Architecture Design
Analyzing Amazon Sales data Analysis

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Document Version	1.0
Last Revised Date	15th July 2023

Document Control

Change Record

Version	Date	Author	Comments
1.0.0	13th July 2023	Karan Singh	Introduction
1.0.1	15th July 2023	Karan Singh	Architecture defined

Reviews

Version	Date	Reviewer	Comment
1.0.0	13th July 2023	Amit	Architecture to be defined
1.0.1	15th July 2023	Amit	Completed

Content

1. Introduction

1.1 What is Architecture design document?

Any software needs the architectural design to represents the design of 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 computer system.” 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) that will 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 form the system.

• Semantic models that help the designer to understand the overall properties of the system.

1.2 Scope

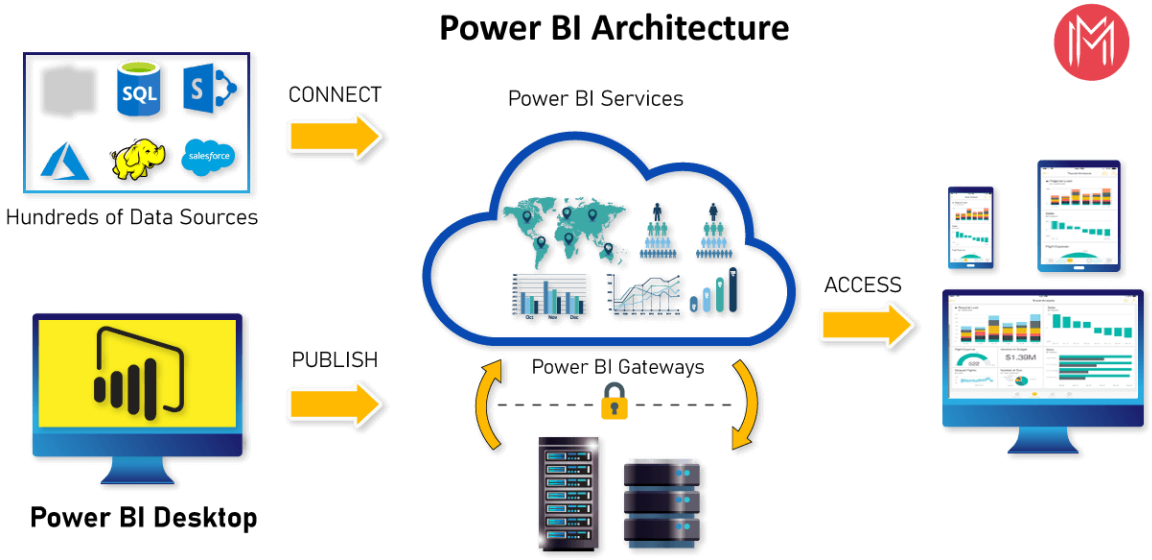
Architecture Design Document (ADD) is an architecture design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the design principles may be defined during requirement analysis and then refined during architectural design work.

2. Architecture

Power BI is a powerful business intelligence tool that follows a client-server architecture to facilitate data processing, visualization, and sharing. This architecture consists of various components that work together to provide a comprehensive solution for data-driven decision-making.

The client-server architecture of Power BI combines various components to enable end-to-end data processing, modeling, visualization, and sharing. From data extraction and transformation to report creation and distribution, Power BI offers a comprehensive architecture that empowers users to make data-driven decisions effectively.

2.1 Power BI Architecture:



Here is an overview of the Power BI architecture:

1. **Data Sources:** Power BI can connect to a wide range of data sources, including databases, cloud services, Excel files, SharePoint lists, and more. These data sources act as the foundation for building data models and creating reports.

2. **Power BI Desktop:** Power BI Desktop is a Windows application used to create and author reports and data models. It provides a rich set of data transformation capabilities, such as data shaping, merging, and modeling. Power BI Desktop allows users to connect to multiple data sources, perform ETL operations, define relationships between tables, and design interactive visualizations.

3. **Power Query Editor:** Power Query Editor is a component within Power BI Desktop that enables data transformation and preparation. It offers a user-friendly interface for data cleaning, shaping, and transformation operations. With Power Query Editor, users

can perform data cleaning tasks, apply filters, remove duplicates, and perform other data preparation tasks before loading the data into the data model.

4. **Data Model:** The data model is the core of the Power BI architecture. It is created within Power BI Desktop and consists of tables, relationships, measures, and calculated columns. The data model provides a structured representation of the data, allowing users to create relationships between tables and define calculations using DAX (Data Analysis Expressions) formulas.

5. **Power BI Service (Cloud):** Power BI Service, also known as Power BI online or Power BI cloud, is a cloud-based platform where users can publish, share, and collaborate on reports and dashboards created in Power BI Desktop. It provides features such as data refresh, sharing and collaboration, scheduled report processing, and content management.

6. **Power BI Mobile**: Power BI Mobile allows users to access and view reports and dashboards on their mobile devices. It provides a responsive and optimized viewing experience, allowing users to interact with the reports and dashboards on the go.

7. **Power BI Gateway:** Power BI Gateway is used to establish a secure connection between Power BI Service and on-premises data sources. It enables data refresh for on-premises data sources and ensures that the data in the reports and dashboards is up to date.

8. **Power BI Report Server:** Power BI Report Server is an on-premises solution that allows organizations to deploy and manage Power BI reports on their own infrastructure. It provides a secure and scalable environment for hosting Power BI reports and dashboards within the organization's network.

These components work together to enable end-to-end data processing, modeling, visualization, and sharing in Power BI. From data extraction and transformation to report creation and distribution, Power BI offers a comprehensive architecture for data-driven decision-making.

2.2 Power BI Communication Flow

Power BI facilitates effective communication and collaboration by providing a seamless flow of information between various stakeholders. The communication flow in Power BI involves the following key components and processes:

1. **Data Sources**: Power BI allows users to connect to a wide range of data sources, such as databases, spreadsheets, cloud services, and online platforms. Users can extract data from these sources to create reports and dashboards.

2. **Data Transformation and Modeling:** Once the data is connected, Power BI enables users to transform and model the data to meet their specific requirements. This includes cleaning, shaping, and merging data from different sources, as well as creating relationships between tables to establish meaningful connections.

3. **Report and Dashboard Creation:** Using the transformed data, users can design and create reports and dashboards in Power BI. Reports consist of visualizations such as charts, tables, and graphs, while dashboards provide a consolidated view of multiple reports and key performance indicators (KPIs).

4. **Publishing and Sharing:** Power BI offers the ability to publish reports and dashboards to the Power BI service or to an on-premises Power BI Report Server. Published content can then be shared with specific individuals or groups, either within the organization or externally, depending on the chosen sharing settings.

5. **Collaboration and Interactivity:** Power BI promotes collaboration and interactivity through features like natural language querying, annotations, and commenting. Users can ask questions about the data using natural language and receive immediate responses. They can also leave comments, annotations, or share insights with others, promoting a collaborative environment.

6. **Data Refresh:** Power BI enables scheduled or on-demand data refresh to ensure that reports and dashboards always display up-to-date information. This allows users to rely on accurate and timely data for decision-making.

7. **Mobile Access:** Power BI provides mobile applications for iOS and Android devices, allowing users to access and interact with reports and dashboards on-the-go. This enhances communication and enables stakeholders to stay informed anytime, anywhere.

8. **Analyzing and Exploring Data:** Users can further analyze and explore data within Power BI reports and dashboards. They can apply filters, drill-down into specific details, and interact with visualizations to gain deeper insights and make data-driven decisions.

Overall, Power BI's communication flow ensures that data and insights flow seamlessly between data sources, report creators, content publishers, and end-users. This facilitates effective communication, collaboration, and decision-making across the organization.