Low Level Design

Analysing Amazon Sales Data

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1. Introduction

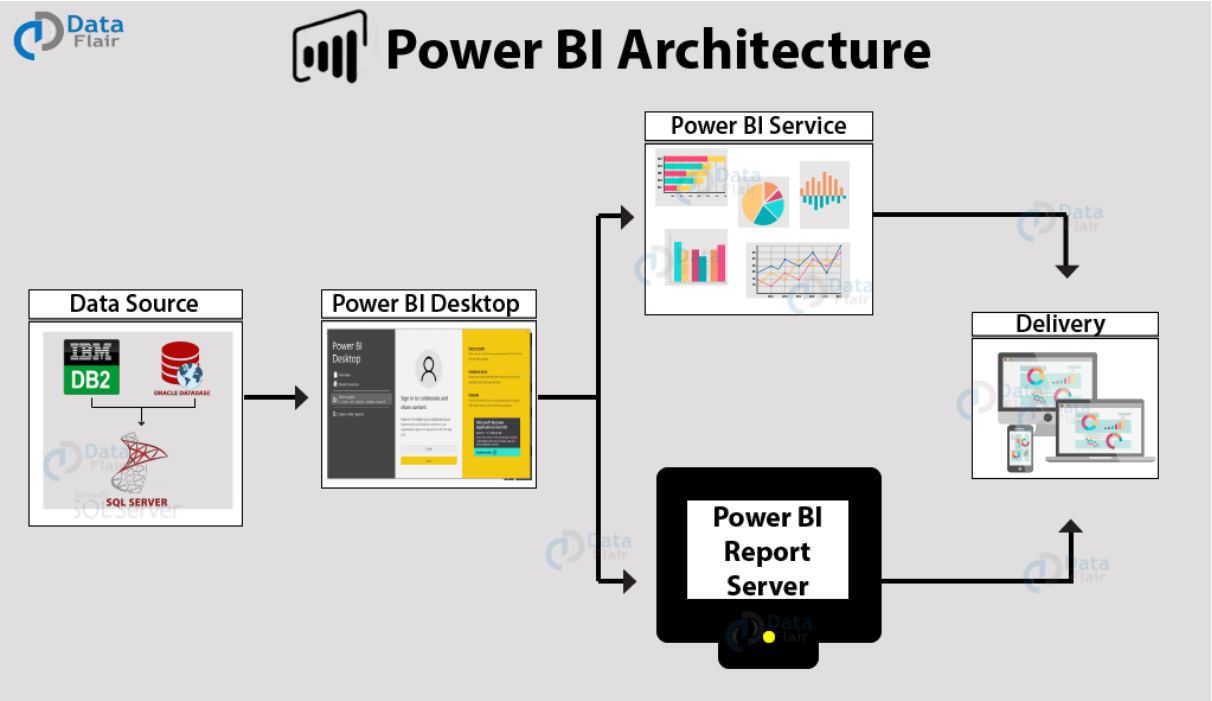
1.1 What is Low-Level design document?

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 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.

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
You must learn about Power BI Data Sources **thoroughly**

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.
Want to learn more about it? Check out the Power BI Report Server Tutorial

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.
Wait! Have you checked our Tutorial on Power BI Gateway

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 consist of Amazon sales data. It includes the details regarding , Region, Country, Item Type, Sales Channel, Order Priority, Order Date, Order ID, Ship Date, Units Sold, Unit Price, Unit Cost, Total Revenue, Total Cost, Total Profit.

1. Region: This column gives information regarding sales in particular region.
2. Country: This column gives information regarding sales in particular country.
3. Item type: This column gives information regarding which type of item being ordered by customers.
4. Sales channel: This column gives information regarding sales whether it is happened online or offline.
5. Order priority: This column gives information regarding priority of particular order.
6. Order date: This column gives information regarding order date of item.
7. Order ID: This column gives information regarding order ID.
8. Ship date: This column gives information regarding ship date of item.
9. Unit sold: This column gives information regarding no of units sold of particular item.
10. Unit price: This column gives information regarding unit price of particular item.
11. Unit cost: This column gives information regarding unit cost of particular item.
12. Total revenue: This column gives information regarding total revenue of particular item.
13. Total cost: This column gives information regarding total cost of particular item.
14. Total profit: This column gives information regarding total profit of particular item.

3.2 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.

3.3 Deployment

1. Publish to the Power BI service: This option allows users to access the report or dashboard from any device with an internet connection, either by logging into the Power BI service or by embedding the report or dashboard into another application or website.

2. Share with colleagues: This option allows users to share a report or dashboard with specific individuals within their organization. The report or dashboard can be shared through email or a link, and can be accessed by the recipients through the Power BI service or by downloading the Power BI Desktop application.

3. Embed in an application or website: This option allows users to embed a report or dashboard into another application or website using the Power BI API or embedding code. This allows the report or dashboard to be accessed within the context of the application or website, and can be used to create custom BI solutions for specific business needs.

4. Publish to a report server: This option allows users to publish a Power BI report to an on-premises report server, such as SQL Server Reporting Services (SSRS). This allows the report to be accessed within the organization's network, and can be used to create custom BI solutions or to integrate with existing reporting systems.