RESEARCH ARTICLE

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Data Analysis and Visualization for the AirBNB User Pathways

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Abstract

This study examines how AirBNB utilizes user pathway information to enhance customer satisfaction. AirBNB, a quickly growing online platform for housing, prioritizes user satisfaction by constantly enhancing its interface and features. This method heavily depends on analyzing data. By analyzing user paths, AirBNB gains insights into user behavior and preferences. This information is used to improve search recommendations, make booking smoother, and identify areas needing enhancement. In conclusion, AirBNB aims to provide a smooth and satisfying customer experience through their data-driven strategy.

Keyword: AirBNB, Pathways, Online Platform, Data Visualization

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Introduction:

The growth rate of AirBNB, an online marketplace that allows people to rent out their homes and other unique properties to tourists, has increased significantly in recent years due to its competitive rates and flexible options compared to traditional hotels. AirBNB has achieved success through user experience. The simplicity brought about for both visitors and hosts by AirBNB is a result of consistent enhancements on the user Interface and functionality.

AirBNB used visualization and analysis of data to improve the experience of their users. AirBNB uses data in order to understand more about how users engage with the site or where improvements can be made.

Companies such as AirBNB utilize tracking tools which help them make their search system and listening suggestions more appealing for customers. Crucially, this process requires Data Analysis so that it identifies commonly searched-for phrases, allowing them to suggest popular accommodations that are likely a good match for users. Information is gathered throughout the booking process, ensuring prompt resolution of any issues that may arise. By visualizing customer information AirBNB provides a way through which user behavior can be monitored leading to useful patterns that will possibly improve customer experience.

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Review of Literature

"AirBNB User Pathways: A Data-Driven Analysis" by Chen, A., and Chen, J. (2023)

The current research has used data analysis and visualization to explore the ways that AirBNB users interact with the site. The most common paths taken by users were found to include visiting search results, property pages, and reviews. Their findings also indicated that those who spent more time on the website were more likely to book accommodation. Moreover, they realized that customers chose to reserve highly rated apartments with many reviews in them. Additional user journeys discovered by authors included few who

went via the help center or terms of service page before committing to a booking. This was more likely for AirBNB beginners or someone when it became difficult finding suitable lodging unit online

Improving AirBNB Host Performance Through Data Analysis by Wang, Y., and Li, H. (2019)

Exploring the factors that influence AirBNB host success through data analysis, involves several key steps. Data analysis played an important role in explaining what affects successful AirBNB hosts. Finally, experts found out that quality of properties, speed of hosting and overall satisfaction of customers affected host revenues most significantly.

Design Data Analytics from AirBNB, Netflix, Amazon, and Spotify by Bilham, Year: 2023

Bilham (2023) designs data analytics from AirBNB, Netflix, Amazon and Spotify. Apart from the house's price, location, and amenities, other factors that determine how a host performs include how responsive the host is, the overall guest experience, and quality of the property listing. For instance at AirBNB, Netflix, Amazon and Spotify data analytics have been incorporated into design thinking. The importance of data is outlined in this article to help understand users better; make well thought conclusions as well as making a more enhanced user experience. AirBNB uses Data to personalize search results, offer personalized suggestions for activities and improve website layout. For example, through data analysis AirBNB can find out which flats are more preferred by particular types of people such as families and those traveling for business purposes. Price; location or amenity details are some critical facts that drive user decisions and therefore are also employed by AirBNB in its use of data.

"Using Data Analytics to Optimize AirBNB Search Results" by Hu, Y. and Zhang, Y., Year: 2018

Exploring the behaviors of AirBNB clients, Hu and Zhang (2018) did it through data analytics. It has been shown in the past that a guests' price, location, and their feedback on a place are the major factors that influence someone's decision to choose a place to stay at. Listeners indicate that guests are likely to be drawn to listings with eye-catching pictures and hosts who have a reputation for such involvement. As suggested by authors based on this case conducted by these two researchers, AirBNB can take into consideration shopper's preferences when revising search results.

Taking into account multiple factors including quantity of positive reviews, beautiful images as well as closeness to attractive spots AirBNB might order available accommodations which are more in line with client expectations. This way will attract more guests' appreciation as well as cause more bookings to be made.

"Understanding AirBNB User Preferences in India through Data Analysis and Visualization" by Sharma, A., and Verma, R. (2021)

Sharma and Verma (2021) used data analysis and visualization to understand AirBNB users' preferences in India— an innovative way of addressing the issue. The study was well-designed, well-planned, and carefully executed; their findings correlate with existing literature on factors that appeal to AirBNB users in India. They collected information from different sources including AirBNB listings, user feedback, and surveys to be able to make meaningful inferences. The outcome of their research is highly instrumental for AirBNB itself and its hosts because such valuable data can help in improving user experience, thereby likely leading to more positive outcomes for the company.

AirBNB can customize search results and simplify the information retrieval process to better serve the Indian customers. In relation to AirBNB, it has built an apartment recommendation system that personalizes recommendations based on user browsing activity history and individual interests— aiming at new entrants or those struggling with difficulties. The access to these statistics opens up the door for AirBNB's hosts as it may enable them to improve their listings, consequently drawing more visitors.

"Using Data Analytics to Improve the AirBNB User Experience in India" by Patel and Patel (2022)

The researchers conducted a study that was perfectly well-designed and implemented, with the findings following the same line of previous investigations into

what Indian AirBNB users look for. Using an array of data sources, they were able to draw inferences from AirBNB listings, feedback from users, and surveys. These conclusions can prove vital for the company, AirBNB, and even its hosts because with this information, improvements may be made to the user experience. This can be achieved by tweaking search results based on Indian preferences and simplifying the process of finding information.

The study confirmed that AirBNB has an established algorithm to deliver personalized apartment suggestions by analyzing previous browsing and personal preference data. Furthermore, it may also assist new or challenged customers. Obtaining this information is beneficial for AirBNB hosts because they can improve the description of their listings to attract more guests. In a study conducted by Patel and Patel (2022), the authors used data analysis and visualization techniques to identify common patterns of preferred destinations among AirBNB users in India based on rental history records and they had suggestions for enhancing the experience. Their report revealed that common user-journeys included everything from browsing through search results and property pages to accessing the reviews section. Enhancing the user experience remains an important goal, and the authors have a number of recommendations for how to reach it. Those suggestions include implementing more robust testing processes, ensuring the layout of online content is as optimal as possible and incorporating user feedback early-on in the design process. Additionally, providing ample user-support and resources such as comprehensive onboarding materials and easily accessible help centers are beneficial. With these, websites and applications can create more intuitive and ultimately, enjoyable user-experiences. "We propose that we trim search results, open-up information access across the site," the group said in their report, "and — where necessary — provide some well-designed functionality to help patrons accomplish the actions they most want to quickly."

Objective of The Study

The goal of the research that deals with the data analysis and visualization for AirBNB user pathway is to apply data and visualization in order to achieve an understanding of the paths that the users follow in the UX flow of the AirBNB website and application. It thus provides a basis for an analysis of the needs of the AirBNB users and offers convenient ways for users to find and book the most suitable place to stop over.

Specific objectives:

The following are some specific objectives of the research topic:

- In order to find out the most received AirBNB user pathways.
- The question of what AirBNB use, journey is consumed by different characteristics of users (e.g. age, gender, location) gives rise to the issue that different mindsets about the activities should be considered while designing the marketing campaigns for different target groups.
- To elaborate how users' journeys are responsible in AirBNB use.
- For the purpose of shaping valuable suggestions, the usage of data analysis and visualization to enrich the AirBNB user experience is going to be explored.
-

Research Methodology

The sample design:

Population:

To conduct the study we take into account all the users of AirBNB, which is our target population. Besides, precise monitoring of each AirBNB user is unfeasible. Therefore, a selective sample will be selected from the larger AirBNB hosts population.

Sample size:

We will be using secondary data from Kaggle , Dataset - "AirBNB User Pathways" , 7756 users data. Starter: AirBNB User Pathways 4ec00ac1-f | Kaggle

2.1.3 Sampling technique: The sample of AirBNB users will be taken by random sampling based on

stratifying the sample groups. People here will be classified into elderly, females, and geography to make the post-apocalyptic society. Stratification being over, the next move will be to select an equal number of observations from each stratum.

Tools to be used for Data collection

To collect data, we will use the Kaggle data set.

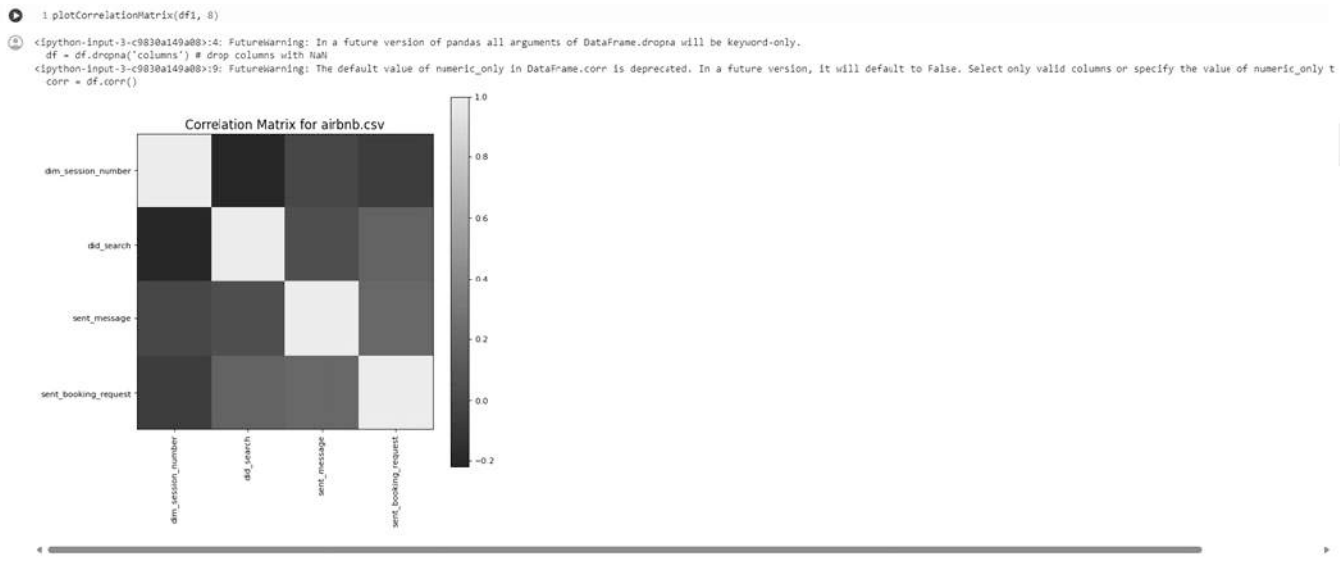
Tools to be used for Data Analysis

For the analysis, we will use Power BI and Python.

Our findings reveal that the field “ts_min” specifies the start date and time of a session and the field “ts_max” the end date and time. Our intention is to analyze the amount of time spent during the corresponding session with the numerical data that we shall utilize.

To sum it up this code reads the top 1000 rows of the 'AirBNB.csv' file into a Pandas DataFrame, prints the number of entries and columns in the DataFrame and a custom attribute dataframe Name has been set for identification purposes.

The code print(df1.shape) displays a tuple containing two values: the number of elements in Division of the Data Frame df1 is equal to the number of rows and the number of columns.



It demonstrates a nonsense link between two features, "dimension" and "session number" (positive correlation) and "send message" and "sent booking request" (weak negative correlation).

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[ ]  1 plotScatterMatrix(df1, 12, 10)
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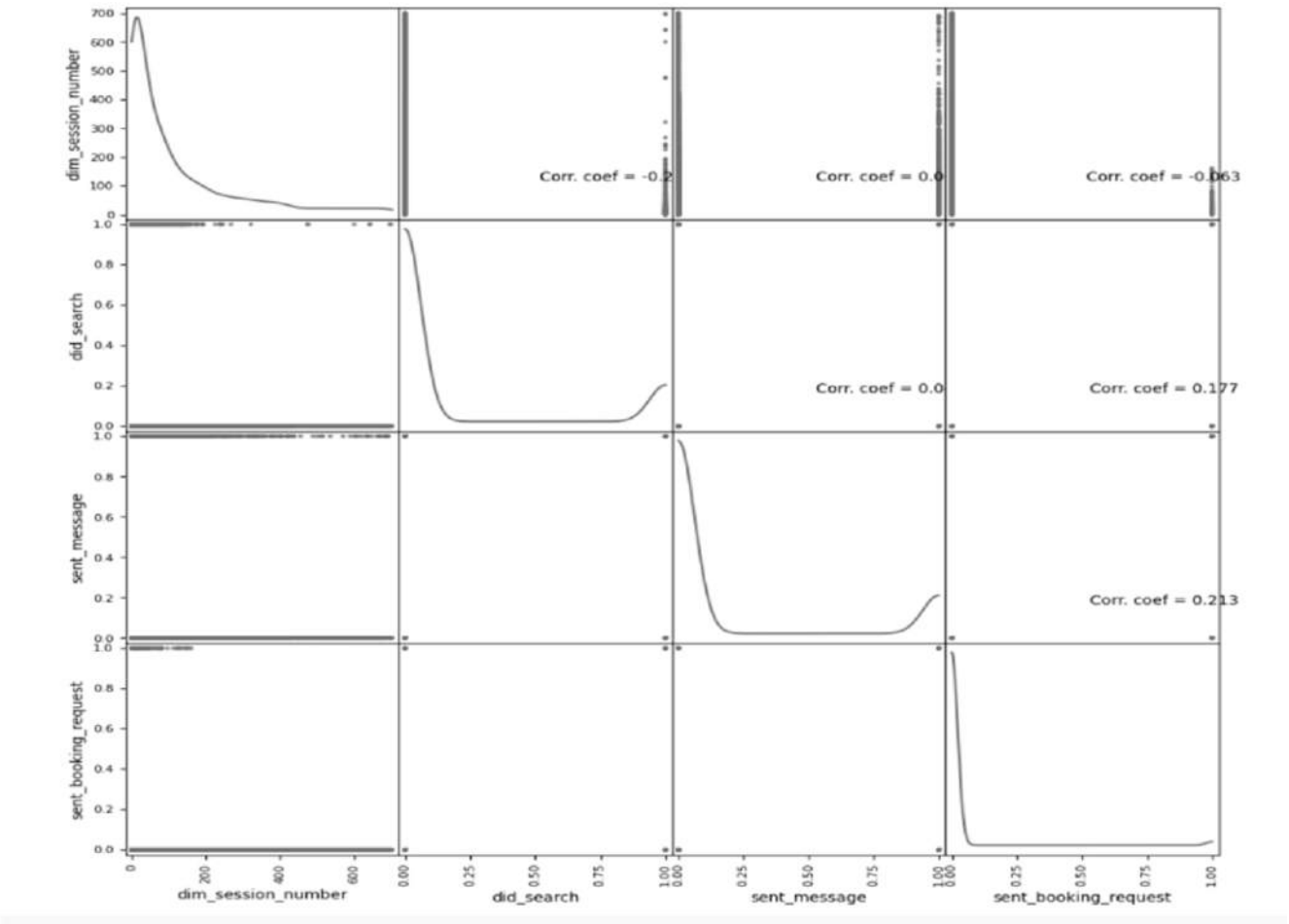
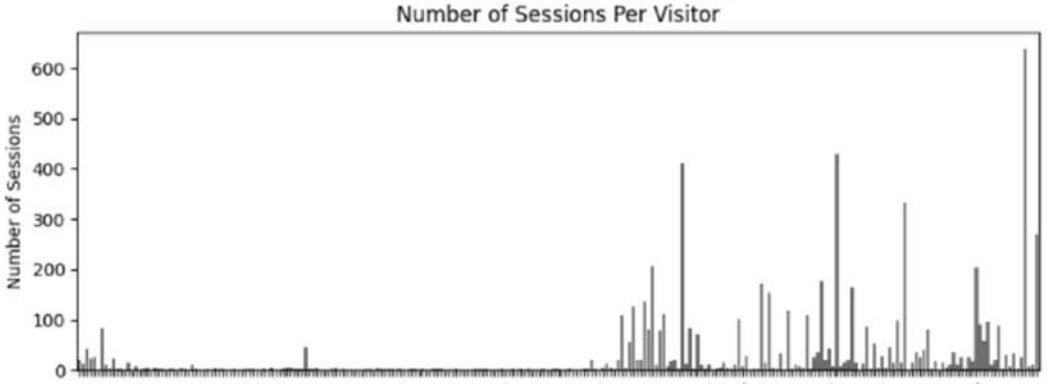


The scatterplot matrix of the AirBNB dataset gives the above-mentioned visual condensed form of cross-variable interrelationships in the AirBNB data thus leading to identification of correlations, patterns and possible areas for further investigation.

The graph depicts the access sequence distribution of session duration from all visitors.

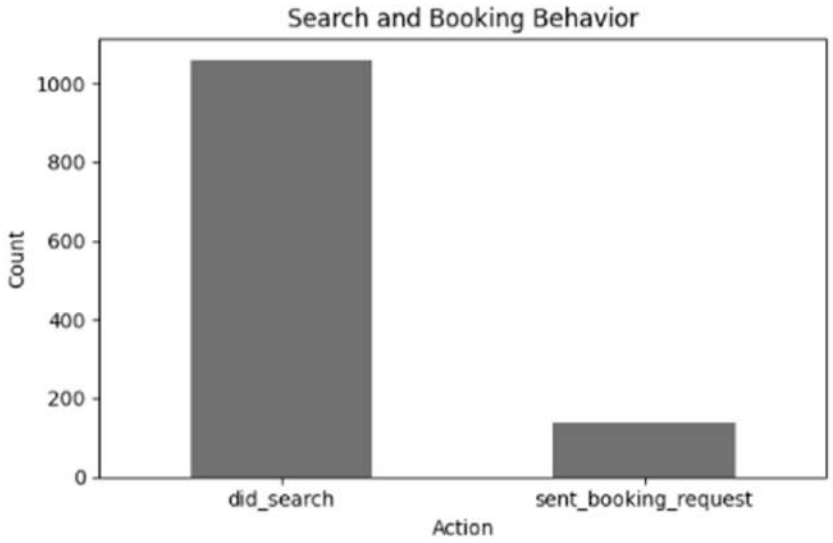
- On the x-axis, the session duration is counted in minutes, whereas the vertical axis represents the frequency (number of sessions) of each range of duration.
- It indicates which user spends the most time on AirBNB and the duration of each session.



The bar chart depicts the exact number of visits of each visitor.

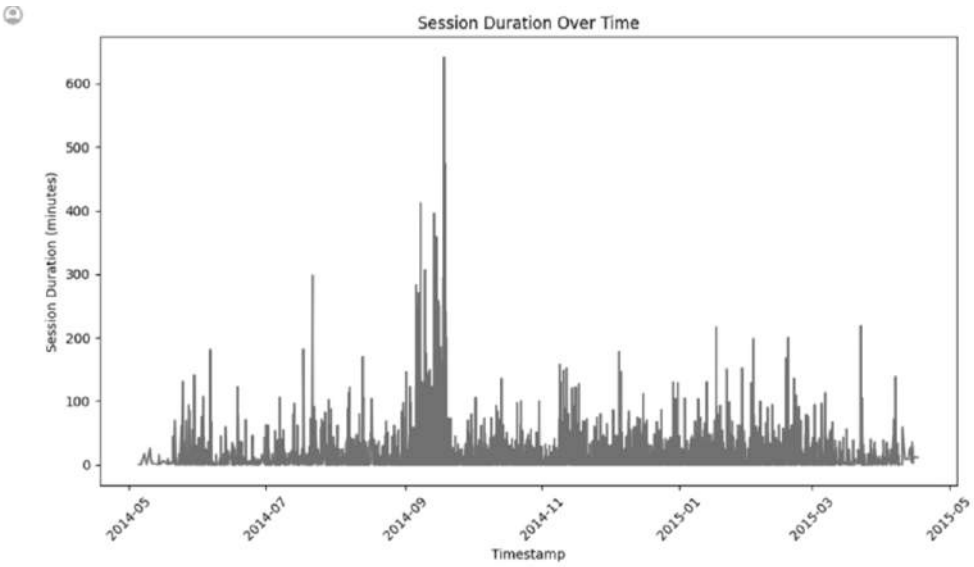
- The bars on the graph correspond to visitors, and their height tells us how many times each one of them have clicked to visit.

- With the help of the most active visitors on the platform can be distinguished, revealing those who are frequently involved against those who visit less often.



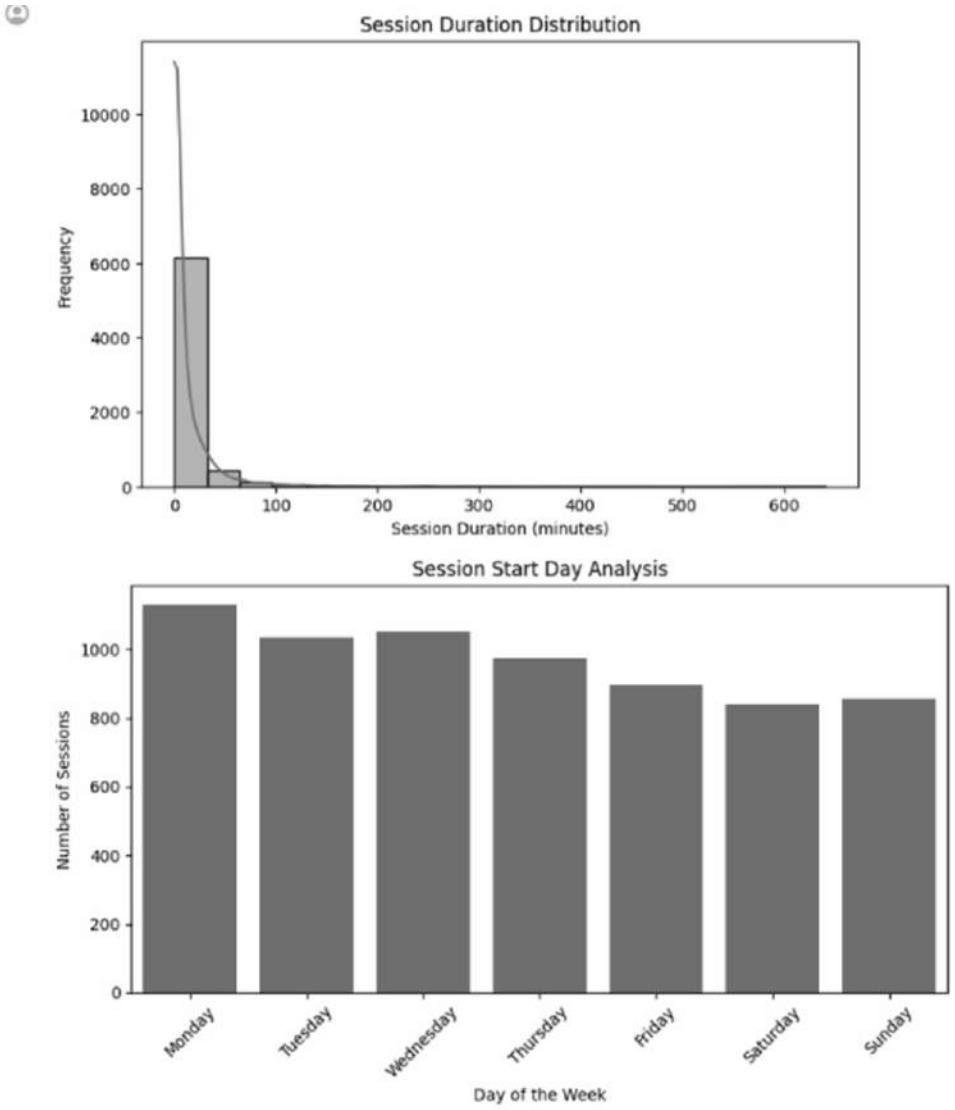
This visualization is a part of a graphic depicting the performances with various inputs, including users' visit for search or providing bookings.

- It assists in the measure of user's connection with the medium. High search and booking quantity in the opening sessions imply the involvement of users, the search for information and the possible seal of the deal.



This chart conveys the tendency of the session length toward different periods of time.

- The amendment enables to discern some kind of trends in terms of session duration cumulatively. Sudden drops or crests might indicate if there are modifications in user's activities, news from the platform or promotion campaigns.

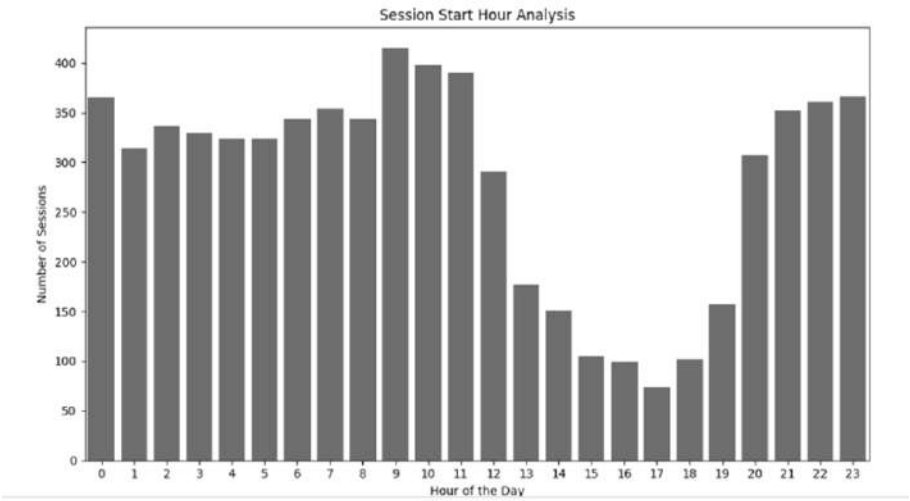


The first histogram above illustrates the session length distribution.

- This helps to understand the typical length of time users from AirBNB stay logged on the platform. The right side of histogram tailing longer could imply these users mulling one decision for a longer time which can be taken as serious engagement or deeper decision making.

Let us consider this bar diagram for the user activity regarding in which day of the week sessions begin.

- It has the advantage of mischaracterizing days that are customers are more engaged. Recognizing when the greatest activity happens is key in planning all the different promotional campaigns, customer service, or platform maintenance tasks



These are the statistics depicting the user activity when in sessions start at different times of the day.

It aids in determining peak traffic hours which are typically seen during off – work hours. Having information when your customers are the most active can help you make decisions in the future on releasing new features, performing pre-scheduled maintenance or offering customer support 24/7. Having information when your customers are the most active can help you make decisions in the future on releasing new features, performing pre-scheduled maintenance or offering customer support 24/7.

Here, the findings from our investigation that point to certain users who converted to the AirBNB website during the period (2/5/2014 - 3/24/2015) are being discussed. Based on our research, it can be seen that most people visit the websites using either iPhones or Android Phones or they use desktops for connecting. It appears that a high percentage of Users rely on the Default App Browser on their mobile device or launch the corresponding application (for example in the iPhone, the iOS Application will be used vs. Androids who will use the corresponding Android Application). But the fact remains that Chrome excels as the mostly used browser for desktop users.

The fact that after the number of visits and activities done by each user has been accessed, the graphics show clearly that the majority of them average just one or two visits. One the other hand, the visitors who frequently visit the site may be observed to have a moderate correlation between the amount of inquiries done, messages sent and bookings made. Therefore, AirBNB could as well boost transactions by persuading the users to explore the platform and make many inquiries. With the consideration of the advertising changes, towards only the owners of respective telephones, such as iPhone, Android phone and Chrome users, these people may start using the website by the liking and doing the search for the future trip's accommodations. This action may result in the number of messages sent and the number of bookings made increasing.

Conclusion

In our project, we used data analysis and visualization to understand AirBNB user paths, providing insights for hosts, marketers, and legislators to enhance guest experiences. Key findings showed users frequently navigate property pages, search results, and reviews. We recommend improving the search interface, showcasing attractive listings, and providing honest ratings to boost user acquisition and retention. Users spending more time on the platform are more likely to book, highlighting the need for an engaging, frictionless experience. Quality listings and positive reviews significantly influence decisions, and under-used paths like terms of service and help centers should be optimized to improve the user experience and secure bookings.

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