ARCHITECTURE DESIGN

World Bank Debt Analysis

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Contents

1.Introduction..... 04

1.1 What is Architecture Design Document? 04

1.2 Scope 04

2. Architecture 05

2.1 Power BI Architecture 05

2.2 Power BI Server Architecture.....06

2.3 Power BI Communication Flow 09

3. Deployment 10

3.1 Deployment Options in Power BI 10

3.2 Power BI Architecture working.....10

4. Conclusion…….. 11

3.4 Five Node Architecture 12

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.

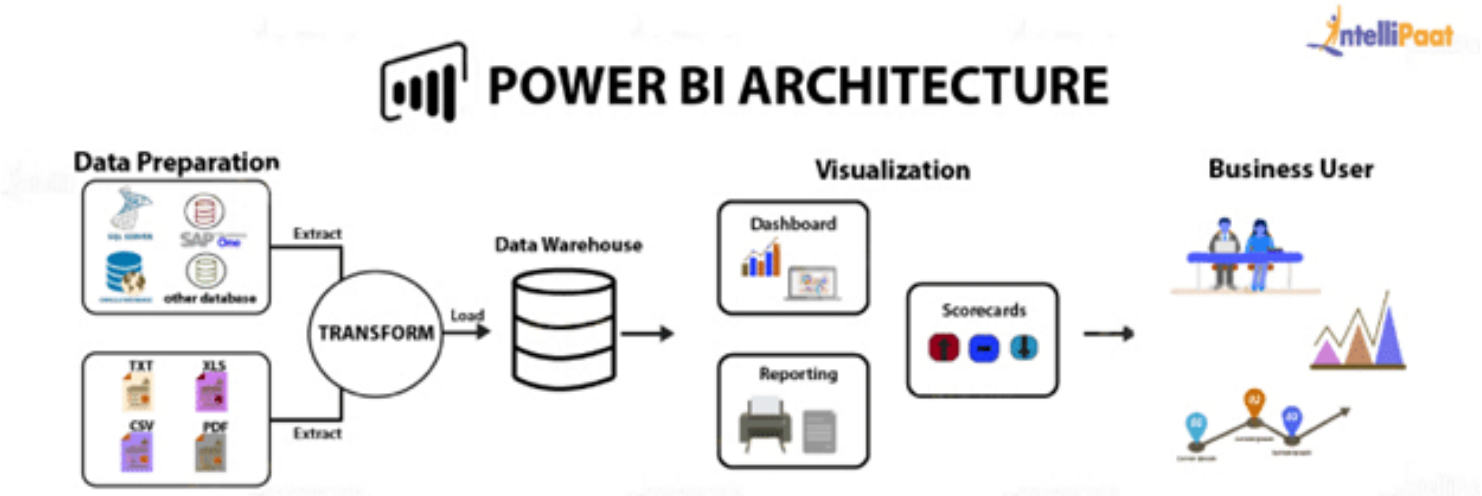
• Semantic models that help the designer to understand the overall properties of the system.

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.

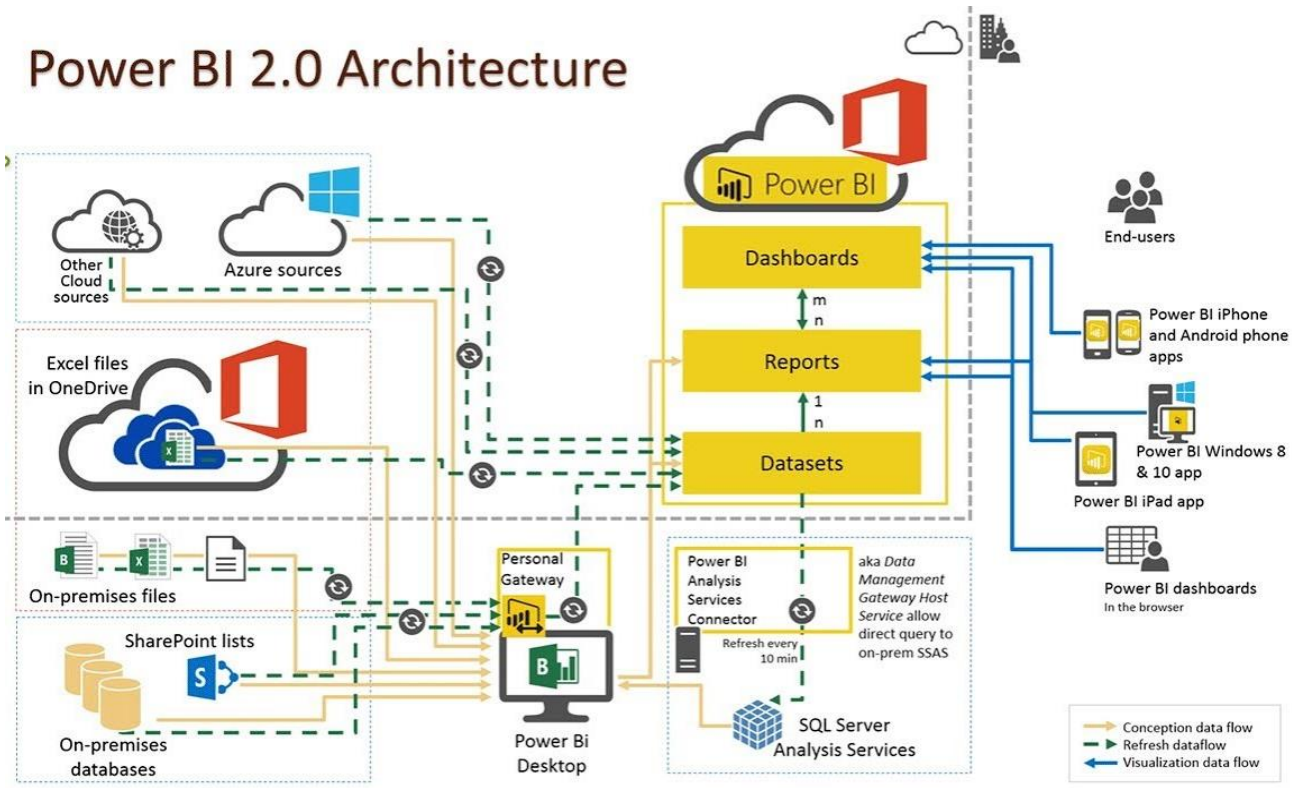
2.Architecture



2.1 POWER BI ARCHITECTURE

Microsoft's Power BI is a collection of Business Intelligence tools such as apps, software services, and connectors that can turn raw business data into visual insights. The raw data could be from Excel spreadsheets, database tables, or a collection of cloud-based hybrid datasets.
The role of Power BI mostly depends on the projects or the teams in an organization. It can be used to view reports and dashboards, monitor progress on sales, find new lead details, and analyse market behaviour. This BI tool also helps an organization plan its future actions by predicting market behaviour.

2.2 POWER BI SERVER ARCHITECTURE



I. Data Sources

Power BI's extensive selection of data sources is a key feature. You can connect directly to live connections, import data from files on your computer, or use cloud-based online data sources. There is a 1 GB limit on the amount of data you can import from on-premises or internet sources.

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

II.POWR BI DESKTOP

You can connect, convert, and view your data on your local desktop using Power BI Desktop, a free software. It has many features and capabilities for connecting to data sources, transforming data, modeling data, and producing reports. Power BI Desktop is available for free download and installation on your computer. One can perform data purification, establish business metrics and data models, specify hierarchies, generate graphics, and publish reports.

III. Power BI Report Server

The Power BI Report Server and the Power BI Service are related. The fact that Power BI Report Server is an on
premise product is the only distinction between these two. Organizations that worry about their data's security and do not want to publish their reports in the cloud use it. Thanks to Power BI Report Server, you may build dashboards and share your findings with other users while adhering to the necessary security rules. You must have a Power BI Premium license to access this service.

IV.POWER BI GATEWAY

In secured networks, this component is utilized to connect to and access on-premise data. Power BI Gateways are typically used in businesses where data is protected and closely observed. Gateways assist in transferring such data to Power BI solutions for analysis and reporting via secure channels.

V.POWER PIVOT

This component imports and combines various datasets from various sources to create in-memory data models. Thanks to such integration, functional users can quickly increase the overall value by merging different data sources. The most well-known instance of these integrations is when Power BI is used to examine corporate sales, demographics, and meteorological data. Additionally, this component offers intricate calculations, key performance indicators, and other metrics that data analysts can utilize to prototype and analyze various business scenarios.

VI.POWER VIEW

Power View is the preferred component for displaying the data and making it even more dynamic. The data is meant to be cross-filtered and highlighted. It almost seems like using

Excel and PowerPoint tools when working with the data in the Power view component. Power View also offers graphs, tabular data, and charts supporting various maps with zoom and pan features.

VII.POWER BI GATEWAY

Power BI Gateway software is needed to access data in an on-premises network. For the data source, the gateway serves as a gatekeeper. The gateway responds to requests, and access is allowed according to users' authentication needs.

Data from the on-premises source is not transferred through gateways to the client platform. It establishes a direct link between the platform and the on-site data source. The client can directly access data from the customer's location for usage in reports, dashboards, and data analysis. A gateway is utilized to make possible connections between a single or multiple data sources.

Two Types of POWER BI GATEWAY

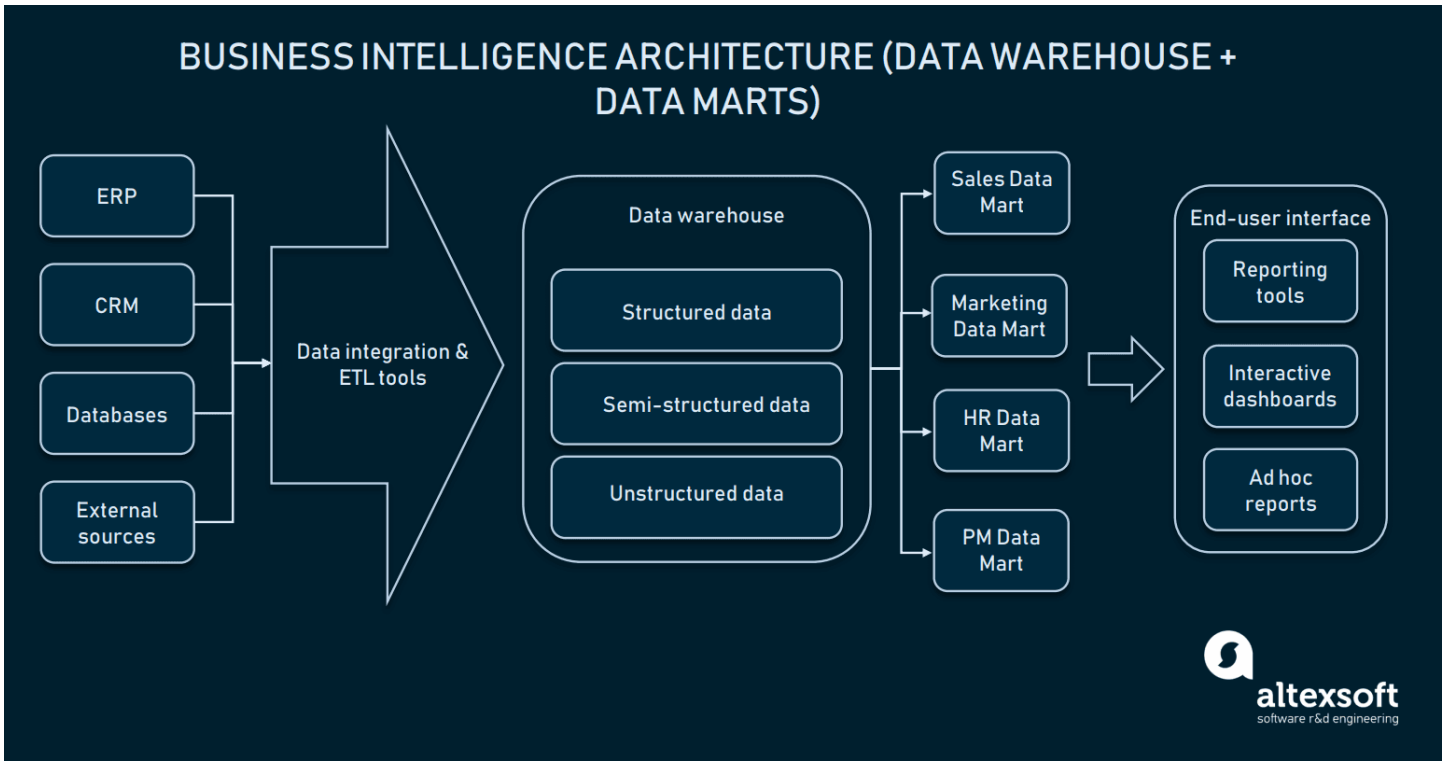
- **On-premises Data Gateway (Standard Mode)**

This mode of on-premises data gateway enables connectivity with several on-premises data sources for more than one user. The data can be used in Microsoft Flow, Power BI, Azure Analysis Services, Azure Logic Apps, and other applications. By establishing this kind of data gateway simply once, you can create direct links to numerous data sources. This data gateway is advised for complicated scenarios where several users must access various data sources.

- **On-premises Data Gateway (Personal Mode):**

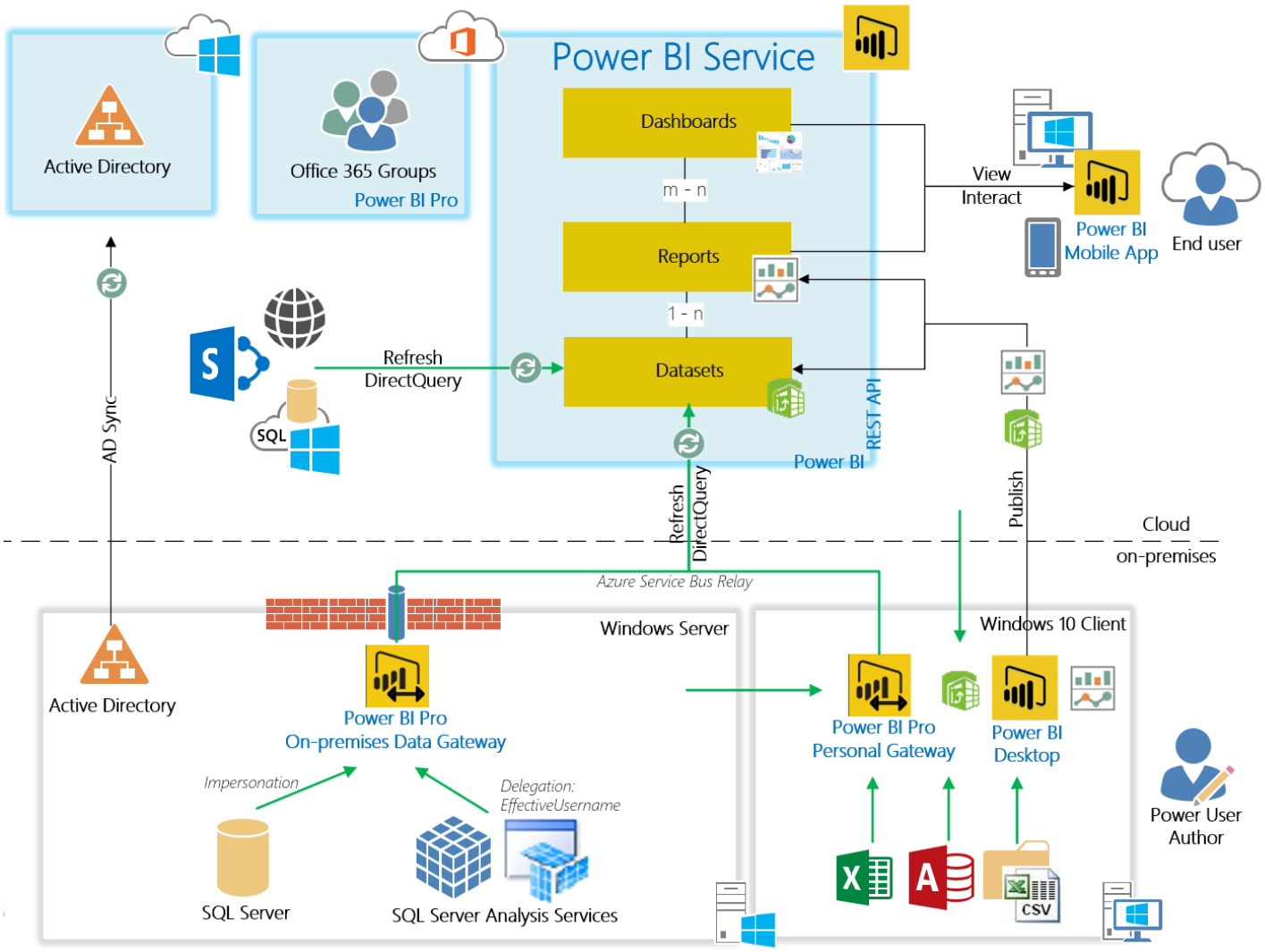
one user connects to several data sources using the on-premises data. Gateway's person mode. It is advised whenever only one person needs to access the data sources. The user cannot grant other users access to their Power BI account to produce reports and dashboards.

2.3 POWER BI COMMUNICATION FLOW



3. DEPLOYMENT

3.1 DEPLOYMENT OPTIONS IN POWER BI



3.2 Power BI Architecture working

Power BI gets these data from different sources such as files, on-cloud, on-premise databases, or from direct connections.

On-Premise

Power BI Desktop is a development, authorizing, and publishing tool that allows users to import data from different data sources. They can use it to create and publish various reports on a Power BI Service or Report Server. These reports are visualized for making better decisions.

On-Cloud

The Power BI Gateway is an important part of Power BI Architecture that makes a secure way to transfer data or information from on-premise to cloud data sources. Besides, the Cloud architecture of Power BI includes various components. Such as; datasets, dashboards, reports, Power BI Embedded, and Premium. Moreover, these on-cloud data sources are connected to various Power BI tools as well.

4. CONCLUSION

The above details explain Power BI architecture and its working covering different aspects. Power BI is a powerful business intelligence suite that includes various components. Moreover, these are useful to gather data and convert it into meaningful insights to prepare attractive reports and dashboards. Using Power BI many business people get successful outcomes for their business data.