Low Level Design

Travel insurance Data Analysis

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Contents

1. Introduction

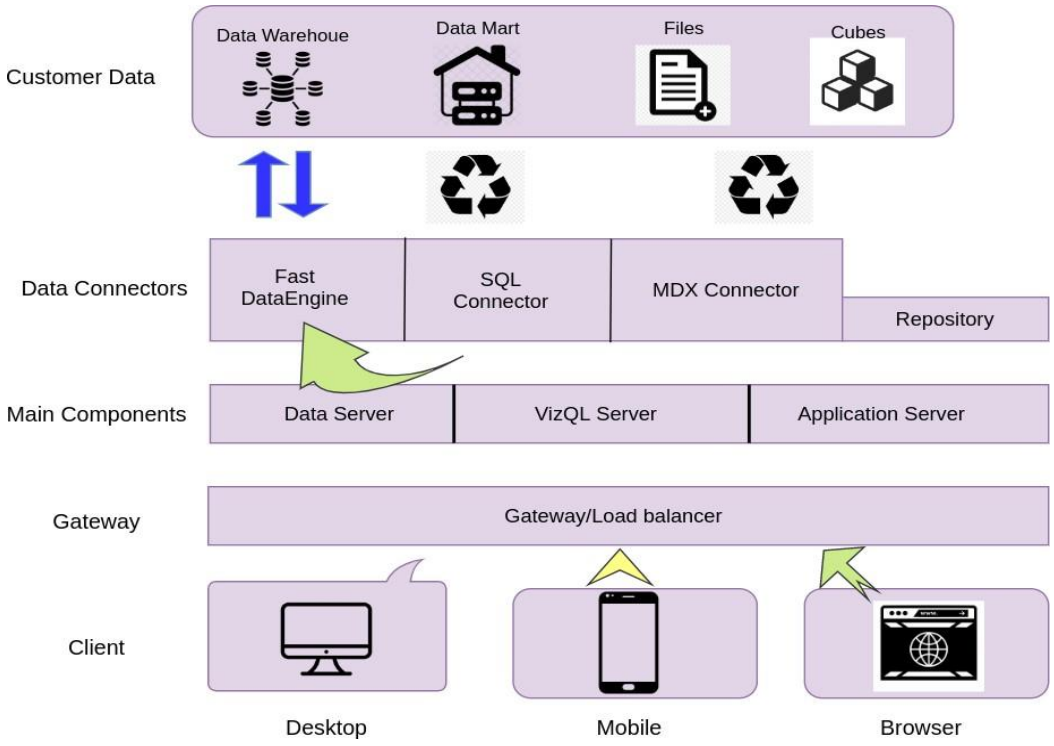
1.1 What is Low-Level design document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the actual program code for the House Price Prediction dashboard. LDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

1.2 Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

2. Architecture



Power BI Architecture – 7 Components Explained with Working

In order to learn technology, you must be handy with its architecture. If you are not aware of the architecture of the technology, you won't be able to become a master of it. Under this *Power BI architecture tutorial by DataFlair*, we're going to learn from the basics then we will gradually move upwards, learn about its components and how it works. We'll also understand how does the front end and back end of Power BI work to provide all its unique functionalities and features for data analysis.

Let's start and have a thorough understanding of the concept.

Power BI Architecture

Power BI is a business suite that includes several technologies that work together. To deliver outstanding business intelligence solutions, Microsoft Power BI technology consists of a group of components such as:

- Power Query (for data mash-up and transformation)
- Power BI Desktop (a companion development tool)

- Power BI Mobile (for Android, iOS, Windows phones)
- Power Pivot (for in-memory tabular data modeling)
- Power View (for viewing data visualizations)
- Power Map (for visualizing 3D geo-spatial data)
- Power Q&A (for natural language Q&A)

In simple terms, a Power BI user takes data from various data sources such as **files, Azure source, online services, DirectQuery or gateway sources.** Then, they work with that data on a client development tool such as ***Power BI Desktop*****.** Here, the imported data is cleaned and transformed according to the user's needs.

Once the data is transformed and formatted, it is ready to use in making visualizations in a report. A report is a collection of visualizations like *graphs, charts, tables, filters, and slicers.*

Moving on to the chain of processes, you can publish the reports created in Power BI desktop on two kinds of platforms; **Power BI Service** and ***Power BI Report Server***.

Power BI Service is a cloud-based public platform whereas Power BI Report Server is an on-premise platform protected by firewall security.

You can create dashboards on these platforms by pinning visualizations from your published reports. Lastly, share your dashboards and reports and collaborate with other users from your organization or outside, using delivery options like a *web-browser, Power BI on iPad, tablets, laptops, phones,* etc.

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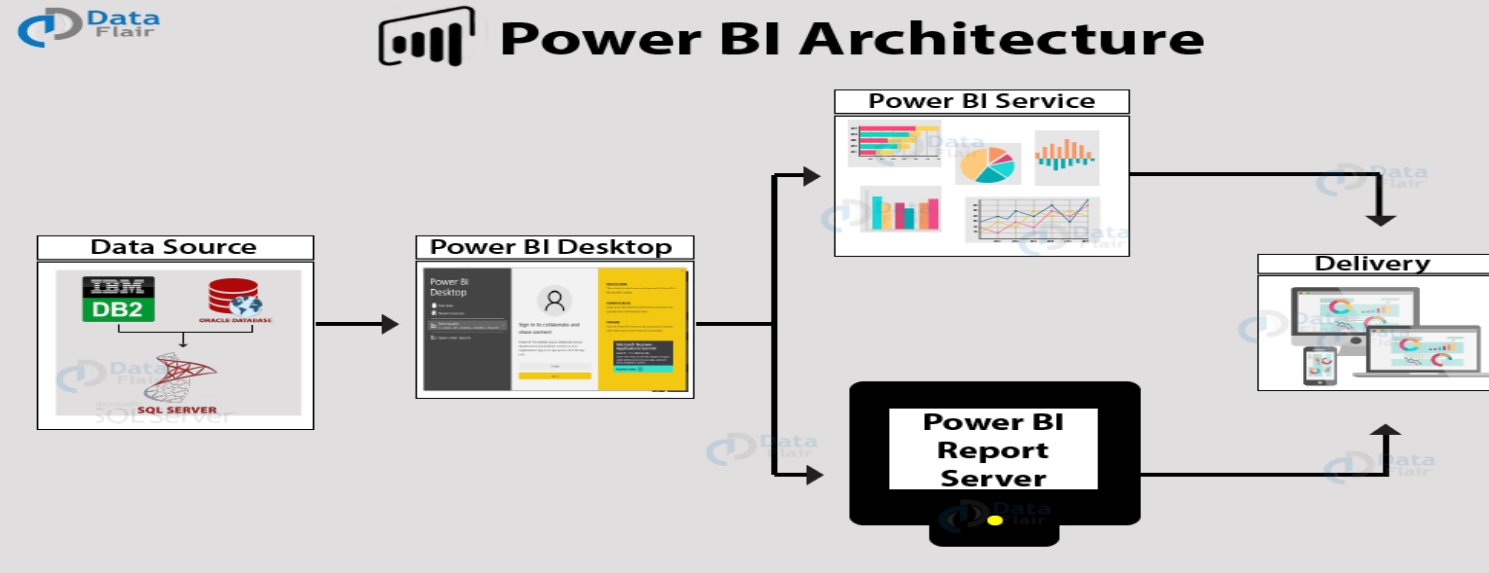

Components of Power BI Architecture

Let us learn about the components of Power BI architecture in detail.

1. Data Sources

An important component of Power BI is its vast range of data sources. You can import data from files in your system, cloud-based online data sources or connect directly to live connections. If you import from data on-premise or online services there is a limit of 1 GB. Some commonly used data sources in Power BI are:

- Excel
- Text/CSV
- XML
- JSON
- Oracle Database
- IBM DB2 Database
- MySQL Database
- PostgreSQL Database
- Sybase Database
- Teradata Database
- SAP HANA Database
- SAP Business Warehouse server
- Amazon Redshift
- Impala
- Google BigQuery (Beta)
- Azure SQL Database
- Salesforce Reports
- Google Analytics
- Facebook
- GitHub

2. Power BI Desktop

Power BI Desktop is a client-side tool known as a companion development and authoring tool.

This desktop-based software is loaded with tools and functionalities to *connect to data sources, transform data, data modeling and creating reports.*
You can download and install Power BI Desktop in your system for free. Using Power BI Desktop features, one can do *data cleansing, create business metrics and data models, define the relationship between data, define hierarchies, create visuals and publish reports.*

3. Power BI Service

Power BI Service is a web-based platform from where you can *share reports made on Power BI Desktop, collaborate with other users, and create dashboards.*
It is available in three versions:

- Free version
- Pro version
- Premium version

Power BI Service is also known as, **"Power BI.com"**, **"Power BI Workspace", "Power BI Site"** and **"Power BI Web Portal"**. This component also offers advanced features like *natural language Q&A* and *alerts*.

4. Power BI Report Server

The Power BI Report Server is similar to the Power BI Service. The only difference between these two is that Power BI Report Server is an on-premise platform. It is used by organizations who do not want to publish their reports on the cloud and are concerned about the security of their data.

Power BI Report Server enables you to create dashboards and share your reports with other users following proper security protocols. To use this service, you need to have a Power BI Premium license.

5. Power BI Gateway

This component is used to connect and access on-premise data in secured networks. Power BI Gateways are generally used in organizations where data is kept in security and watch. Gateways help to extract out such data through secure channels to Power BI platforms for analysis and reporting.

6. Power BI Mobile

Power BI Mobile is a native Power BI application that runs on iOS, Android, and Windows mobile devices. For viewing reports and dashboards, these applications are used.

7. Power BI Embedded

Power BI Embedded offers APIs which are used to embed visuals into custom applications.

3. Architecture Description

3.1. Data Description

The Dataset contains house price of cities that fall under the categories A,B and C based on the availability of parking, rainfall, its built-up area etc

ETL :

1) Filles Blank spaces with the previous cell value in Gender column.
2) Replaced 0's with 10 in Duration column.
3) Replaced -1's with 11 in Duration column.
4) Replaced -2's with 12 in Duration column.
5) New column created for Age group which is divided into MID LEVEL GROUP AND SENIOR CITIZENS.
6) Created a new MEASURE for Average of Net sales,
7) Created New measure for Average of Comission value.

3.2. Web Scrapping

Web scraping is a technique to automatically extract content and data from websites using bots. It is also known as web data extraction or web harvesting. Web scrapping is made simple now days, many tools are used for web scrapping. Some of python libraries used for web scrapping are Beautiful Soup, Scrapy, Selenium, etc.

3.3. Data Transformation

In the Transformation Process, we will convert our original datasets with other necessary attributes format. And will merge it with the Scrapped dataset.

3.4. Data Insertion into Database

a. Database Creation and connection - Create a database with name passed. If the database is already created, open the connection to the database.

b. Table creation in the database.

c. Insertion of files in the table

3.5 Make the EXCEL connection and set up the data source

Step 1: Configuring EXCEL with POWER BI

Step 2: Transform and Load Data

Step 3: Perform ETL (Extract, Transform and Load).

Step 4: Data Processing

Step 5: Create Visuals based on the Data.

Step 6: Design a Dashboard

Step 7: Get insights.

Once you are done with the Dashboard, then we can save it to the Device and share it with the concerned people.

TEST CASE DESCRIPTION	EXPECTED RESULTS
Gender Slicer	When clicked on the slicer, Data must be filtered by the Gender.
Age Slicer	When clicked on the slicer, Data must be filtered according to the Age (Mid age or Senor citizen)
Relation Between Average Net sales by Agency	Here a Bar gaph shows the relatiob between the Average net sales and Agency
Net sales by Age group.	Here a small bar graph which shows the Net sales by age group.
Product name by Destination	The visual should show the distribution of product names by destinations
Net sales by Destination.	This is an important visual in bar-graph which shows the category of Net sales depending on the Destination.

4. Unit Test Cases