Exploring travel agencies customers' loyalty motives throught machine learning analysis

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Abstract: *This article focuses on identifying the directions of changes in the decision-making process of purchasing package travels and the motives determining this purchase, as well as the impact of these motives on the affective, behavioral and global loyalty of travel agency customers during the COVID-19 pandemic. To achieve the research goal, a literature review and field research were conducted. In the case of secondary sources, the content analysis method was used to examine them, while data from primary sources (N = 1,508) were collected using an indirect survey technique (CAWI). The data analysis was carried out using machine learning – the variable importance method and the random forest algorithm. The obtained results allowed us to conclude that during the period of threat of the COVID-19 virus pandemic, tourist packages had been purchased less frequently, and buyers either had limited their trips to domestic trips or had adapted their travel destinations to the changing pandemic situation. The most important motivators that determined the choice of a travel agency during the COVID-19 pandemic were an attractive offer, a wide selection of package travels, previous positive experiences and trust in the organiser. It was also confirmed that in the face of the pandemic threat, buyers of package travels had been loyal to travel agencies. The use of machine learning allowed for more in-depth analyses and identification of motives that had a key impact on the development of buyer loyalty during the pandemic. The factors identified in the study encouraging buyers of package travels to maintain long-term relationships with their suppliers are belief in the value of the travel agency's offer, trust in the travel agency, individual approach travel agency employees, efficient service in the travel agency, and a wide selection of package travels.*

Keywords: *Tourist package, travel agency, customer behavior, random forest, COVID-19 pandemic.*

JEL Classification: *D12, Z31, Z33.*

APA Style Citation: Dudek, A., Jaremen, D. E., Michalska-Dudek, I., & Pellesova, P. (2024). Exploring travel agencies customers' loyalty motives throught machine learning analysis. *E&M Economics and Management*, *27*(2), 201–220. https://doi.org/10.15240/tul/001/2024-2-012

Introduction

The sale of organised tourist trips offered by tour operators constitutes one third of global tourism revenues (Statista, 2021). These trips are called many names, e.g., tourist packages, package holidays, tourist services packages, and

package travels (according to Directive (EU) 2015/2302 of the European Parliament and of the Council of November 25, 2015, on package travel and linked travel arrangements, amending Regulation (EC) No. 2006/2004 and Directive 2011/83/EU of the European Parliament and of the Council and repealing Council Directive 90/314/EEC). Similarly to the entire tourism industry, travel agencies have also been affected by the COVID-19 pandemic in 2020–2022. As a result, in the first year of the pandemic (2020) compared to 2019, sales of package travels decreased by 64%. Tourists gave up traveling most often under the pressure of legal restrictions prohibiting movement and crossing state borders. The effect of reduced demand for international trips was obvious and easiest to observe and estimate. Many researchers, however, assumed that in addition to the forced cancellation of travel, the pandemic had had a much broader impact on the behavior of tourists, including buyers of package travels. All the more so because information published by the internet platform Wasza.turystyka.pl in 2021 from interviews with representatives of tour operators and travel agents, as well as private conversations of the authors of the article with practitioners, signaled that the impact of the pandemic had not been limited to the decline in the number of organised trips, but also had affected other aspects of traveling (distance, length of stay, the method of transport, accommodation conditions) and on the decision-making process itself to purchase package travel and the expectations expressed by customers towards the service in travel agencies (Waszaturystyka, 2020, 2021). For this reason, the authors concluded that a more thorough understanding of the behavior of buyers of package travels was interesting both for scientific reasons and may have had a utilitarian value for representatives of travel agencies.

The main aim of the article was to identify the directions of changes in the decision-making process of purchasing package travel and the motives determining this purchase, as well as the impact of these motives on the affective, behavioral and global loyalty of travel agency customers during the COVID-19 pandemic.

There are four research questions asked:

RQ1: Was the decision-making process for purchasing package travels during the COVID-19 threat different from before the pandemic?

RQ2: What motivators determined the choice of a package travel supplier (tour operator) during the COVID-19 pandemic?

RQ3: Were purchasers of package travels loyal to travel agencies during the COVID-19 pandemic threat?

RQ4: Did the identified reasons for choosing a package travel supplier influence the loyalty of travel agency customers?

The data needed to solve the research problem undertaken in the article was collected from both secondary and primary sources. In the off-the-desk research, the method of systematic content analysis of secondary sources was used. In the case of primary research, data was obtained using a selected indirect survey method, namely a computer-assisted web interview.

1. Theoretical background

1.1 Loyalty of package travel buyers

Customer loyalty is one of the most important long-term goals for all businesses, including tour operators. Tour operators' benefits from buyer loyalty are clear. Customers make repeat purchases of a particular tour operator's service packages and, at the same time, they adopt an attitude favorable to the provider and the brand it offers (in tourism, the brand name is usually identical to that of the tour operator). Loyal buyers very often step into the role of a brand guardian, an ambassador and even a defender, which has positive connotations, especially in times of crisis. Indeed, as Rundle-Thiele (2006) notes, loyalty is a buyer's commitment to persist in a relationship with a supplier for better or worse. An exceptionally loyal customer does not seriously consider alternative brands and, moreover, often ignores other suppliers (Devece et al., 2015). The brand to which the buyer is loyal has a leading position and appears first in his or her mind when making a purchase decision (Han et al., 2011), thus achieving loyalty at the cognitive level (Caruana, 2002). Some researchers, such as Reichheld and Schefter (2000), argue that, from the customer's perspective, brand loyalty is a more important factor in the choice of supplier than price, while Chaudhuri and Holbrook (2001) and Rowley (2005) add that loyalty reduces the price sensitivity of the buyer.

The term "loyal" can be understood in many ways (Morgan, 1999), and its definition has

evolved over time (Campo & Yagüe, 2008). In the marketing literature, customer loyalty is usually defined as either behaviours (Newman & Werbel, 1973) or attitudes towards a brand (Bendapudi & Berry, 1997) or a mixture of both dimensions (Day, 1969; Dick & Baśu, 1994; Goldberg, 1981; Gremler & Brown, 1996; Jacoby & Chestnut, 1978; Oliver, 1999). In the first sense, known as behavioural, loyalty to a tour operator refers to a buyer's behaviour of repeatedly buying package travel from the same brand (e.g., Gonçalves & Sampaio, 2012). Loyalty interpreted in this way is primarily expressed in the frequency and volume (value) of purchases, which translates into the supplier's market share (Richard & Zhang, 2012). However, it does not answer the question of the reasons and motives explaining this repeat purchase (Dick & Baśu, 1994). In contrast, the rationale for loyalty, at least the psychographic one, is contained in the affective approach. In this view, loyalty is the result of buyers' emotions associated with a tour operator's brand, buyers' subjective feelings and their attitude towards the brand, which is expressed in conscious attachment to the brand and a desire to continue a transactional relationship with a particular supplier (Chen & Tsai, 2008). Affective loyalty also includes buyers' preferences, trust in the supplier, commitment to the relationship (Devece et al., 2015) and recommendation of the brand to other potential buyers (Konecnik & Gartner, 2007). The literature sources emphasise that loyalty is a function of thought (mental) processes involving evaluation (valuation) and the buyer's decision based on internal considerations (Andreassen & Lindestad,1998). Taking into account the two dimensions of loyalty mentioned above, Oliver (1999) stresses that loyalty expresses the deep-rooted obligation of the buyer to repurchase or recommend the brand in the future despite the influence of environmental (situational) factors and the marketing efforts of suppliers. Many other researchers present a mixed approach to the concept of loyalty. Among them, Gremler and Brown (1996) claim that the loyalty of a service buyer is the degree to which the customer repeats purchasing behavior with the service provider has a positive attitude towards him and considers using only this supplier when the need for a given service arises (for a tourist package). These combined dimensions yield what is known as global (mixed) loyalty, which is the product of attitudes and actions (Dick & Basu, 1994; Oliver, 1999). In a structured way, global loyalty is defined by Andreassen and Lindestad (1998), who state that it is a non-random (subjective), behavioural response (i.e., purchase), expressed over time by a decision-making individual, to one or more alternative brands among a set of such brands. It should also be mentioned here that recently, in the case of tourist packages, buyer loyalty is increasingly being considered in the context of the Internet, because the activities of travel agencies are undergoing dynamic digitisation. Statista (2021) reports that 70% of sales of organised tourist trips are sold in e-commerce. The loyalty of online travel package buyers results from their favorable attitude towards online shopping and repeat purchases in the online channel (Anderson & Srinivasan, 2003).

In fact, understanding the above-mentioned loyalty perspectives is important for the conceptualisation of research and the construction of an instrument measuring customer loyalty, because each of these interpretations has different consequences for the assessment of motives and ways of measuring loyalty (Gonçalves & Sampaio, 2012; Mazurek-Kusiak, 2020). Behavioral loyalty is usually measured by the frequency of purchases. Although, according to Devece et al. (2015), in the case of purchases of tourist packages, this is not an ideal measure due to the fact that, in essence, the packages are purchased rather sporadically (once or twice a year), not often, which is the result of their high cost and strict dependency on the use from the package from the client's free time (holiday), which is usually limited. A better measure would, therefore, be repeat purchases. An analysis of the literature provides important insight that is a trend in the study of behavioral loyalty, focusing on the level of customer intention/readiness to repeat the purchase (Amaro & Duarte, 2015; Del Bosque et al., 2006). The study of affective loyalty involves measuring buyer attitudes, which may result in repeat purchases. This measurement is much more complex and includes, among others: measuring satisfaction, brand preference over other brands, and the customer's tendency to recommend the supplier to others. In this approach, the measure may be the probability that customers will express positive opinions about the travel agency, recommend it to others and encourage others

to purchase the services of this agency, and the probability that customers will consider a given tour operator as the supplier of first choice when they have a need to use a tourist package (Richard & Zhang, 2012).

In studies on tourists' loyalty, an important role also play the factors that encourage people to be loyal, i.e., the determinants of loyalty. In the case of these studies, loyalty factors of tourism package buyers. The analysis of the achievements of previous researchers on this issue, including 30 relevant articles, deliberately selected from the Scopus and Web of Science databases, published over the last

Tab. 1: Determinants of travel agency customer loyalty considered in previous studies

Determinants of loyalty	Researchers
Satisfaction	Del Bosque et al. (2006), Lee et al. (2011), Setó-Pamies (2012), Major and McLeay (2013), Prause et al. (2013), Lai (2014), Silva and Gonçalves (2016), Yang et al. (2017), Rizal et al. (2020), Cetin (2020), Atsiz et al. (2021), Mursid and Wu (2022), Santos et al. (2022)
Perceived value of services/ relational benefits	Conze et al. (2010), Senders et al. (2013), Lai (2014), Roger-Monzó et al. (2015), Silva and Gonçalves (2016), Ronsana et al. (2018), Dudek et al. (2019), Albayrak et al. (2020), Mursid and Wu (2022)
Perceived quality of service/relationships/ communication quality of website/system	Lee and Cunningham (2001), Campo and Yagüe (2008), Huang (2008), Thi Phuong Thao and Swierczek (2008), Lee et al. (2011), Setó-Pamies (2012), Major and McLeay (2013), Lai (2014), Moisescu and Gica (2014), Roger-Monzó et al. (2015), Devece et al. (2015), Silva and Gonçalves (2016), Abou-Shouk and Khalifa (2017), Dudek et al. (2019), Albayrak et al. (2020), Rizal et al. (2020), Cetin (2020), Elgarhy (2022)
Trust in the supplier	Huang (2008), Setó-Pamies (2012), Prause et al. (2013), Lai (2014), Devece et al. (2015), Silva and Gonçalves (2016), Ronsana et al. (2018), Albayrak et al. (2020), Rizal et al. (2020), Santos et al. (2022)
Prices/transaction costs	Lee and Cunningham (2001), Campo and Yagüe (2008), Thi Phuong Thao and Swierczek (2008), Senders et al. (2013), Elgarhy (2022)
Emotional involvement of customers/customer identification with the company	Richard and Zhang (2012), Prause et al. (2013), Lai (2014), Yang et al. (2017), Elgarhy (2022)
Provider's brand and its image	Richard and Zhang (2012), Dudek et al. (2019)
Corporate social responsibility (CSR)	Moisescu and Gica (2014), Akbari et al. (2020)
Experience and its dimensions	Cetin (2020)
Expectations	Del Bosque et al. (2006), Lee et al. (2011)
Motivations/goals for travelling	Lee et al. (2011), Mody et al. (2017)
Perception of brand	Mody et al. (2017)
Customer orientation	Yang et al. (2017)
Complaints	Lee et al. (2011)
Loyalty programmes	Elgarhy (2022)

Source: own

three decades, provides many valuable tips for studying the determinants of loyalty (Tab. 1). Firstly, the most frequently mentioned motivators for being a loyal customer are the perceived quality and perceived value of services, satisfaction, and secondly, trust in the supplier, price of services, emotional involvement, supplier's image, as well as corporate social responsibility and buyer's experience. Individual studies analysed many other loyalty factors, e.g., loyalty programs, complaint handling, travel motivations and consumer expectations.

It should be noted that a systematic increase in the number of studies conducted in the area of factors shaping loyalty focuses on the determinants of buyers' loyalty to travel agencies (agents and tour operators) operating in an e-commerce environment (Abou-Shouk & Khalifa, 2017; Albayrak et al., 2020; Huang, 2008; Rizal et al., 2020; Ronsana et al., 2018; Silva & Gonçalves, 2016). Their results clearly point to new factors specific to the online environment, such as buyers' involvement in social media, website design, quality of service in functional and hedonic terms, interactional and transactional benefits for the customer, as well as online interactions with other current and potential buyers.

The above literature review from two highly rated databases of scientific publications indicates that over the last 30 years, only 30 articles have appeared on the issues of the drivers of customer loyalty in travel agencies. This means that, on average, 1 article related thematically was published in one year and this is not an impressive number. It should be admitted that in the period under study, it is possible to indicate years in which the interest in the mentioned problem was greater (3–4 articles in 2017, 2020 and 2022), but it passed relatively quickly, and no clearly dominant directions of research on the loyalty of buyers of package travels emerged. In view of the development of new information and communication technologies and the emergence with them of the unlimited possibility for individual travellers to organise their own trips (bypassing the intermediaries), customer retention by package travel suppliers (travel agencies) is now becoming a more important task than it was before the Internet revolution. And the limited research so far, often selectively treating the problem of customer loyalty factors of travel agencies, confirms the need to conduct further research and a more comprehensive approach to identifying and organising these determinants.

Additionally, the analysis of the determinants of travel agency customer's loyalty in light of previous research has allowed the final conceptualisation of the research problem addressed in this study, as well as the operationalisation of the research and the construction of an appropriate measurement instrument that takes into account the scientific achievements of other researchers.

1.2 COVID-19 and the loyalty of buyers of package travels in the light of previous research

In order to confirm the research gap regarding the issue of shaping the loyalty of buyers of tourist service packages in a pandemic situation, a systematic review of the literature on the impact of COVID-19 on the behavior of travel agency customers was conducted. In the process of selecting articles accepted for the review, the databases of scientific publications most valued by the academic community were used first, i.e., Web of Science (WoS) and Scopus, and then the list of articles was supplemented with publications that were presented by the Google Scholar search engine on the 50 pages exposed first. The selection of literature was done according to a specific categorisation key and an assumed filter. The following selection criteria were used: period of publication (2020–2023), language of publication (English), access (full-text) and, type of publication (article in a scientific journal or chapter(s) in a scientific monograph) and nature of publication (research or review). The categorisation key narrowed the search to titles, abstracts and keywords of publications. Databases were browsed by entering the appropriate combination of the following keywords: "loyalty," "packaged tour(s)," "package travel(s)," "tourist package(s)," "holiday package(s)," "travel agency(s)," "tour operator(s)" and "COVID-19" (Tab. 2).

A search of the databases yielded results, including a few scientific publications (Scopus – 4, and Web of Science – 11) touching on the issue of package travel buyers' loyalty under the COVID-19 pandemic. A careful analysis of the content of these publications further revealed that only two of them directly addressed the impact of the pandemic on travel agency customer loyalty. The first article of relevance, by Wu and Riantama (2022), discusses

Tab. 2: Quantitative results of the literature review

Combination	Number of papers	
	Scopus	Web od Science
Loyalty AND packaged AND tour AND COVID-19	–	–
Loyalty AND tourist AND package AND COVID-19	–	–
Loyalty AND holiday AND package AND COVID-19	–	1
Loyalty AND package AND travel AND COVID-19	–	1
Loyalty AND tourist/travel AND agency AND COVID-19	3	9
Loyalty AND tour AND operator AND COVID-19	1	–

Source: own

the problem of the emergence of new predictors of satisfaction – considered one of the main factors motivating buyers to be loyal. The researchers found out that such a new and relevant motive for loyalty in an emergency situation was the travel agent's reaction to the occurrence of an unexpected event that could disrupt the performance of the object of the transaction. The vision of losing the money paid to a supplier for a prepaid package travel long before the service is provided or being unable to use the purchased package were the biggest fears of tourists during the pandemic. This fear often demotivated tourists from undertaking tourist trips during the pandemic. On the other hand, Zhu et al. (2022) considered the relationship between the reliability of travel agency websites and customer loyalty. The results of their study indicated that during the pandemic period, the content presented on a supplier's website did not have a significant impact on buyers' attitudes and purchase intentions. This is because the uncertainty of the environment and the dynamics of the situation during the COVID-19 period caused this content to quickly become outdated, and as a result, customers did not pay much attention to it.

A certain paucity of results left after reviewing the Scopus and Web of Science databases prompted the authors to expand their search to other sources of information. For the penetration, Google Scholar was chosen (as the most popular browser of scholarly resources today), although not without certain imperfections, but containing a very wide selection of studies. This additional review made it possible to supplement the two earlier records with two more. In their study, Lawu et al. (2022), similarly to Wu and Riantama (2022), included among the determinants of travel agency customer loyalty the response of agencies to possible disruptions in the delivery of the purchased travel service. The researchers found out that customer loyalty during COVID-19 was influenced by so-called procedural fairness, i.e., the ways (procedures) a supplier handles problems with the delivery of a service. Implementing appropriate service standards in a service cancellation situation, on the one hand, builds a sense of security and trust in the supplier, and on the other hand, increases customer satisfaction. In contrast, the results of a study by Jasrotia et al. (2023) indicated an increase in the importance of experience-based trust in building loyalty among online travel agency customers during the pandemic. Before the pandemic, trust was not as significant a predictor of loyalty intentions.

The pandemic situation – a completely new, previously unknown condition for conducting business in tourism is an attractive testing ground and an interesting field for testing known research problems, but in the context of a new environment. New conditions may bring new insights and change current thinking about loyalty variables, they may also confirm previous findings, and their results will not be surprising. Determining whether pandemic conditions have altered loyalty factors towards the choice of travel agents warrants further research. The authors of this study seek to fill this gap.

2. Research methodology

2.1 Description of the study and characteristics of the sample

In order to achieve the established research goals, buyer research was carried out on

the issue of traveling during the COVID-19 pandemic. In the conducted survey, the basic tool was a questionnaire containing 38 questions. The research was a partial study and was carried out using an online survey on a nationwide online panel of respondents using the CAWI method. The study used a non-probabilistic sample selection – the Internet sampling method. The survey was conducted from June 1 to August 31, 2022, and ultimately included a sample of 1,508 respondents (N = 1,508).

The surveyed Poles (N = 1,508) included representatives of both sexes, and the most numerous age groups were from 36 to 45, from 26 to 35, and from 46 to 60 years of age (31.0%, respectively 27.90% and 19.2% of respondents). The majority of respondents were married (58.2%) and respondents with higher education (50.7%). Respondents' households usually consisted of 2 to 4 people (79.8% of responses in total), and every second respondent had underage children in their household. Of the respondents, 83.3% were working people. The largest group of respondents (75.7%) were respondents living in cities. Nearly half of the respondents assessed their financial situation as good, and only less than 1.3% of them thought it was very bad.

The study was characterised by a representative distribution of characteristics for the general population of Poles. Comparison of characteristics of the distribution of metric features with those available in public statistics, characteristics of the population of adult Poles allows us to conclude that that the structure of the sample in terms of gender, age, education and size of place of residence corresponds to the structure of the population of adult Poles.

The data analysis was carried out using descriptive statistics indicators and machine learning – the variable importance method and the random forest algorithm using the DATEX package of the R program.

3. Results and discussion

3.1 Analysis of the impact of the COVID-19 pandemic on the behavior of tourist packages buyers

The research results clearly confirm that the situation related to the COVID-19 pandemic has influenced Poles' tourist trips. This was confirmed by as many as 69.1% of respondents. A detailed summary of the research results is presented in Tab. 3.

Among the changes made in the method of carrying out tourist trips, the respondents most often indicated: limiting the number of tourist trips (39.6% of responses), carrying out only domestic tourist trips (27.9% of responses) and changing the destination of tourist trips (22.1% of responses). The remaining answers are presented in Tab. 4.

The above results allow to answer the first research question and provide confirmation that in the face of the threat of the COVID-19 pandemic, the behavior of purchasers of package travels has changed significantly. Travel packages at that time were purchased less frequently and buyers limited their trips to domestic trips.

The analysis of the answers provided by the respondents allowed us to answer the second research question and identify the most important themes that had guided the purchasers of package travels when choosing their organiser (Tab. 5).

Tab. 3: The impact of the COVID-19 virus pandemic on respondents' tourist trips (N = 1,508)

Has the COVID-19 pandemic affected your tourist travel?	Total	
	n	(%)
Definitely yes	480	31.8
Yes	562	37.3
Neither yes nor no	256	17.0
No	131	8.7
Definitely no	79	5.2

Source: own

Tab. 4: Changes in tourist travel caused by the COVID-19 pandemic (*N* = 1,508)

What changes have you made to your tourist trips due to the COVID-19 pandemic?	Total	
	n	(%)
None	55	3.6
Complete resignation from tourist trips	248	16.4
Limited to domestic travel only	421	27.9
Change of travel destination	334	22.1
Travel only by private car	254	16.8
Giving up hotels in favor of more private places to stay (e.g., separate apartments, agritourism lodgings)	199	13.2
Limiting the number of tourist trips	597	39.6
Shortening the length of tourist trips	202	13.4
Complete resignation from purchasing tourist packages organised by a travel agency	241	16.0
Different behavior	24	1.6

Note: The answers do not add up to 100% because the respondents had the possibility of making multiple choices.

Source: own

Tab. 5 Motives of loyalty to the travel agencies – Part 1

Buyers' motives of choosing a travel agency (BM; on a scale of 1–7)	Average rating importance of the motive
BM_1 – interesting/attractive tourist packages	5.68
BM_2 – a wide selection of tourist packages	5.66
BM_3 – satisfaction with previously purchased offers	5.77
BM_4 – trust	5.72
BM_5 – reputation and prestige	5.30
BM_6 – convenient location	5.29
BM_7 – belief in the value of the offer	5.53
BM_8 – favorable price–quality ratio	5.80
BM_9 – sense of security	5.75
BM_10 – special treatment of me by employees	5.14
BM_11 – service by a specially designated employee	5.15
BM_12 – attachment	5.05
BM_13 – offered loyalty program (e.g., loyalty card/club)	5.01
BM_14 – efficient/advisory service	5.62
BM_15 – individual approach of office staff	5.46
BM_16 – favorable payment terms	5.69
BM_17 – competitions and lotteries	4.48

Tab. 5 **Motives of loyalty to the travel agencies – Part 2**

Buyers' motives of choosing a travel agency (BM; on a scale of 1–7)	Average rating importance of the motive
BM_18 – prices, gifts, gadgets	4.54
BM_19 – discounts. discounts and other financial incentives	5.45
BM_20 – advertisement	4.60
BM_21 – no other travel agencies	4.12
BM_22 – convenience of purchase	5.75
BM_23 – no time	4.38
BM_24 – reluctance to change	4.41

Source: own

Among the key motives influencing the choice of a travel organiser, respondents indicated: interesting/attractive tourist packages, wide selection of tourist packages, trust, sense of security, favorable price-quality ratio, favorable payment terms, convenience, efficient advisory service and satisfaction with previously purchased offers.

It can therefore be stated that customers are looking for interesting destinations that suit their travel preferences, as well as the possibility of a wide selection and variety of organised travel options that they can tailor to their individual needs. Previous purchasing experience also plays an important role. Customers who are satisfied with previous trips are more likely to choose the same travel agency in the future, and positive experiences from previous trips can build customer loyalty and encourage them to return to the same travel agency. The credibility and reputation of the travel agency also have a significant impact on the purchasing decisions of buyers of tourist packages. Customers expect that a travel agency will provide them with a safe journey, both during the trip and during their stay there. Customers optimise their choices because they look for offers that propose a good value for the price they pay. Flexible payment options can also be an important factor for customers, especially when purchasing a holiday, which is a significant expense in the household budget. The convenience of purchasing a package travel, as well as a simple and intuitive process of booking and purchasing tourist trips, is also a factor that attracts customers. Moreover, effective and helpful customer service can be another important factor in convincing customers to choose a given travel agency.

Understanding these factors and adapting the travel agency's offer to customer needs can contribute to increasing their satisfaction and building loyalty.

3.2 Machine learning analysis

In the next part of the research (in search of the answer to *RQ4*), machine learning was used, the main goal of which is the practical application of artificial intelligence to create an automatic system capable of improving itself based on experience (data) and acquire new knowledge on this basis. Most often, machine learning is used to detect unknown patterns in data and to formulate rules, and it can be successfully used in consumer research to detect patterns or relationships and predict future consumer behavior, such as making repeat purchases.

Taking into account the criteria for selecting the algorithm, such as: the number of observations, the number of analysed variables and the values of categorical variables (number of labels) in the input data, the random forest algorithm was used in the study.

The idea of operation of this algorithm is based on classification using a group of decision trees and the biggest difference in the structure of both algorithms is the so-called bootstrap. The algorithm starts by building many decision trees (in our case, the number of trees was 50). For each tree, a random sample of observations is selected, consisting of several explanatory variables (the number of variables in each tree is the second parameter defined by the user).

Then, the information gain maximisation mechanism indicates further attributes to be divided. The final decision is made as a result of majority voting on the classes indicated by individual trees. The main advantage of the algorithm is the higher accuracy of the model than in the case of a decision tree.

Random forest is an advanced implementation of the aggregation algorithm (bagging), which uses a tree model as the base model. Each tree in the ensemble is built from samples drawn with replacement (e.g., a bootstrap sample) from the training set. When splitting a node during tree creation, the selected split is no longer the best among all predictors. Instead, the best split is selected from a random subset of predictors. Due to this randomness, the deviation of the forest usually increases slightly (relative to the deviation of one non-random tree). However, as a result of averaging, its variability also decreases – usually to the extent that more than compensates for the increase in deviation. As a result, the overall quality of the model is higher (Breiman, 2011).

The most important advantages of the random forest algorithm are: resistance to various data problems, no data, explanatory variables without significance, association of explanatory variables, a large number of explanatory variables, outliers; ability to reproduce complex dependencies more precisely than decision trees can do; resistance to overfitting; stability; ability to detect interactions between variables and the possibility of determining various costs of misclassification.

For measuring the importance, the method proposed by Fisher et al. (2019) will be used. Let us start with a collection of *n* observations related to *p* explanatory variables and a dependent variable *Y*. The matrix *X* contains these explanatory variable values, while *y* represents the observed *Y* values.

Suppose we have a model *f*( ) (in our case random forest model) generating predictions $\hat{y} = (f(x_1).f(x_2)...f(x_{1n}))'$ for *y*. A loss function $L(\hat{y}.X.y)$ measures how well the model fits the data. This function could be based on the log-likelihood (Nagelkerke, 1991) or other performance measures.

Now consider this algorithm:

Step 1. Begin by computing L^0, which represents the initial loss function value for the original data.

Step 2. For each explanatory variable X^j in the model, follow steps 3 to 5.

Step 3. Create a modified matrix, X^{*j} by rearranging the j^{th} column of *X* (i.e., by shuffling the observed values of X^j).

Step 4. Generate new model predictions, Y^{*j}, based on the adjusted data X^{*j}.

Step 5. Calculate the loss function value, Y^{*j}, for this modified data: $Y^{*j}\ L^{*j} = L(\hat{y}^{*j}.X^{*j}.y)$.

Step 6. Evaluate the importance of X^j by computing $vip^j_{Diff} = L^{*j} - L^0$ or $vip^j_{Ratio} = L^{*j}/L^0$.

The randomisation in Step 3 might lead to different outcomes, so it is recommended to repeat the procedure multiple times to gauge the variability in the calculated variable importance. Step 5 normalises the variable importance measure concerning L^0, the initial constant. This normalisation does not impact the ranking of explanatory variables based on vip^j_{Diff} or vip^j_{Ratio}. Consequently, in practice, the values of L^{*j} are often used to quantify a variable's importance (Fisher et al., 2019).

The use of the random forest machine learning algorithm and the variable importance VI method allowed for combining the output data of many decision trees to obtain a single result of determining the motives for choosing a travel agency that has the greatest impact on the loyalty of buyers of package travels.

The course of the model learning process for 3 variables (affective loyalty, behavioral loyalty, global loyalty) – subsequent iterations until the model converges. A typical run confirms that the model is not degenerate. This is also confirmed by the distribution of residuals in histogram form, which is consistent with the distribution function of a normal distribution.

3.3 The influence of motives on the loyalty of tourist package buyers

In searching of an answer to the further research questions (*RQ3* and *RQ4*), the loyalty of travel agency customers was presented in a broader perspective and the combination of the affective and behavioral approach allowed for a more complete representation of the specificity of the tourist services market and the essence of behavior manifested in repeated purchases and propagation of opinions about a given travel agency. Three approaches were proposed to explore the relationships between the variables: motives for choosing the organiser and affective loyalty, behavioral loyalty and global loyalty of travel agency customers (Tab. 6).

Tab. 6: Operationalisation phase

Variables	Symbol of variables	Question*	Categories
Loyalty of travel agency consumers (LTAC)	**Affective loyalty of travel agency customers (AL)**	Would you recommend the services of travel agency X to a friend in the future?	1 – definitely yes 2 – probably yes 3 – maybe 4 – propably not 5 – definitely not
	Behavioral loyalty of travel agency customers (BL)	Do you intend to use the services of travel agency X again in the future?	1 – I will definitely resign 2 – I will probably give up 3 – I will probably use it 4 – I will definitely use it
Buyers' motives of choosing a travel agency (BM)	**BM_1** – interesting/attractive tourist packages **BM_2** – a wide selection of tourist packages **BM_3** – satisfaction with previously purchased offers **BM_4** – trust **BM_5** – reputation and prestige **BM_6** – convenient location **BM_7** – belief in the value of the offer **BM_8** – favorable price-quality ratio **BM_9** – sense of security **BM_10** – special treatment of me by employees **BM_11** – service by a specially designated employee **BM_12** – attachment **BM_13** – offered loyalty program (e.g., loyalty card/club) **BM_14** – efficient/advisory service **BM_15** – individual approach of office staff **BM_16** – favorable payment terms **BM_17** – competitions and lotteries **BM_18** – prizes, gifts, gadgets **BM_19** – discounts, discounts and other financial incentives **BM_20** – advertisement **BM_21** – no other travel agencies **BM_22** – convenience of purchase **BM_23** – no time **BM_24** – reluctance to change	On a scale of 1–7, please rate the importance of your reasons for choosing travel agency X.	Rating on a scale from 1 to 7, where: 7 means the greatest importance and 1 the lowest weight

Note: *Questions in the survey questionnaire of buyers of travel agencies' services.

Source: own

Declarations of purchasers of package travels regarding their intention to use the services of a travel agency in the future indicate a high level of behavioral loyalty. 96.1% of consumers declare that they will definitely (41.6% of responses) or probably (54.5% of responses) use the travel organiser's offer again. In turn, declarations regarding recommending a travel agency to one's friends included 79.6% of responses (definitely 37.3% and probably 42.3%).

In the case of shaping loyalty in the affective approach, manifested in customers' promotion of positive opinions about a given travel agency, the key factors were the motives of buyers related to: belief in the value of the offer, trust, individual approach of office staff, efficient/advisory service and a wide selection of tourist packages (Fig. 1).

The occurrence of behavioral loyalty, understood as the buyer's behavior manifested

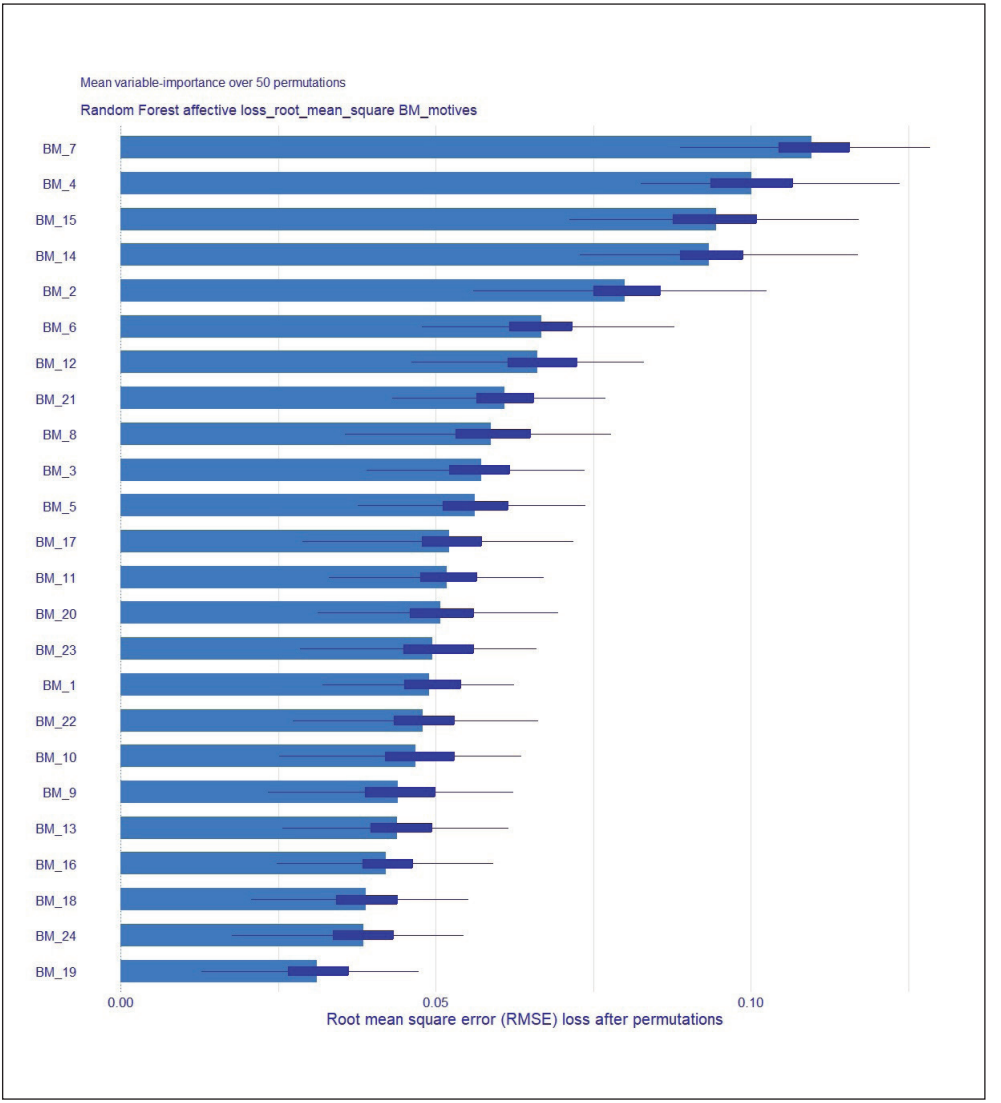

Fig. 1: **Mean explained affective loyalty (AL) variable importance in the random forest model**

Note: BM_1 – interesting/attractive tourist packages; BM_2 – a wide selection of tourist packages; BM_3 – satisfaction with previously purchased offers; BM_4 – trust; BM_5 – reputation and prestige; BM_6 – convenient location; BM_7 – belief in the value of the offer; BM_8 – favorable price-quality ratio; BM_9 – sense of security; BM_10 – special treatment of me by employees; BM_11 – service by a specially designated employee; BM_12 – attachment; BM_13 – offered loyalty program (e.g., loyalty card/club); BM_14 – efficient/advisory service; BM_15 – individual approach of office staff; BM_16 – favorable payment terms; BM_17 – competitions and lotteries; BM_18 – prizes, gifts, gadgets; BM_19 – discounts, discounts and other financial incentives; BM_20 – advertisement; BM_21 – no other travel agencies; BM_22 – convenience of purchase; BM_23 – no time; BM_24 – reluctance to change.

Source: own (based on DALEX package of R program)

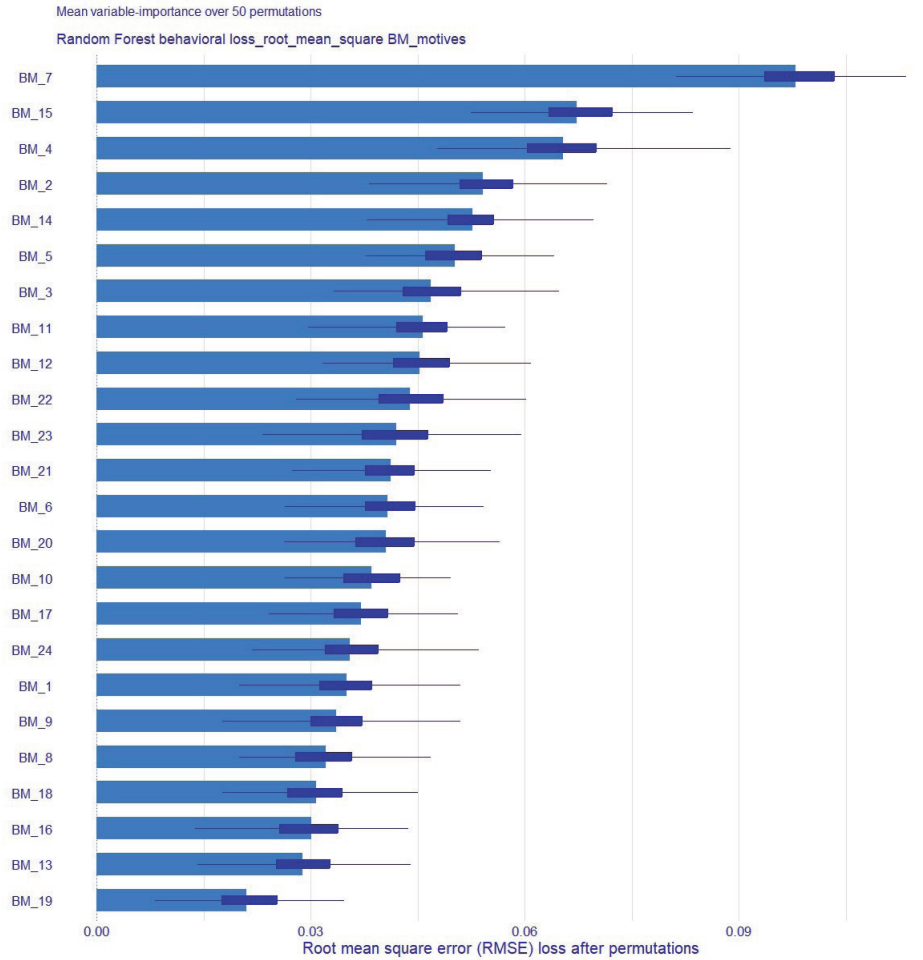

Fig. 2: **Mean explained Behavioral Loyalty (BL) variable importance in the random forest model**

Note: BM_1 – interesting/attractive tourist packages; BM_2 – a wide selection of tourist packages; BM_3 – satisfaction with previously purchased offers; BM_4 – trust; BM_5 – reputation and prestige; BM_6 – convenient location; BM_7 – belief in the value of the offer; BM_8 – favorable price-quality ratio; BM_9 – sense of security; BM_10 – special treatment of me by employees; BM_11 – service by a specially designated employee; BM_12 – attachment; BM_13 – offered loyalty program (e.g., loyalty card/club); BM_14 – efficient/advisory service; BM_15 – individual approach of office staff; BM_16 – favorable payment terms; BM_17 – competitions and lotteries; BM_18 – prizes, gifts, gadgets; BM_19 – discounts, discounts and other financial incentives; BM_20 – advertisement; BM_21 – no other travel agencies; BM_22 – convenience of purchase; BM_23 – no time; BM_24 – reluctance to change.

Source: own (based on DALEX package of R program)

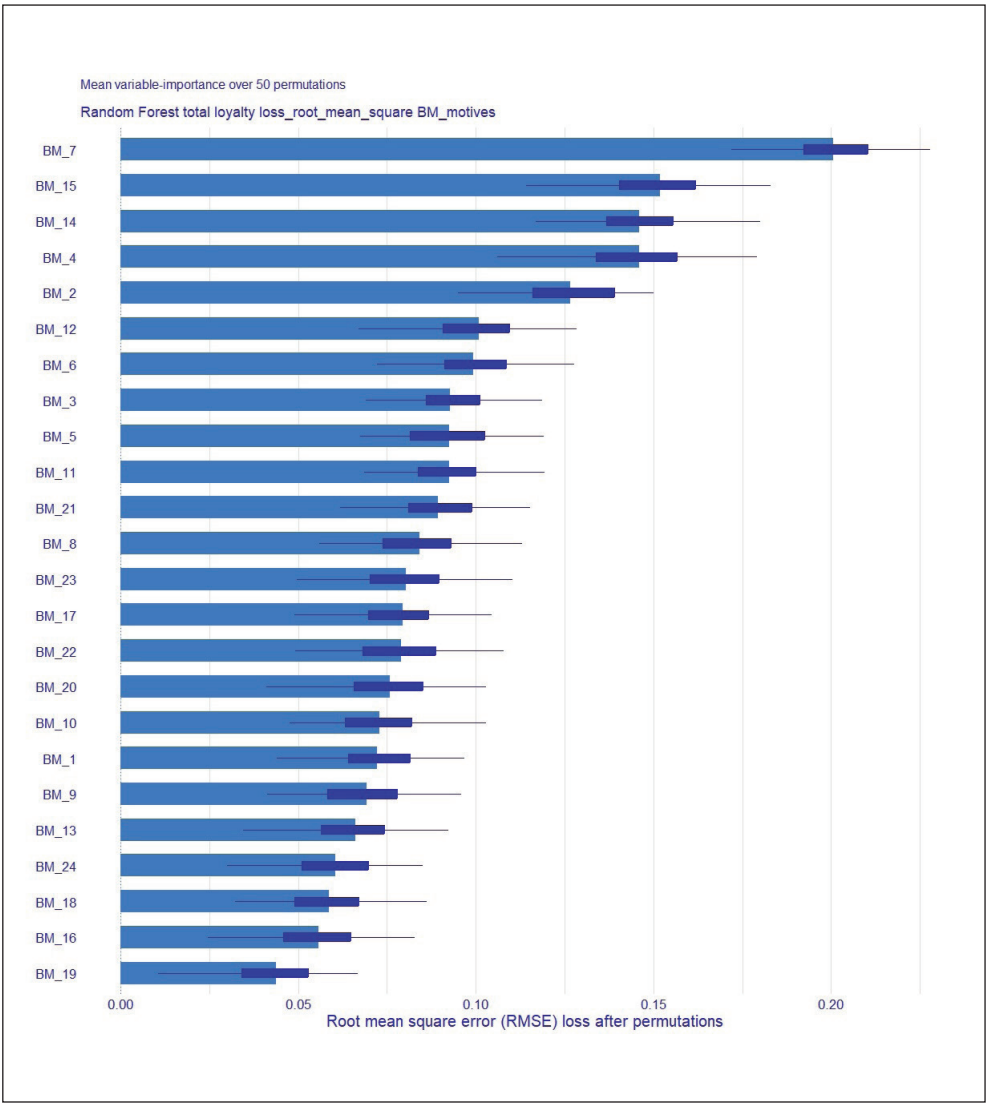

Fig. 3: **Mean explained loyalty of travel agency consumers (LTAC) variable importance in the random forest model**

Note: BM_1 – interesting/attractive tourist packages; BM_2 – a wide selection of tourist packages; BM_3 – satisfaction with previously purchased offers; BM_4 – trust; BM_5 – reputation and prestige; BM_6 – convenient location; BM_7 – belief in the value of the offer; BM_8 – favorable price-quality ratio; BM_9 – sense of security; BM_10 – special treatment of me by employees; BM_11 – service by a specially designated employee; BM_12 – attachment; BM_13 – offered loyalty program (e.g., loyalty card/club); BM_14 – efficient/advisory service; BM_15 – individual approach of office staff; BM_16 – favorable payment terms; BM_17 – competitions and lotteries; BM_18 – prizes, gifts, gadgets; BM_19 – discounts, discounts and other financial incentives; BM_20 – advertisement; BM_21 – no other travel agencies; BM_22 – convenience of purchase; BM_23 – no time; BM_24 – reluctance to change.

Source: own (based on DALEX package of R program)

in repeated purchases of package holidays in a given travel agency, was mainly influenced by the following motives of the buyers' behavior: belief in the value of the offer, trust, individual approach of office staff, efficient/advisory service, reputation and prestige, as well as a wide selection of tourist packages (Fig. 2).

However, in global terms, combining both affective and behavioral understanding of package holidays buyers' loyalty (CLTA), which manifests itself in repeated purchases and propagation of opinions about a given travel agency, the key motives of buyers were: i) belief in the value of the offer; ii) trust; iii) individual approach of office staff; iv) efficient/advisory service; and v) wide selection of tourist packages (Fig. 3).

3.4 Discussion

This study aimed to reveal the most important loyalty factors of package travels buyers during the COVID-19 pandemic. The factors were ordered according to their importance to respondents. The comparison of the obtained results of this study with the findings of previous research indicates that the key loyalty motives are confirmed in previous studies (Tab. 7). They included: belief in the value of the offer, trust, individual approach of office staff and efficient/advisory service.

Unfortunately, the individual examples of previous research on the loyalty of travel agency customers during the pandemic found in the literature review do not allow for a broad discussion of the results presented in this study. Nevertheless, they provide valuable comments. All cited publications prove that during the pandemic, changes were revealed in the motives encouraging buyers to be loyal to suppliers of package travels. While before the pandemic, many researchers considered the level of satisfaction to be the main loyalty factor, during the pandemic, the importance of factors related to trust in the travel agency, the service process, its procedures, and the personalisation of services increased. Therefore, in times of crisis, the observation made by Gounaris (2005) is valid, as he emphasised that increasing the level of customer loyalty requires travel agencies to build strong emotional bonds with customers (i.e., through trust and service provision), and not only focus on improving the satisfaction of customers.

Conclusions

The conducted research on the loyalty of purchasers of tourist packages allows to conclude that during the period of threat of the COVID-19 virus pandemic, the decision-making process of purchasing package travels has changed.

Tab. 7: Comparison of the obtained results with those of other authors

Motives*	Confirmation of research results by other authors
Belief in the value of the offer (BM_7)	Conze et al. (2010), Senders et al. (2013), Lai (2014), Roger-Monzó et al. (2015), Silva and Gonçalves (2016), Albayrak et al. (2020), Mursid and Wu (2022)
Trust (BM_4)	Huang (2008), Setó-Pamies (2012), Prause et al. (2013), Lai (2014), Devece et al. (2015), Silva and Gonçalves (2016), Albayrak et al. (2020), Rizal et al. (2020), Santos et al. (2022)
Individual approach of office staff (BM_15)	Yang et al. (2017)
Efficient/advisory service (BM_14)	Lee and Cunningham (2001), Campo and Yagüe (2008), Huang (2008), Thi Phuong Thao and Swierczek (2008), Lee et al. (2011), Setó-Pamies (2012), Lai (2014), Moisescu and Gica (2014), Roger-Monzó et al. (2015), Devece et al. (2015), Silva and Gonçalves (2016), Abou-Shouk and Khalifa (2017), Albayrak et al. (2020), Rizal et al. (2020), (2020), Cetin (2020), Elgarhy (2022)

Note: *Motives for choosing a travel agency determining the loyalty of buyers of package travels during the COVID-19 pandemic in the light of research results.

Source: own

Packaged tours were purchased less frequently, and buyers either limited their trips to domestic travel or adapted travel destinations to the changing pandemic situation.

The most important TOP10 (out of 24 variables) motivators that determined the choice of a travel agency during the COVID-19 pandemic were: favorable price-quality ratio, satisfaction with previously purchased offers, sense of security, convenience of purchase, trust, favourable payment terms, an interesting/attractive tourist packages, a wide selection of tourist packages, efficient/advisory service and belief in the value of the offer. It is noteworthy that two factors unrelated to the economic efficiency of choice ranked relatively high in this ranking. These are a sense of security (the third place), which is dependent on trust in the service provider (the fifth place).

It turned out that in the face of the pandemic threat, buyers of package travels declared loyalty to travel agencies. The study obtained a high level of loyalty, both behavioral (expressed by buyers' declared readiness to make another purchase of package travel) and affective (expressed by buyers' readiness to recommend a travel agency). This allows us to talk about the existence of a strong relationship between travel agencies and the buyers of their offers during the pandemic threat, which at the same time allows the answer to the research question *RQ3* (Were purchasers of package travels loyal to travel agencies during the COVID-19 pandemic threat?) and confirms that during the threat of the COVID-19 pandemic, buyers of package travels showed loyalty to travel agencies.

The use of machine learning allowed us to identify the reasons for choosing a travel agency, which have a key impact on the loyalty of holiday package buyers during the pandemic. These factors belong primarily to the category of loyalty motives in the customer-provider relationship (trust, individual approach of office staff) and the category of motives related to the evaluation of benefits (belief in the value of the offer, a wide selection of tourist packages and efficient/advisory service). These five motives emerged as the most important factors for each type of loyalty (affective, behavioural and total). The only difference was in the order of their occurrence. Buyers' belief in the value of the offer, trust, individual approach of office staff, efficient/advisory service and a wide selection of tourist packages determined customers' promotion of positive opinions about a given travel agency. In turn, the belief in the value of the travel agency's offer, trust in the travel agency, an individual approach of the travel agency's employees, efficient/advisory service in the travel agency, the reputation and prestige of the travel agency, as well as a wide selection of tourist packages, influenced the repeat purchase of package travels in the given office. However, the shaping of the loyalty of purchasers of package travels in a global perspective, combining both the affective and behavioral understanding of loyalty, was influenced most by belief in the value of the offer, trust, individual approach of travel agency employees, efficient service in the office that is able to advise travel and a wide selection of tourist packages. The first position in the ranking of importance was always occupied by belief in the value of the offer. It should be noted that this is a very broad and aggregate concept, and other factors may also work to influence the degree of buyer belief in the value of an offer.

The study presented here enriches knowledge in the area of tourist loyalty management and tourist behaviour. The research recognises the antecedents of loyalty in an unprecedented situation – a pandemic. It contributes to multiplying the knowledge of the importance of individual loyalty motivators and their relevance depending on the situation of the environment. It proves the constant relevance of the issue of purchasing behavior and the factors determining it, as well as the need for repeated research in this area, especially in the changing conditions of operation of tourist enterprises. The originality of the research lies in the use of a new method of data analysis, i.e., machine learning. Although the results achieved are not surprising and the identified loyalty motives do not differ from those found out by previous researchers before the COVID-19, the confirmation of the findings indicates that the new method is valuable and useful. Moreover, its additional advantage is that the results obtained have a predictive value. With a high degree of probability the identified set of factors will influence the loyalty behavior of tourism package buyers in the future. This is of great importance for the utility of the research results in practice. This attribute can contribute to improving the effectiveness of future marketing decisions of companies, including travel agencies.

The results of this study may be useful for package travels providers as a source of information for planning more effective marketing strategies and crisis recovery strategies. The findings sugges focusing on the activities strengthening customer trust in the travel agency, placing an emphasis on improving the company's image and preparing appropriate standards to maintain the efficiency of service in the event of disruptions in the service provision process. Both the identification of factors and a thorough understanding of their impact on the development of buyer loyalty are important steps from the point of view of the possibility of effective implementation of marketing activities aimed at building and strengthening customer loyalty.

As trust and beliefs are built over the long term, the activities of travel agents should be oriented especially towards forming positive, strong and lasting relationships with customers. Relationship marketing tools will be useful here. The customer decides on a long-term relationship with a service provider when he or she perceives the relationship as beneficial. In the case of travel agencies, the customer benefits on the one hand from a valuable offer of travel packages and on the other from good service in the office. The offer of a travel agency is the result of the agency's cooperation with tour operators – suppliers of travel packages. Customer satisfaction with regard to the value of the offer depends on the ability of travel agencies to attract well-known travel brands, both international (e.g., TUI, Neckermann) and domestic ones (e.g., Itaka, Rainbow, Grecos), to cooperate. Travel agents should consider the widest possible cooperation with multiple tour operator brands due to the fact that customers, according to the research, are interested in a wide choice of travel packages. The satisfaction of travel agency customers also depends on the qualifications of employees, their competences and attitude to work. The respondents themselves emphasised the dependence of repeating a purchase in a travel agency and recommending the agency to other customers on the efficient advisory services and an individual approach from the agency's staff. A well-prepared staff recruitment process, constant improvement of employees, and equipping them with the right working tools are the foundations for ensuring a high level of service.

As every study, also this study is not without limitations. Firstly, the limitations concern the loyalty testing method itself. The data is declarative and refers to the future (intentions). Secondly, comparisons of the results with the findings of previous researchers must be careful because they will cover different groups of respondents, and different sets of loyalty factors, and the data was analysed using different methods. Thirdly, the research only covers a sample drawn from the Polish population, which makes it impossible to generalise the research results.

In the future, taking into account the dynamics of the environment, it is necessary to continue and repeat the study of predictors of loyalty among buyers of tourist services in search of changes that may be important for the effectiveness of taking actions to acquire and retain customers. The results of similar studies conducted in different cultural areas (countries), as well as addressing the issue of customer loyalty in online versus offline travel agencies, may be of interest.

Acknowledgments: *The research was funded by the Ministry of Science and Higher Education in Poland under the programme "Regional Initiative of Excellence" 2019–2022, project number 015/RID/2018/19, total funding amount 10,721,040.00 PLN."*

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