CUSTOMERS' PERCEPTION OF TOURIST GUESTHOUSES IN THE HISTORIC NEIGHBORHOODS OF TIMISOARA, THROUGH A STATISTICAL IMAGE

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RESEARCH ARTICLE

Abstract
The aim of the study is to statistically verify the existence of some differences between the historic neighborhoods of Timișoara, regarding the perception of tourists. The statistical data processed contain the scores obtained by the units with the function of tourist accommodation, through the booking.com platform. From the total types of accommodation units, a random sample of tourist pensions and apartments for rent was selected. Statistically processed data refer to location, cleanliness, facilities, value for money, comfort, respectively the overall score. Direct comparisons were made between the groups determined by the results from the Cetate, Fabric, Iosefin and Elisabetin neighborhoods, but also data for the guesthouses located in other neighborhoods than the historical ones.

Keywords: Timisoara, tourism, statistics, comparations
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INTRODUCTION

The historical districts of Timișoara are Cetate, Fabric and Iosefin-Elisabetin. Their boundaries are difficult to represent exactly today due to the evolution of the city over time. However, an approximate delimitation is possible to achieve.

The Cetate neighborhood is located in the central area of the city. From the residence of King Carol Robert of Anjou from the beginning of the 14th century, the citadel becomes the element around which the city develops. Currently, buildings in the Baroque, Art Nouveau or Secession style predominate. The Fabric district is located in the eastern part of the Cetate district. The name comes from the large number of factories that developed in this neighborhood. The first living quarters appeared in the middle of the 18th century. From the beginning it had a multicultural character, being inhabited by people of different nationalities. The Iosefin and Elisabetin neighborhoods developed as residential areas also in the middle of the 18th century. It was also during this period that the Bega Canal was built. It becomes an important navigable route. The train station built after 1850 brings an important development to the neighborhood. Baroque or eclectic, Art Nouveau or Jugendstil buildings predominate (TM INFO, 2024; TA, 2024; Almasan I.M. et al, 2002; TIMIȘOARA CITY MAPS, 2024). Many of the buildings in the historic districts are old and some are in a serious state of disrepair. Their rehabilitation is an important concern of the European Union countries (Pescari et al 2023).

Figure 1 **The location of the historical neighborhoods in Timișoara: Cetate (1), Fabric (2), Iosefin-Elisabetin (3)**
Source: Our representation using Google Maps

In this paper, the locations registered on booking.com were included approximately in the three neighborhoods.

The aim of the paper is to make a comparison between neighborhoods for the main indicators given by tourists as scores on the booking.com platform.

The booking.com platform (BOOKING, 2024) offers a very useful source of information that allows understanding some phenomena that occur in the tourism industry. Consulting the Google Academic platform (GOOGLE ACADEMIC, 2024), only for the period 01.01.2024 and until 03.27.2024 the term booking.com is found in 621 results corresponding to some scientific articles.

Various scientific topics related to the historical districts of Timisoara are frequent study topics. Among these we mention urban degradation and regeneration viewed by neighborhood residents (Tuță et al, 2023), uses of disused areas as creative spaces (Marian-Potra et al, 2020), concerns for the development of new objectives (Văduva et al, 2022) , seismic risks of historic buildings (Onescu et al, 2023), the concept of digital story (Vert et al, 2021), the use of the Bega canal for tourist purposes (Petroman et al, 2020), digital applications for the knowledge of urban heritage (Szekely et al 2023) or general studies on tourism potential (Babcsanyi et al, 2021).

MATERIAL AND METHOD

A random sample of 45 locations found on the booking.com platform was studied. Their location was estimated within the limits of the old neighborhoods of Timişoara: Cetate, Fabric, Iosefin and Elisabetin. Tourist accommodation units located in other areas of Timişoara were mentioned in a separate group.

The analyzed data refer to location, cleanliness, facilities, value for money, comfort, respectively the overall score. These values are tracked on the booking platform during the period of March 2024.

A statistical summary was made that included the minimum, maximum, mean and median values as well as the coefficients of variation of the series.

Testing of differences between groups was performed using the non-parametric Kruskal–Wallis test. Moreover, in order to confirm the significance of the differences between the groups, the ANOVA parametric test was also used.

SAS Studio was used for statistical processing and graphical representations. SAS-Nonparametric One-Way ANOVA was used for comparisons (SAS 2024, Anderson et al 2020, Abu-Bader 2021, West et al 2022).

RESULTS AND DISCUSSIONS

A statistical summary with indicators of central tendency and dispersion for the statistical data in the three historical districts, in other districts but also for their total are shown in table 1. Overall score presents values between a minimum of 7.1 and a maximum of 10. The average value is 8.84. This is in the 95% confidence interval between 8.61, 9.08. In agreement with the median value, approximately half of the studied units have an overall score higher than 9. The coefficients of variation of the statistical series have low values in all the studied cases. The highest value is 10.64%, which indicates the homogeneity of the data series. Thus, the score indicated by tourists have a homogeneous character, without high variability. This aspect is also given by the range value which does not exceed 2.90.

The values of the indicators in the four neighborhoods are different. By using the Kruskal-Wallis test we will determine whether the differences have statistical significance. For each indicator compared, the null hypothesis represents the absence of differences between neighborhoods. Values of the probability p, lower than $\alpha=0.05$, involve the rejection of the null hypothesis. This fact indicates statistically significant differences between the values of the indicators in the studied neighborhoods. Each application of the test led to the indicators found in Figures 2 a-f. Both the values related to the non-parametric Kruskal-Wallis test (chi square, p) are presented, as well as the values returned by ANOVA (F,p) within the diagrams.

Table 1

Statistical summary regarding the score values indicated by the booking platform for the studied sample consisting of accommodation units in the historical neighborhoods of Timișoara

	N	Variable	Mean	Std Dev	Minim	Maxim	Median	Range	Lower CI 95%	Upper CI 95%	Coeff of Variation
Total	45	Location	8.97	0.62	7.90	10.00	9.00	2.10	8.79	9.16	6.86
		Cleanliness	8.98	0.79	7.10	10.00	9.20	2.90	8.74	9.22	8.83
		Facilities	8.70	0.77	7.00	10.00	8.80	3.00	8.47	8.93	8.85
		Value for money	9.00	0.68	7.40	10.00	9.00	2.60	8.79	9.21	7.60
		Comfort	8.90	0.74	7.30	10.00	9.10	2.70	8.68	9.12	8.37
		Overall score	8.84	0.79	7.10	10.00	9.00	2.90	8.61	9.08	8.88
Cetate	10	Location	9.35	0.49	8.70	10.00	9.35	1.30	9.00	9.70	5.27
		Cleanliness	8.60	0.92	7.10	9.70	8.50	2.60	7.95	9.25	10.64
		Facilities	8.47	0.67	7.40	9.30	8.35	1.90	7.99	8.95	7.91
		Value for money	8.72	0.67	7.70	9.60	8.75	1.90	8.24	9.20	7.68
		Comfort	8.59	0.75	7.40	9.50	8.60	2.10	8.05	9.13	8.75
		Overall score	8.59	0.82	7.30	9.60	8.65	2.30	8.01	9.17	9.51
Fa-bric	10	Location	9.19	0.38	8.60	9.70	9.30	1.10	8.92	9.46	4.09
		Cleanliness	9.52	0.36	8.70	9.90	9.55	1.20	9.26	9.78	3.83
		Facilities	9.27	0.41	8.80	9.90	9.20	1.10	8.98	9.56	4.38
		Value for money	9.53	0.33	8.90	10.00	9.50	1.10	9.29	9.77	3.50
		Comfort	9.44	0.43	8.60	10.00	9.45	1.40	9.13	9.75	4.55
		Overall score	9.51	0.37	8.90	10.00	9.50	1.10	9.25	9.77	3.89
Iosefin Elisa-betin	10	Location	9.09	0.57	8.00	10.00	9.10	2.00	8.68	9.50	6.25
		Cleanliness	9.18	0.74	8.20	10.00	9.35	1.80	8.65	9.71	8.05
		Facilities	8.81	0.88	7.50	9.90	8.90	2.40	8.18	9.44	10.00
		Value for money	9.24	0.51	8.50	10.00	9.35	1.50	8.87	9.61	5.57
		Comfort	9.07	0.72	8.00	10.00	9.30	2.00	8.55	9.59	7.99
		Overall score	8.93	0.64	8.10	9.70	9.00	1.60	8.47	9.39	7.16
Other	15	Location	8.50	0.59	7.90	10.00	8.30	2.10	8.17	8.83	6.99
		Cleanliness	8.75	0.78	7.20	10.00	8.60	2.80	8.32	9.18	8.90
		Facilities	8.40	0.77	7.00	10.00	8.20	3.00	7.97	8.83	9.19
		Value for money	8.67	0.73	7.40	10.00	8.70	2.60	8.27	9.08	8.39
		Comfort	8.63	0.74	7.30	10.00	8.60	2.70	8.22	9.04	8.59
		Overall score	8.51	0.82	7.10	10.00	8.40	2.90	8.05	8.96	9.61

Source: Our calculation using statistical data from booking.com

The comparison of the Location indicator (figure 2a) indicates the value of $\chi2=13.43$ with $p=0.003$, lower than alpha. The null hypothesis is rejected. The differences between neighborhoods of this indicator are statistically significant. Tourists from the accommodation units appreciated the Cetate neighborhood the most in terms of location. In fact, this neighborhood is dominated by the most tourist attractions. The short distances that allow visiting them confirm the high value of this indicator.

The comparison of the Cleanlines indicator (figure 2b) indicates the value of $\chi2=8.47$ with $p=0.037$, and here lower than alpha. So, the null hypothesis is rejected. Differences between neighborhoods are statistically significant. Tourists from the Fabric neighborhood offered the highest average value, 9.5. The highest median value is also in the Fabric district, 9.6. The Cetate neighborhood has the lowest such values. It is very likely that the administrators of the units in the districts other than Cetate have taken an increased interest in cleanliness standards.

For the comfort indicator the differences are also significant (figure 2c). The Fabric neighborhood shows higher average values and median values. The houses in the Cetate neighborhood are placed on very busy streets in Timișoara. Many of the accommodation units in the Cetate neighborhood have a small area compared to the units in other neighborhoods. This is also due to the high costs of real estate in the central area of the city. The situation is different in the Fabric and Iosefin-Elisabetin neighborhoods. Buildings in these neighborhoods often offer higher comfort.

Regarding facilities, the differences are also statistically significant (figures 2d). The Fabric neighborhood has the highest average value of this indicator. It is followed by the Iosefin-Elisabetin neighborhood and then by Cetate.

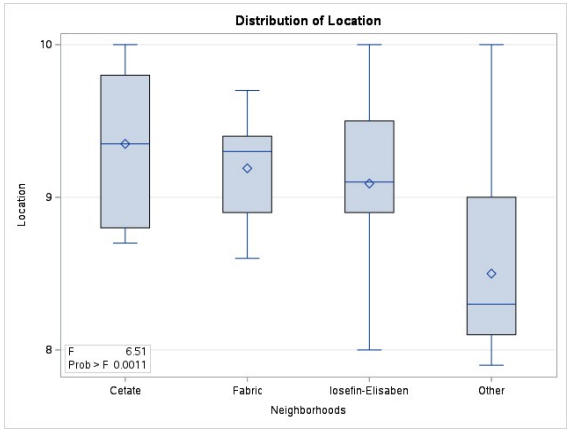
The value for money indicator has significant differences between neighborhoods (figure 2e). The highest average value is in the Fabric neighborhood, followed by Iosefin-Elisabetin. The average values of this indicator are lower in the Cetate neighborhood, on a par with other neighborhoods.

Overall score is one of the most followed indicators by the public. Differences between neighborhoods have statistical significance (figures 2e). The Fabric neighborhood has the highest average value of 9.5. And the median value is the same. Next comes the Iosefin-Elisabetin neighborhood with the average overall score of 8.9 and the median equal to 9. The Cetate neighborhood has the average value of 8.6 and the median of 8.7. The other accommodation units have an average value of 8.5 and a median of 8.4.

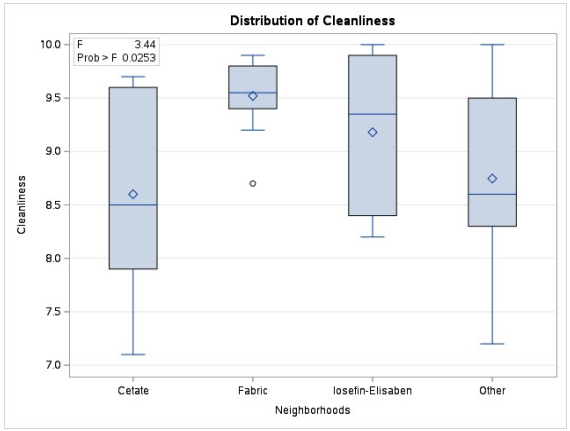
Following the values presented previously, a general trend can be observed for units in the Cetate neighborhood with higher scores in the location indicator. At the same time, the units in the Fabric neighborhoods, respectively Iosefin and Elisabetin, have higher scores for the other indicators: cleanliness, facilities, value for money, comfort. The comfort indicators can be given by the large spaces of the buildings in the Fabric and Iosefin-Elisabetin neighborhoods. The cleanliness, facilities, that was superior in these neighborhoods can be explained by an effort to compensate for the distance from the city's modern tourist attractions, made by the administrators of the accommodation units.

Boxplots diagrames can provide a clear picture of direct comparisons between indicators: the minimum, maximum, median and quartile values of the series.

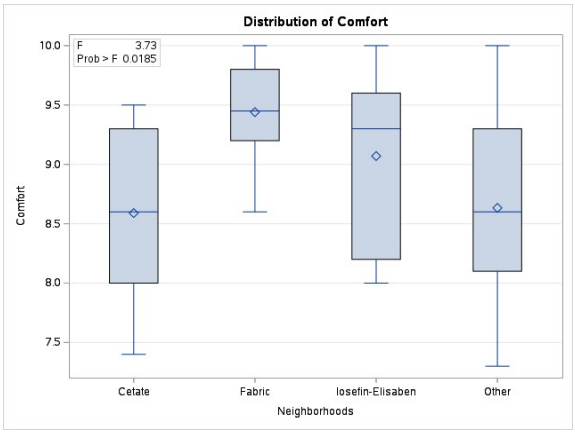
The values marked with the o symbol in the boxplot diagrams represent the outlier values. They appear in situations where the scores indicated by tourists can be very different from the main group of statistical data. It is sometimes useful to remove these values in statistical data processing (Dash et al 2023). However, considering that this aspect was observed in only one situation in this study, the value is preserved. We refer to a low score on the Cleanlines indicator in a unit in the Fabric district. These aspects can be isolated and do not have a representative character.



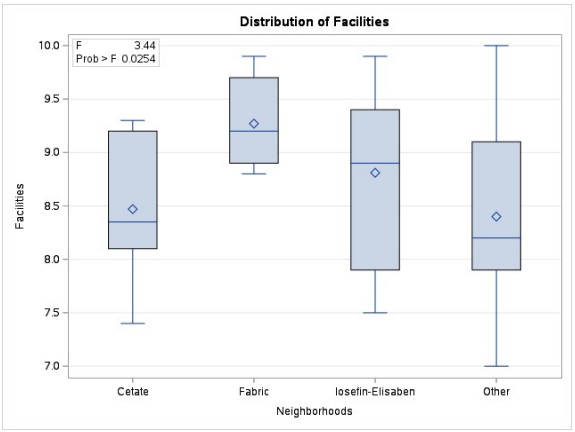
(a) Kruskal-Wallis Test:
Location
Chi-Square 13.4312
Pr > ChiSq 0.0038



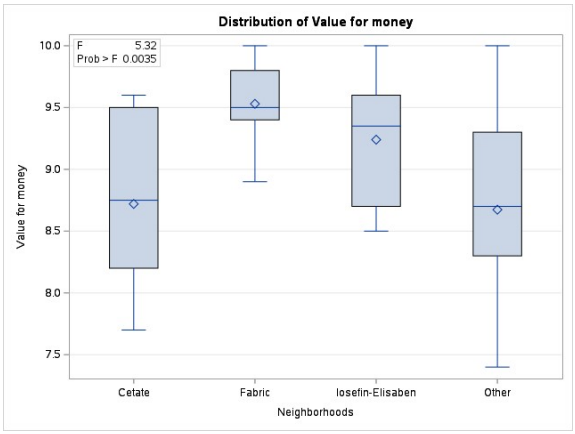
(b) Kruskal-Wallis Test:
Cleanliness
Chi-Square 8.4722
Pr > ChiSq 0.0372



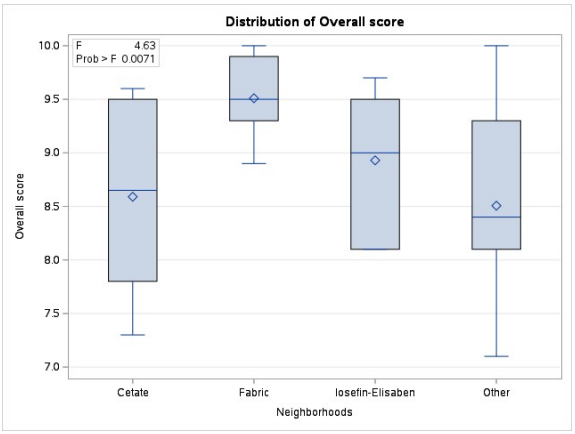
(c) Kruskal-Wallis Test:
Confort
Chi-Square 9.1244
Pr > ChiSq 0.0277



(d) Kruskal-Wallis Test:
Facilities
Chi-Square 8.1718
Pr > ChiSq 0.0426



(e) Kruskal-Wallis Test: Value for money
Chi-Square 11.8761
Pr > ChiSq 0.0078



(f) Kruskal-Wallis Test: Overall score
Chi-Square 10.8967
Pr > ChiSq 0.0123

Figure 2 **Boxplot diagrams for the comparison of the score indicated by the tourists between the historical districts of Timișoara**
(a) Location, (b) Cleanlines, (c) Confort, (d) Facilities, (e) Value for money, (f) Overall score
Source: Our representation using statistical data from booking.com

CONCLUSIONS

For all the analyzed indicators, the values were significantly different when comparing the neighborhoods. Historic neighborhoods have different particularities that are noticeable anyway.

The Cetate neighborhood in Timişoara is superior to the other neighborhoods in terms of the Location indicator, for the average and median value.

Comparing the other indicators, every time the Fabric neighborhood in Timişoara has higher average and median values than the indicators in the other neighborhoods studied.

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