Low Level Design

Bank Marketing Campaign Analytics

Version: 1.0
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Document Control

Change Record

Date Issue	Version	Description	Author
01/10/2022	1.0	Initial LLD – V 1.0	Aditya Gupta

Approval Status

Version	Review Date	Review by	Approved by	Comments

Contents

1. Introduction

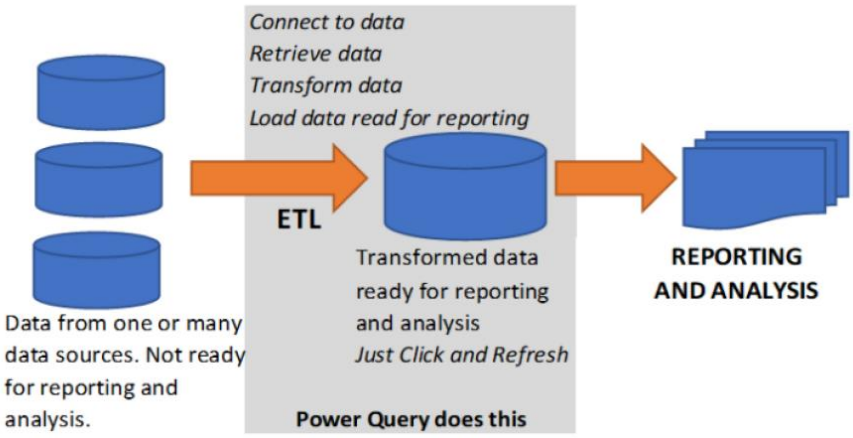
1.1 What is Low Level Design Document?

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 Bank Marketing Campaign Analysis. 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



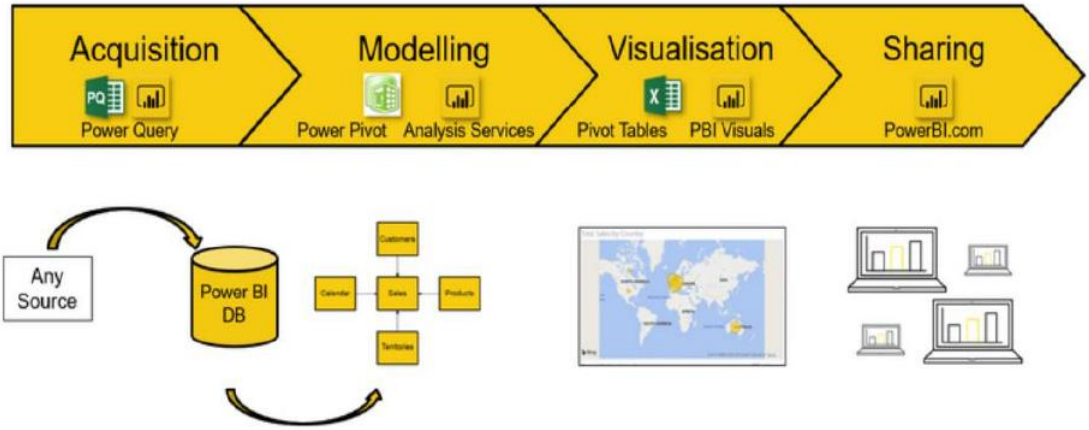
ETL (extract, transform and load) in Power BI used for preparation of data sets for analysis by removing irregularities in the data. It also involves data visualization to draw meaningful patterns and insights.

Based on the results of ETL, companies also make business decisions, which can have repercussions later.

If ETL is not done properly then it can damage the business a lot in many ways such as loss of client which we are working for, the decision making will go completely wrong and many more issues. If done well, it may improve the efficacy of everything we do next.

Following are the steps for ETL:

1. Data Sourcing
2. Data Cleaning
3. Data Modelling
4. Data Visualization



3. Architecture Description

3.1 Data Description

The dataset bank-additional-full is in csv (comma separated values) format. Dataset is collected from https://archive.ics.uci.edu/ml/machine-learning-databases/00222/

3.2 Data Overview:

(i) The data with all examples, ordered by date (from May 2008 to November 2010).
(ii) Total Number of Instances: 41188.
(iii) Total Number of Attributes: 20 + output attribute.

3.3 Detailed Description of Data

Bank client data has following attributes:

1. age: Age of the client (integer)
2. job: Type of job (string)
3. marital: Marital status (String)
4. education: Educational Qualification (string)
5. default: Has credit in default? (string)
6. housing: Has housing loan? (string)
7. loan: Has personal loan? (string)
8. contact: Contact communication type (string)
9. month: Last contact month of the year (string)
10. day_of_week: Last contact day of the week (string)
11. duration: Last contact duration, in seconds (integer)
12. campaign: Number of contacts performed during this campaign and for this client (integer)
13. pdays: Number of days that passed by after the client was last contacted from a previous campaign (integer); 999 means client was not previously contacted
14. previous: Number of contacts performed before this campaign and for this client (integer)
15. poutcome: Outcome of the previous marketing campaign (success)

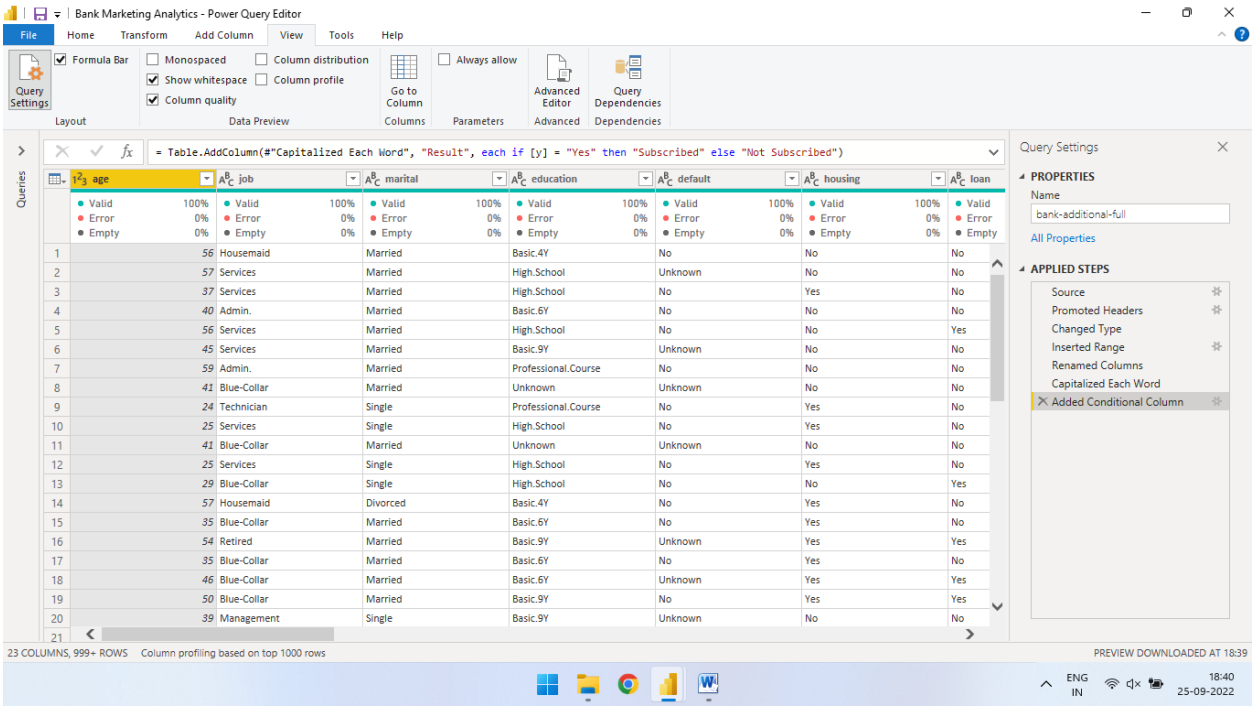
Social and economic context attributes

16. emp.var.rate: employment variation rate - quarterly indicator (integer)
17. cons.price.idx: consumer price index - monthly indicator (integer)
18. cons.conf.idx: consumer confidence index - monthly indicator (integer)
19. euribor3m: euribor 3 month rate - daily indicator (integer)
20. nr.employed: number of employees- quarterly indicator (integer)
21. y: has the client subscribed a term deposit? (binary)

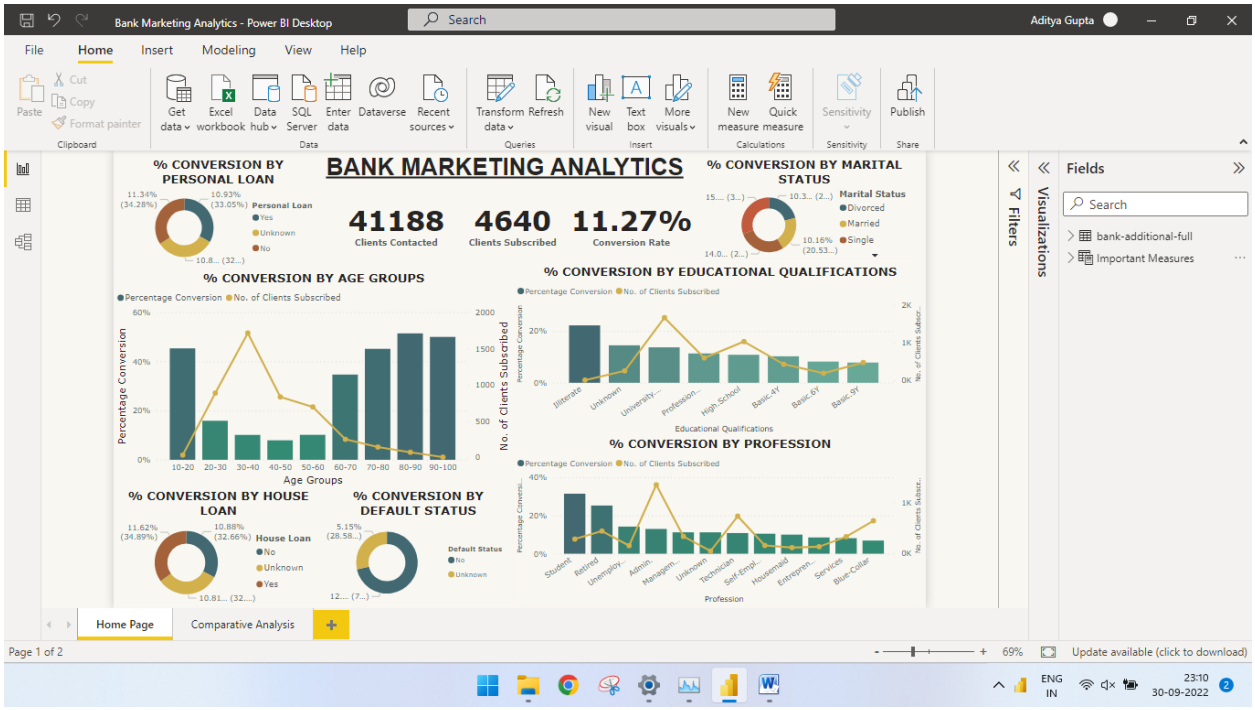
3.4 Data loading in Power BI Query Editor

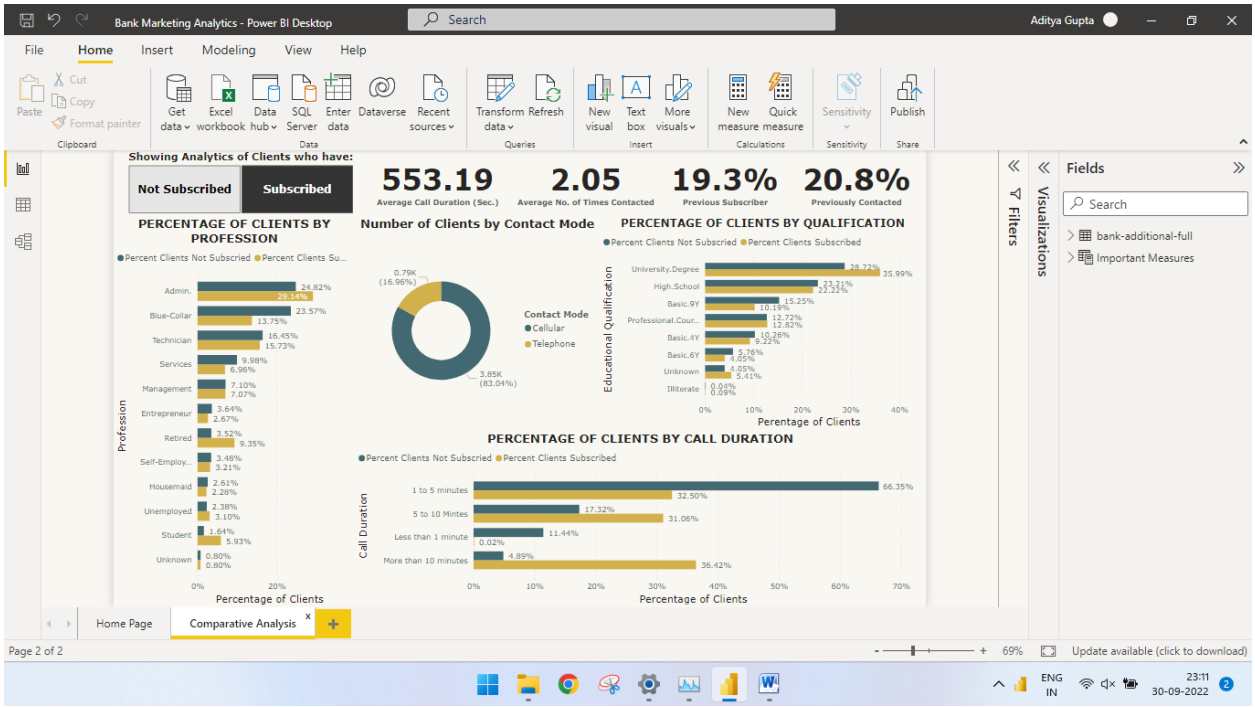
Power Query is the data connectivity and data preparation technology that enables end users to seamlessly import and reshape data from within a wide range of Microsoft products, including Excel, Power BI, Analysis Services, dataverse, and more with the following characteristics:

- There can be multiple rows and columns in the data.
- Each row represents a sample of data,
- Each column contains a different variable that describes the samples (rows).
- The data in every column can be a differents type of data – e.g. numbers, strings, dates, Boolean etc.



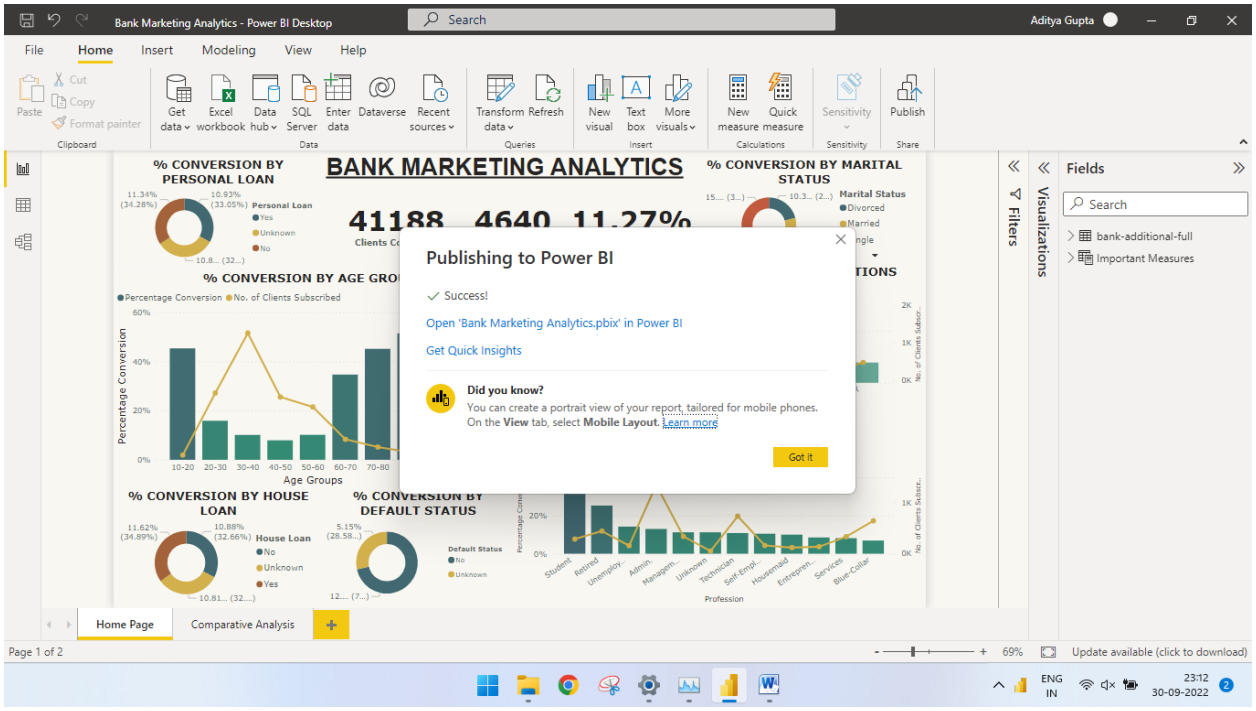
3.5 Data to Insights through Visualizations and Power Query in Power BI Desktop



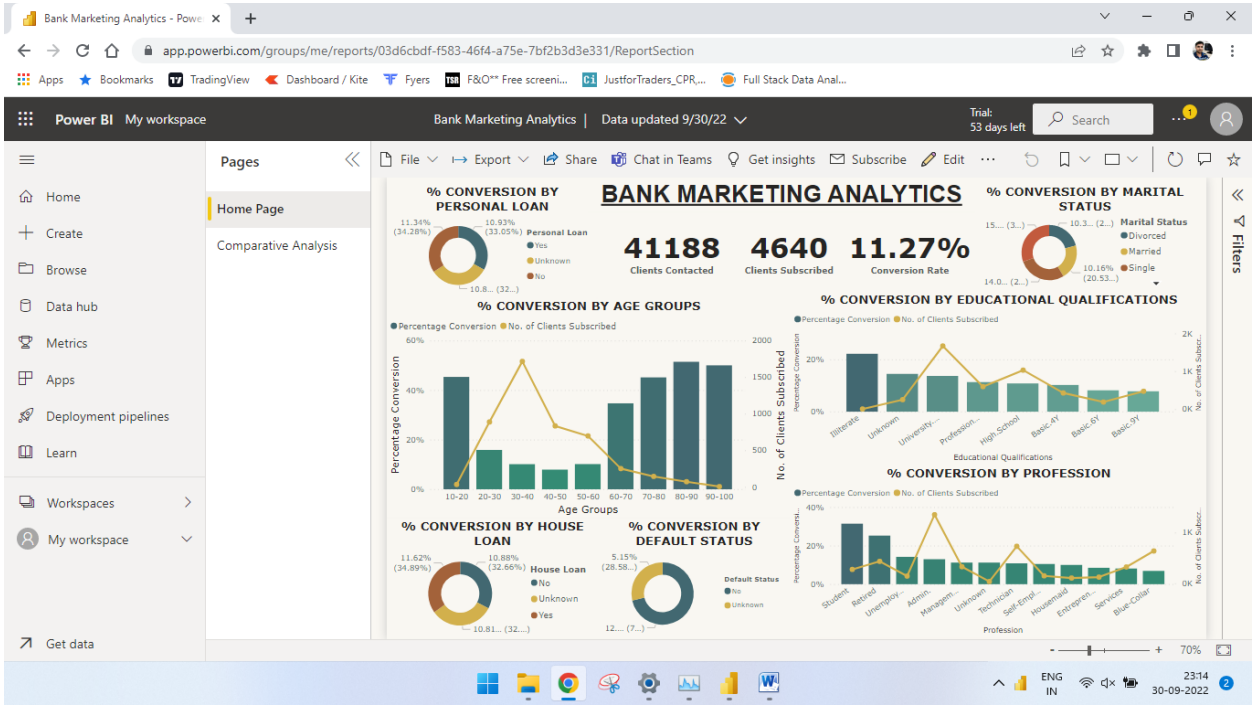


3.6 Deployment to Power BI Service

After creating report with all the visualisation on Power BI Desktop, the report is deployed to power BI service using publish option.



After deploying to power BI service, the report can be accessed and shared online.



4. Unit Test Cases

Test Case Description	Expected result
Total Clients Contacted, Total Subscribed & Percentage Conversion	These three measures should be displayed on three separate cards.
Percentage Conversion by Age Groups, Educational qualification & profession	These relationships should appear in form of a column bar chart with line charts.
Percentage Conversion by Marital Status, Personal Loan, Housing Loan etc	These relationships should appear in form of donut charts.
On second page of report client selector slicer	On selecting the type of clients from the horizontal slicer, some visuals of that page should update as per selection.
Average call duration per client, Average no. of times contacted per client, No. of Previous Subscriber, No. of clients Contacted in Previous Campaign	These measures should be displayed on separate cards.
Percentage of clients by educational qualification, profession & call duration	Should appear in form of clustered bar chart showing comparison between clients who have subscribed and not subscribed.
Number of clients by contact mode	Should appear in form of donut chart.