformation of the Hospitality, Travel, and Tourism (HTT) sector, with multiple mobile apps, websites, and social media platforms, offer tons of new avenues for the development of a better multichannel digital marketing strategy [28]. For example, HTT could construct loyalty programs that compensate positive e-WOM marketing on social media in exchange for loyalty points [29].

The study is allocated in 5 sections: The introduction is presented in Section 1; the materials and methodological framework are defined in Section 2, and the statistical analysis, as well as the Fuzzy Cognitive Map (FCM) and Agent-Based Model (ABM) findings, are presented in Section 3. Section 4 then summarizes the results, and Section 5 concludes with practical and theoretical implications of the research.

1.1. Multichannel Marketing in the Digital Era

The new digitalized ecosystem requires constant changes so as to adapt to the ever-changing environment of social media trends as a way to effectively satisfy customers’ preferences [30]. In an attempt to leverage the power of social media branding, companies are consistently looking for the right methods to effectively target their audience. Creating detailed user personas is challenging; however, it is the first step while developing a successful multichannel marketing strategy [31]. Identifying where a company’s traffic is coming from, in terms of what channels they frequently use and switch between, allows active industry players to bring their business back. Social media platforms are no longer sterile platforms for virtual communities, but important business tools to boost sales opportunities and brand communication through a significant dual effect: by acquiring new followers and influencing new followers’ friends [32].

Companies struggle to achieve optimal multichannel marketing activities since tracking the customer journey has become more difficult than ever. Customers, within the tourism industry, are constantly looking for personalized social media advertising expe-

riences [33], setting personalization as the foundation of this massive shift in consumer behavior. More and more consumers are looking for ways not merely to buy a product or a service, but to also feel engaged toward the brand they have selected [34]. This process demands the development of a robust and strategic approach more personalized than ever before. Effectively executed personalization requires an update in personalized ads so as to reflect the digital transformation of consumers.

COVID-19 has accelerated consumers' behavior to more digital services, heightening in this way their expectations for personalized experiences [35]. Indeed, a number of variables, among which are customer innovativeness, internet experience, and channel experience, greatly contribute to the advancement of customer experience management, taking customer experience to the next level [36]. That is to say that constant innovations in the HTT sector, such as mobile apps and the use of virtual reality, make tourism services more user-friendly and further advance the levels of customer experience as an antidote to brand building [37]. The revolution in digital marketing lies in social media advertising personalization as the default standard for customers' engagement with brands [38]. As tailored advertising is getting smarter, the increase in customers' conversions and leads generations fends off the traditional one-size advertising approaches, preferring instead personalization tactics that meet or even exceed customers' needs and expectations [39].

Multiple touchpoints exist today since consumers spend a great amount of time online, some of which are found on social media platforms. As such, companies struggle to find solutions on how to orchestrate their marketing activities across channels [40]. Not only that, but also as consumers get savvier, the winds of change have moved the bottom-line from less environmental-friendly companies to those that adopt a more sustainable approach in favor of brand optimization [41]. The Ad-Net-Zero Report is an important attempt of advertising professionals to support brand campaigns that promote sustainable behaviors [42]. In fact, tourism companies that support environmental, social, and governance (ESG) principles in their business strategy are more likely to achieve higher levels of travelers' loyalty [43]. An interested work has been recently published by Polman and Winston, named *Net Positive* [44]. In this book, the authors strongly argue that the employment of a holistic, sustainable approach, from maximizing the benefits for products, services, and influence to employees, consumers, suppliers, communities, and more, lead companies to thrive. This is a trend that appeases not only travelers but the entire travel community as well, from travel stakeholders to investors [45]. An interesting attempt has been made by Google Flights, where users can find carbon emission estimates on their flight search results [46]. The stake for companies lies in decarbonizing their ads and environmental fingerprint in an attempt to offer personalized sustainable-focused marketing campaigns, which will become the new driver for competitive advantage [47].

The question here is not whether personalized advertising will shape e-commerce in the future, it is how companies can gather and analyze the right data in favor of personalization, as the foundation of an effective multichannel marketing strategy. Exposure to superior e-business personalization demands a great amount of data to be collected. Noticeably, numerous studies have been devoted to social media efficiency in advertising activities [48–50]. Moreover, multichannel retailing has been thoroughly investigated by researchers, indicating it as a win-win game contingent on market environments [51,52]. However, little research has been conducted on how multichannel shoppers react on different online social media platforms and how digital advertising messages could be best processed to potential customers. Lee and Cho identify the effect of big data on advertisement executions as one of the key trends pertaining to digital advertising [53]. Zhang et al. acknowledge the importance of big data regarding customers' satisfaction and brand awareness [54]. Similarly, Chang, Kaufmann, and Kwon state that big data analysis is here to analyze social science phenomena in the real-world setting [55].

Within the HTT industry, several works of research have been carried out using big data [56–59]. A very interesting study has been carried out by Xiang, Du, Ma, and Fan using social media data in the tourism and hospitality sector [60]. This is one of the first studies

to explore the contribution of social media to the HTT domain and pave the way for more research on this topic, such as tourist sites' image posting [61] and attractions in heritage parks [62]. According to Xu, Nash, and Whitmarsh, social media analytics can contribute to the development of balanced methodological approaches, especially if combined with small data [63]. The literature review reveals that there is a strong connection between big data and innovations within the tourism research [64], a fact that opens new avenues for future research on social media analytics and the HTT sector. The benefits are dual: adopting big data artificial intelligence strategies can offer increased efficiency, productivity, and profitability to tourism businesses and personalized, convenient, and rich experience to customers [65].

The landscape of digital advertising constantly changes, raising concerns regarding customer engagement and retention rate. Marketers need to re-evaluate their ads from massive targeting to personalized messaging in an attempt to meet current needs and anticipate new trends. The possibility of hypereffective ads lies on the prompt analysis of online customers' behavior based on crowdsourcing data [66].

1.2. Digitalization in the Travel and Tourism Industry

According to the World Economic Forum's Digital Transformation Initiative, digitalization in aviation, travel, and tourism is expected to create up to USD 305 by 2025 [67]. Advances in technology boost innovation and growth, allowing travel and tourist companies to replace traditional tourism in a more human-centric, personalized approach [68]. Leveraging technology, such as the social media explosion, goes beyond digitalization; it introduces tools and activities that change the travel behavior from the beginning to the end and enables travel companies to stay ahead of the curve [69,70].

TCI research reveals that 31% of online users are willing to share their travel experiences even with users outside their friend zone [71]. As such, social media should be seen as a part of customers' decision-making process, able to shape perceptions [72], and become an influential factor of selecting tourist destinations [73]. It therefore becomes apparent that by harvesting data and analytics, travel and tourist companies acknowledge behavioral patterns that will help them build targeted marketing campaigns on a larger scale.

Undoubtedly, social media and tourism marketing comprise an incredible opportunity, a perfect match for growth and development of existing activities and future trends within the travel industry. Social media analysis empowers brands with useful insights so as to increase guest engagement, gain competitive advantage, and achieve business superiority within the tourism sector [74,75]. In August 2021, a survey was conducted in the United States to determine the online travel brands with the best social media presence [76]. A total of 34% of the respondents voted for booking.com and 25% for Expedia. However, the systematic use of social media before, during, and after trips depends greatly on the nationality of travelers [77]. One main concern of the popularity of social media platforms is strongly associated with cultural values. Social media tears down national boundaries, and it is the local culture that seems to face the most challenges [78]. Based on a recent paper, 40% of the respondents' cultural identity seems to be affected by the use of social media [79]. Apart from gradually losing their local identity and adopting a cross-cultural one, one could further encounter posts containing feelings that violated their cultural values. Nevertheless, one thing is for sure: social media is here to stay and those companies who manage to engage critically with the dynamics that unfold, by fighting an uphill battle, will win the race of competitiveness [80].

The role of social media has been further researched in multiple sectors, among which are hospitality, tourism, and travel [81]. In 2021, advertisers in the United States were projected to spend nearly USD 106 billion on programmatic digital display advertising, which is expected to increase to nearly USD 142 billion by 2023 [82]. According to a study conducted in the fourth quarter of 2021, approximately 24 percent of surveyed Spanish consumers aged between 18 and 29 years looked at posts on social media for holiday inspiration, and 21 percent of Dutch respondents aged 45 years and older claimed to do the

same [83]. It is evident that both the tourism industry [84] and travelers [85] greatly rely on the use of social media platforms as a way to inspire or get inspired, respectively.

It is apparent that tourism advertising in social media requires further investigation [86]. Hanouda states the positive impact of online users toward social media advertising and highlights the need for future research in the social advertising field within the travel and tourism industry [87]. Several recent works of research in the hospitality, tourism, and travel (HTT) industry exist, exploring interesting topics that mainly look at the role of social media on brand trust [88], sharing behavior [89], tourism information quality [90], destination marketing and image [91–93], among others, showing that social media marketing can affect consumers' online decision-making process [94]. One of the latest studies in the HTT sector identifies that social media advertising is an understudied research field, suggesting future research should be concentrated on social media platforms as an advertising medium [3]. The authors further advise future studies that will overcome the national borders and adopt a cross-national identity. Having that said, the current study attempts to fill this gap and therefore focuses on social media advertising within the HTT industry at a global level. The paper extracts data from 10 world leading tourism websites in an attempt to study the behavioral patterns of online users. Given the great attention that has been given to the relationship between online reviews and online users [95], the present study investigates the interconnection between social media advertising across multiple channels in favor of tourism businesses' brand optimization.

Implementing successful multichannel approaches is a difficult task in business, especially in understanding customers' behavior [96]. Having this in mind, and with an eye to big data-driven technology, the authors focus on the role of implementing a multichannel marketing strategy, with a special interest in social media channels, as a cornerstone to encourage customer engagement, increase sales opportunities, and build brand awareness and visibility across digital platforms. Since advertising on social media is seen as an emerging trend within the tourism sector, the present study is devoted to understanding the importance of new digital technologies in shaping users' purchasing intentions and building brand awareness and stability.

1.3. Web Analytics KPIs and Tourism Digital Brand Name

The implementation and analysis of big data and web analytics on a holistic digital marketing strategy is crucial for the optimization of the digital brand name in various sectors [10,24,42,97]. It is essential for tourism companies to invest in new digital channels of interaction with customers in order to increase bookings and sales in a highly competitive environment [98]. A logical consequent question arises. What are those channels that can contribute to customer user engagement and optimize the corporate digital brand name in tourism enterprises? This study attempts to respond with the extraction and analysis of the following Web Analytics KPIs that have been shown [99–101] that play a crucial role in those parameters.

Web analytics (WA) can be defined as the process of analyzing user activity on a webpage [102]. Web analytics, which were collected from the websites under examination and quantitatively analyzed, are named key performance indicators (KPIs) [103]. The web analytics KPIs for websites' user activity and social media user behavior has been gathered from Semrush.com (accessed on 15 July 2022) and Fanpagekarma.com (accessed on 15 July 2022), respectively.

Table 1. Description of the Web analytics KPIs.

WA KPIs	Description of the WA KPIs
Social Media Traffic	Social media platforms such as Instagram and Facebook redirect users to the corporate website through links or advertisements. This KPI is named Social Media Traffic [104].
Organic Traffic	Visitors that arrive on the webpage using a search engine are referred to as “organic traffic.” [104].
Global Rank	The platforms’ overall traffics (organic, social, and paid traffic) and the user engagement parameters (pages/visits, average time on site) combined produce this KPI. Since a website in the first spot has a higher rating than a website in the fourteenth position, the smaller the global rank, the more famous the website [104,105].
Websites’ Average Time on Site	This WA KPI determines how many seconds are spent on average by users on a webpage per visit [104].
Websites’ Pages/Visit	This WA KPI calculates the total number of pages viewed by each user when they enter a tourism website [104].
Websites’ Paid Traffic	This WA KPI is generated through paid methods. For instance, Google search leads users to tourism websites when they click on an advertisement [104].
Websites’ Total Visits	This WA KPI measures how many users visit a website each day. This sum is computed while a cookie is used to track each visitor’s IP address [104].
Websites’ Bounce Rate	This WA KPI is the percentage of website users that are one-page visits, and the visitor leaving the site without reading a second webpage is known as the bounce rate [104].
Total Fans in Facebook/Instagram	This WA KPI refers to the total number of fans of a tourism website [106,107].
Total Reactions to comments in Facebook/Instagram	The number of comments made on posts that were made during the chosen time frame [108].
Number of Comments in Facebook/Instagram	This WA KPI illustrates the total number of comments of the tourism websites social media [106].
Number of Likes in Facebook/Instagram	This WA KPI presents the total number of likes of the tourism websites’ social media [106].
Post Interaction in Facebook/Instagram	The post interaction metric measures how frequently fans interact with a post’s content. It displays the average number of interactions per fan [109].

1.4. Formulation of Research Hypotheses

To acquire a competitive advantage, tourism enterprises must assess their surroundings using all accessible resources, especially the digital ones [110]. Some crucial elements that need to be taken under consideration are the users’ behavioral factors on the corporate website, such as “average time on site” and “pages per visit”, as well as the behavioral factors of the users on social media, such as “post interaction” and “number of likes”. The analysis of those factors can provide a holistic view of the user engagement and corporate digital brand name [111].

The study’s findings will help decision-makers and marketers determine the optimal multichannel digital marketing strategy that distinguishes one tourism enterprise from another. More precisely, decision-makers may maximize digital investments by analyzing site analytics and combining them into a broader plan to boost the company’s digital brand name [112,113]. Tourism marketers can develop competitive differentiation by incorporating websites and social media big data in their strategy [114,115]. The following hypotheses were developed to explore the impact of social media and website big data on interactivity, user engagement, and digital brand name.

Hypothesis 1 (H1). “Paid Traffic” of tourism enterprises affects the “Social Media Traffic” variable through their “Post Interaction” metric.

This hypothesis studies the effects of paid traffic on social media traffic as well as the effects of interactivity between the users and the tourism social media on social media visibility. This hypothesis will provide valuable insights on social media lead generation. Additionally, it is crucial for marketers to identify the effects of paid traffic on the post interaction metric and the corporate social media in total, in order to have a clear view of the intercorrelation of the metrics when creating a digital marketing campaign [116].

Hypothesis 2 (H2). *“Number of Comments” of tourism enterprises affects the “Total reactions on posts” variable through their “Posts per day” metric.*

A previous study has revealed that the total reactions to social media posts have a positive impact on user engagement and on social media marketing in general [111]. Hence, the second hypothesis attempts to examine the social media interactivity of tourism enterprises. The holistic interactivity can be revealed with the examination of the number of comments per post, the number of posts per day, and their effects on the total user reaction to those posts.

Hypothesis 3 (H3). *“Social media traffic” of tourism enterprises affects the “Total visits” variable through their “Pages per visits” metric.*

After assessing the interactivity of behavioral metrics and their effects on corporate social media, the third hypothesis examines how the effects of social media activity affect the tourism website visibility. This is a crucial hypothesis for multichannel marketing since all platforms (social media and corporate websites) must achieve high visibility in order to produce optimal profitability [10,117].

Hypothesis 4 (H4). *“Social media traffic” of tourism enterprises affects the “Organic traffic” variable through their “Total visits” and “Number of fans” metrics.*

As previous studies have revealed, from the logistics industry to tourism, the steady growth of the metric organic traffic is a valid indicator for the growth of the global rank metric [41,69]; it is crucial to research the effects of social media traffic on this metric. Therefore, the fourth hypothesis examines the effects of social media activity and website activity on the website's organic traffic. Since the variable organic traffic is calculated from all unpaid sources [68], such as users that type booking.com into a search engine or browser and are not redirected from an advertisement, it has been established as the main precursor of the website's digital brand name [118].

Hypothesis 5 (H5). *“Average time on site” of tourism enterprises affects the “Global rank” variable through their “Number of likes” and “Pages per visit” metric.*

After identifying the effects of social media and website behavioral factors on the organic traffic metric, the fifth hypothesis examines if the digital brand name represented with the global rank metric is affected by the average time spent on the website, the pages viewed per visit, and the number of likes on corporate social media. For marketers, it is crucial to identify if those metrics affect the digital brand name and to what extent in comparison with other industries [105,119] in order to produce an effective digital marketing campaign.

As a result, these research hypotheses have been developed to comprehensively assess the main multichannel marketing study. More precisely, tourism enterprises need to identify and invest in the parameters that affect their social media traffic (H1). Then, it would be useful to explore which parameters of the corporate social media could add value to their website's interactivity and visibility (H2, H3). Furthermore, it is critical to understand how the above parameters can be optimized to assist the corporate website to climb in search engines and improve its digital brand name (H4, H5).

2. Materials and Methods

The authors implement an innovative methodology in this research to assess the effects of multichannel digital marketing on tourism enterprises' digital brand name and user engagement. This approach has been developed because the raw retrieved big data are not impacted from any possible cognitive bias [120]. The methodology is divided into four stages. In the first and second stages, big data were extracted from two web analytics websites over 210 days for 10 tourism enterprises and statistically analyzed. In the third stage, a fuzzy cognitive map was developed to illustrate the cause-and-effect relationships and present the macrolevel approach to optimization [121]. Finally, an agent-based simulation model was developed to present the research's microlevel approach [121].

2.1. Data Extraction and Statistics

The websites' behavioral data were extracted from the platform Semrush.com, and the social media big data were extracted from Fanpagekarma.com. The study is limited to Facebook and Instagram since, according to previous research, these are the social media platforms that provide an added value to the corporate digital brand name and profitability [122,123]. The world leading tourism websites that were examined are: Booking.com, Airbnb.com, Trivago.com, Tripadvisor.com, Hoteles.com, Marriott.com, Kayak.com, Edreams.com, Expedia.com, and Agoda.com. Despite the fact that Marriott.com owns more than 30 hotel brands, upon further examination it can be assumed that choosing Marriott.com does not fit among the other type of websites, since it is a single company. This study gathered the top websites based on tourism websites' ranking and revenue [124,125]. The websites were picked based on purpose. Those sites were selected because they represent a holistic view of the tourism industry and also have corporate social media [124,125]. The authors attempt to identify users' behaviors and their effects on the digital brand name of the tourism industry in general and not as a role or category, e.g., "accommodation and hotel", "air travel", or "attractions" [8,124]. Following data gathering, statistical analysis was conducted, including regression analysis and correlation analysis. The analysis offers a thorough view of all the elements and how they interact with each other.

2.2. Fuzzy Cognitive Map and Agent-Based Modeling

The number of correlations between the variables under consideration that were found was used in the development of the fuzzy cognitive map (FCM). The FCM's primary goal is to offer a graphical depiction of the positive and negative cause-and-effect relationships between the metrics under consideration [126]. Consequently, those relationships were used in the creation of three multichannel marketing optimization scenarios. These macrolevel scale scenarios can be beneficial for marketers and decision-makers to understand and implement funds allocation effectively in their marketing strategy [121]. Following the development of the macroscale fuzzy cognitive map, a microscale agent-based model (ABM) was created. ABMs produce simulation and estimation of all the behavioral elements influencing enterprises' brand name and engagement [121,127,128]. Predictive models are valuable to marketers since they can simulate user behavior, reactions, and engagement for free without spending valuable funds on other traditional marketing techniques [129].

3. Results

3.1. Statistical Analysis

This section illustrates the statistical analysis of the extracted tourism big data, as shown in Table 1. The findings are produced from the big data of 10 tourism corporate websites [124,125]. Tables 2 and 3 present the correlation analysis and regression analysis for the H1.

Table 2. Pearson's correlations of the H1.

Correlations	Social Media Traffic	SM Post Interaction	Paid Traffic
Social Media Traffic	1		
SM Post Interaction	−0.072	1	
Paid Traffic	0.931 **	−0.004	1

** Correlation is significant at the 0.01 level (1-tailed).

Table 3. Regression analysis for H1.

Variables	Standardized Coefficient	R ²	F	p-Value
Constant (Social Media Traffic)	-	0.872	223.821	0.116
SM Post Interaction	−0.068			0.126
Paid Traffic	0.931			<0.001

The (H1) shows a positive correlation with $\rho = 0.931 **$ between the social media traffic metric and the total paid traffic metric. Furthermore, nonsignificant correlations were found between the social media posts with paid and social media traffic. That finding highlights the importance of paid traffic that was generated from paid advertisements placed in search engines such as Google, which provides an added value to the visibility of corporate social media. On the other hand, there is no indicator that post interaction plays any crucial role in social media traffic or on paid traffic and vice versa. The regression model for the first hypothesis (H1) is presented in Table 4. Regression analyses can be identified as significant with p -values of less than 0.05. In this nonsignificant regression, for every 1% rise in social media traffic, the paid traffic increases by 93.1% and the post interaction decreases by 6.8%. Since the p -value is more than 0.05, the (H1) is rejected.

Table 4. Coefficients between the examined metrics for H2.

Correlations	Total Reactions on Posts	Number of Comments	Posts per Day
Total Reactions on Posts	1		
Number of Comments	0.573 **	1	
Posts per Day	0.471 **	0.784 **	1

** Correlation is significant at the 0.01 level (1-tailed).

Tables 4 and 5 present the correlation analysis and regression analysis for the H2.

Table 5. Regression analysis for H2.

Variables	Standardized Coefficient	R ²	F	p-Value
Constant (Total Reactions on Posts)	-	0.329	19.195	<0.001
Number of Comments	0.528			0.725
Posts per Day	0.057			0.002

The (H2) shows multiple positive correlations with $\rho = 0.573 **$ and $\rho = 0.471 **$ between the total reactions on posts metric with the number of comments and posts per

day. Such interactivity is commonly shown in social media influencers while providing “giveaways” [130] which directly produce electronic word of mouth (e-WOM) [131,132]. Furthermore, significant correlation was observed between the number of comments and posts per day, with $\rho = 0.784^{**}$. That finding highlights the importance of provoking social media interactivity with stories, posts, reactions, and likes. The regression model for the first hypothesis (H2) is presented in Table 6. Regression analyses can be identified as significant with p -values of less than 0.05. In this regression, for every 1% rise in total reactions on posts, the number of comments and post per day increase by 52.8%, and 5.7%, respectively. Since the p -value is less than 0.05, the (H2) is accepted.

Table 6. Coefficients between the examined metrics for H3.

Correlations	Total Visits	Social Media Traffic	Pages per Visit
Total Visits	1		
Social Media Traffic	0.889 **	1	
Pages per Visit	0.353 **	0.413	1

** Correlation is significant at the 0.01 level (1-tailed).

Tables 6 and 7 present the correlation analysis and regression analysis for the H3.

Table 7. Regression analysis for H3.

Variables	Standardized Coefficient	R ²	F	p-Value
Constant (Total Visits)	-	0.791	126.897	<0.001
Social Media Traffic	0.896			<0.001
Pages per Visits	−0.017			0.779

The (H3) shows positive correlations with $\rho = 0.889^{**}$ and $\rho = 0.353^{**}$ between the websites’ total visits metric and the social media traffic and pages per visits metrics, respectively. Furthermore, nonsignificant correlations have been found between the social media traffic with the websites’ pages per visits with. That finding illustrates the crucial positive effect that the social media traffic and interactivity have on the corporate website visibility. On the other hand, as expected, there is no significant connection between pages per visits and social media traffic. The regression model for the first hypothesis (H3) is presented in Table 8. Regression analyses can be identified as significant with p -values of less than 0.05. In this regression, for every 1% rise in total visits, the social media traffic increases by 89.6%, and the pages per visit decreases by 1.7%. The H3 is accepted because the p -value of the constant variable is <0.05.

Table 8. Coefficients between the examined metrics for H4.

Correlations	Organic Traffic	Number of Fans	Social Media Traffic	
Organic traffic	1			
Number of Fans	−0.127	1		
Social Media traffic	0.628 **	−0.012	1	
Total Visits	0.859 **	−0.097	0.889 **	1

** Correlation is significant at the 0.01 level (1-tailed).

Tables 8 and 9 present the correlation analysis and regression analysis for the H4.

Table 9. Regression analysis for H4.

Variables	Standardized Coefficient	R ²	F	p-Value
Constant (Organic Traffic)	-	0.826	103.200	<0.001
Social Media traffic	0.657			<0.001
Total Visits	0.443			<0.001
Number of Fans	0.006			0.905

The (H4) shows positive correlations with $\rho = 0.628^{**}$ and $\rho = 0.859^{**}$, respectively, between the website's organic traffic and the social media traffic and pages per visit. Additionally, and interestingly, nonsignificant correlations have been found between the organic traffic and the number of fans on social media. Those findings highlight the important effect of social media visibility on the corporate website, but that does not mean that the rise of followers on social media provides an added value to the corporate website visibility. More specifically, nonsignificant correlations can be observed between the number of fans, the social media traffic, and the total social media traffic. Finally, a significant correlation can be identified between the social media traffic and the total visits, with $\rho = 0.889^{**}$, which highlights the importance of investing in social media in order to raise the corporate website visibility. Theregression model for the first hypothesis (H4) is presented in Table 10. Regression analyses can be identified as significant, with p -values of less than 0.05; therefore, the H4 is accepted. More specifically, in this regression, for every 1% rise in organic traffic, the social media traffic increases by 65.7%, the total visits increases by 44.3%, and the number of fans increases by 6%.

Table 10. Coefficients between the examined metrics for H5.

Correlations	Global Rank	Average Time on Site	Number of Likes	Pages per Visit
Global Rank	1			
Average Time on Site	−0.483 **	1		
Number of Likes	0.241 *	−0.189	1	
Pages per Visit	−0.424 **	0.542 **	−0.020	1

* Correlation is significant at the 0.02 level (2-tailed). ** Correlation is significant at the 0.01 level (1-tailed).

Tables 10 and 11 present the correlation analysis and regression analysis for the H5.

Table 11. Regression analysis for H5.

Variables	Standardized Coefficient	R ²	F	p-Value
Constant (Global Rank)	-	0.325	10.433	<0.001
Average Time on Site	−0.345			0.007
Number of Likes	0.171			0.107
Pages per Visit	−0.248			0.044

The (H5) shows significant negative correlations, with $\rho = -0.483^{**}$ and $\rho = -0.424^{*}$, between the global rank and the average time on site, and the pages per visits metrics, respectively. This is an interesting result since it illustrates that the behavioral metrics affect the digital brand name and improve the tourism websites' global rank. It is an improvement because if a website ranks in the 2nd place, it is better than the 14th. Furthermore, it can be observed that the number of likes does not play a crucial role on average time on site

and pages per visit, but it plays an important role on global ranking, with $\rho = 0.241^*$. Additionally, a significant correlation can be identified between the website behavioral factors' average time on site and pages per visit, with $\rho = 0.542^{**}$. The regression model for the first hypothesis (H5) is presented in Table 11. In this regression, for every 1% rise in global rank, the average time on site decreases by 34.5%, the pages per visit decreases by 24.8%, and the number of likes increases by 17.1%. Regression analyses can be identified as significant with p -values of less than 0.05, and the H5 is accepted since $p < 0.001$.

3.2. Creation of Macromodel FCM and Optimization Scenarios

The FCM was created using the statistical analyses described above. An FCM displays the basic characteristics of a system as well as the strength of connections ($-1,1$) between the parameters [121]. This capability is critical for marketers because big data are unstructured data, and their illustration of the cause-and-effect links of a system on a map is particularly valuable for the development of a marketing strategy [133,134]. Figure 1 depicts the fuzzy cognitive map, where the stronger the connection, the larger the line. The standardization of the process and the incorporation of the statistical results to the FCM is crucial for the formulation and analysis of the model. The first step includes the "Clarification of objectives" [135,136]. In our case, the first step is the creation of three scenarios in order to provide a direct effect to tourism companies' decision-making by optimizing paid advertisements, social media interactivity, and digital brand name. The next steps include the "Sources" and "Calibration" of the model [135,136]. In this study, the next step came from the statistical analysis in Section 3.1, and, more specifically, the statistical correlations which have been used to illustrate the interconnections. Finally, for the "Interpretation" [135, 136] of the results, the hyperbolic tangent was used in order to have a clearer presentation of the scenarios [137]. This approach, the incorporation of statistical analysis in the FCM, was utilized in this article since it has been widely included in previous research for providing static results of various metrics to the desired variables of a study [121,136].

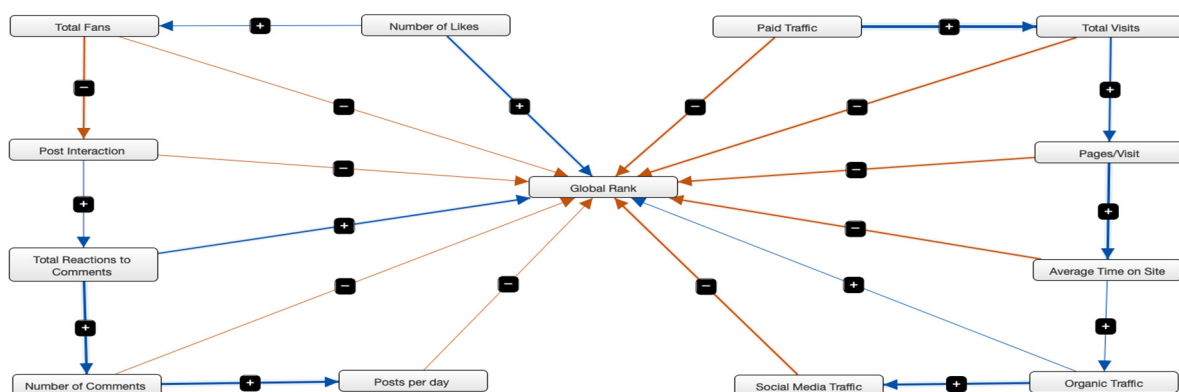


Figure 1. FCM with statistical correlations.

Creation of FCM Optimization Scenarios

The optimization scenarios were conducted to analyze the projected fluctuations in the web analytics' KPIs at various stages of user engagement and interactivity on the tourism website and social media, assisting the FCM model's progress. The hyperbolic tangent was used in all situations since it displays values that are positive and negative and exist within the range $(-1, 1)$ [136]. The scenarios are depicted in Figures 2–4. Figure 2 illustrates the paid traffic optimization scenario. In this case, when the tourism website invests in paid traffic by placing 20% more, the website's digital brand name will improve by 14%, and the website's organic traffic will by 7%. This is expected since paid advertisements in search engines, such as Google, have beneficial effects on the tourism sector, but they do not affect the social media interactivity, as can be observed in Figure 2 [138,139].

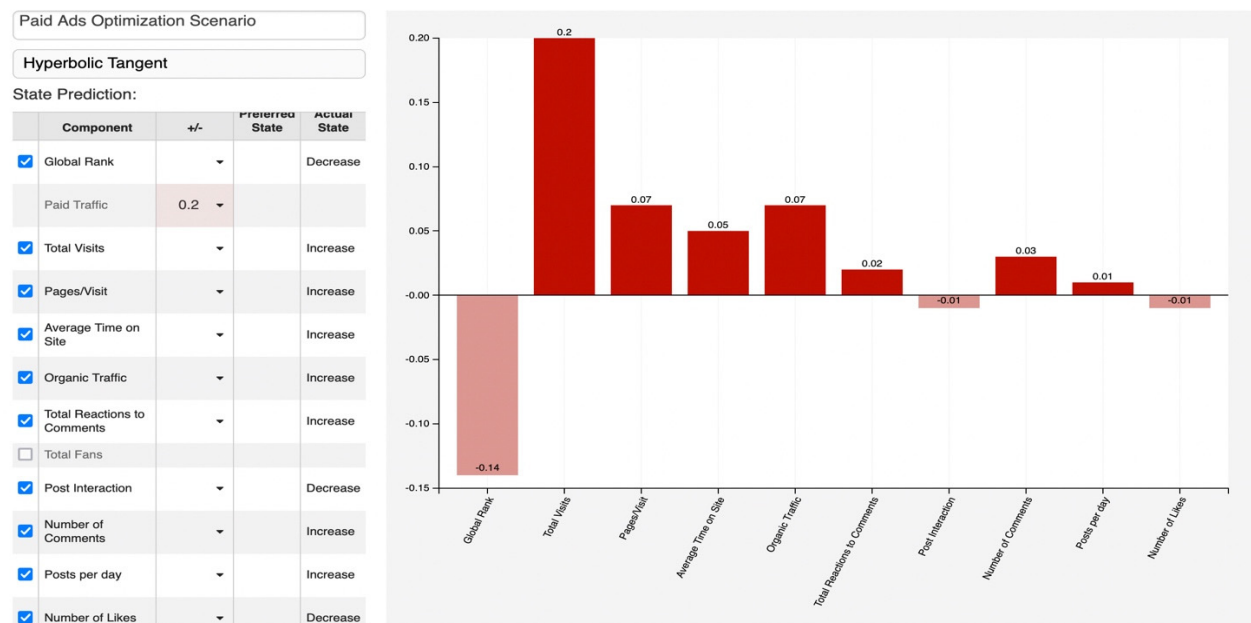


Figure 2. Paid Advertisement optimization scenario.

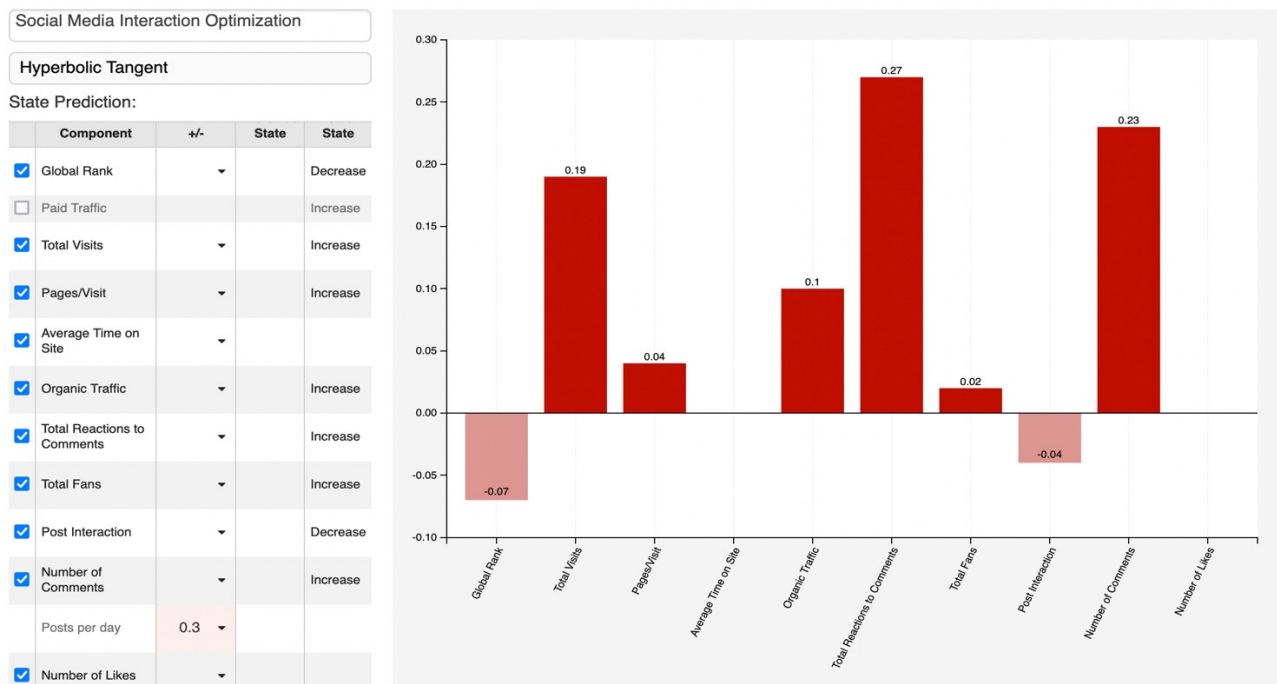


Figure 3. Social media interactivity optimization scenario.

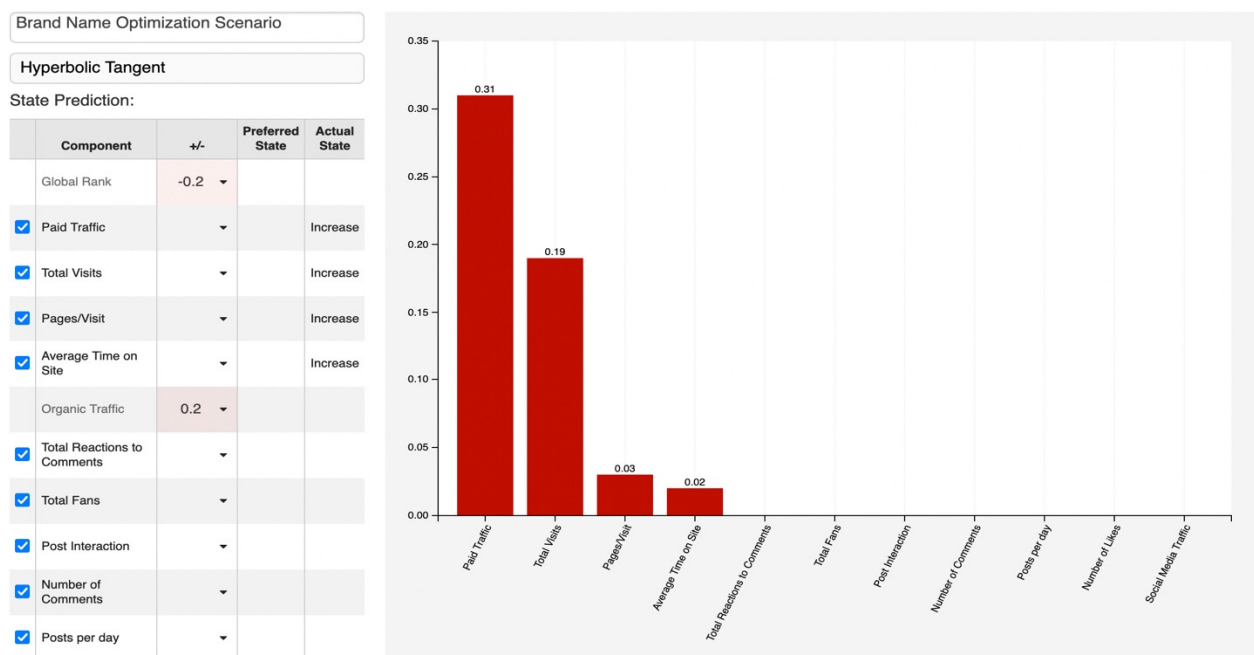


Figure 4. Digital brand name optimization scenario.

Figure 3 illustrates the social media interactivity optimization scenario. As can be observed, if the tourism enterprise creates more posts on social media by 30% daily, the digital brand name will increase by 7%, the website visibility will increase by 19%, and the organic traffic by 10%. This finding is fully aligned with previous research [140,141].

Figure 4 depicts the digital brand name optimization scenario. In this case, if the tourism companies wish to increase the digital brand name by 20%, they must invest in paid traffic by 31%. Additionally, it can be observed that the pages per visit metric and average time on site will also increase, which is in complete contradiction to logistics websites [10,142]. This can be explained since someone wants to book an apartment for vacation enjoys the time that they spend on the request, which is in contradiction with someone trying to search for a parcel.

3.3. Creation of the Agent-Based Model

To produce a microscale examination of the topic, an ABM was developed [121]. The ABM is a well-researched, widely used method which can assist researchers in comprehending and analyzing the patterns of customer behavior [143]. The ABM can encompass traits that are challenging to include in conventional models [121,143]. ABM is most useful when the system's behavior can be predicted by writing down the rules of behavior at the microscale [121]. The main advantage of utilizing an ABM technique in marketing is that the behaviors of businesses and customers inside the ABM may be built on solid ideas of behavior, but simultaneously, the findings can be evaluated against real data, and the ABM can then be used to produce behavioral predictions based on historical data [144]. Its application benefits marketers because ABM simulates real-world scenarios and assesses customers' behavioral patterns in order to extract relevant decision-making strategies. One of the main differences between the FCM and ABM is the ability of the ABM to present the behavioral changes on a time scale [121,143]. Additionally, the usage of agent-based models allows organizations to fully comprehend the insights provided by big data in terms of user interaction with their websites, as well as chances for growth [143,145]. The ABM represents the typical behavior of a client who visits tourism websites and social media. The white box, in particular, depicts an agent's beginning position, named "Potential Visitor". The complete model was created using the Anylogic 8.7.12 software. The Poisson

distribution was chosen for this model since it allows the implementation of the statistical analysis [146,147], as described in Section 3.1.

The model mimics all operations, beginning with how a consumer interacts with the enterprise in three main ways. Firstly, the visitor can enter the website by searching the name on Google or because he remembers it (organic traffic). Secondly, the visitor can redirect to the corporate website from paid traffic (e.g., google ads), and finally, the visitor can access the corporate website through social media links or advertisements. Continuously, the website's behavioral factors are generated from the users' activity in it and represented with light blue color on the left-hand side of the model. On the right-hand side with pink color, the behavioral factors of the social media can be observed. Those factors are summed in the total user engagement parameter (gray color), which leads to the development of the websites' global ranking. The variables (V) at the bottom of Figure 5 represent changes to the required circumstances that generate movement between the blocks, which is shown on the agent-based model with arrows.

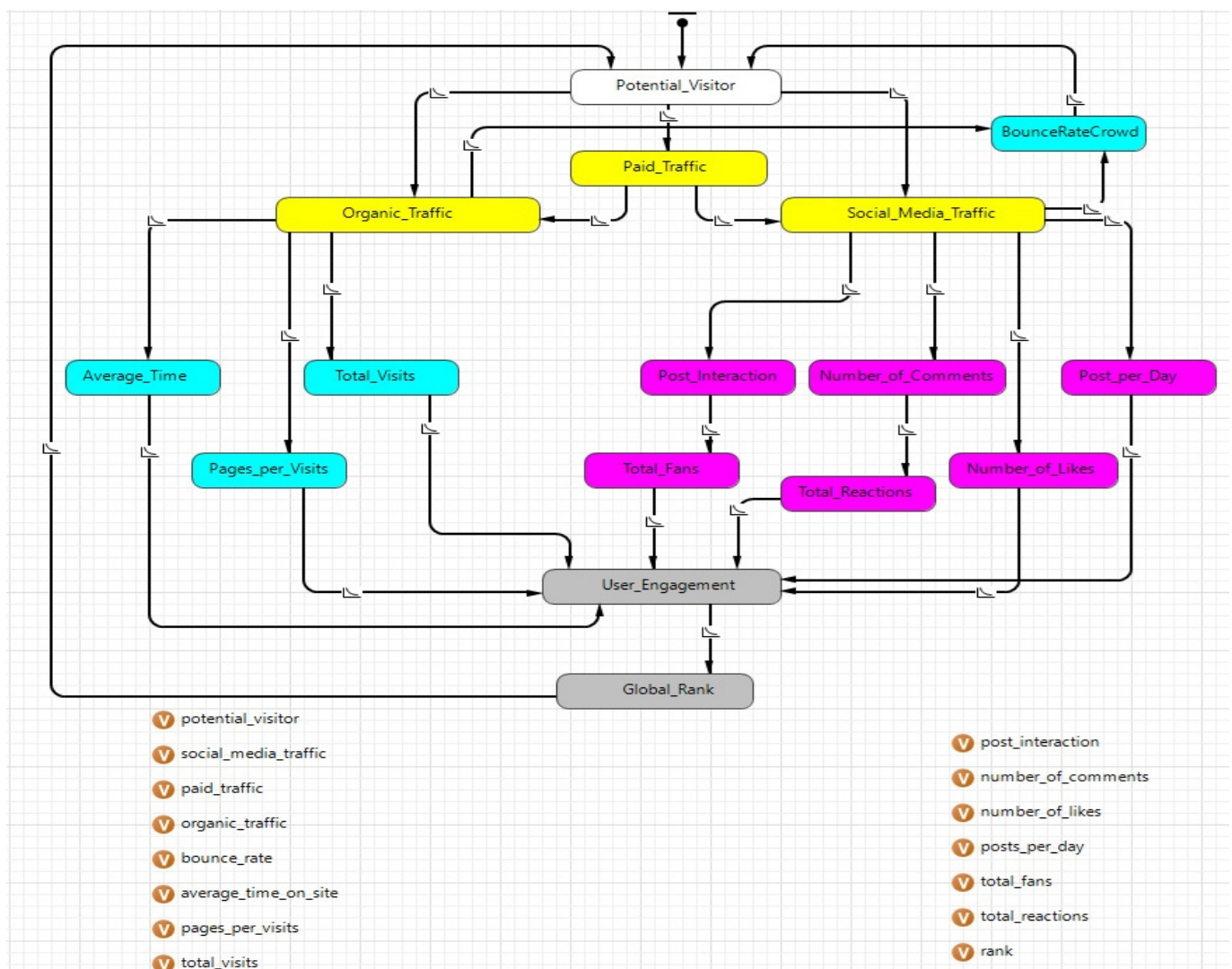


Figure 5. ABM.

Figure 6 illustrates the predictive model population distribution over a six-month period. On the left-hand side of Figure 6a, the 20th day of the model can be observed, and on the right-hand side of Figure 6b, the 170 days of the predictive model can be identified. The blue agents represent the website's behavioral factors, the red represents the paid

traffic, the light blue the social media factors, the yellow represents the organic traffic, and the gray represents the global ranking. As can be observed, on the right-hand side and after 170 days, the gray and yellow agents are more than the day 20, which illustrates the rise of website traffic and ranking, which leads to the rise of the digital brand name.

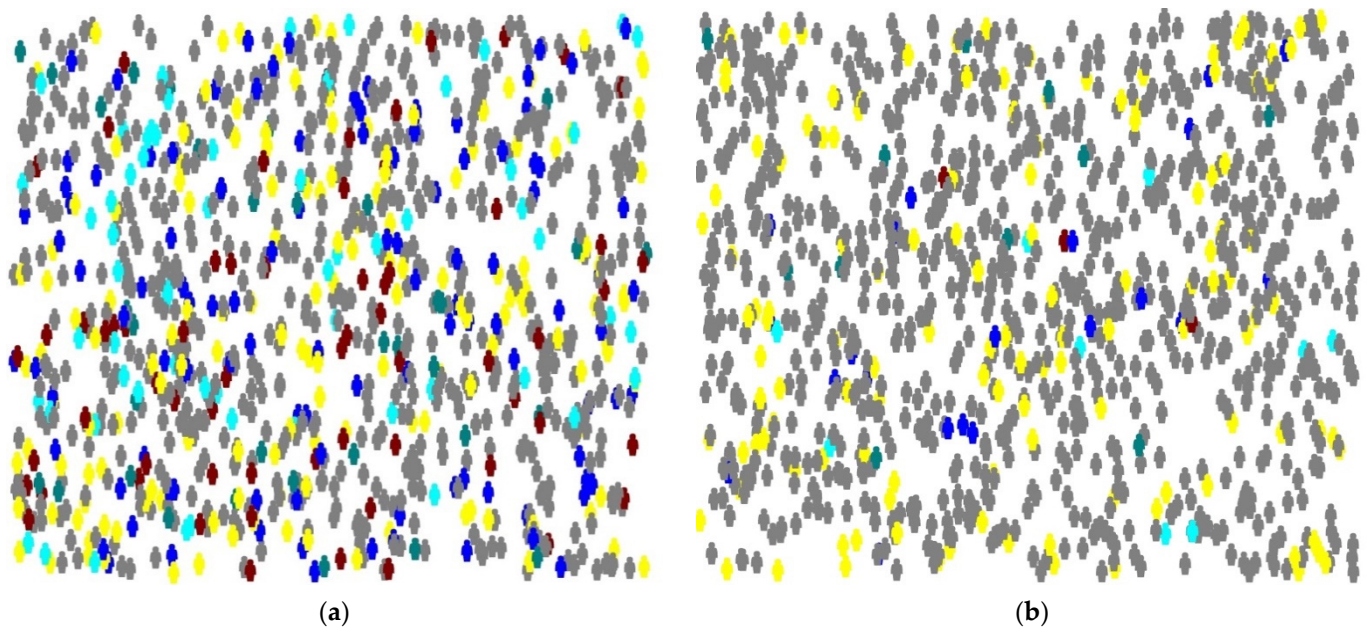


Figure 6. (a) Predictive model's population of 1000 agents over a 6-month period. Day 20. (b) Reductive's model population of 1000 agents over a 6-month period. Day 170.

In Figures 7 and 8, the time charts illustrate the history of the contribution of the examined metrics over six months [148]. More specifically, in Figure 7 a paid traffic boost can be identified by the advertisement that was placed on day 0. This had a big impact on social media traffic, which lasted up to day 55. Then, a second one was placed, from day 55 to day 73, which provoked a positive reaction on the tourism social media that finished on day 117. The final paid traffic boosts in advertisements were placed on days 117 to 127, provoking a bigger reaction with less cost than the one before. That finding illustrates that a digital brand name has already been created, so there was no need for more advertisements that last longer in contradiction to startups that need a steady stream of advertisements to increase their digital brand name [149–151].

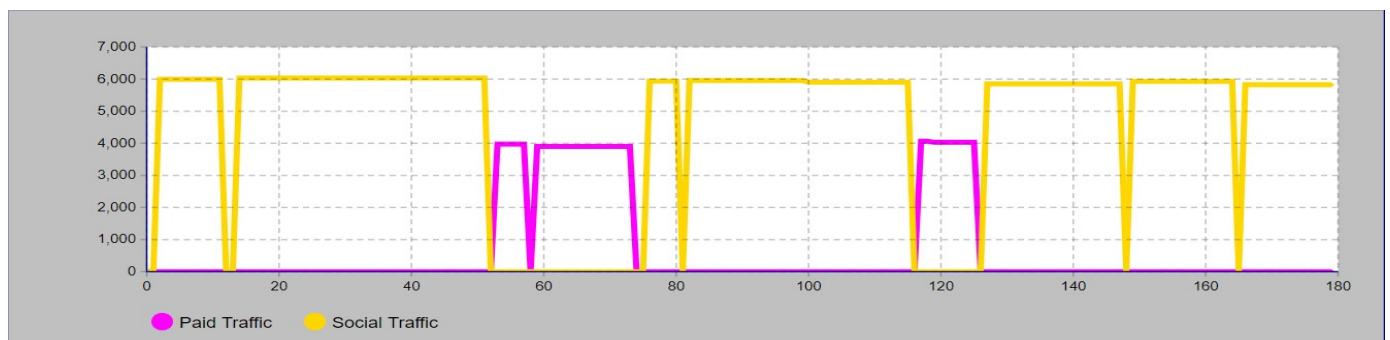


Figure 7. Paid and Social traffic changes in 180 simulation days.

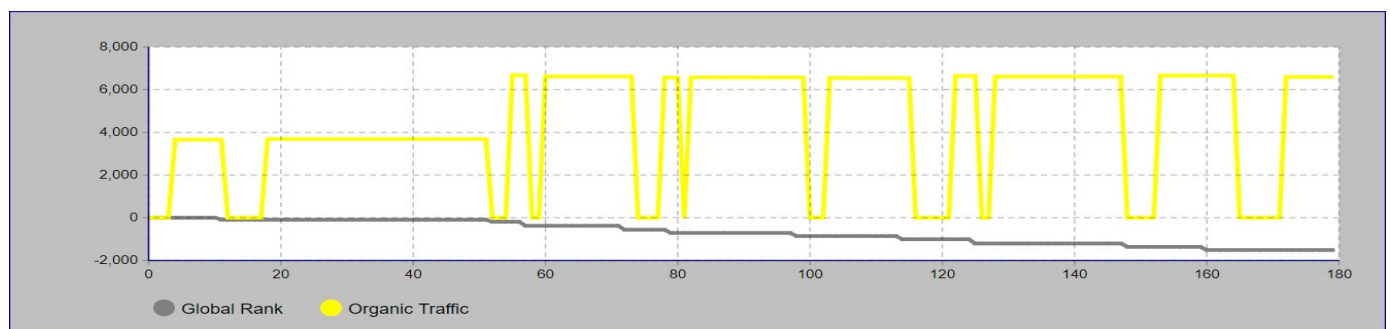


Figure 8. Organic traffic and global rank development in 180 simulation days.

In Figure 8, it can be observed that the growth of paid traffic from the placement of an advertisement at the beginning of the model on day 0 created an interesting impact on the website's organic traffic but did not crucially affect the global rank. Major changes can be observed after the second placement on day 55, which created a boost in organic traffic and global ranking. That can safely lead to the assumption that a digital brand name has been created [10,30,32].

4. Discussion

The chaos and uncertainty caused by COVID-19 requests hospitality businesses to respond effectively, or immediately pivot, through social media marketing [152]. Especially for businesses in hibernation, social media advertising plays a key role in customers' engagement levels and brand establishment [153]. However, using social media as a marketing channel creates content shock, with loads of information being produced every single minute, from publishing links, photos, and videos to performing contests and polls. Either way, the question is the same: among this vaguely structured chaos, how could travel and tourism business survive in such a demanding era? The purpose of the present study is to provide a deep understanding on the role of social media advertising as part of multichannel marketing strategy to brand optimization. It offers fruitful information on how to overcome the overwhelming noise of social media, focusing on gaining a competitive advantage. Specifically, it raises questions on how new technologies could contribute to the advancement of digital marketing activities within the tourism sector, and how consumers could process digital advertising messages.

Since the (H1) is rejected from the statistical analysis, the investments on paid traffic through digital advertisements produce imperceptible results to social media traffic, which is in contradiction with previous research [111,141]. The amount of money and the placement gaps are different from other industries, and this has to do with the seasonality of the tourism industry [154,155]. The results of the second hypothesis (H2) suggest that the high social media interactivity is beneficial for tourism enterprises since it boosts e-WOM [131,132] and could benefit from the social media influencers through "giveaways" [135].

The third hypothesis (H3) suggests that it is beneficial for tourism websites to maintain the customer's attention as much as they can on their website because it increases their visibility [156,157], which is in contradiction to other industries' websites, such as logistics websites in which the customer wants to complete their inquiry as fast as possible and exit the webpage [10]. A suggestion for developers to maximize the time that users spend on the website is the use of AI chatbots in order to promote interactivity with the website [158]. Furthermore, predictive and targeted content could be incorporated, depending on the responses of the chatbot, in order to produce a hypertargeted offer to the user or to sell an extra service before the user's arrival at the destination [159]. Finally, the fourth (H4) and fifth hypotheses (H5) are fully supported by previous research and illustrate the important effects of the website and social media interactivity on the development of digital brand

name [30,32]. The agent-based model additionally provided a more detailed explanation of the paid traffic in correlation to the time.

5. Conclusions

5.1. Theoretical Implications

Having big data as the starting point for acknowledging customers' online behavioral attitude, the hospitality industry is able to redefine online marketing activities. To this end, the current research has designed a precise methodology, containing pioneering context, pertaining to digital marketing activities as the foundation of brand establishment. The research has focused on 10 top hospitality organizations. The outcomes clearly demonstrate the efficiency of social media advertising for companies aiming at building social interactivity and traffic. The examination of the most important KPI's, total fans, post interactions, and posts per day, among others, provide a 360-degree view on online users' behavior. Given these shifting trends, it is helpful for all industry stakeholders to maintain a deep understanding of the market they serve by focusing on the followings:

- (a) Hypertargeted advertisements: It is evident that the future of digital advertising lies in the development of hypertargeted advertisements [160]. Providing the feeling of "one in a million", hospitality marketers can deliver personalized messages to the targeted audience, based on their behavior, and receive valuable feedback. While it is true that the audience is smaller, the results of conversion rates are higher, since they improve advertising relevance. Personalized advertising has been less explored withing the HTT domain, with most research focusing on personalized services [161,162]. Lately, there has been a slight tendency for academic research to deal with personalization and advertising withing the HTT sector [163,164], a fact that indicates that personalized advertising is a promising trend within the HTT domain, with manyresearch extensions. Personalization is the future of digital advertising and the common denominator of every digital marketing activity in favor of higher conversion rates and brand awareness. The HTT sector needs to invest in hypertargeted advertisements, and not just continuously bombard consumers with over-the-top ads, with the use of market segmentation via online reviews [165].
- (b) User-generated content (UGC): The traditional strategy of pushing massive marketing messaged to all no longer drives clicks. The key to tourism business success lies in the development of user-friendly technology that urges users to post reviews and ratings on social media, building in this way trust and brand empowerment [166]. This is where a new opportunity arises: HTT businesses should use social media as an engagement channel for personalized advertisements. However, in order to be seen or heard on such online platforms, there is an urgent need to re-evaluate the content in the first place. The shift toward sustainable digital advertising is increasingly under the scope. If the ultimate goal of hospitality companies is generating more targeted traffic, then showcasing the company's sustainable personality is of the essence [167]. However, it is not only the content that matters, but also the way that this brand-specific content is created and published on social media. Travelers perceive UGC as an empowerment factor that shapes their travel planning [168]. Displaying authentic user-generated content by customers and/or brand evangelists is able to influence engagement, increase conversion rates, and act as a form of modern e-word-of-mouth communication [169].
- (c) Artificial Intelligence (AI) in digital advertising: With an eye to deliver top-notch services, the hospitality industry needs to enhance customer experience. Top-notch services start by understanding the customer journey across all touchpoints and profiling guests. The statistical analysis demonstrates that digital branding and social media interaction are closely associated and interdependent variables. Interactions happen through "likes", "shares", and "posts"; however, in order to achieve higher levels of customer satisfaction, boost retention rates, and drive sales, personalizing services through automation and big data is the key to unlock business potential. The

HTT providers heavily rely on AI-powered tools, such as chatbots, virtual reality, and language translators, to boost the user experience [158]. AI is revolutionizing the hotel industry since it takes personalization one step further by actually detecting patterns in data and forecasting behavioral attitudes [38].

Customers' preferences are constantly changing, raising concerns on the future of digital advertising within the hospitality sector. Social media has transformed the decision-making process of travelers by choosing their travel services based on social sharing, reviews, and ratings, which in turn manipulates the HTT companies' reputation [3,60]. More travelers are using social platforms such as Facebook, Instagram, and YouTube as search engines, making social media advertising an important tool in the tourism industry [4,30]. As consumers become more digitalized, they are mesmerized by sharing videos, photos, reviews, and opinions of their travel experiences, building an influential web peer-to-peer content [16].

During the digital age, customers have heightened their expectations for superior services, leading tourism businesses to struggle with keeping up with the latest trends within hospitality marketing. Travelers' digitalization has altered the guest journey from linear to scattered. That said, travel companies are now able to reach their customers directly through social media and multiple touchpoints, making social media management important in all phases of the customers' online journey [85]. Emerging technologies, such as mobile social media [170], enable the industry to better cater to the need of the market by offering seamless personalized customer experiences through hypertargeted advertisements. Even small brands that leverage data-driven practices, such as social media analytics, are likely to develop long-term drivers of growth. With a focus on customers' lifetime value, hospitality brands can use personalized social media advertisements to increase their revenue, improve retention, and create brand awareness. The future of advertising lies in using AI-personalized marketing activities, with authentic users generating brand-specific content, that will successfully guide online consumers through the buying process.

5.2. Practical Implications

The current study suggests that the hospitality sector should invest more resources in analyzing the behavioral patterns of online users by utilizing big data analytics. By doing so, the tourism companies will be able to track existing trends and acknowledge the variables that greatly shape the online purchasing behavior of users based on their social media interaction. Whether it is a well-established brand or not, the opportunities arisen by the social media analysis could impact the level of customers' engagement, leading to higher conversion rates, driving sales, and achieving higher levels of brand recognition and establishment. Therefore, there is an urgent need for companies within the hospitality sector to be supported by good data analysts familiar with the latest developments of big data [171]. The research further highlights the importance of personalization and user engagement-content to e-WOM, suggesting to tourism businesses to welcome posts made by customers and employees. In addition, it paves the way for companies to adopt AI technology, for instance, chatbox and voice search, in an attempt to offer superior services and improve the customer experience.

5.3. Limitations and Future Research

Specifically, the main focus of this paper is to identify the importance of personalization in optimizing brand strategies through social media platforms. While our proposed methodology based on data from 10 hospitality websites and their social media platforms (Facebook and Instagram) represent novel, robust evidence on the impacts of social media advertising on brand optimization, the proposed methodological framework could be expanded and generalized to other tourist companies.

The current study raises the alarm regarding customers' privacy concerns, as personalized advertisements use personal information. In addition, more attention needs to be

placed on the content of personalized advertising, so as to examine the role of sustainability as well as culture in digital marketing activities. Eventually, our proposed methodology and framework could offer deep insights to other markets as well and reflect users' on-line behavior, such as the healthcare sector, transportation sector, etc. Moreover, deep research within the hospitality sector, such as on luxury hotel branches, will elucidate the effectiveness of the proposed methodology.

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