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► **To cite this version:**

V. Senthil, Susobhan Goswami. An Exploratory Study of Twitter Sentiment Analysis During COVID-19: #TravelTomorrow and #UNWTO. International Working Conference on Transfer and Diffusion of IT (TDIT), Dec 2020, Tiruchirappalli, India. pp.487-498, 10.1007/978-3-030-64861-9\_43 . hal-03744788

**HAL Id: hal-03744788**

**<https://inria.hal.science/hal-03744788>**

Submitted on 3 Aug 2022

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# An Exploratory study of Twitter Sentiment Analysis during COVID-19: #TravelTomorrow and #UNWTO

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## Abstract

**Purpose:** The COVID-19 has impacted travel and tourism like no other event before in history and Tourism is the hardest hit of all economic sectors. As of now, 96% of all worldwide destinations have introduced travel restrictions in response to the pandemic. Analyzing the impact of COVID-19 sentiments throws some light on the overall situation and provides insights and guidance for recovery measures.

**Design:** The research focuses on the collection of tweets referring to #Travel-Tomorrow online campaign and tweets from #UNWTO subsequently evaluated through a sentiment analysis using NViVo.

**Findings:** We analyzed the twitter sentiments in a systematic way and investigate the insights of twitter sentiments in COVID-19 situation. Our research result shows the valence of sentiments such as positive, moderately positive, very positive, negative, moderately negative and very negative sentiments which are helpful to the tourism stakeholders for their decision making.

**Research Implications:** The key insights, themes, subthemes and sentiments which are useful to the policy makers for their strategic decision making and the implications of this research is helpful for the academic and tourism practitioners in tourism industry.

**Originality:** The insights of this research are helpful to Destination Marketing Organizations of developing countries to popularize their destinations and helpful for the faster recovery measures from the pandemic situations.

**Keywords:** Electronic Word of Mouth, Twitter Data Analysis, COVID-19 Sentiments, Destination Marketing Organization, Strategy.

## 1 Introduction

Information sharing platforms on the internet have shifted from being relatively static websites, to become dynamic with socio-cultural exchanges between a sender and a receiver. In addition to the rise of users, technology has enabled the number of options for near synchronous distribution of digital data characterized by mobility and wearability (Dimitrios Kotsakos, 2015). These fusions of technological developments have

boosted up the number of potential participants and the volume of synchronously shared destination eWOM (Dan Wang, Xiang, & Fesenmaier, 2014). This has permitted direct studies of technology influences on any event or a social cause. Here we take the fecundity of pandemic Covid 19. The effects are phenomenal and changing lives of millions. All facets of human life have been struck, not the least of which is a basic intention of human beings to see the unknown, and to visit places not seen hitherto. In the absence of visits or in the event of curtailed visits, like cutaneous pigmentation occurring, tourists take to sharing their experiences, opinions, moods, emotions and other sentiments in digital channels such as YouTube, Twitter, FaceBook, and others. Marketing has fructified more on packaging existing resources and assets of a tourist destination, and onward sales to new markets (Scott McCabe, 2014), basing on opinions and sentiments vented out. Hongbo Liu, et al (2018) presents the idea of 'social envy' that emanates from social posts of visiting luxurious vacation spots. In a way then, Twitter handles incite millennials to visit such places. Financial capacity though determines travel, but the intention remains.

In this research we used Twitter sentiments as an e-WOM; Twitter is a social networking service in which users post and interact with messages known as "tweets". Registered users can post, like, and retweets, but unregistered users can only read them. Twitter interaction enriches the value exchange between consumers and marketers. Twitter as a crowd sourced messaging service. The United Nations World Trade Organization (UNWTO) is a leading global organization promoting tourism for sustainable development. In this paper we researched the #TravelTomorrow an online campaign promoted by UNWTO with the tagline "by staying home today, we can travel tomorrow". The main objective of this paper is to explore the twitter sentiments with macroscopic (#UNWTO) and microscopic (#TravelTomorrow) data analysis. The flow of this paper is as follows; Section 2 discusses the literature review on how the tourist sentiments are captured, modelled, and analyzed in e-WOM. Section 3 discusses the conceptual framework proposed in our research. The section 4 shows the research methodology and the findings are discussed in section 5 and the final section discusses the theoretical and practical implications with conclusion.

## **2 Literature Review**

This study draws upon a resource and capabilities-based perspective (Kevin Trainor, 2012) as the theoretical basis. According to this perspective, a firm is properly viewed as a collection of resources, such as brand names, reputation, in-house IT knowledge, skilled employees and capital (Birger Wernerfelt, 1984). Organizational capabilities (or competences) can be generated from such resources and, as a result, lead to competitive advantage. Organizational capabilities are shown in different forms, including business processes (David Teece et al., 1998), routines (Robert Grant, 1999) and IT deployment and use (Anandhi Bharadwaj, 2000). Resources allow sentiments to develop if used and delivered properly to consumers. Accordingly, moods of people are positive or negative

and have been found to make more optimistic or pessimistic in travel decisions (Mina Dragouni et al 2016). According to Robert M Grant (1999), a capability is ‘a regular and predictable patterns of activity’ (p. 122), such as customer service, new product development, advertising and technology adoption and use. In technology contexts, Ananthi Bharadwaj (2000) noted that IT capability is a firm’s ability to leverage IT for organizational benefit. The adoption and use of organizational technologies, which varies among companies, largely rely on firms’ resources (Mario Caldeira et al, 2003). This resource and capability perspective has been adopted in social media contexts (Kevin Trainor, 2012).

Within this framework, Tweets are an important resource, being a reservoir of information. Destinations and sentiments too are a vital resource that are amenable for competitive advantage. A Twitter user profile includes a description of the user, his or her profile age, number of followers (both individuals and groups) and other user information. Twitter portrays public destination and eWOM at the time it is generated. Twitter members take recourse to it for public conversations, information-sharing (including eWOM) disseminating news and self-promotion (Krishnamurthy, Gill, & Arlitt, 2008).

While other social media platforms have significantly larger audiences (for example, Facebook), Twitter postings are public by default, enabling participation without prior social (Facebook) or professional (LinkedIn) ties (Zhang, Jansen, & Chowdhury, 2011). Though Twitter is a mass platform albeit with a difference of concise comments, a destination eWOM participant may use it for cogent reasons. Overall, it makes up an index of public online activity that can encapsulate empirical scale, structure and geographic distribution of information (Takhteyev, Gruzd, & Wellman, 2012). On a Twitter platform, anyone can post views, due to low barriers for participation; tweets can be shared via email, dedicated applications (apps) or SMS (Waters & Jamal, 2011). The medium is also a flexible communications mode that can support multiple nodes of communication from one-to-one and many-to-many (Evelien D’heer et al 2015). Not only that, Twitter also throws insights into online communications while activities are happening.

A low time lag for updates (Zhao & Rosson, 2009) spurs reporting of events or festivals while activities are occurring. Unlike other platforms, Twitter metadata (user profile, location, time and interaction data) are widely available to provide detail about the characteristics of users sharing eWOM (Kwak, Lee, Park, & Moon, 2010). In addition, organisations archive Twitter data accessible at later date (Proferes, 2016). These ingredients (public posts, low barriers, timely, archiving) make it a fertile ground for research in challenging times like Covid. A limitation here exists, however, is that Twitter users tend to be younger and are located in urban areas.

Coming to COVID-19, this pandemic is a witness to fierce competition. Industry contours are changing and so also sentiments. Exploring and deciphering the trends and sentiments of the industry can provide a clue to face competition. Only creative and innovative destinations can survive in this competition from the post Covid-19 macro-economic situation. Innovations are continually implemented in Social Media (stories,

lives, stickers) which makes tasks interestingly creative for DMO employees (Adriana Wacker et al 2020). In this context, Che-Hui Lien et al (2018) examines the functional and symbolic value linkages between positive moods and WOM. Not to be left out is the visuals. Anja Dnhopl et al (2016) discusses the practice of selfie taking in specific to the visual culture of the self. Even the colour compositions of visual UGC count for consumer response as per Nima Y. Jalali et al (2016)'s study.

The newly discovered twitter sentiments on tourist destination are quite actionable similar to e-WOM and can potentially lead to higher level of credibility as widely studied by Peter Lugosi (2016). Coming to content, Myshkin Ingawale et al (2013) examines whether high and low quality of User Generated Content differs in their connectivity structures in Wikipedia. High quality content will make room for dense connectivity which in turn, will make for quality e-WOM. Mood is also a determining factor. Mina Dragouni et al (2016) analyses why the moods of people is positive or negative and have been found to make more optimistic or pessimistic in travel decisions. Both cognitive and affective values influence travel tweets and so the intention to travel. Where than DMOs can take refuge? DMOs can plan downstream activity that was scarcely touched in literature before. Past research concentrated on reviews. Potential visitors observing the destination via social media reviews might have been confused by the dizzying array of updates. To clear this confusion, marketers or DMOs have to find the area of intersection between credibility of reviews and genuine consumers' interests. Only then, a suitable sharp marketing strategy can be devised. However, reviews or comments may be sporadic or a gush of feeling or a haphazard observation. As such, it needs more scrutiny. What is apparent however is that consumers' tweets of comments and implementing firm's suggestions jointly can make the purchase decision.

In the event of Twitter sharing, writers may adopt simple heuristics (i.e. mental rules) that focus attention on updates shared from the point of the experience (Aladhadh, Zhang, & Sanderson, 2014). In this scenario, hubs play a critical role in the cohesion of local and global destination e-WOM networks. Due to their high visibility, they reduce the confusion community participants may face in their search for useful information. Celebrities, media or institutions, whose identity is independently verifiable and therefore have source credibility, can act as hubs. A dynamic flow results.

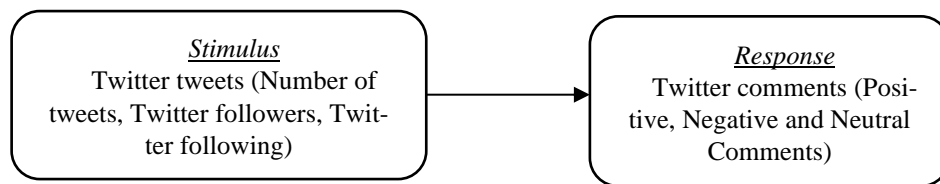
Based on the review of literature, the Stimulus-Organism-Response (SOR) theory is an appropriate thematic foundation for analyzing the Twitter sentiments. This proposed theory foundation also helps to diagnose COVID-19 scenario with a Model laid down in discussion. The moot research question is Does #TravelTomorrow and #UNWTO twitter sentiments are positive or negative in Covid-19 scenario?.

### **3 Research Model and Methodology**

The online campaign of #TravelTomorrow by the #UNWTO tweets are taken for our research analysis in specific to COVID-19 situations. Why? Because the Twitter

sentiments of #TravelTomorrow and #UNWTO have a massive impact on social networks and is being embraced by a growing number of countries, destinations and companies linked to tourism, cities, media outlets and individuals from all over the world. We used sentiment analysis on tweeter comments to systematically extract, quantify, and study the affective states and subjective information of twitters. The figure 1 depicts the conceptual framework of our proposed research work. The number of followers, number of following, number of tweets in the twitter channels (#TravelTomorrow and #UNWTO) are act as stimulus, users of twitter act as Organism and their comments manifest as a response. The data for these stimulus, organism and response variables are collected automatically almost in real time which is cheaper than the traditional techniques using Ncapture.

Antoni Serra Cantallops (2018) and Van Noort G, W. L. M. (2012), highlighted that people with high self-esteem are more likely to share and discuss their experiences online. We assume that the tweeter comments are trustworthy and are generated by the self-esteem public. The exchange of tweets has an effect on perception and likelihood to visit or increase the attractiveness of the destination. Opinions are in the garb of comments. It is classified as positive sentiments, negative sentiments, moderately positive sentiments, moderately negative sentiments, very positive sentiments and very negative sentiments and is analyzed qualitatively using NVivo.

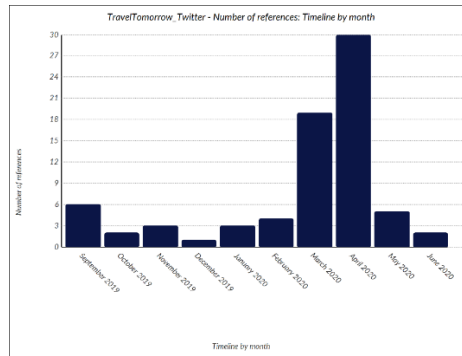


**Fig. 1.** Conceptual framework of Twitter Sentiment Analysis

Information from secondary sources is very useful as it exists for almost any theme and can give pointers to current trends and issues. Secondary data are collected from the publicly available sources on Twitter channel. It refers to the information collected through direct observation of actual online behavior. Users may create an account for free while the tweets are freely accessible online and this online observed secondary data is helpful in controlling the common method variance with reduced measurement error. The samples are collected using Ncapture and qualitatively analyzed using NVivo. By dint of this qualitative nature, sentiment analysis has started acquiring top attention of researchers. One can investigate the polarity of the twitter sentiments on selected twitter tags #TravelTomorrow and #UNWTO. The number of followers, number of following, number of tweets, high frequency of words and sentiments of comments in these tweets throw up interesting insights which are helpful to the DMOs for better understanding of their destinations.

## 4 Data Analysis and Findings

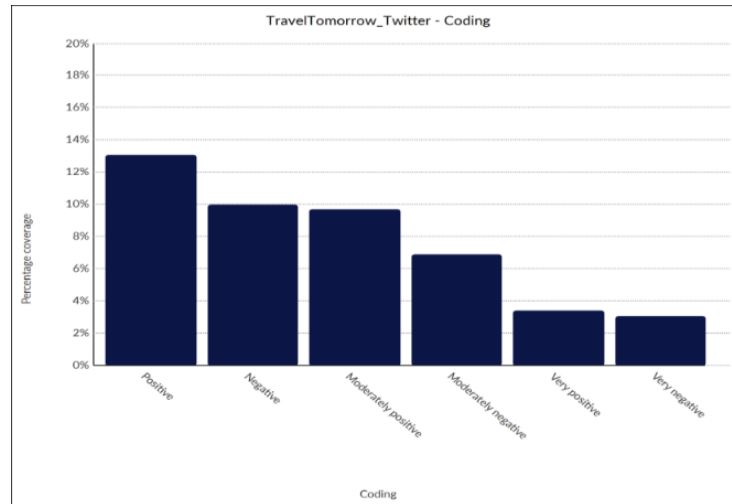
4.1. Microscopic Twitter sentiment analysis: The NVivo software is used for qualitative data analysis for #TravelTomorrow, it has number of followers 48, number of following 111 and the number of tweets 102. The bar-graph in figure 2 depicts the frequency of references for #TravelTomorrow, most of the conversations occurred in the month of April 2020, and it was the starting period of Covid-19 pandemic, where most of countries are announced their lockdown and many travellers rescheduled or cancelled their trips. The table I shows the different hashtags such as #stayhome, #staysafestayhome, #staycation, #travelpodcast, #newepisode, #socialdistancing and #TravelTomorrow are actively participated in online campaign by UNWTO. The bar-graph in figure 3 shows the coding percentages of sentiments, positive (13.07), negative (9.96), moderately positive (9.70), moderately negative (6.90), very positive (3.38) and very negative (3.05) in #TravelTomorrow. The total percentage of positive sentiments (26.15) is higher than the negative sentiments (19.91) that indicates more number of positive efforts are taken by the DMO's during the COVID-19 pandemic.



**Fig. 2.** Month-wise frequency of #TravelTomorrow sentiments

**Table 1.** Weighted percentage of hashtags

Word	Length	Count	Percentage
#traveltomorrow	15	17	1.70
#stayhome	9	16	1.60
#staysafestayhome	17	11	1.10
#staycation	11	10	1.00
#travelpodcast	14	8	0.80
#newepisode	11	5	0.50
#socialdistancing	17	5	0.50



**Fig. 3.** - Sentiment analysis of #TravelTomorrow

4.2. Macroscopic Twitter sentiment analysis: The twitter data analysis of #UNWTO has number of followers (108431), number of following (3977) and the number of tweets of a week duration (3821) is used in this research. These twitter sentiments are captured from all over the world. The percentage of #UNWTO sentiments is, positive (14.22), negative (10.35), moderately positive (9.88), moderately negative (5.56), very negative (4.80) and very positive (4.34). The percentage of very negative sentiments is higher (0.46) than the percentage of very positive sentiments. We infer that this higher negative value may be the negative emotions of COVID-19 pandemic or bad quality of services from the tourism industry or negative emotions of twitter users. DMOs should carefully read these very negative sentiments to take appropriate actions or strategies to improve their destinations. The different themes and sub-themes of #UNWTO tweets are tabulated in Table II and the major themes of conversations are centered around Efforts, Future, Guides, Sector, Services, Tourism sector, Tourist, Travel, Travel restrictions. The major sub-themes are centered around COVID-19 is, Future: future crisis, future generations, future holidays, future trips, next future, resilient future, sustainable future, Sector: Covid19 travel sector, Tourism: recovery accessible tourism, getting emergency tourism, promoting peace through tourism, supporting tourism recovery, tourism destination recovery, tourism recovery, Tourist: million tourist arrivals, safety tourists, tourist confidence, travel restrictions, Travel: Covid19 travel sector, easing travel restrictions, responsible traveller, safe travel, travelling tomorrow, world travel19, travel restrictions, Travel restrictions: easing travel restrictions, lifting restrictions, travel restrictions and others. DMOs should spend quality time to read all these details of themes and sub-themes to explore the insights that are relevant to their business and devise appropriate strategies to keep their destinations tourist friendly.



**Table II.** The themes and sub-themes of #UNWTO sentiments

<b>Themes</b>	<b>Sub-Themes</b>
Efforts	gradual efforts, illustrating efforts, joint efforts, tireless efforts
Future	future crisis, future generations, future holidays, future trips, next future, resilient future, sustainable future
Guides	district level tourist guides, fledged guide, freelance guide, guide jobs, guides status, knowledgeable guide, level guides, little guide, qualified guides, regional guides, tour guide, word guide, affected sectors
Services	inbound logistic services, service qualities, standard services
Tourism Sector	abusive tourism, accelerating tourism, recovery accessible tourism, allowing tourism, boosting tourism, business tourism, coastal tourism, planning controlled tourism, cross-border tourism, cultural tourism, direct tourism, policies discussing tourism, domestic tourism, eco-tourism, european tourism, fun tourism, gastronomy tourism, getting emergency tourism, funding global leisure tourism, global tourism, family global tourism industry, heritage tourism, inbound tourism, inbound tourism policies, inclusive tourism, independent tourism, indian tourism, indian tourism industry, international tourism, international tourism receipts, kerala tourism, leading tourism, leading tourism destinations, love tourism, making tourism, performing quality tourism, promoting peace thru tourism, responsible tourism, restarting tourism, spanish tourism, package deal spanish tourism, package support tourism, supporting tourism recovery, sustainable tourism, tourism board, tourism bureaucrats, tourism committee, tourism companies, tourism destination recovery, tourism development, tourism government, tourism industry, tourism minister, tourism ministry, tourism professions, tourism recovery, tourism returns, tourism sector, tourism stakeholders, tourism supply chain, tourism worker, tourism workforce cultural tourism sector
Tourist	foreign tourist, foreign tourist arrivals, global tourist destinations, global tourist receipts, global tourists arrivals, inbound tourist, international tourist, international tourist arrivals, million tourist arrivals, tourist attractions, safety tourists, tourist arrivals, tourist confidence, tourist facilitators, tourist industry, tourist numbers, tourist protection, tourist traffic, travel restrictions
Travel	travel experts, accessible travel, covid19 travel sector, easing travel restrictions, must-see travel destination, outbound travellers, responsible traveller, safe travel, seamless travels, travel agencies, travel businesses, travel corridors, travel division, travel experiences, travel industry, travel insights, travel pros, travel sector, travellers, travelling tomorrow, world travel19, travel restrictions
Travel Restrictions	easing travel restrictions, lifting restrictions, travel restrictions

## 5. Discussion and Conclusion

*5.1. Discussion of Results* - Table II above shows themes and a panoply of sub-themes. Various types of 'tourist' can be termed marketing segments, 'services' are value added, and travel banner includes all value-chain activities. 'Sector' theme is the focus of all marketing efforts. Future connotes strategy. A plethora of 'Tourism' sub-themes are adding to the fanfare. The traditional approach to strategy is sequential: 1) Strategies are formulated, DMOs set goals, 2) strategies are implemented, and 3) performance is measured against the predetermined goal set. Such traditional control systems are termed 'single-loop learning' by Chris Argyris (1994). This model is more appropriate when the environment is stable and relatively simple.

As opposed to this model, we have a contemporary approach first given by James Brian Quinn (1992). Carefully integrated plans seldom work according to Quinn. Most strategic change process occurs incrementally-one step at a time. Mintzberg visualizes strategic change as crafting change like a potter. Leaders should introduce a sense of direction, some logic in incremental steps. So fixed ideas become dysfunctional in crisis times like Covid. Uncertainty looms large and nothing can be predicted. Strategies need to change frequently and opportunistically. Predetermined goals and milestones can prevent adaptability that is required of a functional clear strategy. As we see in Table II, all the themes are highly interrelated and interactive. Adapting to and anticipating both internal and external environmental change is crucial in Covid time. So information gleaned from tweets need to be controlled suiting whether or not a firm, or DMO is doing the right job. Another control is required here what is called 'behavior control'. It asks whether an organization is doing things right by listening to twitter sentiments. In such double-loop learning, a firm's assumptions, premises, goals, and strategies are continuously monitored, tested, and reviewed. Benefits are that time lags are shortened, changes in environment are detected early, and DMO's ability to respond with speed and flexibility is enhanced.

Tweets display experiences, moods, emotions and other sentiments which are classified as very positive, positive, moderately positive, moderately negative, negative and very negative. The exchange of these sentiments between tourist and potential tourists have a positive effect on the perception of destination and increase the attractiveness of the destinations. The loyal tourist is one whose experiences with the destination exceed their expectations and who provide very positive sentiments about the destination to others. The defectors feel neutral or moderately positive satisfied with the destination and are likely to switch to another destination for lower prices. DMOs should take adequate efforts to raise the satisfaction levels of defectors and turn them into loyalists. Even in the crisis situations such as COVID-19 pandemic, DMO's efforts if positive, are having positive effect on tourism and should carefully discern the very negative sentiments and grope on the details of themes and sub-themes to extract insights.

*6.2. Practical implications* - Any Strategy chosen must address information always on flows. Focus is of strategic importance as even in Covid-19 times, new flows and

frontiers are coming like iconic tourism, marine tourism. If DMOs have the ability to properly manage the large amount of these sentiments, they can design tailor-made services to the specific needs of tourists' requirements. Frivolous comments can be filtered out lest it can be pernicious for business results. DMOs can optimize their resources by targeting potential tourists instead of large audiences.

The locus of finding potential tourists lies within agencies, Govt departments, hoteliers, travel assistants and the ecosystem. Not only informed downstream activities like communications can tide over the crisis now but also upstream activities like product development on destinations can hike the score. Well designed tweets will achieve good reach and have the capability to positively influence the destination image. An image booster marketing plan together with associated activities can add sentiments which can act as 'psychological overhaul'. The positive and negative sentiments will reveal critical information to drive marketing managers to demarcate marketable segments, notwithstanding pricing and positioning tasks. Not all the negative comments are rumors; so the DMOs should take effective steps to reduce the undesirable impact of negative comments. In case of crisis situations like COVID-19, the guidelines by the DMOs can help both employees and customers. Not only words, but some form of pictography, symbols, caution, rejoinders can alleviate to an extent the anxiety of non-normal situation now. Based on the theoretical and practical implications and dearth of such studies on Twitter, its comments broach up for further study and findings. Specifically, how traumas can be avoided or negotiated for tourism intentions can be dealt with in future studies.

*6.3. Limitations* - There are two limitations found in this study, first, this study is restricted to only on #TravelTomorrow and #UNWTO; it limits the generalization of our findings. The second limitation is short duration of uploaded tweets that are taken in this research. Longitudinal data analysis will be considered for future research work. Many text-based features in tweets, such as the average rating of tweets and the length of the tweets can be the denominators for onward research analysis. These limitations may inspire future undertakings in this area.

*6.4. Conclusion* – Recent researchers have shifted from an interrogatory research framework to more listening based and interactive research. If the DMOs think of viral tweets, either they are funny or surprising that makes no sense to share. There are contagious tweets like awe or elevation or aha moments which people like to pass it to others. Different types of tweets by tourists lead to different impacts on destinations but identifying and leveraging them effectively is a challenging task. Several strong emerging markets have powerful implications for the future shape of tourism demand. In any case tourism demand should be made inelastic. DMOs should regularly post quality tweets on various newly created themes, such as cuisine, sporting activities, adventure, fishing trips, marine tourism, underwater restaurants overlooking marine life already opened in Norway. New vectors of inputs and outputs can emerge in the domain of tourism, may be giving Twitter the top slot for eliciting consumer opinion. Animators can inject new life into static attractions within destinations, which would be a cultural

capital in Tweets (Donald Getz & Page, 2016). Large-scale events can be perceived as part of a destination's offering of products, services and experiences, rendering them indistinguishable from the location in which they are staged.

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