

AIRBNB-INSPIRED BOOKING SYSTEM DATABASE

1.Introduction

Online hotel booking systems have transformed the travel industry, offering an efficient way to book accommodations. The global online hotel booking market is expected to grow significantly, underlining the economic impact of these systems. Airbnb, a leading platform, offers unique stays like treehouses, historic homes, or houseboats. It also facilitates user-to-user communication, allowing guests to talk directly to hosts and get recommendations from hosts. The data mart will enable efficient data analysis and reporting, enhancing decision-making and strategic planning in the online hotel booking industry. This project aims to create a data mart for a similar system, using Airbnb's features and design principles.

1.1 Objective

This project aims to create a data mart that replicates the Airbnb hotel booking system. We will design a scalable and user-friendly Airbnb DataMart using MySQL as the database management system and MySQL Workbench to create the underlying data structures.

1.2 Methodology

By implementing a step-by-step methodology, the project maintained a clear and organized development process:

Conceptual design: Identify key data entities (properties, users, hosts, bookings, reviews) and their relationships through using the Entity Relationship (ER) model in MySQL Workbench.

Developing a Database Schema: Translating an ER model into a working database schema using MySQL Workbench. This includes creating tables, defining data types, and setting foreign key constraints to ensure data integrity.

Data Population: Creating sample data using dbForge Studio to test features and demonstrate datamart capabilities.

Testing and Refinement: Perform functional testing on each board using a variety of use cases. Based on the results, the plan was further refined to optimize performance and fill gaps.

1.3 Database management functionality

The Airbnb-inspired data management system is user-friendly and built on two main factors: listings and users. Listings provide important details for traveller's, such as location, property type, amenities, descriptions, availability, prices, and photos. User data provides a complete profile, including basic information and account type(guest/host). The system also stores user reviews, ratings, and booking history, promoting community and trust.

Key features include easy search, seamless booking, transparent reviews, direct communication, simple booking payment/transaction and continuous improvements based on user engagement data.

AIRBNB-INSPIRED BOOKING SYSTEM DATABASE

2. airbnb schema

We used the 'SHOW TABLE STATUS FROM airbnb' command to analyse the size of the Airbnb database. This information, detailing each table with roughly 20 entries, is stored in a downloadable comma-separated values (CSV) file within the finalization directory. Below you can find more information about the airbnb schema.

No.	Table_name	Engine	Total_Rows	Avg_Row_Length	Data_Length	Index_Length	Created Time
1	address	InnoDB	20	819	16384	49152	07-04-2024 0.27
2	aspect_rating	InnoDB	20	819	16384	32768	07-04-2024 0.27
3	attribute_category	InnoDB	10	1638	16384	16384	07-04-2024 0.27
4	booking	InnoDB	26	630	16384	32768	07-04-2024 0.27
5	booking_guest	InnoDB	46	356	16384	32768	07-04-2024 0.27
6	country	InnoDB	33	496	16384	32768	07-04-2024 0.27
7	favourite	InnoDB	20	819	16384	32768	07-04-2024 0.27
8	guest_categories	InnoDB	6	2730	16384	0	07-04-2024 0.27
9	guest_review	InnoDB	20	819	16384	32768	07-04-2024 0.27
10	host	InnoDB	21	780	16384	32768	07-04-2024 0.27
11	language	InnoDB	35	468	16384	16384	07-04-2024 0.27
12	location	InnoDB	20	819	16384	16384	07-04-2024 0.27
13	messages	InnoDB	20	819	16384	32768	07-04-2024 0.27
14	neighborhood	InnoDB	20	819	16384	16384	07-04-2024 0.27
15	place_type	InnoDB	20	819	16384	16384	07-04-2024 0.27
16	property	InnoDB	20	819	16384	65536	07-04-2024 0.27
17	property_amenities_rules	InnoDB	50	327	16384	32768	07-04-2024 0.27
18	property_attributes	InnoDB	31	528	16384	16384	07-04-2024 0.27
19	property_availability	InnoDB	20	819	16384	16384	07-04-2024 0.27
20	property_category	InnoDB	20	819	16384	16384	07-04-2024 0.27
21	property_category_link	InnoDB	20	819	16384	32768	07-04-2024 0.27
22	property_images	InnoDB	20	819	16384	16384	07-04-2024 0.27
23	property_review	InnoDB	20	819	16384	32768	07-04-2024 0.27
24	property_type	InnoDB	20	819	16384	16384	07-04-2024 0.27
25	region	InnoDB	25	655	16384	16384	07-04-2024 0.27
26	review_aspect	InnoDB	20	819	16384	16384	07-04-2024 0.27
27	social_media	InnoDB	20	819	16384	16384	07-04-2024 0.27
28	transaction	InnoDB	26	630	16384	32768	07-04-2024 0.27
29	user_account	InnoDB	40	409	16384	49152	07-04-2024 0.27
30	user_language	InnoDB	30	546	16384	32768	07-04-2024 0.27
31	user_preferred_guest_type	InnoDB	41	399	16384	32768	07-04-2024 0.27
32	voucher	InnoDB	20	819	16384	16384	07-04-2024 0.27

3.Conclusion

The final design of the data mart includes 32 tables, which encompass key features such as reservations (filtering, booking, managing), review management, and property management tools. MySQL Workbench played a central role in the design and optimization of the data schema. Its functionalities facilitated the creation, visualization, and optimization of the 32 tables. Meanwhile, dbForge Studio generated test data that mimicked real-world scenarios to ensure the proper functioning of the database.

Throughout the process, valuable insights were gained, highlighting the importance of a clearly defined ER model, careful considerations regarding data types, and the effectiveness of testing.

Project GitHub Repository: <https://github.com/rahulragiri/iu-airbnb-datamart>