Customer Lifetime Value

Low Level Design

Project On:

Title : Customer Lifetime Value

By: Rushikesh Khandare

Low Level Design (LLD)

Contents:

Low Level Design (LLD)

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 Expenditure Data Analysis 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.

Low Level Design (LLD)

2. Architecture

Power BI Desktop Architecture

1. Get Power BI Desktop

With Power BI Desktop, you can build advanced queries, models, and reports that visualize data. You can also build data models, create reports, and share your work by publishing to the Power BI service. Power BI Desktop is a free download.

2. BI solution architecture in the Centre of Excellence

BI solution architecture can consist of:

- Data sources
- Data ingestion
- Big data / data preparation
- Data warehouse
- BI semantic models
- Reports

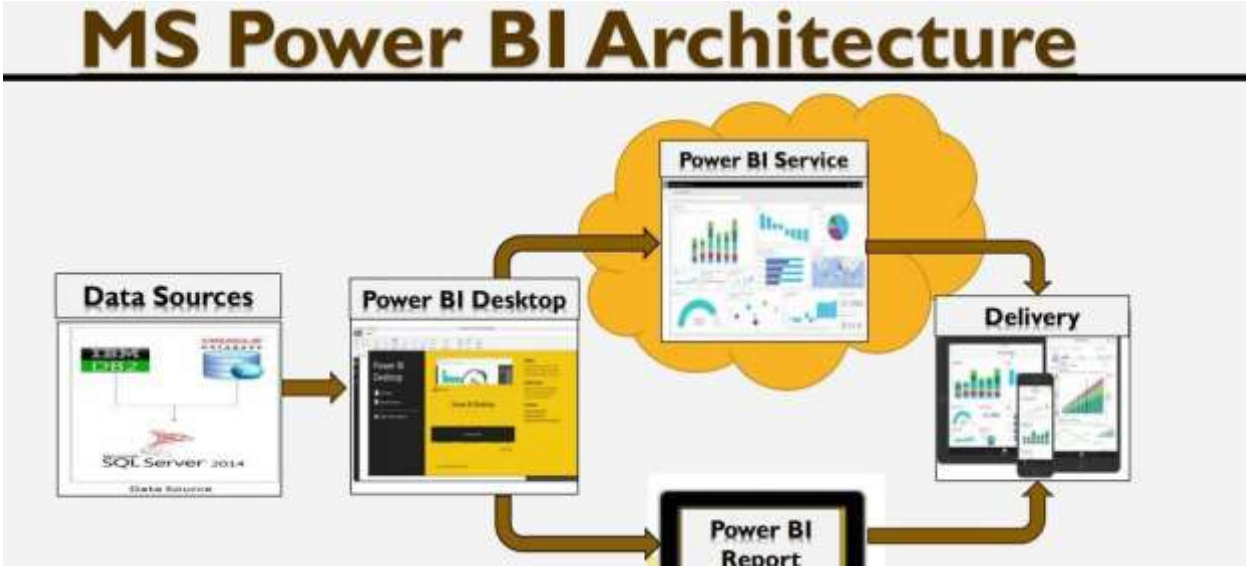


Fig: Power BI Architecture diagram

Low Level Design (LLD)

Microsoft Power BI Desktop is a companion desktop application to Power BI.

With Power BI Desktop, you can:

1. **Get data:**

   The Power BI Desktop makes discovering data easy. You can import data from a wide variety of data sources. After you connect to a data source, you can shape the data to match your analysis and reporting needs.

2. **Create relationships and enrich your data model with new measures and data formats:**

   When you import two or more tables, oftentimes you'll need to create relationships between those tables. The Power BI Desktop includes the Manage Relationships dialog and the Relationships view, where you can use Autodetect to let the Power BI Desktop find and create any relationships, or you can create them yourself. You can also very easily create your own measures and calculations or customize data formats and categories to enrich your data for additional insights.

3. **Create reports:**

   The Power BI Desktop includes the Report View. Select the fields you want, add filters, choose from dozens of visualizations, format your reports with custom colours, gradients and several other options. The Report View gives you the same great report and visualizations tools just like when creating a report on PowerBI.com.

4. **Save your reports:**

   With the Power BI Desktop, you can save your work as a Power BI Desktop file. Power BI Desktop files have a .pbix extension.

5. **Upload or Publish your reports:**

   You can upload the reports you created and saved in the Desktop to your Power BI site. You can also publish them to Power BI right from Power BI Desktop.

3. Architecture Description

3.1. Data Description: The Dataset contains month wise Policies for 2011 for the following columns:

1) Customer

2) State:

Arizona
California
Nevada
Oregon
Washington

3) Customer Lifetime Value

4) Response

Yes
No

5) Coverage

Basic
Extended
Premium

6) Effective to date

.

7) Education:

Bachelor
College
Doctor
High School or Below
Master

8) Employment Status

Disabled
Employed
Medical Leave
Retired
Unemployed

9) Gender

10) Income

11) Location Code

Rural
Urban

12) Marital Status

Single
Divorced
Married

13) Monthly Premium Auto

14) Months Since Last Claim

15) Months Since Policy Inception

16) Number of Open Complaints

0
1
2
3
4
5

17) Number of Policies

18) Policy Type

Corporate L1
Corporate L2
Corporate L3
Personal L1
Personal L2
Personal L3
Special L1
Special L2
Special L3

19) Policy

Corporate Auto
Personal Auto
Special Auto

20) Renew Offer Type

Offer 1
Offer 2
Offer 3
Offer 4

21) Sales Channel

Agent
Branch
Call Center
Web

Low Level Design (LLD)

22) **Total Claim Amount**
23) **Vehicle Class**
    - Four Door Car
    - Luxury Car
    - Luxury SUV
    - Sports Car
    - SUV
    - Two Door Car
24) **Vehicle Size**
    - Small
    - Medsize
    - Large
25) **Present Value of Customers**

3.2 Export Data from Python
Perform Exploratory Data Analysis Using Python:

1. **Import Python Modules**
2. **Load Dataset**
3. **Data Preparation**
4. **EDA: Data Visualization**

```
# import python libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

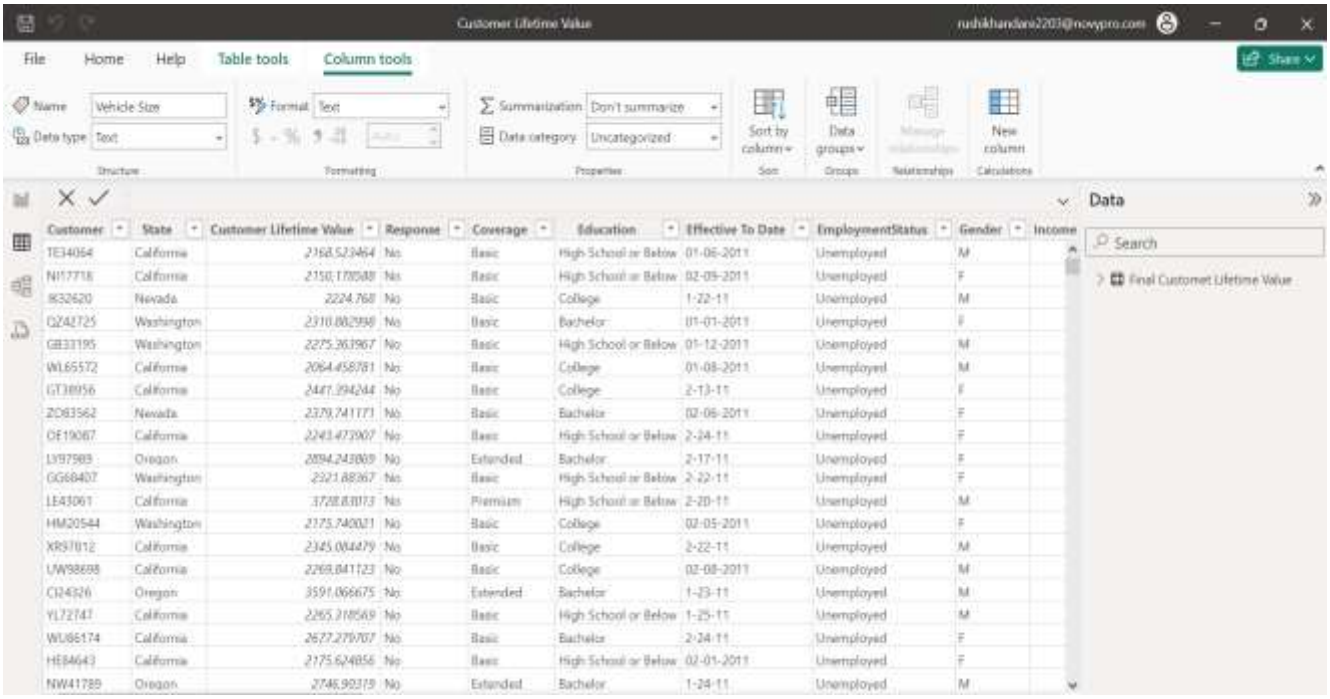
```
df = pd.read_csv("Data\Customer-Value-Analysis.csv")
df.head()
```

- After performing Pre-processing and cleaning dataset.
- After cleaned data, its exported into csv as a Final Customer Lifetime Value.csv.
- Now this cleaned dataset uses for creating dashboard in Power BI.

```
[31]  1  df.to_csv('Final Customet Lifetime Value.csv',index=False)
```

3.3 Data Preparation:

- In the Preparation Process, we will convert our original datasets with other necessary attributes format.
- All the datasets is of same format as shown below: Original dataset.



Customer	State	Customer Lifetime Value	Response	Coverage	Education	Effective To Date	EmploymentStatus	Gender	Income
TE34064	California	2168.523464	No	Basic	High School or Below	01-06-2011	Unemployed	M	
NI17718	California	2150.178588	No	Basic	High School or Below	02-05-2011	Unemployed	F	
IR32620	Nevada	2224.768	No	Basic	College	1-22-11	Unemployed	M	
QZ42725	Washington	2310.882998	No	Basic	Bachelor	01-01-2011	Unemployed	F	
GB33195	Washington	2275.263967	No	Basic	High School or Below	01-12-2011	Unemployed	M	
WL65572	California	2064.458781	No	Basic	College	01-08-2011	Unemployed	M	
GT38956	California	2447.394244	No	Basic	College	2-13-11	Unemployed	F	
ZO83562	Nevada	2370.741771	No	Basic	Bachelor	02-06-2011	Unemployed	F	
OE19087	California	2243.472907	No	Basic	High School or Below	2-24-11	Unemployed	F	
LY97989	Oregon	2894.243869	No	Extended	Bachelor	2-17-11	Unemployed	F	
GG68407	Washington	2321.68367	No	Basic	High School or Below	2-22-11	Unemployed	F	
LE43061	California	3728.83173	No	Premium	High School or Below	2-20-11	Unemployed	M	
HM20544	Washington	2175.740021	No	Basic	College	02-05-2011	Unemployed	F	
XR37812	California	2345.084479	No	Basic	College	2-22-11	Unemployed	M	
UW98698	California	2269.841123	No	Basic	College	02-08-2011	Unemployed	M	
CI24326	Oregon	3591.066675	No	Extended	Bachelor	1-23-11	Unemployed	M	
YL72747	California	2265.218569	No	Basic	High School or Below	1-25-11	Unemployed	M	
WU86174	California	2677.279707	No	Basic	Bachelor	2-24-11	Unemployed	F	
HE84643	California	2175.624856	No	Basic	High School or Below	02-01-2011	Unemployed	F	
NW41789	Oregon	2746.90219	No	Extended	Bachelor	1-24-11	Unemployed	M	

- As you all can notice that format of the data, we have is not good to analyse and visualize. So, we need to reconstruct the structure of the dataset.

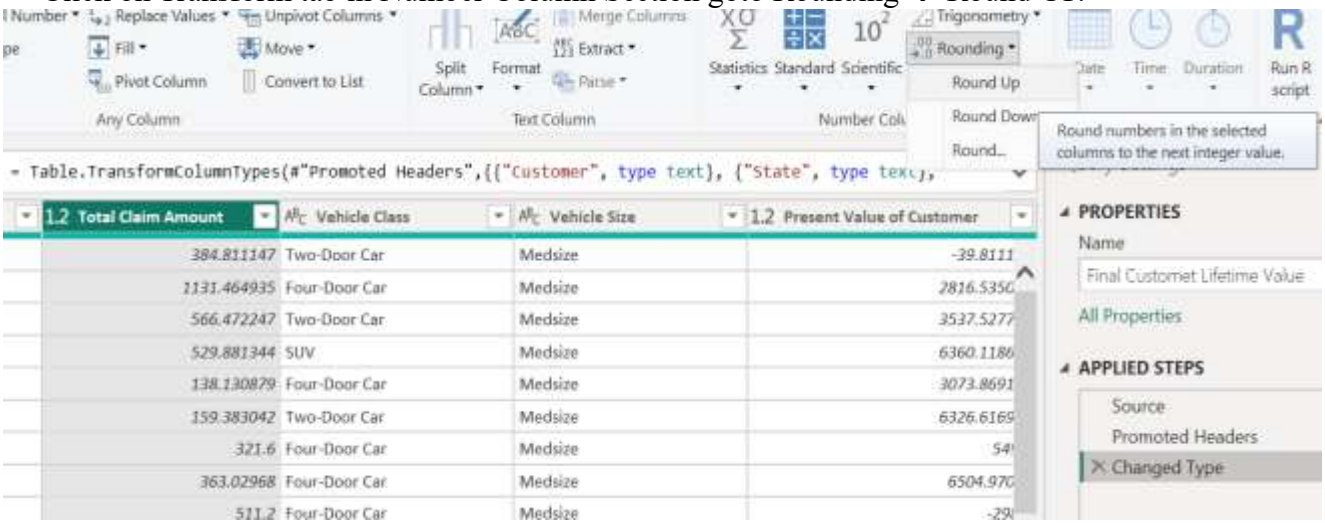
Low Level Design (LLD)

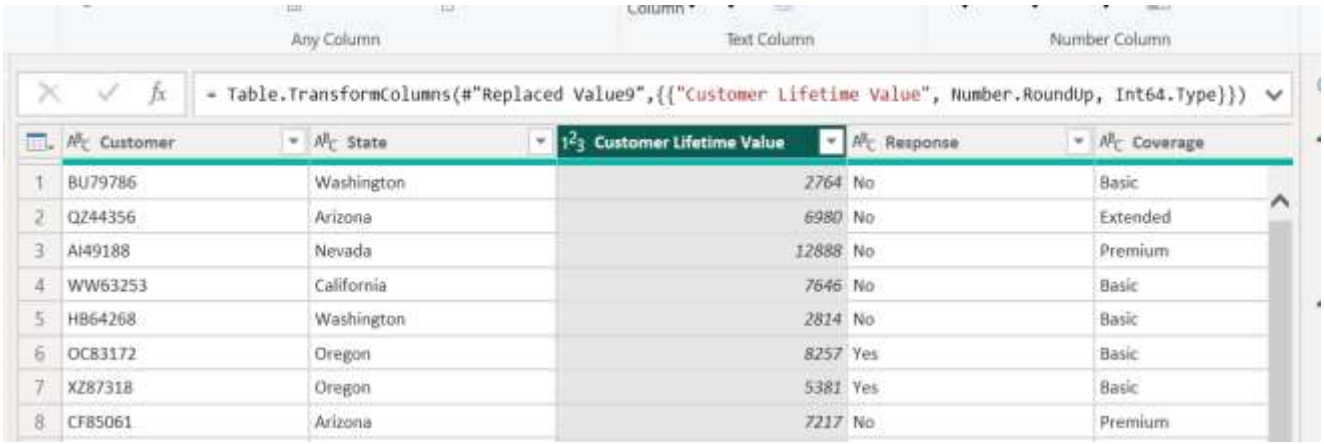
We will be using only Power BI with power query for data restructuring and cleaning purpose.

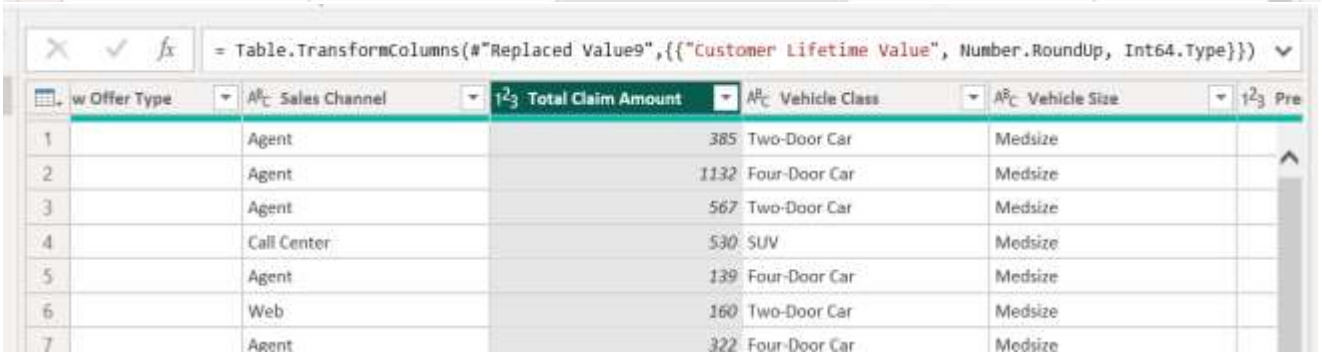
- Also We can upload csv data from Home section, click on Data tab, click on get data ,then from text or csv and upload dataset into Power query editor.
- Power Query Editor window will get popped up.

Step 1) Home Section:

- Click on Transform tab in Number Column Section goto Rounding → Round UP.

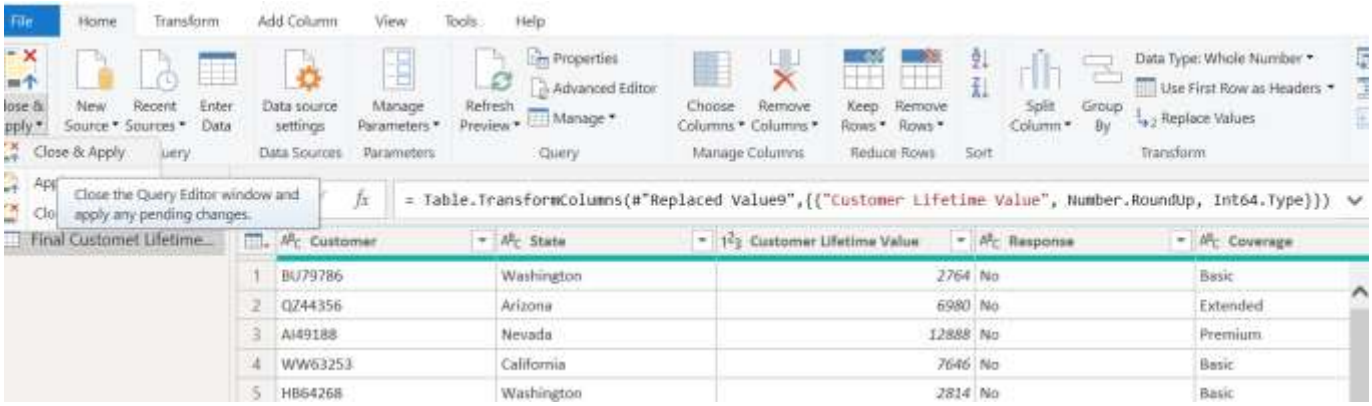






Step 2) Close and save:

- Now go to Home section and click close and load.
- In such a way we preparing dataset and now we need to all these steps for all the others datasets we have.
- And save it into new folder as prepared data.



4. Deployment

For Development I used Power BI and NovyPro

Once you've completed your dashboard, follow these steps:

1. Load dataset on Power BI in csv formats and creates visuals for dashboard.
2. After creating all visual, create insightful dashboard.
3. Then Login into Power BI Service by using Microsoft developer account.
4. Then create new project workspace for uploading dashboard and reports into this workspace.
5. Then login into NovyPro Power BI account.

6. Then share dashboard as embedded link as a web into NovyPro portfolio.