Architecture Design
Amazon Sales Analysis

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Contents

- # Introduction

  - ## What is Architecture Design Document?

    Any software needs the architectural design to represent the design of the software. IEEE defines architectural design as "the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computersystem." The software that is built for computer-based systems can exhibit one of these many architectures.
    Each style will describe a system category that consists of:

    - A set of components (eg: a database, computational modules) thatwill perform a function required by the system.
    - The set of connectors will help in coordination, communication,and cooperation between the components.
    - Conditions that how components can be integrated to formthe system.
    - Semantic models help the designer to understand the overallproperties of the system.

  - ## What is Scope?

    Architecture Design Document (ADD) is an architectural 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 design principles may be defined during requirement analysis and then refined during architectural designwork.

- • **Architecture**

2.1 Components of Power BI Architecture

- • **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 Big Query (Beta)
- • Azure SQL Database
- • Salesforce Reports

- • Google Analytics
- • Facebook
- • GitHub
- •

- • **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.*

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

- • **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 theirreports 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 followingproper security protocols. To use this service, you need to have a Power BI Premium license.

- • **Power BI Gateway**

This component is used to connect and access on-premise data in secured networks. Power BI Gateways aregenerally 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.

- • **Power BI Mobile**

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

- • **Power BI Embedded**

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

Working of Power BI Architecture

Now that we have understood the individual components of Power BI, let us learn how do all of these components work in tandem. We will understand the Power BI architecture with the help of this diagram.
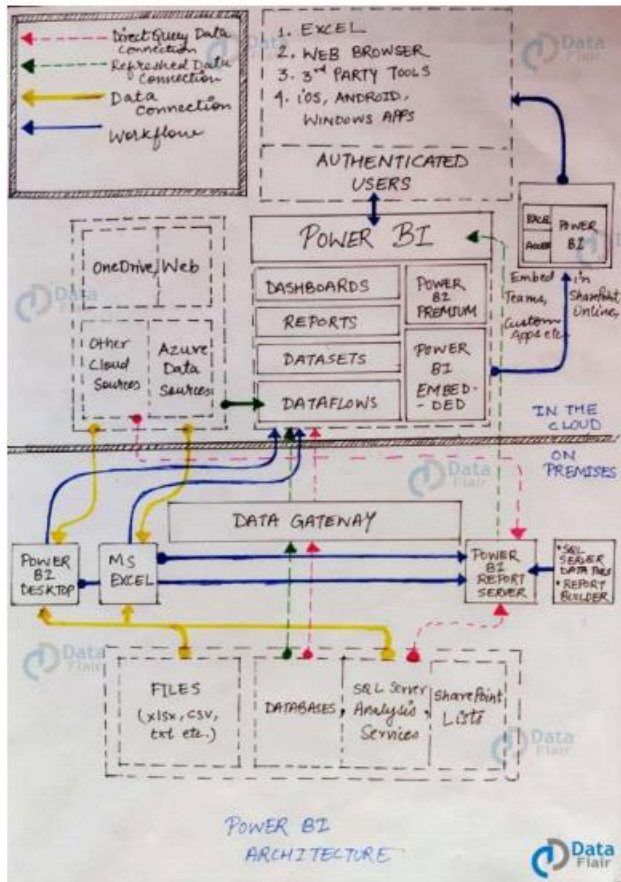
If you look closely, the diagram has numbering done on each component in the architecture. Also, note that thelower half part is the on-premise part and the upper half part depicts the on-cloud services.

To begin with, what forms the starting point or source of all the data flowing into Power BI components are thedata sources. Power BI has the get data feature using which you can connect to different kinds of data sources like *files, on-premise or on-cloud databases, direct connections,* etc. Data connections are established from these data sources to authoring tools such as Power BI Desktop.

On-Premise
Power BI Desktop is a companion development, authoring, and publishing tool. You can import data from data sources to Power BI Desktop and use it to create reports and then publish them on a Power BI Service or PowerBI Report Server.

You can also publish Excel workbooks directly using Power BI Publisher for Excel to the Power BI Report Server.The SQL Server Data tools and Report Publisher help in *creating datasets, KPIs, mobile reports, paginated reports,* etc. The reports from all kinds of reports are published to the Power BI Report Server from where theyare distributed to the end-users.

On-Cloud
An important component in Power BI architecture is the Power BI Gateway. The Power BI Gateway acts as asecure channel to transport data from on-premise data sources to on-cloud apps or sites.

On the cloud side of the architecture, resides a lot of components. Like a complete Power BI suite having *dataflows, datasets, dashboards, reports, Power BI Embedded, Power BI Premium,* etc. You can embed your reports and dashboards into *Teams, SharePoint, custom applications,* etc. There are on-cloud data sourcesas well that connects to Power BI tools via direct connections.
At last, there is a layer of authenticated users who share the published reports and dashboard and collaboratewith one another to make educated decisions based on the insights. There are different kinds of users who consume Power BI reports and dashboards and connect through *web browsers, Excel, third-party tools, and mobile devices* (iOS, Windows, Android apps).
Power BI Service

As we have learned in the earlier sections, all the reports that you create in Power BI Desktop are published ona cloud platform known as Power BI Service.

Users can access the reports and dashboards from Power BI Service using client platforms like websites, mobiledevices, etc. This means that every client who wants to access content created on Power BI needs to interact with Power BI Service. And so, we must take a look under the hood and learn how Power BI Service works.

- # **Deployment**

  - ## **Power Bi 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 analysing 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 IT 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.