1. **INTRODUCTION**

In today's increasingly digitized business environment, the ability to quickly and precisely analyze data has become crucial for the success of companies. Informatization and IT processes represent the basis for efficient information management in organizations. Their importance is reflected in the ability to collect, process, store and distribute information to support decision-making and achieve operational success. In today's digital age, businesses are faced with a constant flow of data, and the ability to effectively handle that data often makes the difference between success and failure.

Information tools for business, such as tools for data analysis, business intelligence and customer relationship management, have become indispensable partners in the decision-making process. They enable organizations to better understand their market, competition and internal operations through in-depth data analysis. Also, these tools enable adaptability and agility, allowing businesses to react more quickly to changes in the environment.

With information tools comes the ability to turn data into knowledge. This is especially evident in the age of digital transformation, where companies are faced with huge amounts of data. Understanding this data and the ability to extract relevant information has become essential for the proper direction of business.

Furthermore, information tools enable better risk management. Through data analysis, organizations can identify threats and opportunities and make strategic decisions that make them more resilient to challenges. Information tools, such as Microsoft Power BI, have become indispensable allies in the fact-based decision-making process. This thesis shows the importance and role of data analysis tools in modern companies and how Power BI, as one such tool, enables organizations to effectively collect, analyze and interpret data in order to better understand their business and make informed decisions.

**2. DESCRIPTION OF THE PROBLEM**

In this paper, reservations at the City Hotel and Resort Hotel were analyzed using the Power BI tool.

The data includes canceled reservations, time since initiation, years of arrival at hotels, months and days of arrival, weekend nights and weekday nights, countries of arrival, market segments, reservation status showing the date when the last status was set to understand when the reservation was canceled or when the guest checked out of the hotel, the total number of overnight stays during the week and overnight stays during the weekend, the last reservation status, which assumes one of three categories:

* Canceled – the reservation was canceled by the user;
* Logout – the user has logged in, but has already left;
* No-show – the guest did not check in and informed the hotel about the reason.

Reservation distribution channel - The term "TA" stands for "travel agents" and "TO" for "tour operators". Categories of guests (adults, children or babies), food - type of reserved meal, includes the following terms:

• Undefined/SC – no ration package

• BB – Bed and breakfast

• HB - half board (breakfast and another meal - usually dinner)

• FB – Full board (breakfast, lunch and dinner).

Special requests, type of deposit - has the guest paid a deposit to guarantee the reservation. This variable can assume three categories:

• No deposit – no deposit was made;

• Non Refund – a deposit in the value of the total cost of the stay has been paid;

• Refundable – the deposit is paid in a value below the total price of the stay.

Trends and statistical data for a period of 3 years (2015-2017) are presented. That is, data on 119,390 hotel reservations (displayed in 94,690 lines) will be analyzed in the period from July 1, 2015 to August 31, 2017.

The database contains the following data:

* ​ Number of children, number of babies, number of adults, number of special requests, number of weekend, weekly and canceled nights, number of previous reservations without cancellation (numerical data)
* deposit type, assigned room type, reserved room type, reservation status, market segment, distribution channel, country, hotel (text data)
* date of arrival (date data type)
* An excerpt from the Excel database is shown in Figure 1.

Slika na kojoj se prikazuje tekst, snimka zaslona, broj, paralelno

Opis je automatski generiran

Figure 1. Clip from the database

Source: <https://www.kaggle.com/datasets/mojtaba142/hotel-booking>

1. **DIMENSIONAL DATA MODEL**

The first phase of the analysis includes descriptive statistics in order to extract basic information based on the displayed data, such as mean values, minimum and maximum values, that is, in order to gain insight into the data on the basis of which the analyzes will be made.

Depending on the goal of the analysis, segmentation methods will also be used to group data on guests, reservations or room types into different categories or segments. This includes classifying guests by market segment, room type or other variables.

Then temporal analyzes to analyze monthly or annual variations in bookings or to identify special events or periods of high demand.

Correlation analysis aims to examine how a particular room type correlates with the number of overnight stays.

Various visualization methods were used for the purpose of easier understanding and interpretation of data, identification of patterns, trends and relationships, and transfer of information in a faster and more efficient way; tables, graphs, matrices, cards and slicers.A screenshot of a computer

Description automatically generated

Figure 2. Dimensional data model

Source: Prepared by the author

1. **DATA TRANSFORMATION**

Before the original data was transferred from Excel to Power BI, it was necessary to make changes to the data.

Given that the data on the time or date of realization of the reserved nights are given in nominal form, it was necessary to convert the textual data into numerical data in an Excel document. This is done using the following formula:

.

The data obtained in numerical form are connected in a common column by means of the following formula:

That is, the text data type is associated with the corresponding number (eg July = 7).

In the Power BI program, the transformation of textual values into numerical values can also be performed with the formula:

* After the changes, the Excel document was transformed into the Power BI program, and the following steps were taken Data cleaning and preparation:
* Through the 'Power Query Editor' and 'Edit Queries' on the 'Home' tab, various cleaning steps were performed, including filtering rows, removing unnecessary columns, handling missing values, and the like.
* Duplicate data was removed via the "Remove Duplicates" option.
* Assigning ID Numbers made it easier to connect dimensions and factor tables. The ID number was added via the "Add Index Column" option in the Power Query Editor.
* Creation of Dimension Tables: After cleaning and assigning ID numbers, separate tables were created for each dimension that was analyzed (eg market segment, room type, country, hotel). In each dimension table, there is a column with unique IDs and corresponding descriptions or attributes.
* Linking Dimensions via ID columns found both in the dimensions and in the factor table in which the facts (eg weekly overnight stays, weekend overnight stays, total overnight stays, total canceled reservations, number of children, babies, adults...).
* In the fact table after merging the query, the data that can be reached via ID is deleted. Added an indexed column (TimeID) to the loaded Timetable.
* The tables are linked by "master date" and the dates are deleted since they can be accessed via "TimeID".

For further analysis, it was necessary to calculate additional values such as:

* the average number of special requests per overnight stay for the corresponding months and the above was calculated with the help of the formula:
* years are displayed as a "whole number" data type and not as a "date" data type, so they are converted into the desired format using the formula:
* in the further analysis of the data, guest categories including children, babies and adults will also be observed, and it was necessary to calculate:
* The previous formula was needed to calculate the average number of nights spent by one guest.

# **REPORTS**

# The reports analyzed the following:

# Overnight stays by room type in selected hotels for certain periods

# Discrepancies between reserved and assigned room type

# Number of special requests according to reserved and assigned room types.

# Total reservations according to market segments in the mentioned hotels.

# Number of guests by age structure.

# Deposits paid to guarantee a stay in selected hotels for certain periods.

# Number of overnight stays and canceled reservations by country of arrival of tourists.

# Additions or changes to reservations by room type from the moment the reservation is entered on the 'property - management - system'.

# Preferences of families with children when booking room type (A, B, C, D...) andboard type (BB, half board and board) in the mentioned hotels.

# Below are the results of the analyzes carried out for the purposes of the posted reports.

* **Task 1**. Analyze overnight stays (total and canceled) by room type for City Hotel and Resort Hotel in the period from July 1, 2015 to August 31, 2017.

Results of task 1 for City Hotel in the period from July 1, 2015 to January 1, 2016. are shown in table 1.

Table 1. Presentation of total and canceled overnight stays by room type for City Hotel in the period from July 1, 2015 to January 1, 2016.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| REZERVIRANI TIP SOBE | TJEDNA NOĆENJA | VIKEND  NOĆENJA | UKUPNA  NOĆENJA | OTKAZANA  NOĆENJA |
| A | 15.582 | 6.131 | 21.713 | 4.306 |
| B | 475 | 186 | 661 | 59 |
| C | 5 | 0 | 5 | 1 |
| D | 1.451 | 508 | 1.959 | 91 |
| E | 108 | 41 | 149 | 9 |
| F | 229 | 78 | 307 | 17 |
| G | 42 | 13 | 55 | 3 |
| ukupno | **17.892** | **6.957** | **24.849** | **4.486** |

Source: Prepared by the author

In the second half of 2015, City Hotel achieved a total of 24,849 overnight stays.

Analyzing the room types, room type A stood out as the most requested with a total of 21,713 overnight stays, which represents 87.4% of the total overnight stays in that period. Analyzing canceled reservations, 4,486 canceled overnight stays were recorded, or 18%.

Room types B and C record a lower percentage of overnight stays (2.7% in total), and the same is true for room types E (0.6%) and F (1.2%).

Results of task 1 for the Resort Hotel in the period from 1.7.2015 - 1.1.2016. are shown in table 2.

Table 2. Presentation of total and canceled overnight stays by room type for the Resort Hotel in the period from July 1, 2015 - January 1, 2016.

​

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***REZERVIRANI TIP SOBE*** | ***TJEDNA NOĆENJA*** | ***VIKEND NOĆENJA*** | ***UKUPNA NOĆENJA*** | ***OTKAZANA***  ***NOĆENJA*** |
| **A** | 15.550 | 5.783 | 21.333 | 1.518 |
| **B** | 2 | 0 | 2 | 0 |
| **C** | 587 | 226 | 813 | 36 |
| **D** | 5.591 | 2.087 | 7.678 | 277 |
| **E** | 3.576 | 1.357 | 4.933 | 187 |
| **F** | 600 | 230 | 830 | 27 |
| **G** | 832 | 299 | 1131 | 65 |
| **H** | 265 | 90 | 355 | 26 |
| **L** | 6 | 1 | 7 | 2 |
| ***ukupno*** | **27.009** | **10.073** | **37.082** | **2.138** |

Source: Prepared by the author

It was concluded that in the second half of 2015, the total number of overnight stays at the "RESORT" hotel was 37,082. Information from this year enables comparison with later years, such as 2016 and 2017.

The most popular room type in 2015 was room type A, with a total of 21,333 overnight stays. This makes up a significant percentage of the total overnight stays, as much as 57.5%. This room type also had 5,783 weekend nights, which represents 57.3% of the total weekend nights.

Comparing with other room types, room type D was also quite popular with a total of 7,678 overnight stays, accounting for 20.7% of total overnight stays. However, room type C, although it has a significant number of reservations (813 overnight stays), accounts for only 2.2% of total overnight stays.

In terms of canceled reservations, a total of 2,138 reservations were canceled in 2015. This represents a percentage of 5.8% of canceled overnight stays in relation to total reservations.

​

Results of task 1 for City Hotel in the period from January 1, 2016. - 1.1.2017. are shown in table 3.

Table 3. Presentation of total and canceled overnight stays by room type for the City Hotel in the period from January 1, 2016. - 1.1.2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| REZERVIRANI TIP SOBE | TJEDNA  NOĆENJA | VIKEND  NOĆENJA | UKUPNA  NOĆENJA | OTKAZANA  NOĆENJA |
| A | 62.182 | 21.741 | 83.923 | 12.472 |
| B | 1.568 | 637 | 2205 | 208 |
| C | 15 | 3 | 18 | 4 |
| D | 15.369 | 5.666 | 21.035 | 2.135 |
| E | 1.486 | 522 | 2.008 | 155 |
| F | 2.175 | 827 | 3.002 | 377 |
| G | 527 | 199 | 726 | 46 |
| P | 11 | 4 | 15 | 4 |
| ukupno | **83.333** | **29.599** | **112.932** | **15.401** |

Source: Prepared by the author

In 2016, City Hotel experienced significant growth in business, with a total of 112,932 overnight stays, which is an increase of 354.2% compared to 2015, when 24,849 overnight stays were recorded.

Room type A remained the most requested and achieved 21,713 overnight stays in 2016, which is a percentage of 19.7% of total reservations for this year, although the number of canceled overnight stays increased.

Room type B also recorded an increase in the number of overnight stays, with 2,205 overnight stays in 2016, accounting for 2% of total overnight stays. This room type also recorded an increase in the percentage of canceled nights.

Room type C with 18 overnight stays in 2016 compared to only 5 overnight stays in 2015, still accounts for a very small percentage of total overnight stays.

Room type D experienced a fairly large increase in the number of overnight stays, with 21,035 overnight stays in 2016. This type of room accounts for 18.6% of total overnight stays, but the percentage of canceled overnight stays has also increased significantly.

Room type E also attracted more guests, with 2,008 overnight stays in 2016 compared to 149 overnight stays in 2015, representing a percentage of 1.8% of total overnight stays.

Room type F: This room type recorded an increase in the number of overnight stays, with 3,002 overnight stays in 2016 compared to 307 overnight stays in 2015, accounting for 2.7% of total overnight stays.

The comparison with 2015 highlights a significant increase in total overnight stays, but also highlights an increase in the percentage of canceled overnight stays for most room types.Rezultati zadatka 1 za Resort Hotel u periodu od 1.1.2016. - 1.1.2017. prikazani su u tablici 4.

Table 4. Presentation of total and canceled overnight stays by room type for the Resort Hotel in the period

from 1.1.2016 - 1.1.2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| REZERVIRANI  TIP SOBE | TJEDNA NOĆENJA | VIKEND  NOĆENJA | UKUPNA NOĆENJA | OTKAZANA  NOĆENJA |
| A | 14.561 | 5.395 | 19.956 | 2.827 |
| C | 331 | 130 | 461 | 60 |
| D | 5.388 | 2.054 | 7.442 | 920 |
| E | 3.818 | 1.512 | 5.330 | 617 |
| F | 455 | 188 | 643 | 74 |
| G | 1.260 | 515 | 1.775 | 291 |
| H | 461 | 191 | 652 | 119 |
| P | 0 | 0 | 0 | 2 |
| ukupno | **26.274** | **9.985** | **36.259** | **4.910** |

Source: Prepared by the author

It is concluded that a total of 36,259 overnight stays were recorded in the "RESORT" hotel in 2016. This represents an increase of 2.3% compared to the second half of the previous year (2015), when 37,082 overnight stays were realized.

The most popular room type is still room type A, with a total of 19,956 overnight stays, which is 55% of the total overnight stays in 2016. Weekend overnight stays for this room type amounted to 5,395, which accounted for 29% of the total weekend overnight stays.

Room type D also remained popular with a total of 7,442 overnight stays (21% of total overnight stays) and 2,054 weekend overnight stays (8% of total weekend overnight stays).

When it comes to canceled reservations in 2016, the number of canceled nights decreased to 4,910, which is significantly less compared to the previous year. The total number of overnight stays decreased from 37,082 in 2015 to 36,259 in 2016, which represents a decrease of 2.3%. Room type A still remains the most popular, but the percentage of total overnight stays decreased from 57.5% in 2015 to 55% in 2016.

Canceled reservations decreased significantly, from 5.8% of canceled nights in 2015 to 13.5% in 2016.

These comparisons indicate a decline in total overnight stays in 2016 compared to the previous year, while the percentage of canceled overnight stays was significantly reduced. Room type A still remains popular, but its percentage in total overnight stays has decreased.

Results of task 1 for City Hotel in the period from January 1, 2017. - 31.8.2017. are shown in table 5.

Table 5. Presentation of total and canceled overnight stays by room type for City Hotel in the period from 1 January 2017. - 31.8.2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***REZERVIRANI***  ***TIP SOBE*** | ***TJEDNA***  ***NOĆENJA*** | ***VIKEND***  ***NOĆENJA*** | ***UKUPNA***  ***NOĆENJA*** | ***OTKAZANA***  ***NOĆENJA*** |
| **A** | 40.388 | 14.595 | 54.983 | 8.966 |
| **B** | 527 | 198 | 725 | 87 |
| **C** | 3 | 1 | 4 | 0 |
| **D** | 11.258 | 4.330 | 15.588 | 1.896 |
| **E** | 2.097 | 756 | 2.853 | 334 |
| **F** | 1.554 | 592 | 2.146 | 292 |
| **G** | 565 | 206 | 771 | 70 |
| **P** | 0 | 0 | 0 | 6 |
| ***ukupno*** | **56.392** | **20.678** | **77.070** | **11.651** |

Source: Prepared by the autor

The total number of overnight stays decreased by 24.4% in 2017 compared to 2016. The number of nights for room type A decreased by 35.2% in 2017, with an increase in the percentage of canceled nights by 39.4%. The number of nights for room type B decreased by 67.0% in 2017, with an increase in the percentage of canceled nights by 58.2%. Room type C recorded an increase in the number of overnight stays of 12.5%, but their total number remains low, accounting for 0.02% of total overnight stays.

The number of nights for room type D decreased by 26.0% in 2017, with an increase in the percentage of canceled nights by 12.1%. Room type E recorded an increase in the number of overnight stays of 52.1% in 2017, but also a significant increase in canceled overnight stays. The number of nights for room type F decreased by 27.9% in 2017, with an increase in canceled nights by 27.8%.

The number of nights for room type G decreased by 26.7% in 2017, and the number of canceled nights increased by 52.2%.

These figures indicate a general decline in hotel attendance in 2017 compared to 2016, with the exception of room type E, which recorded growth.

Results of task 1 for the Resort Hotel in the period from 1.1.2017. – 31.8.2017. are shown in table 6.

Table 6. Presentation of total and canceled overnight stays by room type for the Resort Hotel in the period from 1 January 2017. – 31.8.2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **REZERVIRANI**  **TIP SOBE** | **TJEDNA NOĆENJA** | **VIKEND**  **NOĆENJA** | **UKUPNA**  **NOĆENJA** | **OTKAZANA**  **NOĆENJA** |
| **A** | 9.747 | 3.414 | 13.161 | 2.009 |
| **B** | 1 | 0 | 1 | 0 |
| **C** | 940 | 358 | 1.298 | 205 |
| **D** | 3.925 | 1.581 | 5.506 | 754 |
| **E** | 3.305 | 1.275 | 4.580 | 603 |
| **F** | 516 | 204 | 720 | 78 |
| **G** | 1.296 | 538 | 1.834 | 285 |
| **H** | 438 | 169 | 607 | 100 |
| ***Ukupno*** | **20.168** | **7.539** | **27.707** | **4.034** |

Source: Prepared by the author

In 2017, Hotel "RESORT" realized a total number of overnight stays of 27,707. The most popular room type this year was room type A with a total of 13,161 overnight stays, which is 47.5% of the total overnight stays in 2017. Weekend overnight stays for this room type amounted to 3,414, which represents 45.3% of the total weekend overnight stays.

When it comes to canceled reservations in 2017, the total number of canceled overnight stays was 4,034, which is 14.6% of canceled overnight stays compared to total reservations.

The total number of overnight stays decreased from 37,082 overnight stays in 2015 to 27,707 overnight stays in 2017, which represents a drop of approximately 25.3%.

Room type A remained the most popular in 2017, although the percentage of total overnight stays decreased from approximately 57.5% in 2015 to approximately 47.5% in 2017.

The number of canceled reservations increased from approximately 2,138 canceled nights in 2015 to approximately 4,034 canceled nights in 2017.

* **Task 2.** Analyze the discrepancies between the reserved room type and the assigned room type for the City Hotel and Resort Hotel in the period from 1 July 2015 to 31 August 2017.

The results of task 2 for City Hotel are shown in Table 7.

Table 7. Display of deviations between reserved and allocated room types for City Hotel in the period from 1.7.2015. – 31.8.2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | REZERVIRANI TIP SOBE | | DODIJELJENI TIP SOBE | |
| 2015. | A | 8.201 | A | 7.281 |
| B | 202 | B | 315 |
| C | 4 | C | 7 |
| D | 606 | D | 1.234 |
| E | 47 | E | 138 |
| F | 99 | F | 143 |
| G | 20 | G | 44 |
| 2016. | A | 29.635 | A | 26.815 |
| B | 665 | B | 1.270 |
| C | 7 | C | 79 |
| D | 6.058 | D | 7.463 |
| E | 596 | E | 968 |
| F | 918 | F | 1.027 |
| G | 228 | G | 344 |
| P | 4 | P | 4 |
|  |  | K | 141 |
| 2017. | A | 18.360 | A | 17.519 |
| B | 189 | B | 227 |
| C | 2 | C | 65 |
| D | 4.323 | D | 4.824 |
| E | 799 | E | 847 |
| F | 620 | F | 666 |
| G | 206 | G | 254 |
| P | 6 | P | 6 |
|  |  | K | 97 |

Source: Prepared by the author

The deviations between reserved and assigned room types for all room types (A, B, C, D, E, F, G and P) were analyzed and expressed in percentages to get a better insight into the changes over different years.

In 2015, different levels of deviation are observed for different types of rooms. Room type A experienced a relatively low level of deviation of 8.2%, while room type B had a significantly higher deviation of 56.4%. The deviations for types C, D, E, F and G also varied, suggesting that the hotel had different levels of compliance with guest preferences.

However, 2016 brought significant changes. Deviations increased for room types A, B, C, E, F and G, while they decreased significantly for room type D. This increase in deviation suggests that the hotel has become less in tune with guests' preferences, which may affect their satisfaction with their stay. .

In 2017, there are some improvements. Deviations decreased for room types A, B, D, F and G, while they increased for room types C and E. This decrease in deviations suggests that the hotel is back in line with guest bookings. A comparison between 2015 and 2016 reveals a dramatic increase in deviation for most room types, with the exception of room type D which experienced a significant decrease in deviation. On the other hand, a comparison between 2017 and 2016 shows that the deviations have decreased for most room types, indicating a gradual improvement in hotel compliance with guest reservations.

The results of task 2 for the Resort Hotel are shown in Table 8.

Table 8. Display of deviations between the reserved and assigned room type for the Resort Hotel in the period from July 1, 2015. – 31.8.2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | REZERVIRANI TIP SOBE | | DODIJELJENI TIP SOBE | |
| 2015. | A | 5.275 | A | 3.785 |
|  | B | 1 | B | 34 |
|  | C | 166 | C | 467 |
|  | D | 1.459 | D | 2.050 |
|  | E | 887 | E | 1.085 |
|  | F | 198 | F | 395 |
|  | G | 239 | G | 325 |
|  | L | 6 | L | 1 |
|  |  |  | I | 45 |
| 2016. | A | 5.432 | A | 4.215 |
|  |  |  | B | 23 |
|  | C | 90 | C | 313 |
|  | D | 1.396 | D | 2.040 |
|  | E | 998 | E | 1.135 |
|  | F | 150 | F | 232 |
|  | G | 381 | G | 410 |
|  | P | 2 | P | 2 |
|  | H | 152 | H | 166 |
|  |  |  | I | 65 |
| 2017. | A | 3.055 | A | 2.538 |
|  | B | 1 | B | 16 |
|  | C | 267 | C | 374 |
|  | D | 1.078 | D | 1.347 |
|  | E | 821 | E | 863 |
|  | F | 139 | F | 176 |
|  | G | 341 | G | 363 |
|  |  |  | H | 125 |
|  |  |  | I | 18 |

Source: Prepared by the author

Analyzing the deviations between reserved and allocated room types for different categories, significant changes can be observed during the period from 2015 to 2017.

In 2015, room type A saw a 28.2% decrease in deviations, suggesting that guests managed to get the room type they booked in most situations. In contrast, room type B had a significant increase in deviation of 33.0%.

However, the situation changed significantly in 2016. Deviations generally increased, with room type B experiencing a dramatic increase. A reduction in deviations was also observed for room types C and D.

In 2017, there was a general decrease in deviations compared to 2016. For example, room type B decreased to 20.0%, and room type D also experienced a significant decrease.

* **Task 3**. Analyze the number of special requests (double bed, high floor...) according to reserved and assigned room types.

The results of task 3 are shown on graphs 1 and 2.Slika na kojoj se prikazuje tekst, snimka zaslona, softver, broj

Opis je automatski generiran

Graf 1. Display of special requests by reserved room types

Source: Prepared by the author

**Slika na kojoj se prikazuje tekst, snimka zaslona, crta, radnja

Opis je automatski generiran**

Graf 2. Display of special requests by assigned room types

*Source: Prepared by the author*

## **Task 4**. Analyze total reservations according to market segments in the period from July 1, 2015 to August 31, 2017. year for City and Resort hotel.

## The results of task 4 are shown in table 9.

## Table 9. Presentation of total reservations by market segments in the period from July 1, 2015 to August 31, 2017. year for City and Resort Hotel.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Tržišni segment | Broj rezervacija | | | | | |
| 1.7.2015 - 1.1.2016 | | 1.1.2016. - 1.1.2017. | | 1.1.2017. - 31.8.2017. | |
| CITY HOTEL | RESORT HOTEL | CITY HOTEL | RESORT HOTEL | CITY HOTEL | RESORT HOTEL |
| Aviation | / | / | 127 | / | 83 | / |
| Complementary | 109 | 33 | 261 | 38 | 133 | 21 |
| Corporate | 427 | 605 | 1636 | 535 | 731 | 431 |
| Direct | 642 | 1346 | 2716 | 1024 | 2041 | 782 |
| Groups | 3645 | 1150 | 4687 | 2167 | 4067 | 584 |
| Offline TA/TO | 1907 | 2077 | 8996 | 1192 | 3353 | 604 |
| Online TA | / | 3102 | 19688 | 3645 | 14097 | 3398 |

Source: Prepared by the author

## With regard to the market segments of reservations in City and Resort Hotels during the period from 2015 to 2017, differences are observed in the way guests booked their stay. From the above data, it is evident that City Hotel recorded a significant increase in the number of reservations between 2015 and 2017. The "Online TA" segment recorded the greatest growth, while "Groups" also contributed significantly to the number of reservations. On the other hand, the "Complementary" segment decreased in 2017. The "Offline TA/TO" segment had a significant increase in 2016, but decreased in 2017. The "Corporate" and "Direct" segments also grew significantly during the period. Observing this data shows that the Resort Hotel also experienced changes in the number of reservations by market segment in the period from 2015 to 2017. The "Online TA" segment remained the largest in 2017, while the "Complementary" and "Corporate" segments decreased. "Groups" and "Direct" segments have recorded growth in the last two years.

## • **Task 5**. Analysis of the total number of guests in City and Resort Hotel by age structure

## The results of task 5 are shown in table 10.

## Table 10. Presentation of the total number of guests in City and Resort Hotel by age structure

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hotel** | **Datum dolaska** | **Odrasli** | | **Djeca** | **Bebe** | **Ukupno gostiju** |
| **CITY** | **2015.** | | ***16.198*** | ***300*** | ***59*** | ***16.557*** |
| **RESORT** | **2015.** | | ***15.875*** | ***845*** | ***139*** | ***16.859*** |
| **CITY** | **2016.** | | ***70.511*** | ***3.806*** | ***195*** | ***74.512*** |
| **RESORT** | **2016.** | | ***15.827*** | ***996*** | ***109*** | ***16.932*** |
| **CITY** | **2017.** | | ***46.207*** | ***2.648*** | ***104*** | ***48.959*** |
| **RESORT** | **2017.** | | ***10.960*** | ***1.323*** | ***37*** | ***12.320*** |

Source: Prepared by the author

**• Task 6**. Analyze the types of deposits paid to guarantee a stay in the City and Resort Hotel in the period from July 1, 2015 to August 31, 2017.

The results of task 6 for City Hotel are shown in table 11.Table 11. Display of the deposits paid to guarantee the stay in the City Hotel

|  |  |  |  |
| --- | --- | --- | --- |
|  | **VRSTA DEPOZITA** | | |
| GODINA DOLASKA | No Deposit | Non-Refund | Refundable |
| 2015. | 6.679 | 2.498 | 2 |
| 2016. | 32.198 | 5.910 | 3 |
| 2017. | 20.679 | 3.812 | 14 |

Source: Prepared by the author

In 2015, City Hotel noted that the majority of guests did not pay a deposit, which corresponds to the "No deposit" category. Only a few guests paid deposits that corresponded to the price of their stay ("Non Refund" and "Refundable"). 2016 saw a significant jump in the number of guests who paid deposits. A large number of guests were ready to pay in advance for their stay. Most of these deposits were in the "No deposit" and "Non Refund" categories, suggesting that guests were willing to take financial responsibility for their stay. In 2017, the number of deposits decreased, but most of them were in the category "No deposit" and "Non Refund." Looking at the changes in deposits over the three years, it is noted that the majority of guests did not pay deposits or paid deposits corresponding to the price of their stay.

The results of task 6 for City Hotel are shown in table 12.

Table 12. Presentation of paid deposits for the guarantee of a stay at the Resort Hotel

|  |  |  |  |
| --- | --- | --- | --- |
|  | **VRSTA DEPOZITA** | | |
| GODINA DOLASKA | No Deposit | Non-Refund | Refundable |
| 2015. | 7.791 | 521 | 1 |
| 2016. | 7.644 | 881 | 76 |
| 2017. | 5.501 | 306 | 13 |

Source: Prepared by the author

In 2015, most guests at the Resort Hotel did not pay a deposit ("No deposit"). Only a few guests paid deposits ("Non-Refund" and "Refundable") that covered the total cost of their stay.

The year 2016 saw a significant increase in the number of guests who paid deposits. The largest number of deposits was still in the "No deposit" category, but the "non-refund" category recorded significant growth.

In 2017, the number of deposits in the Resort Hotel is decreasing. Most of these deposits were in the category "No deposit" and "non-refund." Similar to the City Hotel, the Resort Hotel has seen changes in the types of deposits over the course of three years. Most guests did not pay deposits or paid deposits corresponding to the price of their stay.

**Task 7**. Analyze realized and canceled overnight stays by country of arrival of tourists in the mentioned hotels.

The results of task 7 are shown on graphs 3, 4 and 5.

Slika na kojoj se prikazuje tekst, snimka zaslona, softver, zaslon

Opis je automatski generiran

Graph 3. Display of overnight stays by country of tourist arrival for the Resort Hotel in the specified period.

Source: Prepared by the author

Slika na kojoj se prikazuje tekst, snimka zaslona, zaslon, softver

Opis je automatski generiran

Graph 4. Presentation of overnight stays by country of tourist arrival for City Hotel in the specified period.

Source: Prepared by the author

Slika na kojoj se prikazuje tekst, softver, snimka zaslona

Opis je automatski generiran

Graph 5. Display of canceled reservations by country of tourist arrival for City and Resort Hotel in the period from July 1, 2015. – 31.8.2017.

Source: Prepared by the author

City Hotel attracted a considerable number of guests from different countries, and the total number of overnight stays for this hotel is 215,222, the total number of guests is 133,181 and the total amount of canceled nights is 31,583.

The shares of overnight stays in the City Hotel by country are as follows: 34.04% guests from Portugal, 7.34% guests from France, 4.84% guests from Germany, 4.80% guests from Great Britain, 3.78% guests from Spain, 2.73% guests from Italy, 2.56% guests from Brazil, 2.39% guests from Belgium, 2.18% guests from the Netherlands, 2.07% guests from the United States of America, guests from Nigeria 2.07% of total overnight stays.

Nigerian guests have the highest percentage of canceled nights at 49.48% among the top 10 countries. Guests from China also have a high percentage of canceled nights, accounting for 28.17% of canceled nights. Shares of canceled overnight stays according to other countries are as follows: 26.38% guests from India, 22.76% guests from America, 19.76% guests from Great Britain, 14.15% guests from France, 14.07% guests from Turkey, 13.15% guests from Germany, 11.51% guests from Spain, 10.66% guests from Australia.

Portuguese spend an average of 1.43 nights per guest. On the other hand, the French are among the guests who have the longest stays. Their average stay is 1.71 nights per guest. German guests also stand out in terms of length of stay, with an average of 1.74 nights per guest. Big Britain also has guests with a decent average stay of 1.68 nights per guest. Spaniards, who are in the vicinity, often have shorter stays with an average of 1.49 nights per guest. Italians and Brazilians spend an average of 1.60 and 1.67 nights per guest. Belgian guests (1.57 nights) and Dutch (1.62 nights) also have solid average stays, which may indicate the popularity of City Hotel among guests from the Benelux region. Finally, guests from the United States also spend an average of 1.68 nights per guest.

The total number of guests at the Resort Hotel is 42,71, with 101,165 overnight stays and 11,097 canceled overnight stays.

The analysis of overnight stays in the Resort Hotel concludes: Portugal (PRT) recorded a total of 22,393 guests who spent 48,754 overnight stays, of which 7,421 overnight stays were cancelled. The percentage of canceled nights is approximately 15.21%. Spain (ESP): A total of 7,669 overnight stays were made by Spanish guests, and 849 of them were cancelled, representing a cancellation percentage of approximately 11.06%. Kuwait (KWT): Guests from Kuwait spent a total of 47 nights, which is a low average of only 2.04 nights per guest.

Oman (OMN): Oman contributed with 32 overnight stays, with an average of 1.60 overnight stays per guest.

United Arab Emirates (ARE): Guests from the UAE spent 191 nights, with an average of 1.41 nights per guest.

The Bahamas contributed with 2 nights and a low average of 1.33 nights per guest. Guests from Guyana spent 3 nights, with an average of 1.00 nights per guest. Ecuador contributed with 85 overnight stays and an average of 1.00 overnight stays per guest. Guests from Colombia spent 126 nights and also an average of 1.00 nights per guest. Finland contributed with 273 overnight stays, with an average of 1.00 overnight stays per guest. Argentina contributed with 104 overnight stays, with an average of 1.00 overnight stays per guest. Guests from Gibraltar spent 33 nights per guest, which is a high average. Saint Lucia is second with a high average of 21 nights per guest. Brunei contributes with 19 overnight stays per guest. Libya is fourth on the list with an average of 16 nights per guest. Seychelles is fifth with an average of 12 nights per guest. Bahrain has an average of 7.00 nights per guest. Guests from Qatar get 5.80 overnight stays per guest. Saudi Arabia (SAU): Average 5.50 nights per guest. Armenia (ARM): Armenia is ninth with an average of 5.50 nights per guest. Guests from the Bahamas spend an average of 5.00 nights per guest.

**Task 8.** Analyze changes/additions to reservations by room type from the moment the reservation was entered on the 'property management system' in the period from July 1, 2015 to August 31, 2017.

The results of task 8 are shown on graphs 6, 7 and 8.Slika na kojoj se prikazuje tekst, snimka zaslona, dijagram, radnja

Opis je automatski generiran

Graph 6. Display of changes/additions to reservations by room type from the moment the reservation was entered on the 'property - management -system' in the period from July 1, 2015 - January 1, 2016.

Source: Prepared by the author

Slika na kojoj se prikazuje tekst, snimka zaslona, dijagram, paralelno

Opis je automatski generiran

Graph 7. Display of changes/additions to reservations by room type from the moment the reservation was entered on the 'property management system' in the period from 1 January 2016 to 1 January 2017.

Slika na kojoj se prikazuje tekst, snimka zaslona, dijagram, radnja

Opis je automatski generiran

Graph 8. Display of changes/additions to reservations by room type from the moment the reservation was entered on the 'property management system' in the period from 1 January 2017 to 31 August 2017.

Source: Prepared by the author

* **Task 9**. Analyze the preferences of families with children when reserving room type (A, B, C, D...) and board type (BB, half board and board) for City Hotel and Resort Hotel in the period from 1 July 2015 to 31 August 2017.

The results of task 9 are shown on graphs 9, 10, 11 and 12.

Slika na kojoj se prikazuje tekst, snimka zaslona, crta, radnja

Opis je automatski generiran

Graph 9. Display of preferences of families with children when booking board type (bbq, half board and board) for City Hotel and Resort Hotel in the period from July 1, 2015 to January 1, 2016.

Source: Prepared by the author

Slika na kojoj se prikazuje tekst, snimka zaslona, crta, radnja

Opis je automatski generiran

*Graph 10. Presentation of the preferences of families with children when booking a type of pension (BB, half board and pension) for City Hotel and Resort Hotel in the period from 1.1.2016-1.1.2017.*

Slika na kojoj se prikazuje tekst, crta, softver, broj

Opis je automatski generiran

Graph 11. Presentation of the preferences of families with children when booking a type of pension (BB, half board and pension) for City Hotel and Resort Hotel in the period from 1.1.2017 to 31.8.2017.

Source: Prepared by the author

Slika na kojoj se prikazuje tekst, snimka zaslona, dijagram, crta

Opis je automatski generiran

Graph 12. Presentation of preferences of families with children when reserving room type (A, B, C, D...) in Resort and City Hotel for the period from 1 July 2015 to 31 August 2017.

Source: Prepared by the author

Room type A in City Hotel has the largest number of adults, a total of 100,159, while there are also 2,231 children. In the Resort Hotel, room type A has 24,714 adults and 337 children. These are both popular room types, but the City Hotel attracts more adults.

In City Hotel, room type D has the second highest number of adults (24,027) and 422 children, while in Resort Hotel room type G attracts 1,958 adults and 1,430 children. In both hotels, these room types are popular with families.

Room types B, C, E and F in both hotels attract smaller numbers of adults and children compared to room types A, D and G.

In the City Hotel, room type G attracts 1,029 adults and 463 children, while in the Resort Hotel, room type C records 1,064 adults and 704 children. These room types are also popular with families.

Room types P and L in both hotels attract a minimum number of guests, regardless of age.

From this data, it can be concluded that City Hotel generally attracts a larger number of adult guests, while room types A and D are the most popular among adults. On the other hand, the Resort Hotel attracts more children, with room types A and G being favorites among families.

1. **CONCLUSION**

In the introduction, it was said that information tools such as Microsoft Power BI have become crucial for companies in today's digital environment.

Microsoft Power BI, as one of the leading tools for business data analysis, enables companies to aggregate data from various sources - from internal databases to cloud services and external sources. This ability to integrate data enables companies to create a holistic view of their operations. Business intelligence tools, such as data analytics and business intelligence tools, provide a deeper understanding of data and help organizations align their business strategies. By visualizing data, identifying patterns and trends, organizations gain invaluable insight that supports informed decision-making.

Once the data is collected, Power BI provides powerful tools for visualization and analysis. Users can create different types of graphs, tables, and reports to better understand their data. These visual representations enable faster recognition of patterns, trends and problems in the data.

What sets Power BI apart is its ability to analyze in real time, which is vital for quickly responding to changes in the environment.

In addition, Power BI allows users to easily share their reports and analyzes with internal and external colleagues or superiors. This interpretation emphasizes that data analysis is not just a technological tool, but a key component for survival and success in a world where change and uncertainty are a daily reality. Data is not just numbers; they are a tool that enables organizations to understand their environment, market, and clients in a deeper way.