Architecture Design

Crop Production Analysis In India

BY – Dhanshri Manusmare

- **Document Control**

Date	Version	Description	Author
28-01-23	1.1	Introduction, Architecture, Deployment	Dhanshri
25-04-23	1.2	Final Revision	Dhanshri

- **Contents**

1. Introduction

1.1 Why this 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 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 design work.

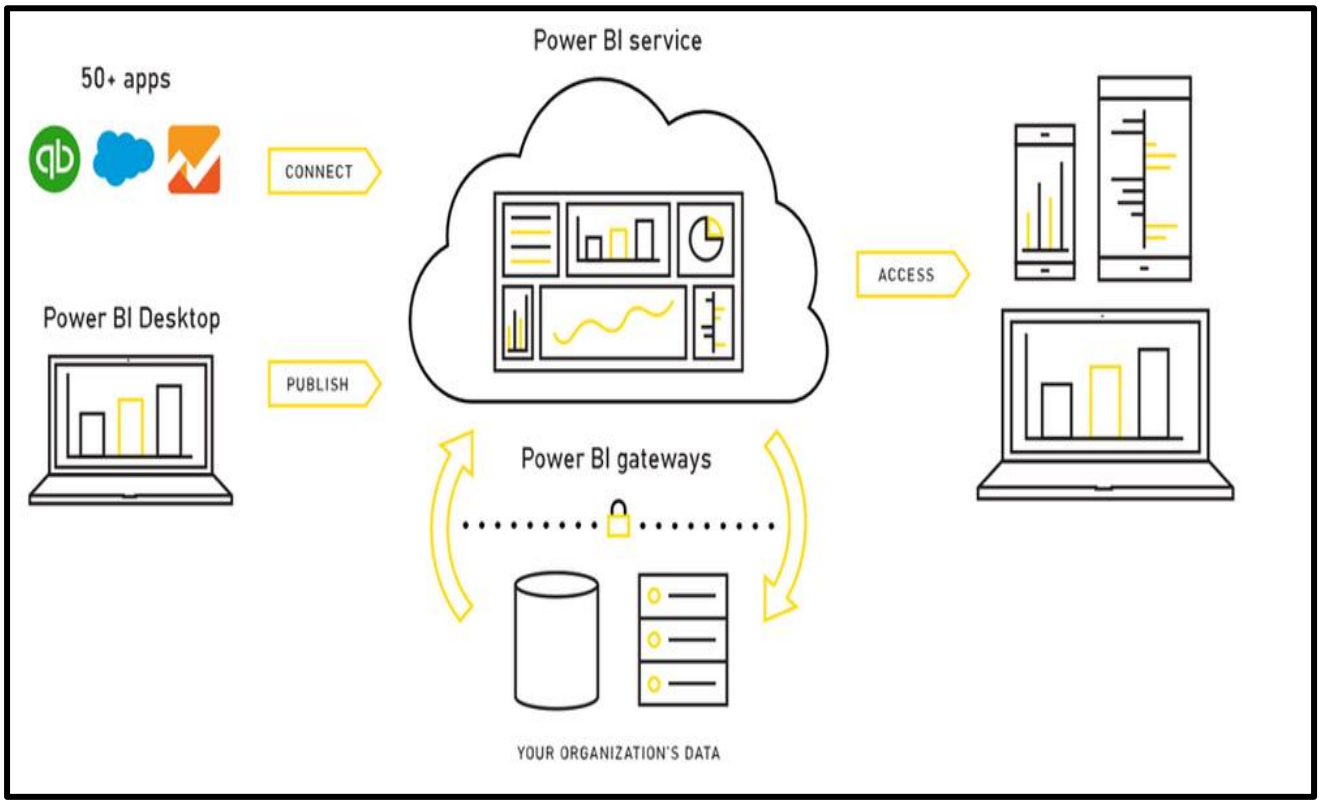
2. Architecture

2.1. Power BI

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 modelling)
- Power View (for viewing data visualizations)
- Power Map (for visualizing 3D geo-spatial data)
- Power Q&A (for natural language Q&A)

Power BI user takes data from various data sources such as files, Azure source, online services, Direct Query 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.



2.2 Components

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

2. Power BI Desktop

Power BI Desktop is a free application you install on your local computer that lets you connect to, transform, and visualize your data. With Power BI Desktop, you can connect to multiple different sources of data, and combine them (often called *modeling*) into a data model. This data model lets you build visuals, and collections of visuals you can share as reports, with other people inside your organization. Most users who work on business intelligence projects use Power BI Desktop to create reports, and then use the *Power BI service* to share their reports with others.

3. Power BI Service

The **Power BI service** is a cloud-based service, or *software as a service* (SaaS). It supports report editing and collaboration for teams and organizations. You can connect to data sources in the Power BI service, too, but modeling is limited. The Power BI service is used to do things such as creating dashboards, creating and sharing apps, analyzing and exploring your data to uncover business insights, and much more.

Most Power BI report designers who work on business intelligence projects use **Power BI Desktop** to create Power BI reports, and then use the **Power BI service** to collaborate and distribute their reports.

It is available in three versions:

• Free version

• Pro version

• Premium version

4. Power BI Report Server

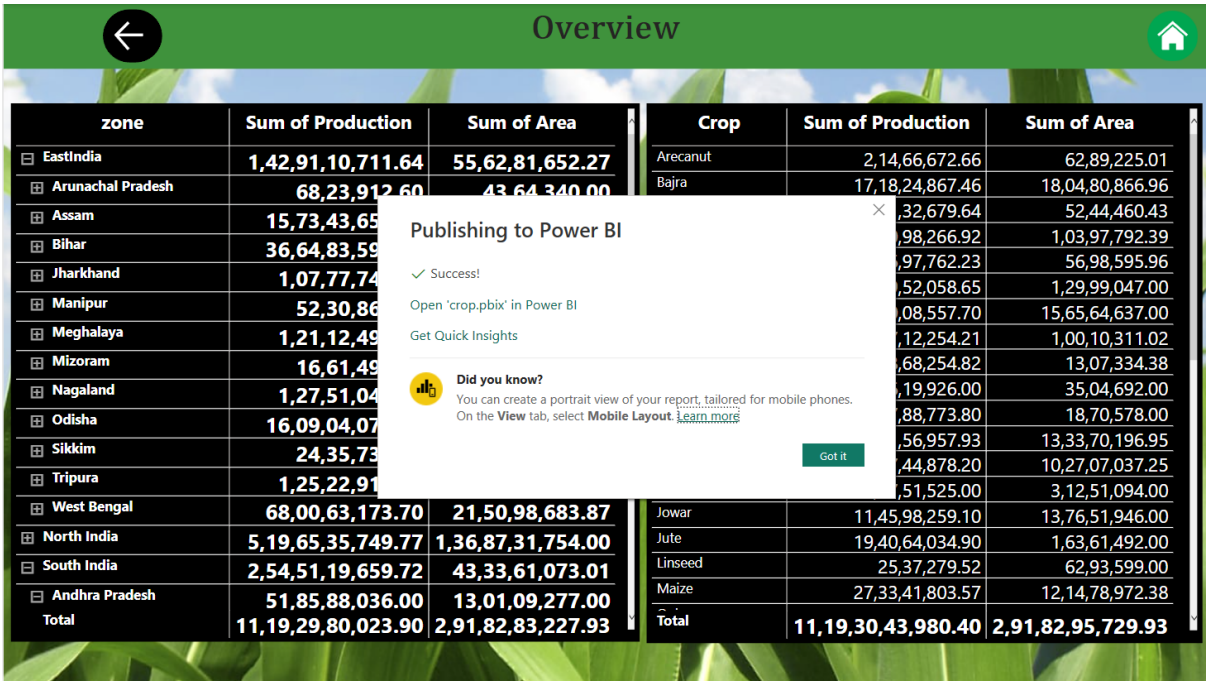
Power BI Report Server is an on-premises report server with a web portal in which you display and manage reports and KPIs. Along with it come the tools to create Power BI reports, paginated reports, mobile reports, and KPIs. Your users can access those reports in different ways: viewing them in a web browser or mobile device, or as an email in their in-box.

3. Deployment

3.1 Power BI Deployment

Now, once you have created a report in Power BI Desktop, you can use the Publish option to share it with others. Publishing a report to Power BI Service having Power BI license is necessary. You can share the report at any location of Power BI Service such as your personal workspace, team workspace, or elsewhere.

3.2 Publish datasets and reports from Power BI Desktop



zone	Sum of Production	Sum of Area
EastIndia	1,42,91,10,711.64	55,62,81,652.27
Arunachal Pradesh	68,23,912.60	43,64,340.00
Assam	15,73,43,65	
Bihar	36,64,83,59	
Jharkhand	1,07,77,74	
Manipur	52,30,86	
Meghalaya	1,21,12,49	
Mizoram	16,61,49	
Nagaland	1,27,51,04	
Odisha	16,09,04,07	
Sikkim	24,35,73	
Tripura	1,25,22,91	
West Bengal	68,00,63,173.70	21,50,98,683.87
North India	5,19,65,35,749.77	1,36,87,31,754.00
South India	2,54,51,19,659.72	43,33,61,073.01
Andhra Pradesh	51,85,88,036.00	13,01,09,277.00
Total	11,19,29,80,023.90	2,91,82,83,227.93

Crop	Sum of Production	Sum of Area
Arecanut	2,14,66,672.66	62,89,225.01
Bajra	17,18,24,867.46	18,04,80,866.96
	,32,679.64	52,44,460.43
	,98,266.92	1,03,97,792.39
	,97,762.23	56,98,595.96
	,52,058.65	1,29,99,047.00
	,08,557.70	15,65,64,637.00
	,12,254.21	1,00,10,311.02
	,68,254.82	13,07,334.38
	,19,926.00	35,04,692.00
	,88,773.80	18,70,578.00
	,56,957.93	13,33,70,196.95
	,44,878.20	10,27,07,037.25
	,51,525.00	3,12,51,094.00
Jowar	11,45,98,259.10	13,76,51,946.00
Jute	19,40,64,034.90	1,63,61,492.00
Linseed	25,37,279.52	62,93,599.00
Maize	27,33,41,803.57	12,14,78,972.38
Total	11,19,30,43,980.40	2,91,82,95,729.93