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The impact of COVID-19 on tourism: Analysis of online reviews in the airlines sector

Paulo Rita [a,1,*], Sérgio Moro [b], Gabriel Cavalcanti [a]

[a] NOVA Information Management School (NOVA IMS), Universidade NOVA de Lisboa, Portugal
[b] Instituto Universitário de Lisboa (ISCTE-IUL), ISTAR, Lisboa, Portugal

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ABSTRACT

This research aimed to understand how airline companies are addressing the crisis generated by the Covid-19 pandemic and handling issues like cancellations and customer (dis)satisfaction. Research on online reviews from the most popular tourism website, TripAdvisor, was conducted through the collection of review posts from the leading 10 worldwide airline groups by number of passengers. These reviews were extracted from the sector's most impacted period during the pandemic – from the date where the first travel restrictions were imposed until the date where they began to be lifted again (from March to May 2020), which consequently led to a greater number of posted and shared reviews. A total of 885 reviews were collected and analysed with the help of the Python-based sentiment analysis tool *VADER*.

Results showed a very negative trend, which was mainly caused by issues related to refund policies and process, confirming the reported pandemic impact on this sector. Low-cost airlines revealed a lower customer satisfaction rate when compared to traditional ones, while most of the posts were related to Loyalty/Competitiveness, which affected brands' overall equity. This study enables to better understand, from the customers' perspective, how airlines were able to deal with the severe impact of the COVID-19 pandemic. Through such knowledge and subsequent critical discussion, we unveil the critical issues that have led to unsatisfied customers, helping to build up the body of knowledge on airlines' recovery after the pandemic.

1. Introduction

In 2019, a novel coronavirus disease outbreak emerged in the most populous city of central China, Wuhan. The virus quickly evolved and spread across borders, affecting 215 countries and more than 100 million people worldwide (Worldometers, 2020). Almost every industry suffered with it as countries were confined in quarantine attempting to maintain physical distancing and mitigate the propagation of the virus. The global airline industry was the first to halt, since international mobility concerns led to ground entire fleets of aircrafts worldwide, to prevent the virus to enter each country from abroad (Piccinelli et al., 2021). The aftermath of the initial shock and stop of businesses worldwide required from organizations radically different approaches to address concerns raised by the pandemic (Ayiine-Etigo and Amankwah-Amoah, 2021). The dramatic changes suffered by airlines in such a short period of time gave rise to specific strategies to deal with in-flight service, including hand hygiene, physical distancing, respiratory etiquette as well as flight postponing and even cancellations (Amankwah-Amoah, 2020a). Specifically, as Piccinelli et al. (2021) pointed out, airlines were flooded with refund requests which they could not at all fulfill due to unsustainable cash-flow and revenue situations. Such circumstances raised different sentiments from prospective travelers who could not travel at all, understood the huge impact to airlines while at the same time did not want to lose their already paid money (Piccinelli et al., 2021). The pandemic has led to subsequent strategic renewal by airlines, which needed to steer through the COVID-19 crisis by pushing organizational changes to boundaries that would not be conceivable before the pandemic (Amankwah-Amoah et al., 2021). Additionally, by grounding fleets, the resume of flights raised further and higher concerns from the public opinion about the pollution caused by aircrafts, with governmental bodies such as those from within the European Union promoting environmental sustainability

* Corresponding author.
E-mail address: prita@novaims.unl.pt (P. Rita).

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(Amankwah-Amoah, 2020b).

Under the abovementioned context, we aimed to answer through the customer perspective to the following two research questions. How did the virus impact the airline sector in terms of customer satisfaction? How did airlines handle flights cancellations and the issues that arose with them? To assess this, four hypotheses were tested through an extensive analysis of the customers opinions shared on the internet. Specifically, the chosen platform of analysis was TripAdvisor which constitutes the largest and most popular community of tourism reviews (Kinstler, 2018; Lock, 2019). To process the data gathered, a Python-based sentiment analysis of reviews over the leading 10 world-wide airline groups (by number of passengers in 2019) was conducted, using the *VADER* algorithm. Each post's satisfaction grade was extracted, alongside the reasons leading to those opinions and the brand's characteristics affected with it. The chosen time frame of analysis was from the date when the first travel restrictions were imposed until the date where they began to be lifted again (March–May 2020), as it constitutes the period with greater number of reviews made and most impact on the sector. In the case of Chinese companies, the study time frame was anticipated to start in January 2020, as this month was when the first restrictions were imposed by that country (Gibbs et al., 2020).

The main goal of this investigation is to evaluate how airlines are addressing their customers' issues and situation during this period of uncertainty (to later compare the outcomes with what has been reported in the media), and to build a knowledge base that airlines can leverage to assess the market and take decisions upon it. As a study with few to no precedents, it aims to help airline companies' executives by gathering insights that could be useful for strategic decisions (Ban and Kim, 2019; Sezgen et al., 2019), as the report can be used in the way that best fits each of these companies – either with focus on their own business and clients' needs, or with attention being paid to their competitors and how to take the most out of their weaknesses.

2. Literature review

2.1. Impact of COVID-19 on tourism

As an industry whose foundations rely on people's travelling and consuming behaviours, the COVID-19 pandemic situation came to halt the second-fastest growing sector in the world (Leposa, 2020), which had a $9.25 trillion contribution to the global economy in 2019 (Lock, 2020). The same report also stated a $264.53 billion projected travel and tourism revenue decline from 2019 to 2020 due to COVID-19. Later, Lock (2022) reported a −74% percent change in international tourist arrivals worldwide during COVID-19 as well as government legislation/restrictions as the leading barrier to worldwide travel during COVID-19. The negative impact of the virus goes even further as 50 million people became at risk of losing their jobs in this sector (Lombrana, 2020).

Looking deeper at the airlines' sector, the main focus of this research, the situation is even worse. As a sector that has had great difficulties in crisis situations (Ruiz Estrada, Park and Lee, 2020), airlines were forced to halt most of their scheduled flights (Kommenda, 2020; Pogkas et al., 2020). Because of that reason and with the increase of international travel bans, air transportation companies faced a widespread shutdown (Coulter and Farrer, 2020) – predictions pointed to a projected loss of about $314 billion worldwide (Topham, 2020). Indeed, the number of flight cancellations increased exponentially. As a way of minimizing these losses, most airlines offered vouchers/coupons to passengers whose flights had been cancelled, instead of refunds (Collinson, 2020) – something that did not please customers (Peachey and Park, 2020). A better approach from airlines managers was expected, since hospitality has become an industry where soft skills are now more critical than hard ones (Sisson and Adams, 2013). Despite the situation, this sector is expected to re-emerge over an extended timeframe (Baum and Hai, 2020). Knowing these circumstances there is a base for this work that further explores how these airlines' response has been done through researching online reviews.

2.2. Online reviews in tourism

This study is based on the analysis of online reviews from a tourism website, TripAdvisor. In the hospitality field, to achieve a superior customer experience management, several organization-wide activities must be addressed, such as technology and social media (Kandampully et al., 2018). In fact, the importance of online reviews, also called User Generated Content (UGC) and electronic Word of Mouth (eWOM), in the process of consumer decision making is increasing at a great pace (Saleh, 2018). Customers now tend to look online feedback before travelling (Mauri and Minazzi, 2013), while studies reveal that positive reviews bring financial benefits to hospitality companies (Neirotti et al., 2016), and passenger reviews also impact airline profitability and efficiency (Merkert and Pearson, 2015). Furthermore, eWOM has become a great influence in this industry (Litvin et al., 2018), playing a major role in tourists' decision-making and, therefore, increasing the adoption of technologies in this field (Law et al., 2014). When we look at statistics, we see that the numbers corroborate this increasing importance of online reviews, since 93% of consumers are influenced by them (Kaemingk, 2019). Thus, leveraging social media in hospitality has been a successful strategy (Zeng and Gerritsen, 2014). However, with this great volume of reviews online, one problem arises – relevance. In this matter, Park and Nicolau (2015) identified two very interesting perspectives: 1) extreme reviews have a higher impact in consumers' perception, and 2) negative reviews are always more powerful than positive ones. As it can be seen, a review's importance relies on aspects which lie in consumers' thinking and perception.

To meet consumers' demands, reliable and trust-worthy platforms are needed. In this sense, TripAdvisor is the clear leader, a website which is considered by many as the best review platform available (Schuckert et al., 2015; Moro et al., 2019). The same authors also refer that when taking these websites' content into consideration it then becomes crucial for companies to better understand their clients' priorities and needs. On the one hand, airlines can identify possible issues with their services, allocate resources according to customers' needs and evaluate general customer satisfaction. On the other hand, they can benchmark the competition and use that information for strategic purposes (Ban and Kim, 2019; Sezgen et al., 2019). Not assessing this kind of content could be harmful for companies, as pointed out by Brochado et al. (2019), which could lead to more negative reviews and to a decrease in brand's equity. Having trained employees who can handle these complaints in an effective and efficient way and provide the needed attention to their customers is one of the measures to be taken by airlines to increase the previously referred brand's equity (Liau and Tan, 2014). The prime goal is then to match the target expectations with customers' actual perceptions (Corbitt et al., 2003).

After conducting the background analysis, which addressed the three main aspects that are approached during this research, there is a base of knowledge that contextualizes the described pandemic situation (airlines sector crisis) with the study goal (assess customer satisfaction during its most impacted period).

3. Conceptual Model

3.1. Model design

This research intends to study the airlines' sector and how it was and has been impacted by the new coronavirus. Thus, there was a need to develop a model to better explain the elements and processes involved in this scenario. To develop such model, the following three stages of the process had to be assessed:

- First stage – the service delivered by the airline

- Second stage – the online review the customer made about that service
- Third stage – the impact of that review on the brand

The first stage is the one where the service takes place. When a customer decides to buy a trip, (s)he can do it either through online channels (like website or smartphone) or through offline channels (like helpdesks or stores). However, as pointed out by Shankar et al. (2003), Chen and Chang (2005) and Yang and Fang (2004), despite having the choice of using online services to buy a trip and handle the reservations, customers still have to experience offline the service itself. While the first stage relates to the offline factor, classifying the air transport sector in two aspects – ground service (which includes elements like information gathering, reservations and ticket purchases, airport check-in and post-flight service) and in-flight service (such as entertainment, food, and staff), the second one addresses the online aspect of it, where the quality of the website and the emails and phone calls conducted were evaluated. Considering all the mentioned studies, the current investigation then sets the first two categories of service delivered in the proposed model: *Online* – composed by the *Website*, *Emails* and *Phone calls,* and *Physical* – composed by *In-flight* and *Airport* services. During "normal" times, these two aspects (Online and Physical) would be the only ones representing an Airline service – both Cancellations and Delays would also be addressed in them. However, with the pandemic, the Delays and Cancellations that COVID-19 generated gained greater importance. For this reason and because they were reported as one of the main sources of dissatisfaction during the pandemic (Robinson, 2020; Laris, 2020; Brantley, 2020), as it was seen in the literature analysis, they arise as a third factor of analysis – Refunds. This third category is constituted by Vouchers and Money refunds, as they are the two ways an airline can reimburse a client, as also seen in the literature. Hence, this paragraph and its references explain the connections of the left column of the proposed model (Fig. 1).

The second stage is the one where customers evaluate the service they received. Depending on the customer's level of satisfaction about the experience they had, a written review can be classified as positive, neutral, or negative, based on the content's polarity (Cambria et al., 2013; Casaló et al., 2015). This explains the central column of the proposed model, where those connections are portrayed.

Finally, the third stage represents how the reviews affect the brand and its characteristics. This is further explained based on the models developed by Esch et al. (2006) and Sijoria et al. (2019). The model proposed by Esch et al. (2006) focuses on the aspects needed to build brand equity, while in the model put forward by Sijoria et al. (2019) a wider perspective is illustrated, where the Consumer Based Brand Equity is influenced not only by the different aspects that characterize a brand, as in the previous model, but also by eWOM. Regarding Brand Equity, many studies have investigated this concept and which elements affect it. The studies by Aaker (1991) and Keller (1993) are examples where elements like Brand Knowledge, Loyalty or Competitive Advantage are pointed as being connected to the increase/decrease of Brand Equity. Based on these models, this research addresses four main brand elements that affect *Equity*: *Image*, *Consistency, Loyalty* and *Competitiveness*. Hence, the models described in this paragraph constitute the foundation of the right column of the proposed model.

3.2. Research Hypotheses

The first hypothesis of this research intends to confirm if indeed the wide-spread media reports, like the ones from Peachey and Park (2020) and Collinson (2020), are faithfully representing the actual situation regarding the refunds and policies applied by airlines. This is described in the left column of the model of Fig. 1, where the reported delays and cancellations led airlines to reimburse customers with voucher/money refunds, which are categorized as *Refunds*. The first hypothesis is then set – **H1: Airlines are not being able to handle properly flight cancellations and delays.**

The second hypothesis aims to validate the overall customer satisfaction level during this period and how it was affected by the pandemic. As pointed out by Tegar et al. (2017), airlines must pay attention to all aspects of customer service, as these will afterwards impact the overall satisfaction. In the model of Fig. 1, the customer side can be seen in the central column. With this feedback, there is a base for the assessment of the average customer satisfaction level during the pandemic. Moreover, to understand the pandemic effect on this period, an analysis of the reviews related to *Refunds* and their weight in comparison to the reviews regarding the other two categories, *Online* and *Physical* service, must be made. By adding the knowledge of the level of satisfaction that was reported in the media (Peachey and Park, 2020; Collinson, 2020), we can then establish the second study hypothesis, which connection is seen in the model's central column, where the service reviews meet the negative end – **H2: The pandemic has negatively impacted the airlines average customer satisfaction.**

Next, the third hypothesis is divided in two. H3a aims to understand how airline companies' overall value (*Equity*) is being affected by the virus – **H3a: Airlines brand equity is being negatively affected by the pandemic.** When a review is done, most of the brand's characteristics are evaluated. The analysis of this research addresses four major

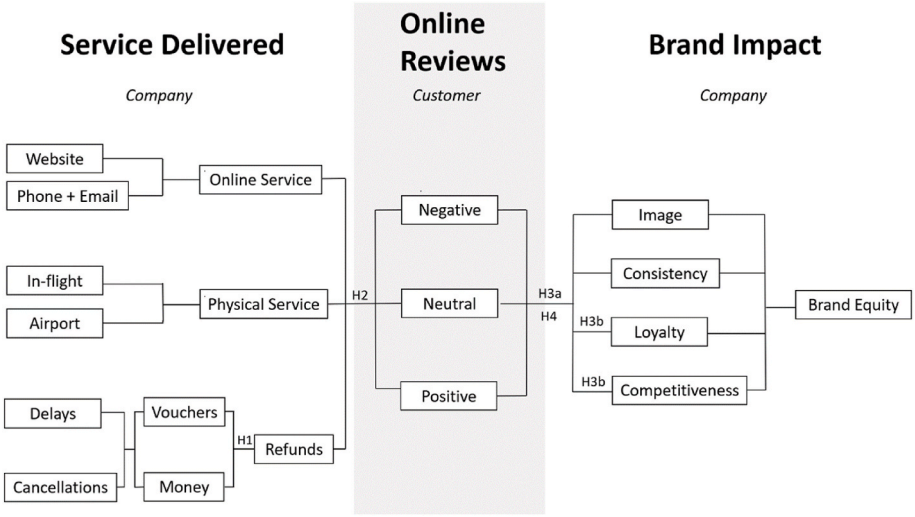

Fig. 1. Conceptual model and research hypotheses.

aspects of a brand: *Image*, *Consistency, Loyalty* and *Competitiveness* – these elements affect the overall perception of a company and influence future decisions of customers (Esch et al., 2006; Sijoria et al., 2019; Aaker, 1991; Keller, 1993). The first characteristic, *Image*, represents the view that customers have on their minds regarding a company, and their beliefs towards it (Keller, 1993; Kaemingk, 2019a). This is always present when customers interact with a brand, which also happens with *Consistency*. In turn, this second characteristic relates to the consistency not only of the service provided (e.g., quality, features) but also the values that the company supports, leading to trust and reliability (Eggers et al., 2013; Arruda, 2016). The third factor of analysis is *Loyalty*. This is followed by the last of the mentioned characteristics, *Competitiveness*, as they both address the same field. These two are conveyed in H3b – **H3b: Airlines customer service during pandemic is moving customers to the competition** – when a customer has a bad experience with a brand, the tendency is that (s)he looks to other suppliers to fulfil his/her needs, which decreases *Loyalty* (Aaker, 1991) in result of a lack of *Competitiveness* (Muniz and O'guinn, 2001; Winzar et al., 2018).

Finally, the fourth research hypothesis aims to extend the concept presented by Park and Nicolau (2015), which points that the customers perceive extreme ratings (i.e., 1 or 5 starts) as more useful and enjoyable than moderate ones, which in turn have a higher impact in the readers perception. The aim here is to find out to what extent these reviews could also constitute a majority, when compared to moderate ones. As so, hypothesis 4 is **H4: Customers tend to write more extreme reviews than moderate ones**.

4. Methodology

4.1. Target

This research looked into the 10 leading airline groups worldwide as these airlines were expected to be the ones delivering the best quality service to their clients, based on their dimension and number of passengers (Statista, 2020) – American Airlines, Delta Airlines, Southwest Airlines, United Airlines, China Southern Airlines, Ryanair, Lufthansa (Lufthansa Airlines, Eurowings, SWISS, Austrian Airlines, Brussels Airlines and Sun Express), China Eastern Airlines, IAG (British Airways, Iberia, Vueling and Aer Lingus) and Air China. These top 10 groups are composed by 18 airlines, being four of them low-cost (Southwest Airlines, Ryanair, Eurowings and Vueling), which in turn allows the comparison of service and customer satisfaction between traditional and budget companies.

4.2. Procedure

The process of analysis of the data from these companies was done through a sentiment analysis (e.g., Calheiros et al., 2017; Guerreiro and Rita, 2020), using the document-level approach, which extracts the general opinion of the review, considering the whole post as one unit (Alessia et al., 2015). This type of analysis, being a sentiment one, encompasses the following 5 stages of research (Alessia et al., 2015): Data Collection, Text Preparation, Sentiment Detection, Sentiment Classification and Presentation of Output.

Regarding the first stage (Data Collection), the extraction of the posts was made through the most popular, reliable, and trust-worthy tourism website, TripAdvisor (Kinstler, 2018; Lock, 2019). The results were filtered by period, where English written reviews from March to May were gathered. This time period, March to May 2020, was the first period where companies and customers were seriously impacted by the virus (Vinod, 2020), as explained before. Furthermore, for the Chinese airlines the period of analysis was extended back to January, as China imposed travel restrictions earlier than the rest of the world (Gibbs et al., 2020).

The remaining analysis stages were then addressed. To analyze the reviews, a tool named *VADER - Valence Aware Dictionary for sEntiment Reasoning* (Hutto and Gilbert, 2014) was used. This Python-based algorithm classifies a review's sentiment by providing a "compound" score, which varies from −1 (extremely negative) to 1 (extremely positive). These authors constructed a lexicon based in well-known sentiment banks such as the Linguistic Inquiry Word Count (LIWC), the Affective Norms for English Words (ANEW) and the General Inquirer (GI). They also added several lexical features which are common in social media posts, like slangs, emoticons and sentiment-related acronyms and initialisms – providing then a very solid and reliable tool, as explained by the authors (Hutto and Gilbert, 2014).

In the Text Preparation stage, the text of the reviews was formatted so that it could be read by the tool – orthographic errors were corrected, and general text misconfigurations were fixed (e.g., extra spaces).

Next, in the Sentiment Detection phase, the posts were analysed by the authors based on the proposed model in Fig. 1, to understand the main general reasons to cause those feelings (*Online Service, Physical Service* or *Refunds* – left column of Fig. 1) and, as a result, it was also possible to infer what brand characteristics were affected (*Image, Consistency, Loyalty, Competitiveness* – right column of Fig. 1), which in turn all affect the overall *Brand Equity*.

In the following Sentiment Classification phase, the main sentiment was drawn as result of the "compound" score given by *VADER* (*Positive* vs *Neutral* vs *Negative* – central column of Fig. 1).

Lastly, in the Presentation of Output phase, the results obtained were then presented and turned into insights to help better understand the situation and its causes. The detailed schema of the referred approach can be seen in Fig. 2.

4.3. Advantages and limitations of using data from online reviews

Given the widely use of online reviews within travel and tourism, datasets from online reviews have been extensively adopted for empirical research in these domains (e.g., Rita et al., 2022). There are important advantages as well as relevant disadvantages of using data from online reviews that need to be further discussed. The key disadvantages are scrutinized in the last section of the article by Moro et al. (2020), who also adopted online reviews for their study. These include the fact that a researcher using online reviews is limited to the available information on the selected platform. For example, if a deeper characterization of the individuals is needed and information is missing (e.g., age, gender), then the study renders unfeasible. As the same authors argue, this is a limitation common to any secondary data-based study. Also, Piccinelli et al. (2021) add that when users write reviews, they are not concerned in mentioning within the text the aspects researchers want to analyze, limiting reviews' usefulness. As both studies concur, such limitations might be addressed by collecting data from other sources or adopting a complementary primary data-based study.

Another important limitation stems from analyzing textual contents,

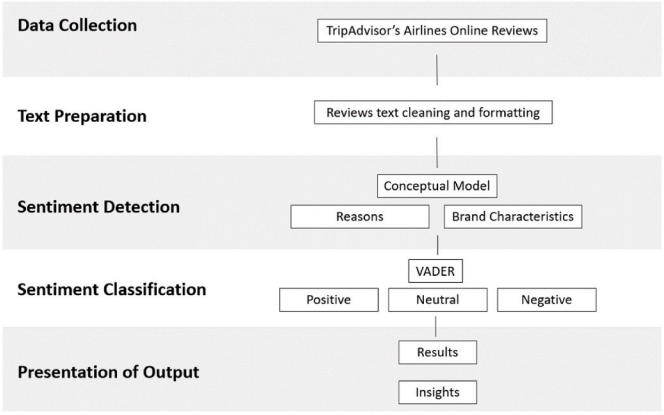

Fig. 2. Sentiment Analysis adopted approach.

given the subtleties of human natural language. Considering we adopted sentiment analysis, some limitations within this approach include lack of punctuation, spelling errors, and abbreviations, among others, which are quite common in online written reviews, since users are not really concerned with the writing format and correctness. Nevertheless, the use of figures of speech such as irony and sarcasm are even harder to detect and deal with by sentiment analysis tools such as *VADER* (Bagheri et al., 2013).

Despite the aforementioned disadvantages, the adoption of textual online reviews has several advantages which lead researchers to use them. Those include the ability to efficient and quickly handle and extract knowledge from a large set of texts, such as the 885 reviews collected and analysed. Additionally, the reviews were freely written by users and, thus, are less likely of being biased such as in primary data collected through questionnaires, since users usually do not feel compelled to participate without an incentive (Moro et al., 2020).

4.4. Testing the hypotheses

With the results obtained, it was then possible to either support or not support the four defined hypotheses.

To assess **H1** (Airlines are not being able to handle properly flight cancellations and delays), it was necessary to analyze all the reviews of the *Refunds* category and validate their sentiment. In order to confirm the hypothesis, these reviews must have a negative trend, which implies their dissatisfaction with the refund service; this would confirm what has been said on several media reports (Collinson, 2020; Peachey and Park, 2020) – lack of commitment by airlines in refunding clients, denial of money refunds/replacement with vouchers and negative online service experience (in website, through phone calls and in emails). If this condition is met, the first hypothesis will then be supported.

In order to validate **H2** (The pandemic has negatively impacted the airlines average customer satisfaction), results must show two factors: first, the overall customer satisfaction level must be negative; second, the weight of reviews related to *Refunds* must be greater than the weight of reviews regarding the other two categories, *Online* and *Physical* service. This must happen because, as previously explained, this category is directly related to the impact that the virus had on the sector. Consequently, if those reviews were indeed the largest part of the total reviews, there was a trend confirming the virus effect on the sector and in turn on the reviews. Meeting these conditions supports then the second hypothesis.

Regarding **H3a** (Airlines brand equity is being negatively affected by the pandemic) for the brand equity to be affected, the overall customer satisfaction must also be affected (Aaker, 1991; Keller, 1993; Tegar et al., 2017). As so, to confirm this hypothesis, the two following conditions must be met: overall customer satisfaction level must be negative and the weight of reviews related to *Refunds* must be greater than the weight of reviews regarding the other two categories, *Online* and *Physical* service.

H3b (Airlines customer service during pandemic is moving customers to the competition) has two conditions that must be met: reviews related to competition (which mention *Competitiveness* and *Loyalty* subjects) must be greater than the ones not mentioning it, which shows the customers' trend to look to other companies; and those reviews must have a negative trend. With those two conditions being satisfied, hypothesis 3b is then supported.

Finally, for **H4** (Customers tend to write more extreme reviews than moderate ones) the study must simply have a greater volume of extreme reviews, when compared to moderate ones. If this condition is met, then H4 is supported.

5. Results and discussion

The process of extraction, classification, and analysis produced a total of 885 reviews. From those, 567 (64.07%) were negative, 261 (29.49%) were positive and 57 (6.44%) were neutral. The average compound score was −0.22 – these base numbers showed a clear negative trend within reviews made during the chosen period, which was something expected. Out of these 885 reviews, Ryanair (95 reviews), American Airlines (91 reviews), and United Airlines (75 reviews) were the ones with most reviews.

Hypothesis 1. Airlines are not being able to handle properly flight cancellations and delays.

When looking at each airline group's feedback, it is possible to observe that Ryanair had the highest percentage of negative reviews (95.8%), followed by IAG group (77.8%) and American Airlines (68.1%). In terms of airlines, the three companies with lower reviews were Eurowings (96.4%), Ryanair (95.8%) and Vueling (95.4%). These three airlines are budget ones, which shows that low-cost companies had indeed a worse performance in terms of customer service when compared with traditional ones. From the compound score perspective, these results were corroborated since Eurowings (−0.72), Ryanair (−0.69) and Vueling (−0.66) were still the worst rated airlines (Table 1). Nevertheless, such results require a deeper discussion. For example, Vueling was given by Skytrax the best low-cost European carrier award, according to customers (Skytrax, 2021). First, such award consists in 23 months (September 2019 to July 2021), thus including almost seven months pre-pandemic, when airlines were not faced with the challenge to deal with massive cancelation requests. Also, despite an airline being ranked high, we may argue that due to the harsh context, all airlines were likely ranked very low on the scale. Thus, a higher ranked airline does not directly imply that customers were satisfied with it, it just means that customers were less displeased with that airline in comparison to the remaining ones. In fact, our results seem to corroborate such claim since Vueling was indeed the low-cost airline with less negative sentiments, in comparison to the other competitors. However, we also need to carefully reflect on the limitations of using data from social media. Specifically, online reviews tend to be biased, with a large percentage of users writing specifically when they are highly pleased or displeased by a service or product (Schoenmueller et al., 2020). Thus, we need to pinpoint that our analysis is likely leaving out a majority of customers with more neutral views of airlines, while the pandemic turned the previously larger percentage of highly positive reviews (as found by Schoenmueller et al., 2020) into a larger percentage of highly negative reviews. Such claim should be accounted for the remainder of this discussion.

Table 1
Total reviews.

Company	Number Reviews	Average Compound	Positive	Negative	Neutral
American	91	−0.33	19	62	10
Delta	70	0.21	38	26	6
Southwest	59	0.16	31	26	2
United	75	0.06	32	37	6
China Southern	51	0.04	24	22	5
Ryanair	95	−0.69	4	91	0
Lufthansa	63	−0.32	19	40	4
Brussels	22	−0.30	7	15	0
Eurowings	28	−0.72	1	27	0
Austrian	20	−0.35	4	15	1
Swiss	29	−0.32	6	21	2
Sun Express	7	0.37	5	2	0
China Eastern	41	−0.09	11	22	8
BA	68	0.06	33	29	6
Aer Lingus	54	−0.55	5	48	1
Iberia	32	−0.52	5	27	0
Vueling	43	−0.66	2	41	0
Air China	37	0.01	15	16	6
Total Reviews	885	−0.22	261	567	57

The second aspect analysed was focused on the main reasons that led customers to post a review about the companies. The first category, *Refunds*, was the one with highest presence among the three, as 64.3% of total reviews (Table 2) did some mention to them – either in respect to the reimbursement policies themselves or to processes to handle them. From the 569 *Refunds'* reviews, 83.7% were negative. This is portrayed in situations where companies, against their clients' will, offered coupons/vouchers instead of money refunds; situations where airlines cancelled/delayed flights without notifying customers; and finally, situations where the time it took to claim and receive a refund for a flight was excessive or did not happen at all. When we look at this negative statistic, we can infer that in fact the refunds question was the most commented category, while most of its posts were negative and matched the media reports. Hence, the first hypothesis was supported (H1).

The category which followed was *Online Services* related reviews – that represented 49.8% of total reviews. It covered all posts where customers addressed aspects like how well they were treated by phone operators, the quality of the website, how long they had to wait for their calls to be answered and, also, emails' response time. From a total of 441 *Online Service*-related reviews, 82.5% were negative. This showed that

Table 2
Reviews by reason of feedback category.

Company	Refunds	%	Online Service	%	Physical Service	%
American	52	57.14%	39	42.86%	67	73.63%
Delta	29	41.43%	21	30.00%	48	68.57%
Southwest	28	47.46%	15	25.42%	35	59.32%
United	40	53.33%	27	36.00%	37	49.33%
China Southern	20	39.22%	19	37.25%	38	74.51%
Ryanair	86	90.53%	54	56.84%	9	9.47%
Lufthansa	45	71.43%	27	42.86%	25	39.68%
Brussels	15	68.18%	13	59.09%	10	45.45%
Eurowings	27	96.43%	24	85.71%	9	32.14%
Austrian	14	70.00%	11	55.00%	7	35.00%
Swiss	24	82.76%	19	65.52%	8	27.59%
Sun Express	1	14.29%	1	14.29%	6	85.71%
China Eastern	11	26.83%	14	34.15%	32	78.05%
BA	50	73.53%	45	66.18%	23	33.82%
Aer Lingus	45	83.33%	36	66.67%	11	20.37%
Iberia	27	84.38%	27	84.38%	6	18.75%
Vueling	39	90.70%	34	79.07%	1	2.33%
Air China	16	43.24%	15	40.54%	21	56.76%
Total Reviews	569	64.29%	441	49.83%	393	44.41%

Company	Refunds + Online	%	Refunds + Physical	%	Online + Physical	%	Online + Physical + Refunds	%
American	18	19.78%	13	14.29%	2	2.20%	17	18.68%
Delta	14	20.00%	7	10.00%	1	1.43%	3	4.29%
Southwest	10	16.95%	2	3.39%	1	1.69%	3	5.08%
United	24	32.00%	2	2.67%	1	1.33%	0	0.00%
China Southern	11	21.57%	2	3.92%	3	5.88%	5	9.80%
Ryanair	47	49.47%	0	0.00%	1	1.05%	3	3.16%
Lufthansa	25	39.68%	6	9.52%	1	1.59%	1	1.59%
Brussels	11	50.00%	1	4.55%	0	0.00%	2	9.09%
Eurowings	16	57.14%	0	0.00%	0	0.00%	8	28.57%
Austrian	9	45.00%	1	5.00%	2	10.00%	0	0.00%
Swiss	17	58.62%	1	3.45%	0	0.00%	2	6.90%
Sun Express	1	14.29%	0	0.00%	0	0.00%	0	0.00%
China Eastern	6	14.63%	1	2.44%	3	7.32%	3	7.32%
BA	38	55.88%	1	1.47%	3	4.41%	4	5.88%
Aer Lingus	34	62.96%	0	0.00%	0	0.00%	2	3.70%
Iberia	23	71.88%	0	0.00%	1	3.13%	2	6.25%
Vueling	31	72.09%	0	0.00%	0	0.00%	0	0.00%
Air China	10	27.03%	2	5.41%	1	2.70%	1	2.70%
Total Reviews	345	38.98%	39	4.41%	20	2.26%	56	6.33%

Company	Just Online	%	Just Physical	%	Just Refunds	%
American	2	2.20%	35	38.46%	4	4.40%
Delta	3	4.29%	35	50.00%	5	7.14%
Southwest	1	1.69%	29	49.15%	13	22.03%
United	1	1.33%	33	44.00%	13	17.33%
China Southern	0	0.00%	28	54.90%	2	3.92%
Ryanair	3	3.16%	5	5.26%	36	37.89%
Lufthansa	0	0.00%	17	26.98%	13	20.63%
Brussels	0	0.00%	7	31.82%	1	4.55%
Eurowings	0	0.00%	1	3.57%	3	10.71%
Austrian	0	0.00%	4	20.00%	4	20.00%
Swiss	0	0.00%	5	17.24%	4	13.79%
Sun Express	0	0.00%	6	85.71%	0	0.00%
China Eastern	2	4.88%	9	21.95%	1	2.44%
BA	0	0.00%	15	22.06%	7	10.29%
Aer Lingus	0	0.00%	9	16.67%	9	16.67%
Iberia	1	3.13%	3	9.38%	2	6.25%
Vueling	3	6.98%	1	2.33%	8	18.60%
Air China	3	8.11%	17	45.95%	3	8.11%
Total Reviews	19	2.15%	259	29.27%	128	14.46%

companies were not able to provide a consistent online service, where customers suffered with long hours of wait over the phone, encountered glitchy websites, did not get responses to their questions via email (or when they got them, it was with a great delay), and faced rude and unfriendly customer service agents.

The last category, *Physical Service*, was present in 44.4% of all reviews. In those posts, customers mentioned aspects that went from the cleanliness of the airplane (covid-related), to the quality of the flight (comfort, food, staff), hygiene measures taken (mandatory use of mask and minimum distance between seats), airport service (help-desk quality) and overall staff quality (friendly, respectful and caring). This is the category with lowest percentage of posts, which can be explained if we consider that the majority of the chosen period's posts were at a time where flights were grounded, and airlines core operations were online and related to refunds. Therefore, its reviews were not as bad as the other two categories one's – 51.9% were positive, 35.6% negative and 12.5% neutral. As a more balanced category in terms of satisfaction grades, it reflected in customers opinions, where there was evidence of many good experiences (friendly staff, comfortable flights, quality food, covid measures taken and respected) as well as less positive ones (rude staff, tight seats, bad quality food and flights where covid safety measures were ignored).

Hypothesis 2. The pandemic has negatively impacted the airlines average customer satisfaction.

When looking at the overall customer satisfaction results a clear negative trend can be observed. In a wider view, almost 2/3 of the total 885 reviews were negative (64.1%) – having an average compound of −0.22, while in a deeper view, the results also point in that direction: *Online Service* – 82.5% negative vs 15.4% positive; *Refunds* – 83.7% negative vs 13.7% positive; *Physical Service* – 35.6% negative vs 51.9% positive. Consequently, with this evidence and with the data previously shown that *Refunds* was the category with highest presence among the three (64.3% of total reviews), that points towards supporting the second hypothesis of study (H2).

It is also important to notice that the three reasons of feedback were not mutually exclusive, which means that a customer could write a review and mention one, two or even the three simultaneously. In this context, it is important to highlight that 345 reviews (39.0% - more than 1/3 of all reviews) were a combination of *Online Service* + *Refunds*. This is a very relevant statistic, has it further confirms what was explained in hypothesis 1 and 2 – there is a trend of *Online Service* and *Refunds* reviews during the chosen period, caused by the pandemic, which halted flights and switched its core business to these areas. Additionally, it is also important to notice that 85.5% of the reviews combining these two services were negative, which translates in overall bad experiences when handling refunds through online channels. In fact, this means that there is a great relationship between handling refunds and using online services – when looking at the remaining combinations, the number of reviews is considerably lower: *Physical Service* + *Refunds* (4.4%/total), *Online Service* + *Physical Service* (2.3%/total), *Online Service* + *Physical Service* + *Refunds* (6.3%/total), just *Online Service* (2.2%/total), just *Physical Service* (29.3%/total), just *Refunds* (14.5%/total).

Hypotheses 3. H3a - Airlines brand equity is being negatively affected by the pandemic; H3b - Airlines customer service during pandemic is moving customers to the competition.

The third factor of analysis was related with the brand elements that were affected in each review. In this matter, the content of the posts was analysed to assess which of the four elements (*Image, Consistency, Loyalty* and *Competitiveness*) were mentioned and motivated the customer to write a review. When a customer makes a comment about a company, there are two characteristics that are always affected – *Image* and *Consistency*. On the one hand, a brand's *Image* constitute the consumer's general idea of a brand, which in turn is always evoked when a contact with it takes place (Keller, 1993; Kaemingk, 2019a); on the other hand, the brand's *Consistency* relates to the quality of service provided and if it maintains the standards expected by customers, as well as if the brand values are used and respected (Eggers et al., 2013; Arruda, 2016). These two factors are related to an internal perspective, and results of this analysis showed that they always come as a pair, constant in every review. From the external perspective, other two aspects are taken into consideration, *Loyalty* and *Competitiveness*. *Loyalty*, although referring to inner brand characteristics, addresses the trust and confidence that it incites for a customer to keep using its products/services when comparing to others (Aaker, 1991), while *Competitiveness* looks to what other brands offer and how one can differentiate from them (Muniz and O'guinn, 2001; Winzar et al., 2018). Similarly, to the first two characteristics, results showed that *Loyalty* and *Competitiveness* also formed a pair that appeared together – every review that mentioned the competition field, affected the *Loyalty* one. When a customer looked to a company's service, it also looked how other companies were handling the same issues and used that benchmarking as a review argument, which would then relate to the *Loyalty* field.

Regarding H3a, as seen in H2, the two needed conditions were met: the overall customer satisfaction results have a clear negative trend (64.1%, compound of −0.22) and *Refunds* was the category with highest presence among the three (64.3% of total reviews), hence supporting H3a.

As of H3b, from the total 885 reviews, 471 (53.2%) mentioned the two competition factors (*Loyalty* and *Competitiveness*), while 414 (46.8%) only mentioned the *Image* and *Consistency* of the airlines (Table 3). Statistics also showed that 69.7% of reviews mentioning the competition elements were negative, while reviews that did not mention competition were negative in 57.7% of the cases. In both situations, there was majority of negative reviews. This statistic, in addition to the one that highlights a higher percentage of reviews referring competition, portrays what was set at this hypothesis.

Hypothesis 4. Customers tend to write more extreme reviews than moderate ones

Regarding the satisfaction grade (1–5 stars) provided by customers, 60.9% of reviews were of 1 star, 3.2% of 2 stars, 6.4% of 3 stars, 9.8% of 4 stars and 19.7% of 5 stars (Table 4). These figures corroborate what was proposed in H4, that when customers write a review, it has a higher tendency to be an extreme one (i.e., 1 or 5 stars). In fact, 80.6% of the reviews were extreme, which is highlighted when we look at the

Table 3
Reviews by brand characteristics affected.

Company	Image, Loyalty, Competitiveness, Consistency	%	Image, Consistency	%
American	45	49.45%	46	50.55%
Delta	41	58.57%	29	41.43%
Southwest	38	64.41%	21	35.59%
United	35	46.67%	40	53.33%
China Southern	24	47.06%	27	52.94%
Ryanair	46	48.42%	49	51.58%
Lufthansa	37	58.73%	26	41.27%
Brussels	12	54.55%	10	45.45%
Eurowings	19	67.86%	9	32.14%
Austrian	10	50.00%	10	50.00%
Swiss	17	58.62%	12	41.38%
Sun Express	2	28.57%	5	71.43%
China Eastern	22	53.66%	19	46.34%
BA	39	57.35%	29	42.65%
Aer Lingus	30	55.56%	24	44.44%
Iberia	17	53.13%	15	46.88%
Vueling	25	58.14%	18	41.86%
Air China	12	32.43%	25	67.57%
Total Reviews	471	53.22%	414	46.78%

Table 4
Reviews by rating.

Company	1 Star	%/Total	%/Negative	2 Stars	%/Total	%/Negative
American	57	62.64%	91.94%	5	5.49%	8.06%
Delta	24	34.29%	92.31%	2	2.86%	7.69%
Southwest	26	44.07%	100.00%	0	0.00%	0.00%
United	35	46.67%	94.59%	2	2.67%	5.41%
China Southern	20	39.22%	90.91%	2	3.92%	9.09%
Ryanair	91	95.79%	100.00%	0	0.00%	0.00%
Lufthansa	39	61.90%	97.50%	1	1.59%	2.50%
Brussels	15	68.18%	100.00%	0	0.00%	0.00%
Eurowings	26	92.86%	96.30%	1	3.57%	3.70%
Austrian	14	70.00%	93.33%	1	5.00%	6.67%
Swiss	21	72.41%	100.00%	0	0.00%	0.00%
Sun Express	1	14.29%	50.00%	1	14.29%	50.00%
China Eastern	17	41.46%	77.27%	5	12.20%	22.73%
BA	29	42.65%	100.00%	0	0.00%	0.00%
Aer Lingus	45	83.33%	93.75%	3	5.56%	6.25%
Iberia	26	81.25%	96.30%	1	3.13%	3.70%
Vueling	40	93.02%	97.56%	1	2.33%	2.44%
Air China	13	35.14%	81.25%	3	8.11%	18.75%
Total Reviews	539	60.90%	95.06%	28	3.16%	4.94%
% Negative/Total 567				64.07%		

Company	3 Stars	%/Total
American	10	10.99%
Delta	6	8.57%
Southwest	2	3.39%
United	6	8.00%
China Southern	5	9.80%
Ryanair	0	0.00%
Lufthansa	4	6.35%
Brussels	0	0.00%
Eurowings	0	0.00%
Austrian	1	5.00%
Swiss	2	6.90%
Sun Express	0	0.00%
China Eastern	8	19.51%
BA	6	8.82%
Aer Lingus	1	1.85%
Iberia	0	0.00%
Vueling	0	0.00%
Air China	6	16.22%
Total Reviews	57	6.44%

Company	4 Stars	%/Total	%/Positive	5 Stars	%/Total	%/Positive
American	2	2.20%	10.53%	17	18.68%	89.47%
Delta	10	14.29%	26.32%	28	40.00%	73.68%
Southwest	1	1.69%	3.23%	30	50.85%	96.77%
United	14	18.67%	43.75%	18	24.00%	56.25%
China Southern	15	29.41%	62.50%	9	17.65%	37.50%
Ryanair	3	3.16%	75.00%	1	1.05%	25.00%
Lufthansa	5	7.94%	26.32%	14	22.22%	73.68%
Brussels	3	13.64%	42.86%	4	18.18%	57.14%
Eurowings	0	0.00%	0.00%	1	3.57%	100.00%
Austrian	1	5.00%	25.00%	3	15.00%	75.00%
Swiss	0	0.00%	0.00%	6	20.69%	100.00%
Sun Express	3	42.86%	60.00%	2	28.57%	40.00%
China Eastern	6	14.63%	54.55%	5	12.20%	45.45%
BA	11	16.18%	33.33%	22	32.35%	66.67%
Aer Lingus	2	3.70%	40.00%	3	5.56%	60.00%
Iberia	2	6.25%	40.00%	3	9.38%	60.00%
Vueling	1	2.33%	50.00%	1	2.33%	50.00%
Air China	8	21.62%	53.33%	7	18.92%	46.67%
Total Reviews	87	9.83%	33.33%	174	19.66%	66.67%
% Positive/Total 261				29.49%		

negative ones, where 95.1% of them were of 1 star. Therefore, H4 is supported. While this result confirms existing literature (e.g., Schoenmueller et al., 2020), the pandemic has turned the table upside down. Hence, while some previous studies acknowledged a larger percentage of extreme positive reviews in comparison to extreme negative ones (e.g., Hu et al., 2017), our results show the larger percentage on the negative end. Additionally, as Filieri et al. (2018) pointed out, extreme negative reviews are considered more helpful than the remaining ones by readers and prospective travelers. Thus, airline managers can use them to analyze and explore the specific subset of these reviewers, which may have particular demographics. Considering that those reviews are more helpful, if managers can reduce them, the propagation effect through the online community becomes more limited.

6. Conclusion

Our results support the four raised hypotheses. As for the first, we needed to look at the associated reason for these reviews, cancellations, and delays, which were comprised in *Refunds*, translating in posts related to refund policies and processes. The numbers show that it indeed had a negative score (83.7%) and that the contents of the reviews matched what was reported in the media channels. This negative rate represents the level of service provided by airlines in relation to this subject, which in turn supported hypothesis 1. In addition, stemming from our results, we argue that existing rankings that rate airlines according to customers do not necessarily reflect their opinion, since when all airlines generate negative sentiments from their customers, the baseline for comparison is low and, in general, customers are highly displeased with all the airlines.

As for the second hypothesis, we needed to look to the overall customer satisfaction results obtained. In fact, almost 2/3 of the total 885 reviews were negative (64.1%), while the average compound score was −0.22, which was also portrayed when we focused on each category's reviews results: *Online Service* – 82.5% negative, *Refunds* – 83.7% negative; *Physical Service* – 35.6% negative. Moreover, the weight of Refunds related reviews was also the greatest among the three categories – present in 64.3% of total reviews, comparing to the 49.8% of *Online Service* and 44.4% of *Physical Service*. As a result, there was a clear negative trend that supported hypothesis 2.

In relation to hypothesis 3, we needed to look to the brand characteristics that were affected with these reviews to assess if the hypothesis was supported. Having the same conditions of H2, H3a is therefore also supported. As of H3b, 69.6% of reviews related to competition (*Loyalty*, *Competitiveness*) were negative, while reviews that only covered brand's *Image* and *Consistency* aspects were negative in 57.6% of the cases. Out of the 885 total reviews, 471 (53.2%) mentioned competition factors (*Loyalty* and *Competitiveness*), while 414 (46.8%) only mentioned the *Image* and *Consistency* of the airlines. With the evidence of this negative trend and the existence of a higher presence of competition related refunds, hypothesis 3b was also supported.

As of hypothesis 4, results confirmed a greater presence of extreme reviews (80.6%) in the sample analysed, which thus supported this hypothesis.

The statistics obtained revealed and confirmed what has been reported in several media channels (Collinson, 2020; Peachey and Park, 2020) since the first restrictions were imposed – airlines are handling the crisis situation in a harmful way, mainly due to refunds related processes, which was translated in the analysed reviews. In fact, this research's first goal was to analyze the airlines sector during the initial phase of the virus, which produced negative results in relation to customer satisfaction. The comparison with the media reports came to reinforce the expected outcome, confirming the undermining situation this sector has been going through. As so, the study questions were then successfully answered.

The second goal of this study was to constitute a knowledge base that could be used by companies of the aviation sector to benchmark how the main brands are responding to the added demands of this period. In fact, by analysing the top 10 airline groups worldwide, 18 companies were assessed, being 4 of them low-cost. This diversity also added the possibility to understand how well the two different business models operated. It was concluded that low-cost airlines did indeed have lower customer satisfaction rates, since out of the four low-cost companies analysed, three (Eurowings, Ryanair and Vueling) were the worst rated companies out of the total of 18 airlines. With the information from this report, marketing managers and airlines stakeholders have the possibility to assess how their company operated in this period, but also how the competition has – this can further be strategically leveraged to increase one's brand equity and overcome the competition (Ban and Kim, 2019; Sezgen et al., 2019).

6.1. Research contribution and managerial implications

When it comes to the impact of COVID-19 in the tourism industry, and most specifically in the airlines sector, there are few studies addressing it – like the ones from Albers and Rundshagen (2020) or Nicola et al. (2020). Despite assessing several topics that affected airlines during the pandemic (e.g., socio-economic implications or strategic decisions made in face of the pandemic), none of the existing studies addressed the customer satisfaction aspect, which is a gap this study filled. The numbers, but especially the insights obtained add meaning to the existing information and are applied to the specific case of this new pandemic, which lacks real and practical intelligence. Thus, this research contributes to the advancement of knowledge by assessing this unexplored customer satisfaction field. It also has a clear practical application, as the gathered information comes from different companies with different types of business (traditional vs budget), it can be used by all companies in the sector, hence allowing these airline companies to improve and fill important gaps, take strategic decisions, and overcome rivals. By knowing how both one's own company and its rivals are seen by customers, decision makers can leverage this data to improve and fix their service and therefore improve reputation, brand image and equity, as previously explained.

In addition, our approach can be adopted by airlines to understand the customer perspective and how prospective travelers are raising their concerns through social media. In fact, in the current Era of Big Analytics, organizations must adopt data-driven approaches to deal with the post-pandemic world (Sheng et al., 2021), which brought users even more tightly connected through the Internet in the periods of confinement. Airlines can take advantage of data to design new strategies to excel in a competitive world where the pandemic shutdown a few while many others were supported by state funds aiming to their survival.

6.2. Study limitations and recommendations for future research

This report has several limitations since the gathered sample, although providing interesting insights, do not represent the totality of the industry. Specifically, as previously discussed, online reviews tend to reflect the more extreme ends of sentiments by customers. Thus, we are not able to understand the important perspectives of potentially more neutral customers. Furthermore, we do not know how the proportion of extremely satisfied versus neutral versus extremely dissatisfied customers changed due to COVID-19. From our analysis, we can only highlight that while previously to COVID-19 the positive extreme-end represented the larger percentage, now the negative extreme-end dominates. Additionally, while representing the leading groups of the sector and having companies with both business models (traditional and low-cost), it cannot be assumed that the remaining companies had the same customer service situations during the pandemic, and that the policies noted in this study apply to every airline. Future research on this specific topic – airline customer satisfaction during pandemic – can be approached in two perspectives: the study of customer satisfaction over the same initial period, but for a different target of companies (for example only low-cost airlines, or country-specific ones) or a study over the periods that followed this study's one.

Author statement

This manuscript is original, has not been published before and is not currently being considered for publication elsewhere.

The manuscript has been read and approved by all named authors. I further confirm that the order of authors listed in the manuscript has been approved by all of us.

The Corresponding Author is the sole contact for the Editorial process. He is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.

Paulo Rita.

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