High-Level Design (HLD)

Travel Data Analysis

Last date of revision: 3/04/2023

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Document Version Control

Date Issued	Version	Description	Author
3 April 2023	1.0	First Version of Complete HLD	Satyam Patel, Karishma Grover

Abstract

The analysis of Airbnb data of Amsterdam provides insights into customer behavior, pricing strategies, market trends, reviews, and ratings. By analyzing this data, hosts and property managers can optimize their pricing strategies, improve the quality of their listings, and create targeted marketing campaigns. This data can also provide insights into market trends, such as the popularity of destinations and the impact of external factors on the market. Overall, data analysis is essential for staying competitive in the Airbnb market and providing a better experience for customers.

Airbnb data analysis involves analyzing data collected from Airbnb's platform to gain insights into customer behavior, pricing strategies, and market trends. This data includes information on booking patterns, pricing trends, reviews, and ratings.

Some of the key insights that can be gained from analyzing Airbnb data include:

Pricing strategies: Airbnb data can be used to optimize pricing strategies by analyzing demand patterns, seasonal fluctuations, and competitor pricing. This can help hosts to maximize their revenue while remaining competitive in the market.

Customer behaviour: Airbnb data can also provide insights into customer behaviour, such as the locations they prefer to visit, the types of accommodations they prefer, and the amenities they value most. This information can be used to create targeted marketing campaigns and improve customer experiences.

Reviews and ratings: Analysing reviews and ratings can provide insights into the quality of accommodations and the customer experience. Hosts can use this information to improve the quality of their listings and attract more customers.

Market trends : Airbnb data can also provide insights into market trends, such as the popularity of different destinations.

1 Introduction

1.1 Why this High-Level Design Document?

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding and can be used as a reference manualfor how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface is implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project:

1.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

2 General Description

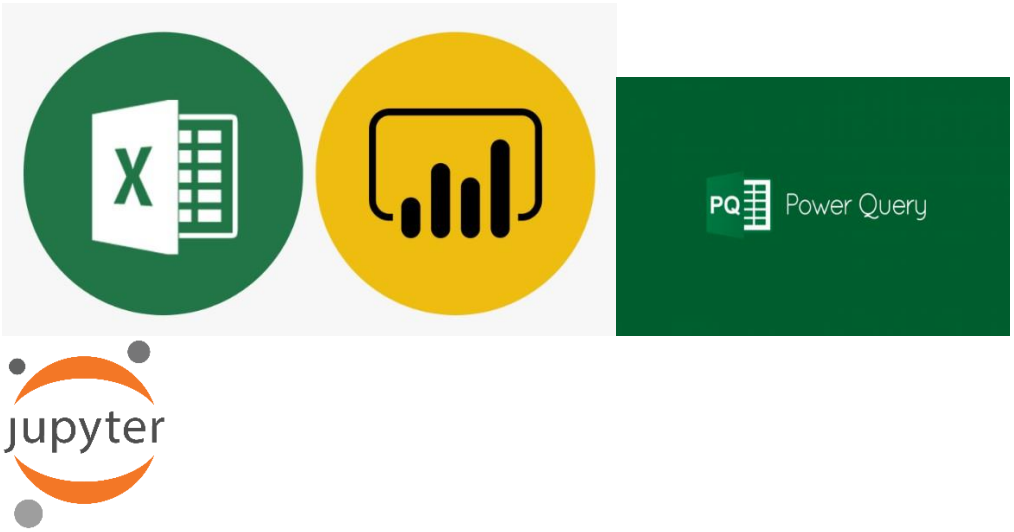
2.1 Product Perspective & Problem Statement

The analysis of Airbnb data provides insights into customer behavior, pricing strategies, market trends, reviews, and ratings. By analyzing this data, hosts and property managers can optimize their pricing strategies, improve the quality of their listings, and create targeted marketing campaigns. This data can also provide insights into market trends, such as the popularity of destinations and the impact of external factors on the market. Overall, data analysis is essential for staying competitive in the Airbnb market and providing a better experience for customers.

The objective of this project is to perform data visualization techniques to understand the insight of the data. This project aims to apply various Business Intelligence tools such as Power BI to visually understand the data.

2.2 Tools used

Business Intelligence tools and libraries work such as Excel, and Power BI is used to build thewhole framework.



3 Design Details

3.1 Functional Architecture

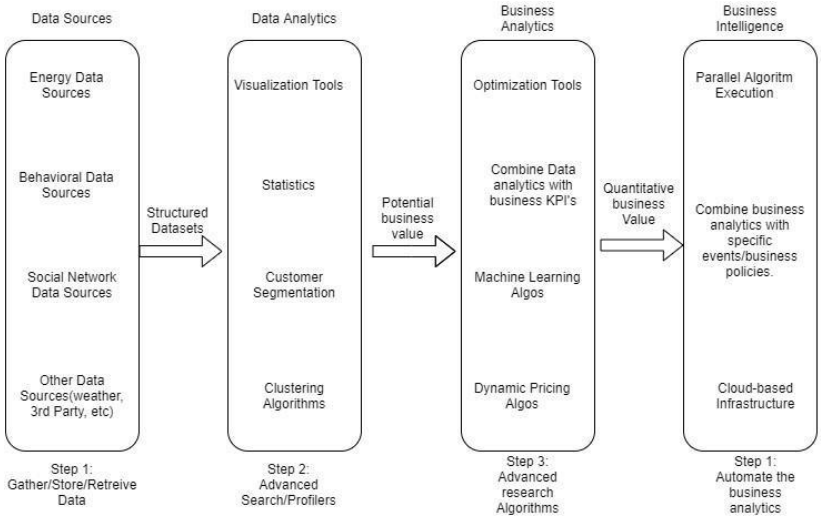
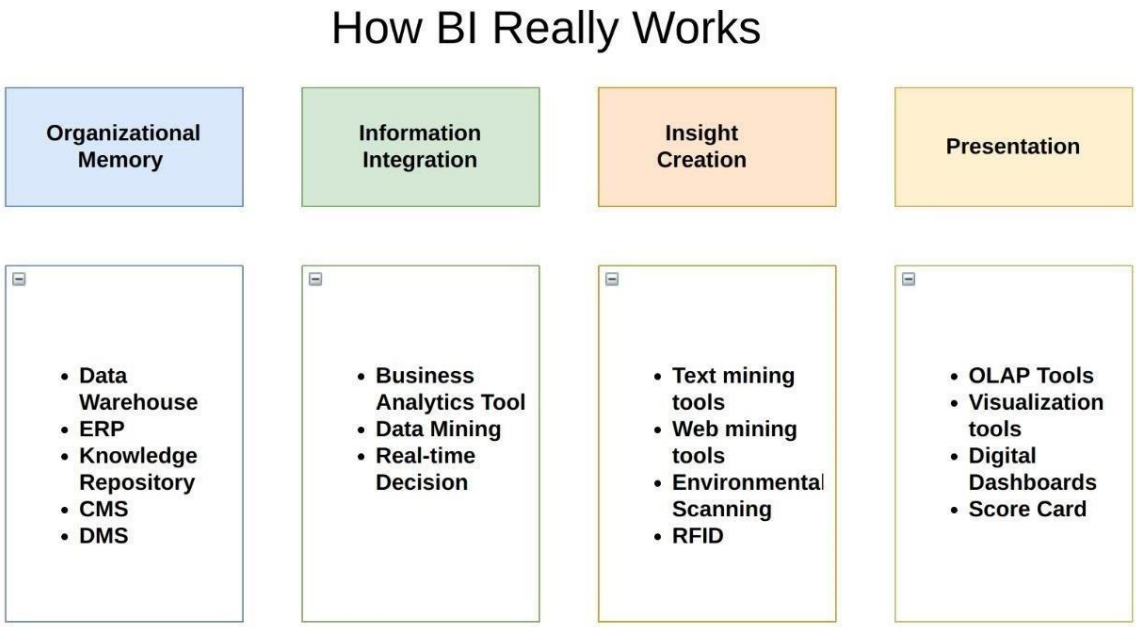


Figure 1: Functional Architecture of Business Intelligence



3.2 Optimization

Your data strategy drives performance

- Minimize the number of fields
- Minimize the number of records
- Optimize extracts to speed up future queries by materializing calculations, removing columns, use of new queries and measures

Reduce the marks (data points) in your view

- Practice guided analytics. There's no need to fit everything you plan to show in a singleview. Compile related views and connect them with action filters to travel from overviewto highly-granular views at the speed of thought.

  Reduce the granularity of LOD or table calculations in the view. The more granularthe calculation, the longer it takes.

- Where possible, use MIN or MAX instead of AVG. AVG requires more processing than MIN or MAX. Often rows will be duplicated and display the same result with MIN,MAX, or AVG.

- Make a power query to perform operating with the report to get the desired result.Including Measures helped to get all the relevant visualization and Insights that reduces the load on the platform.

4 KPIs

Dashboards will be implemented to display and indicate certain KPIs and relevant indicatorsfor the disease.

As and when the system starts to capture any data for a user, the dashboards will be includedto display charts over time with progress on various indicators or factors

4.1 KPIs (Key Performance Indicators)

Key indicators display a summary of the Airbnb Data Analysis that helps to identify theoutcomes that are used on daily basis by the Airbnb.

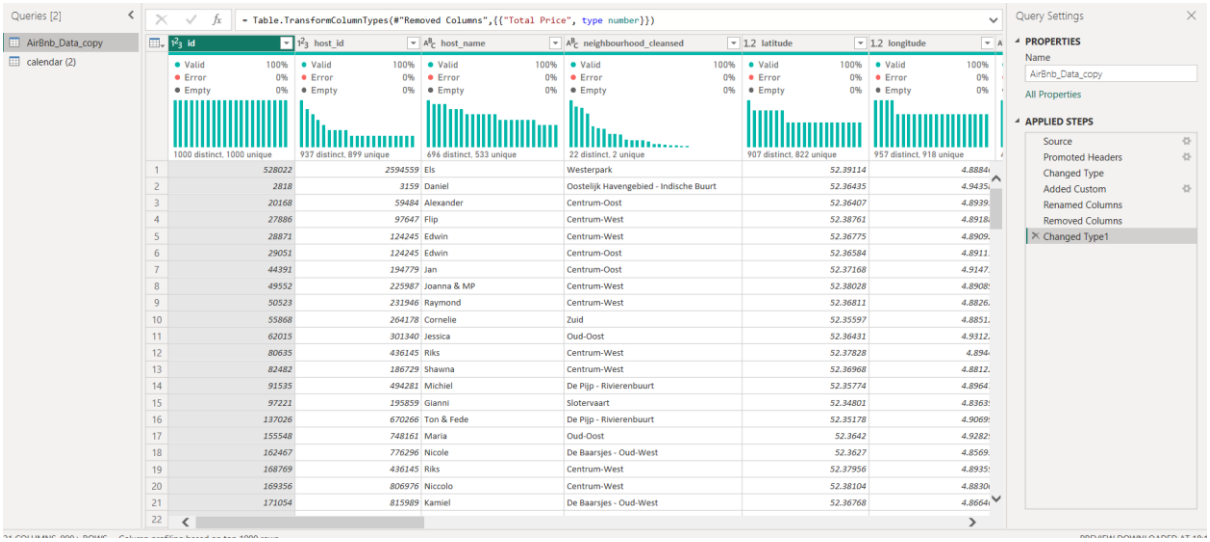
1. Pricing strategies
2. Customer behavior
3. Most booked location
4. Top-earning host
5. Average price as per locations
6. Reviews and ratings

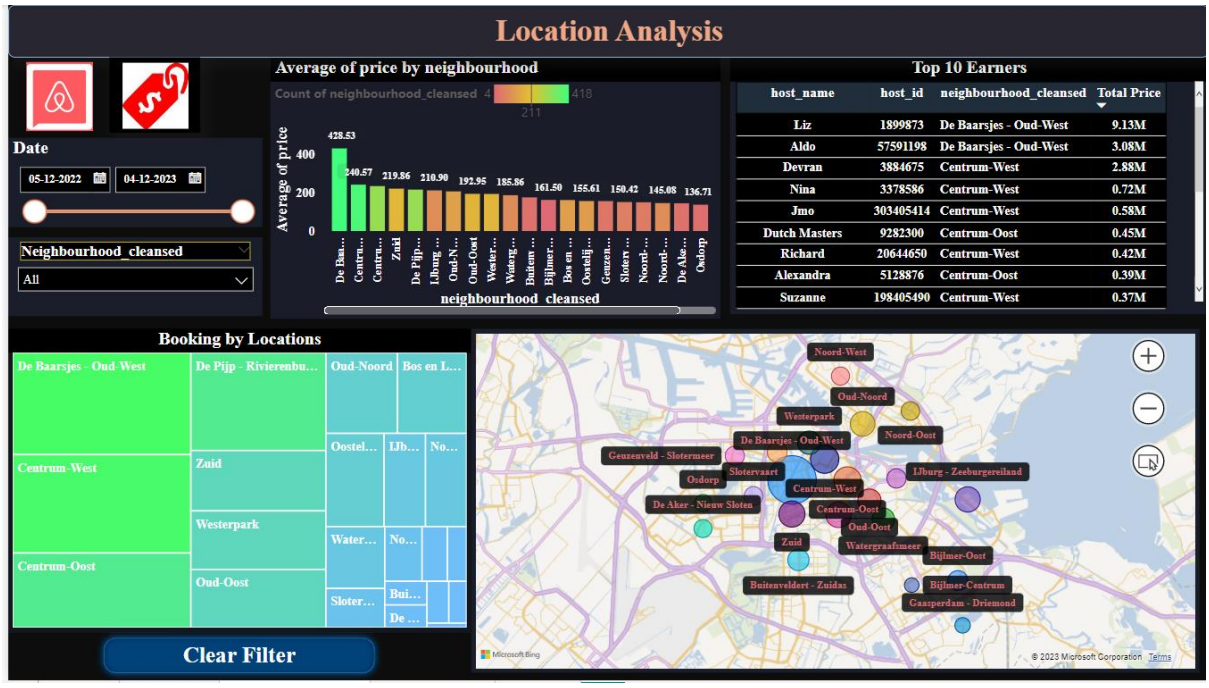
5 Deployment

Prioritizing data and analytics couldn't come at a better time. Your company, no matter what size, is already collecting data and most likely analyzing just a portion of it to solve business problems, gain competitive advantages, and drive enterprise transformation. With the explosive growth of enterprise data, database technologies, and the high demand for analytical skills, today's most effective organizations have shifted their focus to enabling self-service by deploying and operating Power BI at scale, as well as organizing, orchestrating, and unifying disparate sources of data for business users and experts alike to author and consume content.

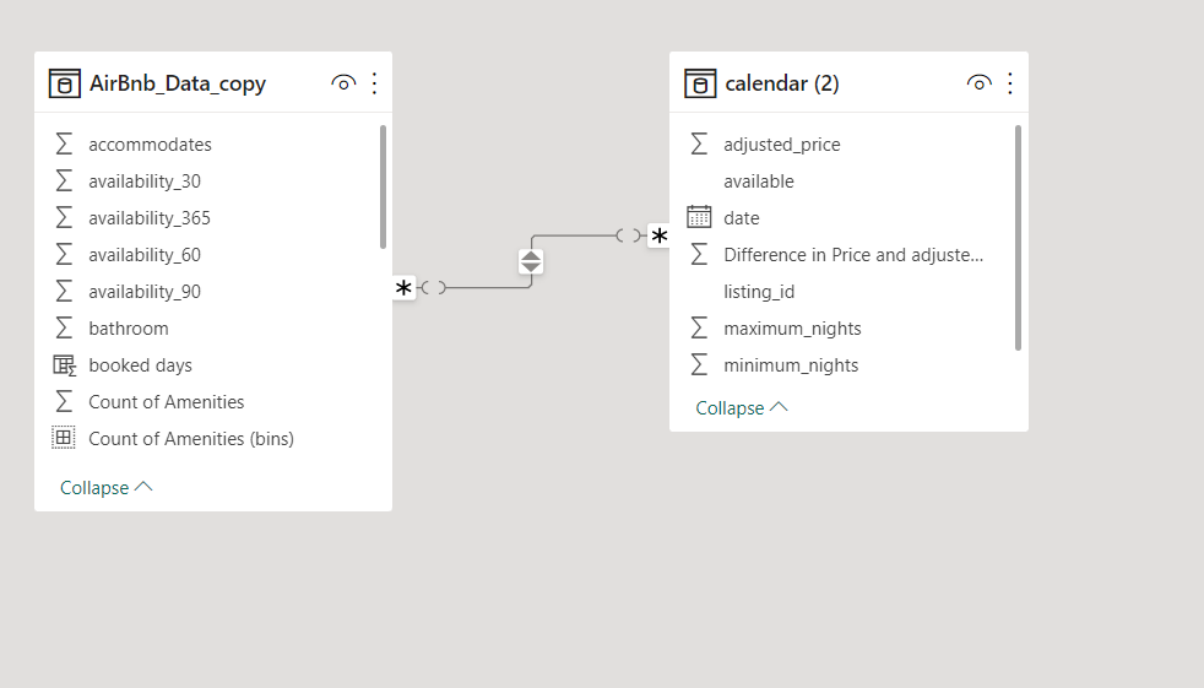
Power BI prioritizes choice in flexibility to fit, rather than dictate, your enterprise architecture. Power BI Desktop and Power Bi Online leverage existing technology investments and integrate them into infrastructure to provide a self-service, modern analytics platform for users.

Power BI - Desktop – On-premise





High Level Design (HLD)



- It's the *free* version which has **data analysis** and **reports creation capabilities**. Putsinfrastructure in same place as data (for migration to cloud).
- It has a drag-and-drop feature that makes creation of visualisation really easy.
- With Query Editor, you can use it to *connect* to lots of data sources and transform thedata into a model.
- Also, you primarily *don't* need the internet for the desktop version to work. You wouldonly need to hop online for publishing the reports to the online version.
- Features unique to Power BI Desktop include:
    - Data transformation, modelling, and shaping
    - Calculated columns
    - Python and DAX
    - RLS creation
    - In Power BI Desktop **modifying data is difficult**. In order to go back to the spreadsheet, make the changes, and reconnect the data is a lot of steps to do everytime for a small task.
    - To **specify the relationship** between different values is easy
    - The *existing* relationships of data are visible at a glance with Power BI Desktop's **model view**.
    - Power BI Desktop doesn't have a **dashboard feature**.