Low Level Design

Food Environment Atlas

Written By	Devendra Kandpal
Document Version	0.1
Last Revised Date	

DOCUMENT CONTROL

Change Record:

VERSION	DATE	AUTHOR	COMMENTS
0.1	19- Jan - 2023	Devendra Kandpal	Introduction and architecture defined

Reviews:

VERSION	DATE	REVIEWER	COMMENTS
0.1	19- Jan - 2023	Devendra Kandpal	Unit test cases added

Approval Status:

VERSION	REVIEW DATE	REVIEWED BY		APPROVED BY	COMMENTS

Contents

1. Introduction

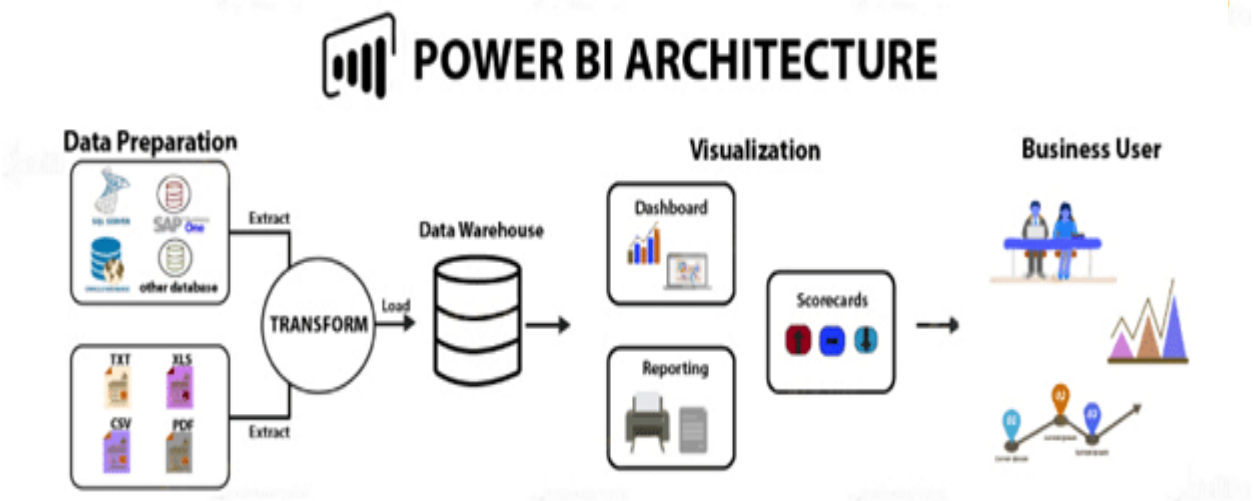
1.1 What is Low-Level design document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the actual program code for the House Price Prediction dashboard. LDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

1.2 Scope

Low-level design (LLD) is a component-level 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 data organization may be defined during requirement analysis and then refined during data design work.

2. Architecture



Power BI Architecture

MS Power BI architecture consists of four major steps that explain the whole process from data sourcing to the creation of reports and dashboards. Various technologies and processes work together to get the required results with extreme precision.

- **Sourcing data:** Power BI extracts data from various servers, Excel sheets, CSV files, and databases. The extracted information can be directly imported to Power BI, or a live service link is established to receive it. If you directly import the data in Power BI, it will only be compressed up to 1 GB. Post that, you can only run live queries on your chunky datasets.
- **Transforming the data**: Before visualizing the data, cleaning and pre processing it should be done. This means removing useless or missing values from rows or columns. Following that, certain rules will be applied to transform and load the datasets into the warehouse.
- **Report and publish:** After cleaning and transforming the data, reports will be created based on requirements. A report is a visualization of the data with different filters and constraints presented in the form of graphs, pie charts, and other figures.
- **Creating dashboards:** Power BI Dashboards are created by pinning individual elements or pages of live reports. Dashboards should be created after you have published your reports to the BI service. When the reports get saved, the visual maintains the filter settings chosen so that the user can apply filters and slicers.

Power BI Service Architecture

The Front-end Cluster

The front-end cluster acts as a medium between the client and the on-cloud servers in the Power BI data flow diagram. After the initial connection and authentication using Azure Active Directory, the client can interact with the datasets located across the globe.

The Back-end Cluster

The back-end cluster manages datasets, storage, reports, visualizations, data connections, data refreshing, and other services in Power BI. At the cluster, web clients have only two points to interact with the information, i.e., Azure API Management and Gateway Role. These components are responsible for authorizing, routing, authentication, load balancing, etc.

Now that you know about the Power BI architecture and its works, let’s discuss the Power BI dashboard and its unique features of Power BI.

Power BI Dashboard

Power BI dashboard is a single-page visualization generated from different reports based on your datasets. In other words, it is a canvas that brings different elements representing multiple datasets together. A report can be of multiple pages, but a dashboard will only be of a single page.

Data visualizations attached to a BI dashboard are called tiles. You can alter these tiles by adding or removing some of them as per requirements

3. Architecture Description

3.1. Data Description

The data set contains many tables contain the population of country, access to stores, restaurants, farms, health, insecurity, etc. From this data tables we have to make a meaningful visuals.

1. Access To Stores: How easily people can easily access to stores.

2. Stores availability: The number of stores, supercentre , SNAP-authorized, specialized, convenience stores and Grocery changed during a year .

3. Restaurant availability and expenses: It tells about the number of restaurant increased from 2002 till 2007 and its expenses

. 4. Food Assistance: It is the programme, which distributes food to the public.

5. State food insecurity: This data tells us about the food insecurity that happened in household and in child's life.

6. Food price tax: This gives information about the tax that incurred over the different food items.

7. Local food : It gives the information about the local farms and crops.

8. Health and Physical activities: This table gives information about the health of adults and child's and their physical activities. It also provide information about the recreation facility that changed during years.

9. Socioeconomic: This table gives information about the population of the country and their populations.

3.2. Data Transformation

In the Transformation Process, we will convert our original datasets with other necessary attributes format. In this all the null and errored value have been replaced with the correct value as it have connection to the numeric data.

4. Unit Test Cases

TEST CASE DESCRIPTION	EXPECTED RESULTS
Country Slicer(or drop down menu)	When clicked on the slicer, a dropdown should occur which has various country name and choose the country you want to see data of.
Pie Chart	The pie chart might go empty sometime this means that the graph have zero value on it .
Gauge Chart of population change	Here in this case, the gauge chart will show the change in the population. It sometime could be negative and sometime could be positive depend upon the change of population .
The % change in restaurant, participant or health	Many times, the graph column might go to -y axis this shows that the participant have left the job or restaurant number have decreased as compared to previous year or the disease have been lowered. There is nothing to worry about.