

# Tourism in the Digital Age: E-booking Perspective

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## Abstract

Digitization in the tourism sector beside hospitality information systems application as its integral part has also led to the application of on-line booking systems, which enable the booking of the desired tourist arrangement via the Internet. Consequently, the emergence of the e-booking concept has made it possible reducing administrative and operational costs, since the e-booking system is also used on smartphones with appropriate applicative support. This paper aims to point out the importance of e-booking in the digital age of tourism, especially from monitoring the most common destinations, customer preferences and performing predictive analytics by collecting large amounts of data. In this way, the implementation of big data and cloud computing concept enhances tourism services, since it is possible to analyse destination history and tourist potential of the client via the Internet.

**Keywords:** tourism, digitization, e-booking, online booking systems, hospitality information systems

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## Introduction

We are well aware of the growth of the travel and tourism industry in the last few years, and the effects it has on the global economy. In 2016, it contributed directly US\$2.3 trillion and 109 million jobs worldwide; taking into account its wider indirect and induced impacts: it contributed US\$7.6 trillion to the global economy and supported 292 million jobs (World Travel & Tourism Council, 2017). One of the biggest, if not the biggest, the challenge of the tourism industry lies in adopting technology, precisely the lack of accurate education of the type of technology suitable for their business (Sakulsureeyadej, 2011). Moreover, tourists travel now longer distances and explore alternative places while engaging in a broad spectrum of activities (Jansson, 2018C:\Users\Toni\Downloads\jansson2018.pdf). During the past few years, there was a breakthrough in one particular aspect of tourism: platforms and applications for online booking. Plane and train tickets, restaurant tables, hotel rooms, short excursions or complete tour packages - now everything can be booked in advance, with just a few clicks on your computer or smartphone (Lu et al., 2015).

The simplicity and usefulness are the main reasons why these platforms and applications' popularity skyrocketed in the past few years, and why they are expected to grow even more in the future. It is interesting to note that most users in the United States use mobile booking for the option of making a last-minute booking. These applications allow the users a lot of flexibility they can make a last-minute booking however they can also cancel the booking very easy (Jang et al., 2019). However, it is important to note that from the quality of the platform or website depends on how much trust the client will put in each company (Li et al., 2017). Mobile booking has drastically changed the distribution channels for Hotels and online travel agents and there is a clear expectation that in the future it will be a prevailing channel (Ozturk et al., 2016).

Moreover, the trends show that in recent years more people book via mobile devices and that people who use them prefer to make bookings by using applications rather than searching websites (Wu & Law, 2018). The conducted studies have shown that the use of computer reservation systems (CRS) can be a big benefit to the field of tourism. On the one hand, it improves the travel industries efficiency and productivity, provides a lot of information aside from reservations, improves customer satisfaction, lessens operating expenses, reduces human errors in quotation pricing and ticketing of net fares information, develops and nurtures the best skills in the travel agency industry, makes the workload easier, connects guests to all forms of travel, etc. (Felicen, & Ylagan, 2016). Koide and Ishii (2005) "It would be obtainable to create a model for an optimal room allocation with early discounts for bookings and concerning cancellations and overbooking". Sierag et al. (2015) "it is smart to consider what an optimal offer of products would be under overbooking taking into account early cancellations."

To understand how firms compete we must consider both whether competitors will follow and ignore the pricing method according to Karakaya and Yannopoulos (2011) as well as the customers' response. The latter determines the customer segmentation, some customers are less patient and more inclined to pay higher fares, as discussed, among others, by Dana (1998), Su (2007) and Abrate et al. (2012), while leisure travellers are on the other hand often willing to be patient and wait for last-minute deals. The management of customers' perceptions is a crucial topic in the literature about Relation Management: for example, Haws and Bearden (2006), Sahut et al. (2016), Choi and Mattila (2017) find that loyal customers perceive Price as a main strategic variable in the short-run (Guizzardi et al., 2019).

The success of a company depends a lot on the understanding of consumer behaviour and today's environment is very fast-changing, therefore, companies need to adapt fast (Xiang et al., 2015) Timing is very important in the service industry because of the nature of the product being offered if the service is not consumed at a given time the revenue is forever lost (Zangh et al., 2018). As for applications of data on online hotel booking websites to hotel management and marketing, Ali et al. (2016) propose a classification feature for review's identification and inquiry of opinions about the hotels and all the features of the hotel.

Kardaras et al. (2013) investigate the content and media presentations and adaptation of tourism websites. Korfiatis and Poulos (2013) examine the use of online consumer reviews as a source for demographic profiling. Shuai and Wu (2011) analyze the impact of internet marketing on the hotel's general performance. Xu et al. (2017) examine customer reviews and research satisfaction and dissatisfaction of hotel products and services. Raguseo et al. (2017) explore how hotels can increase value when they manage their visibility on infomediary platforms well. Systems that calculate overbooking based on customers discreet choices can greatly reduce the expanses for hotels and increase the revenue (Saito et al., 2019).

We can see some other reasons why e-booking is a preferred choice for the majority of customers. A professional line of work, education path or private life struggles put a toll on many, so it is no wonder that people need every little bit of help in making every day easier. Technology is a logical choice here since any process that can be automated is a huge relief in otherwise busy days. When using an application to book a vacation, for example, as soon as the customer makes a choice, everything going forward is automated. Preserved customer information, important document data, payment method of their choosing - everything is one click away, and at the very end, a confirmation will be sent to their email address (Schoenherr, 2004).

Payment method choice is an important part of the customer experience, and it has been made simple by many new applications. Users can choose to pay upfront, or at the premises, use credit cards, or cash, pay a little more to have an option of a refund. There is little to no fear in terms of safety of customers' data and assets, since all of the leading platforms have top-level security in place. The final stage of the e-booking process is an email confirmation that a customer gets when completing the reservation. In that email, customers have all of the important info regarding their reservation, and usually a few useful links for a quick reaction if anything is wrong or has to be changed. In addition to all of the data being in one place, it will always be available to customers, anywhere and anytime, so the need for bringing and taking care of any additional notes/papers/itineraries etc. becomes deprecated (Lu et al., 2015). The most important advantages of e-booking are gathering data and getting valuable insight into the business.

Online booking systems provide owners with priceless analytics, to determine the most popular time slots, a customer group that the business is most likely to attract, best employees that bring revenue (Toh et al., 2011). A careful study of this data can indicate what additional packages of services can be offered to customers, what activities are becoming increasingly popular, or how to expand working hours most efficiently to grow the business.

## Methodology

The methodology used in this research relates primarily to the implementation of cluster analysis in statistical software, which aims to group selected countries by e-booking performance. The country selection was made based on the adoption

percentage of on-line travel booking services, with the analyzed countries currently being the world leaders. For example, Sweden (Figure 1) has the highest percentage of adoption of e-booking mobile services with the number of realized tourist arrangements for 2018 (Sweden, United Kingdom, USA, France, Germany, Spain, Italy and China).

Figure 1  
Percentage Adoption Of E- Booking: Leading Countries



Source: Author's illustration

Therefore, the starting hypotheses of the aforementioned cluster analysis were formed:

H1: The analyzed countries differ in the performance of on-line booking and accordingly belong to different clusters.

H2: Countries that have the highest percentage of use of on-line e-booking services do not have the same structure in terms of destination selection and therefore gravitate to different clusters.

Cluster analysis is the name for a set of multivariate techniques whose primary purpose is to group objects based on the common characteristics they possess. Multivariate is a feature of cluster analysis that is used to analyze multiple variables simultaneously and together that are part of a single whole. Unlike other multivariate statistical techniques, cluster analysis does not evaluate variables empirically, but rather these variables are set by the researcher himself. The choice of variables represents the most important step and depends on the goals to be achieved, therefore the choice of variables involves the conceptual and practical consideration of the researcher. This is because it is a fact that variables must be defined as objects of cluster analysis and must be relevant taking into account the aim of the research. The cluster analysis methodology has six steps:

- Determining objects for cluster analysis,
- Determining the research scheme
- Determining assumptions
- Formation and estimation of the number of clusters
- Cluster interpretation
- Evaluation of clusters and their profiling.

Cluster analysis determines equal measures for all paired objects. In this way, it is possible to compare the analyzed objects together. Furthermore, cluster analysis arranges related objects into clusters or groups. After selecting a sample and

defining the variables with all the necessary assumptions as to the formation of a matching matrix, the next step in cluster analysis is to form a cluster. The agglomerative hierarchical analysis method is based on the assumption that each object can be a homogeneous cluster and that at the beginning of the analysis there are as many clusters as there are objects ( $n$ ). In the next step, the most similar pair of objects are grouped into a cluster using a matching matrix. The cluster is accordingly created based on the objects that are most similar, meaning that the total number of clusters at that point decreases by one. This process is repeated until all objects belong to a particular cluster.

Within the agglomerative method, the variance method used is Ward's method, which is a typical representative of this group of variance methods. In the Ward procedure, the average value for each variable (centre of the cluster) is calculated for each cluster, and then the square of Euclidean distance from the centre of the cluster is calculated for each object, after which the distance for the objects is summed. In this procedure, two objects are joined at each step, which ultimately has the largest total distance from the cluster centre.

In general, this method is based on minimizing the loss of information resulting from the grouping of objects into clusters, which is measured by the total sum of the squares of the standard deviations of each object from the middle of the cluster to where the object is located in the cluster. The mentioned total sum of squares is known as the sum of squares of error. Regardless of whether hierarchical or non-hierarchical methods are used in the analysis, the question of the finite number of clusters that is appropriate for the research and implementation of the cluster analysis raises itself. Thus, there is no clear rule in the literature to address this problem, but there are so-called "stopping rules".

According to these "rules", the author applied statistical software for conducting cluster analysis, and based on experiential and theoretical solutions, applied the "rule" in a restrictive form to a maximum of three clusters. Also, in determining the number of clusters, the value of the distance between objects in the cluster was used. This information is in the agglomeration scheme or can be seen from the dendrograms which will be shown below.

## Results and discussion

The agglomerative approach used in cluster analysis is, in fact, an accumulative approach that starts the bottom-up analysis and systematically combines objects and groups until each of the objects is in a group or cluster. The biggest change in the pattern of agglomeration (Table 1 - red rectangle) occurs in the last three steps where is the progressive growth of coefficients values, which implies the number of clusters. In the aforementioned agglomeration scheme in Table 1, important information for country clustering is that related to the first column of this table, which is the Stage column, which shows the number of successive iterations (steps) taken in the grouping process.

Table 1  
Agglomeration Scheme

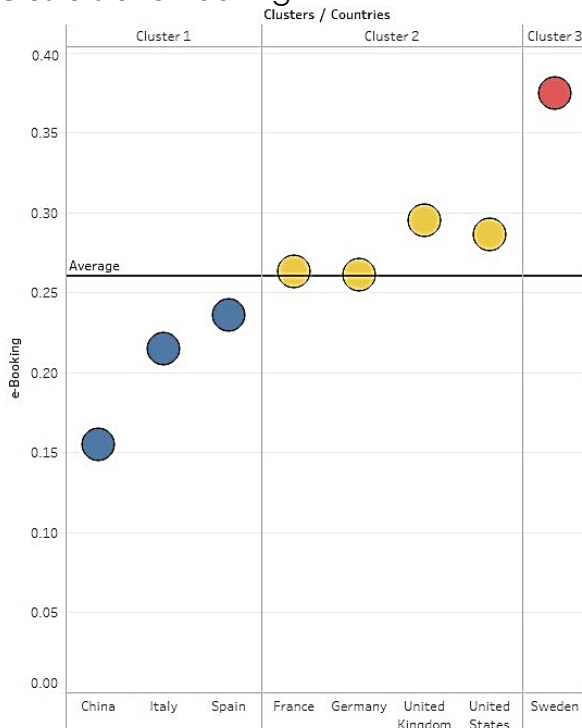
Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	4	5	.000	0	0	4
2	2	3	.000	0	0	4
3	6	7	.000	0	0	5
4	2	4	.001	2	1	6
5	6	8	.004	3	0	7
6	1	2	.012	0	4	7
7	1	6	.029	6	5	0

Source: Authors calculation

The second and third columns (Table 1) within the Cluster Combined section show the number of countries (objects) that have entered the clustering process into a new, unique cluster. In this case, it is France (4) and Germany (5). As for the next Coefficients column, it shows the value of the calculated square of the Euclidean distance between the given countries. The following Stage Cluster First Appears column shows the iteration in which the cluster was first formed.

The last column Next stage shows in the first place in which iteration merging one country with another into mentioned cluster occurred. In the specific case, we have code 4, which means that in step four, the country under number 4 (France) merged with the country under number 5 (Germany) and formed a cluster. Following the analysis, clusters were formed with the appropriate number of countries.

Figure 2  
Clusters of e-Booking



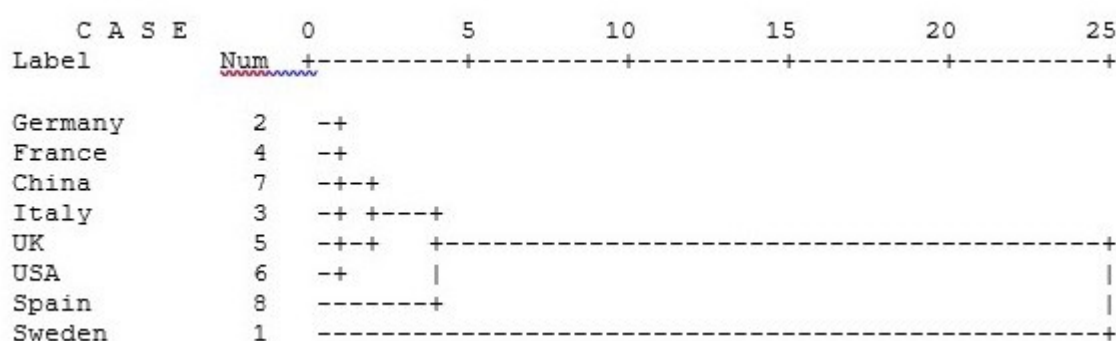
Source: Author's illustration

As can be seen in Figure 2, the first cluster (blue circles) contains China, Italy and Spain, while the second cluster consists of France, Germany, UK and USA. In the third cluster in Sweden. Countries are grouped in the cluster according to the most similar

e-booking performance. The average value of these performances, represented by the Average line in Figure 2, shows that the adoption percentage of e-booking will predominantly gravitate towards the values of the second cluster countries.

The dendrogram (Figure 3) is the result of cluster analysis in the form of a tree that shows the objects grouped. The vertical axis of the dendrogram gives the ordinal number of the state. The horizontal axis of the dendrogram shows the distance where the states or states are grouped. For practical reasons, the distance was calculated. The vertical lines show the countries that are grouped (number of clusters). Objects that are more similar to each other are grouped at a lower height, while objects that deviate more from each other are at a higher level of the dendrogram.

Figure 3  
Dendrogram of e-Booking



Source: Author's illustration

Different statistical techniques can be applied to further cluster analysis interpretation and to confirm its validity and correctness (Table 2). Here, the ANOVA procedure for checking the statistical significance of differences in the average values of variables between clusters is particularly emphasized, with the application of the variance homogeneity test or the so-called Levene test. If one takes a closer look at the descriptive statistics (Table 2-Mean column), it can be seen that the average percentage values of online travel booking services for the first cluster are 0.375 (37.5%), for the second cluster 0.2763 (27.63%) and the third cluster 0.2020 (20.20%) respectively. Accordingly, it is concluded that the countries in the second cluster, compared to the first cluster, are in the worst position in terms of online travel booking services.

Table 2  
Descriptive Statistics

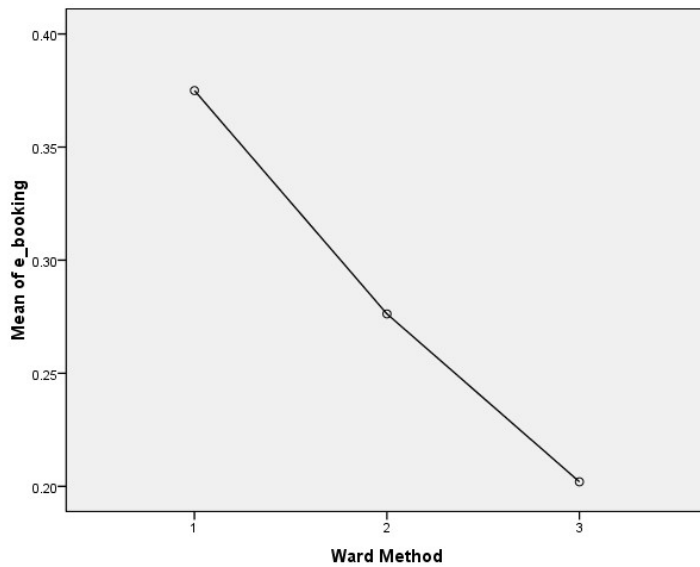
Clusters	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
1	1	.3750					.38	.38
2	4	.2763	.01688	.00844	.2494	.3031	.26	.30
3	3	.2020	.04204	.02427	.0976	.3064	.16	.24
<b>Total</b>	8	.2608	.06410	.02266	.2072	.3143	.16	.38

Source: Authors calculation

Figure 4 shows the ratio of the average values of the variable of all three clusters.

Figure 4

The average value of the mean of e-booking across all three clusters



Source: Authors Illustration

The test of statistical significance of differences between group means for individual variables is carried out by the test of homogeneity of variance, or so-called homoscedasticity. The best test for this is the so-called Levene test, which starts from the null hypothesis that the variance is the same in all samples if  $p < 0.05$ . If  $p > 0.05$ , the null hypothesis is accepted and the alternative is rejected, which means that the variance is not equal for at least one pair of samples. Formally, expressed by the formula, it looks like this:

$$H_0 : \sigma_1^2 = \sigma_2^2 = \dots = \sigma_k^2, p > 0.05$$

$$H_1 : \sigma_1^2 \neq \sigma_2^2 \neq \dots \neq \sigma_k^2, p < 0.05$$

From Table 3, it can be concluded, after the test, that there are no statistically significant differences between the variations of the given samples, that they are the same, which is observed in the column Sig. where it can be seen that is for the given sample and the variable  $p > 0.05$  (Sig. = 0.103). This further implies that the null hypothesis is accepted, that is, the variance is homogeneous for a given variable across groups.

Table 3  
Levene Statistic

Levene Statistic	df1	df2	Sig.
3.963	1	5	.103

Source: Authors calculation

Note: Groups with only one case are ignored in computing the test of homogeneity of variance for e-booking.

The results of the ANOVA procedure (Table 4) show that there are statistically significant differences in the average values for the variable on-line travel services by groups as seen in the last column, where  $p (0.009) < 0.05$  (Table 4).



Table 4  
ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	.024	2	.012	13.881	.009
<b>Within Groups</b>	.004	5	.001		
<b>Total</b>	.029	7			

Source: Authors calculation

## Conclusion

From a consumer standpoint, e-booking is a time and money-saving, simple and useful help. From a business standpoint, it is a bit more complicated, but if managed properly, it can be a great asset. Ultimately, the Digital era is here to stay, affecting all businesses including the service industry, and both consumers and businesses are relying on it more and more, making it one of the greatest aspects of Modern-day tourism. The online booking industry is in a huge surge and trends show that most future users will use mostly mobile apps to make bookings (Ozturk et al., 2016). Companies will depend even more on e-booking as the main channel of distribution both using their app and depending on three-party apps and systems. There have been studies analyzing different booking channels and comparing them, for example, the study of Cheung and Law (2007) as well as studies looking at a particular destination (Jasrotia et al., 2019) and the companies operating there as well as studies looking into factors that influence customers to make an e-booking. However, this paper focused on connecting countries into clusters depending on similar characteristics.

This study could be used to help countries understand the new trends of online booking as well as help them develop strategies for their destination. The study is limited by the number of countries involved as well as the period in which the study is conducted. Moreover, all future estimates for revenue will have to be revised because future revenue growth will be impacted by sars-co2 pandemic influencing the whole world.

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