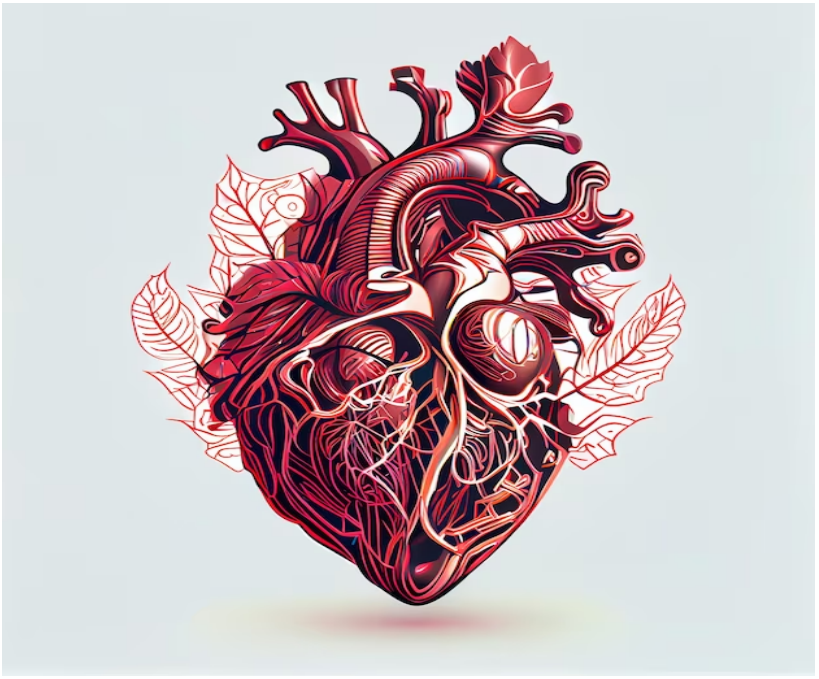

Architecture Design

Heart Disease Diagnostic Analysis

Revision Number: 1.1

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Sameer Singh

Document Version Control

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24.09.2023	1.0	Introduction, Architecture, Deployment	Sameer Singh
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Contents

1 Introduction

1.1 Why this Architecture Design Document?

Any software needs an architectural design to represent 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 (e.g.: 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 PowerBI 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:

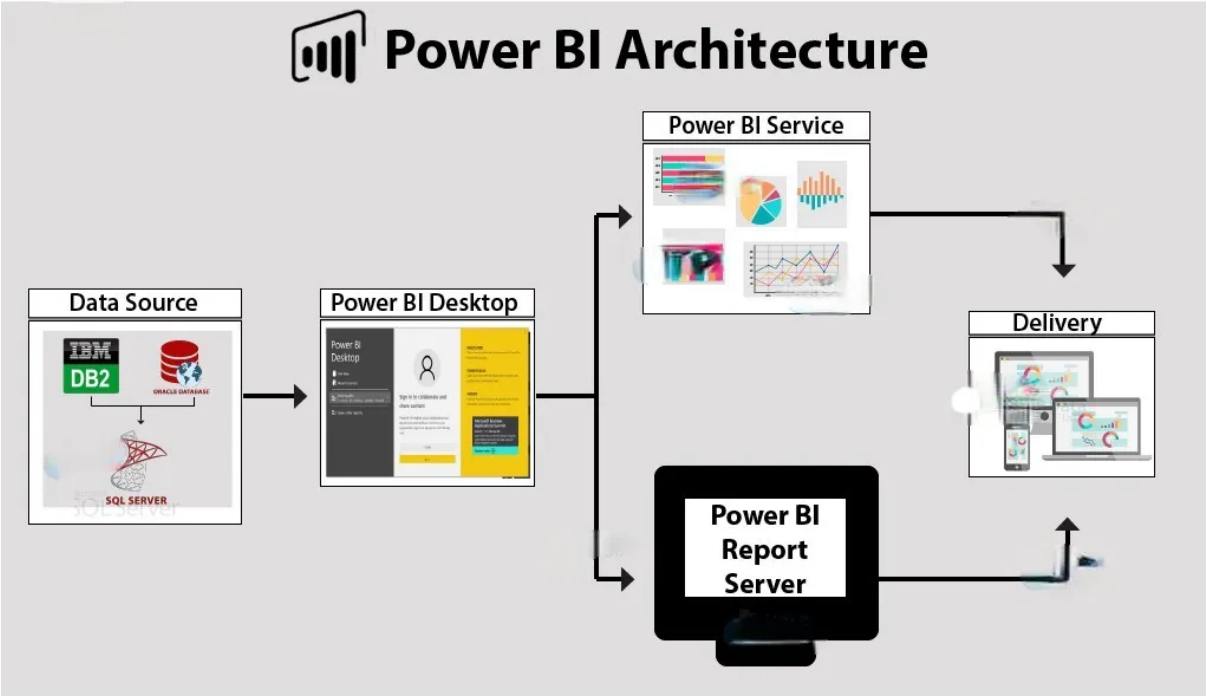
- Power Query (for data mash-up and transformation)
- Power BI Desktop (a companion development tool)
- Power BI Mobile (for Android, iOS, Windows phones)
- Power Pivot (for in-memory tabular data modeling)
- Power View (for viewing data visualizations)
- Power Map (for visualizing 3D geo-spatial data)
- 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 make 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 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.



2.2 Components of PowerBI Architecture

1. **Data Sources :** An essential 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, and many more…

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, model, and create 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 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. Therefore, it is used by organizations who do not want to publish their reports on the cloud and are concerned about their data security. 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 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 Deployment

3.1 PowerBI Deployment

The deployment process lets you clone content from one stage in the pipeline to another, typically from development to test, and from test to production.

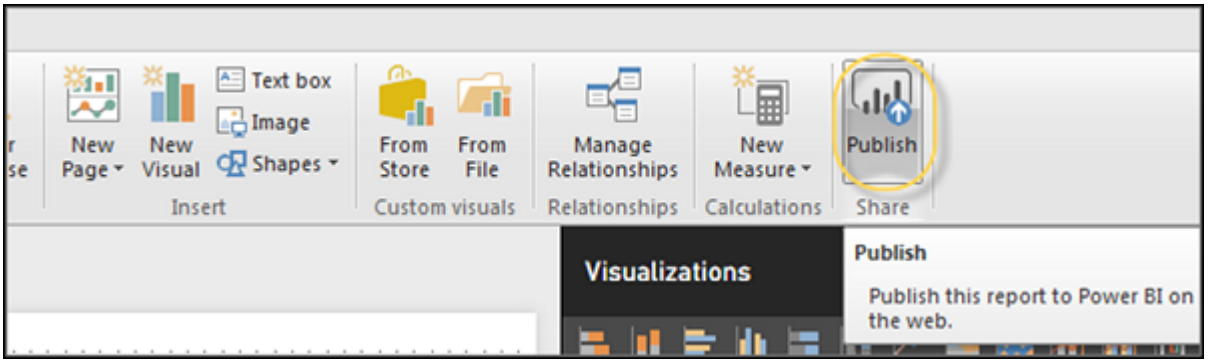
During deployment, Power BI copies the content from the current stage, into the target one. The connections between the copied items are kept during the copy process. Power BI also applies the configured deployment rules to the updated content in the target stage. Deploying content may take a while, depending on the number of items being deployed. During this time, you can navigate to other pages in the Power BI portal, but you cannot use the content in the target stage.

3.2 Publish datasets and reports from Power Bl Desktop

When you publish a Power BI Desktop file to the Power BI service, you publish the data in the model to your Power BI workspace. The same is true for any reports you create in Report View. You'll see a new dataset with the same name, and any reports in your Workspace navigator.

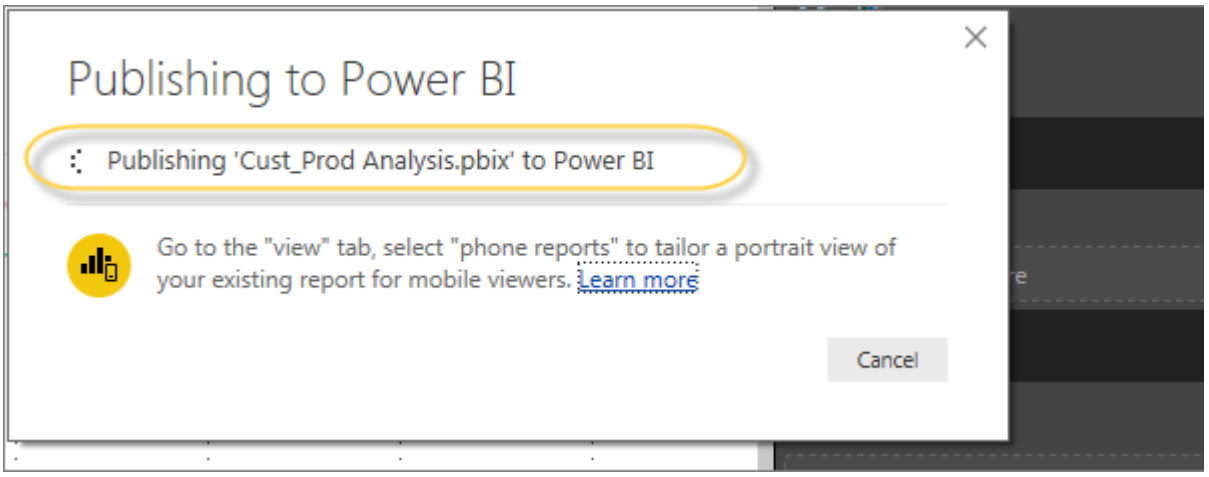
Publishing from Power BI Desktop has the same effect as using Get Data in Power BI to connect to and upload a Power BI Desktop file.

1. Once the report is created, navigate to the Publish button on the Home tab in Power BI desktop.



2. Once you select the Publish service, your visuals, custom measures and reports are all packaged and published to Power BI service.

Power BI files have an extension **.pbix** files. When the upload is in process, you get a dialog box that Publishing is in process.



3. Once the upload is complete, you will get a confirmation message announcing the "Success". You can also view Quick Insights and open the shared report from the dialog box.