

# Low Level Design

## Amazon Sales Data Analysis

<b>Written By</b>	Sumit Mohod
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## DOCUMENT CONTROL

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## 1. Introduction

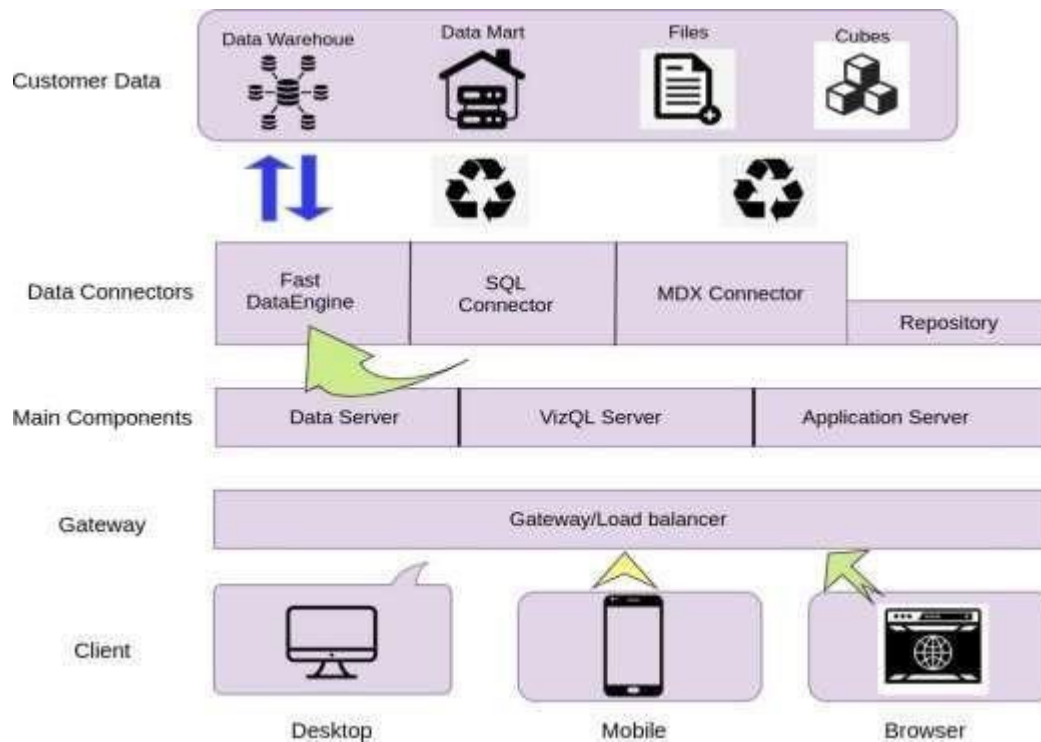
### 1.1 What is Low-Level design document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the report for the Amazon Sales Data Analysis. LDD describes the procedures and relationships between the variables and programs data visualizations.

### 1.2 Scope

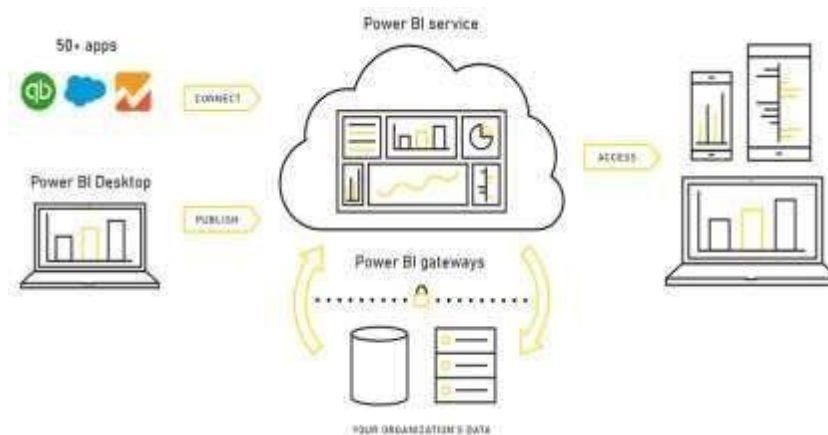
Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing reports, dashboards and required charts to showcase relationship between different data points.

## 2. Architecture



### Power BI Architecture:

Power BI has a highly scalable architecture that serves mobile clients, web clients and desktop-installed software. Power BI architecture supports fast and flexible report and dashboard creation to drive business insights. The following diagram shows Power BI's architecture:



## 3. Architecture Description

### 3.1. Data Description

The Dataset contains Amazon Sales Data consists of columns like Sales Amount, Sales Quantity, Margin Amount, Sales Cost, Items, Item Orders, Sales Representatives, Item Class and Date of Order.

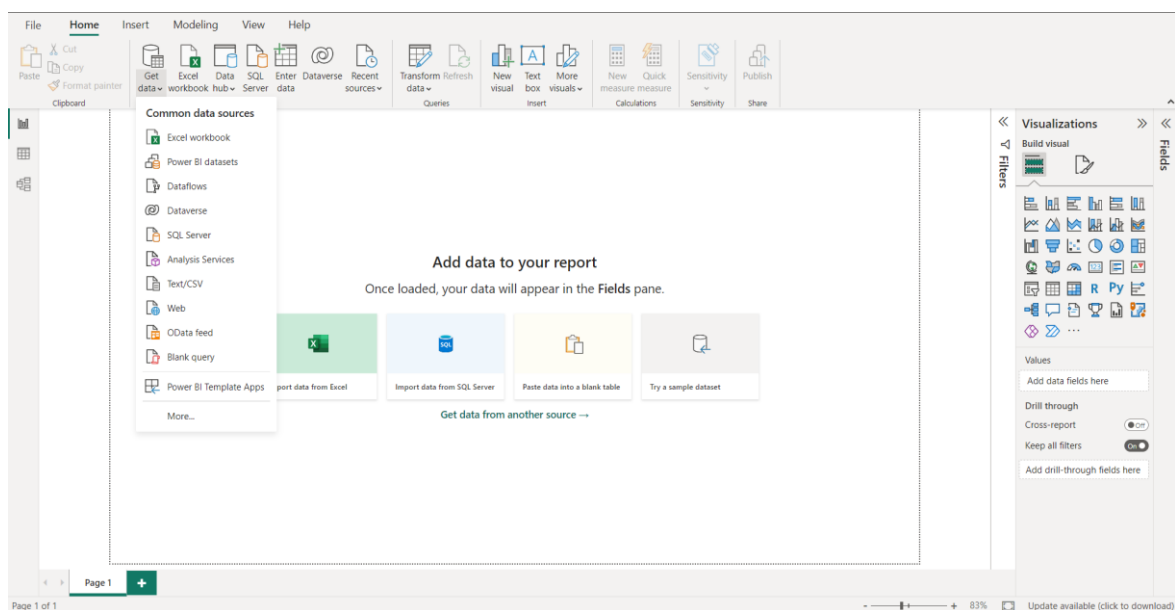
1. CustKey : Customer Key
2. DateKey : Date Key
3. Discount Amount: Discount on every ordered item
4. Order Number: Order Number
5. Item Number: Item number
6. List Price: Listed price at which the item.
7. Sales Amount: Total amount of sales for particular item.
8. Sales Amount Based on List Price: Sales Amount according to Listed Price
9. Sales Cost Amount: Amount spent for conversion of Sale
10. Sales Margin Amount: Margin amount on each item sold
11. Sales Quantity: Total number of items sold
12. Sales Representative: Representative under whom sale is completed.
13. Unit Sale Price: Sales Price per unit
14. Index: Index column

### 3.2. Data Cleaning

Data Cleaning is a crucial stage before we start creating visuals. The dataset given some time has impurities such as missing values or incorrect data types. Data cleaning can be performed in Python with Pandas library to remove missing values and make dataset ready for building visuals.

### 3.3. Data Importing

In Power BI, we have options to connect to our dataset via various options such as SQL Server, MYSQL, excel or CSV files. We have our clean data in CSV file. We will import it in Power BI with import data option and start working with it.



### 3.4. Data Transformation in Power BI

Once the data is imported in Power BI, we do 'transform data' i.e. using Power Query editor to perform certain operation on to the data. Ensuring correct data types, creating custom/conditional columns are some fundamental task performed in Power Query.

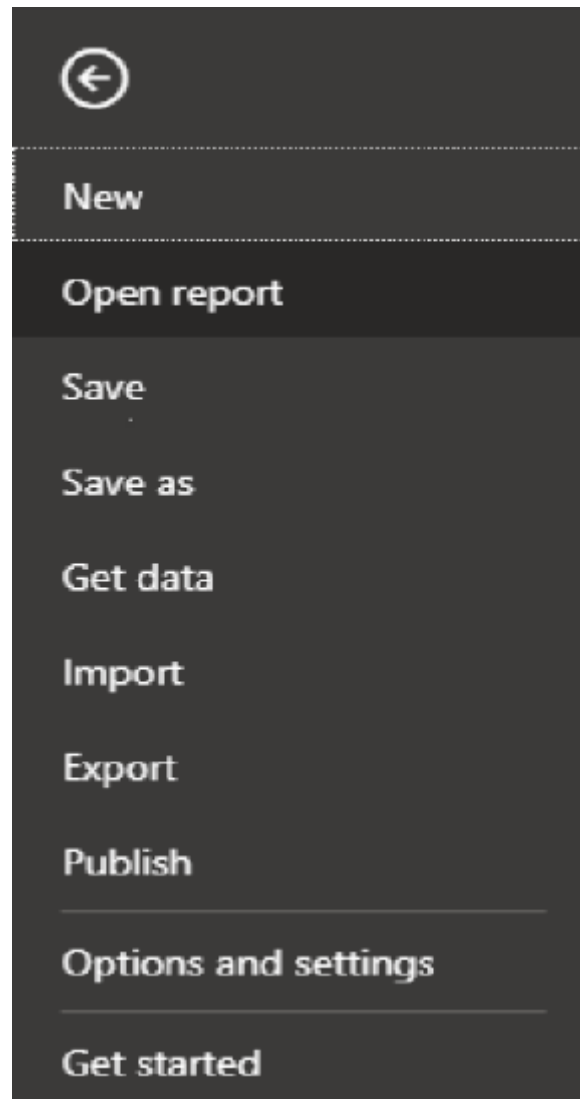
The screenshot displays the Power Query Editor window for a query named 'Amazon Sales Analysis'. The main area shows a table with 20 columns and 999+ rows. The columns are: CustomerKey, DateKey, Discount Amount, Invoice Date, Invoice Number, Item Class, and Item Number. The data is filtered to show rows from 1 to 28. The right-hand pane shows the 'Query Settings' for 'Amazon Data', including 'Properties' and 'Applied Steps'. The 'Applied Steps' list includes: Source, Promoted Headers, Changed Type, Filtered Rows, Removed Columns, and Renamed Columns. The bottom status bar indicates '20 COLUMNS, 999+ ROWS' and 'Column profiling based on top 1000 rows'.

CustomerKey	DateKey	Discount Amount	Invoice Date	Invoice Number	Item Class	Item Number
10002220	14-07-2017	368.79	14-07-2017	100239	P01	20910
10002220	17-10-2017	109.73	17-10-2017	116185	P01	38076
10004316	27-09-2017	96827.94	27-09-2017	101941	P01	40776
10007865	03-09-2017	371.014	03-09-2017	100400	P01	20910
10009106	18-06-2017	608.08	18-06-2017	105481	P01	62550
10009106	18-06-2017	424.8	18-06-2017	105481	P01	60794
10009106	18-06-2017	13492.8	18-06-2017	105481	P01	36001
10009106	18-06-2017	10481.1	18-06-2017	105481	P01	38076
10009106	18-06-2017	404.1465	18-06-2017	105481	P01	61484
10009606	16-09-2017	1287.3476	16-09-2017	100445	P01	17801
10009606	16-09-2017	4764.83	16-09-2017	100445	P01	48500
10009633	10-06-2017	-526.64	10-06-2017	104708	P01	38631
10009633	20-08-2017	0	20-08-2017	100379	P01	60449
10009645	17-11-2017	0	17-11-2017	100684	P01	61801
10009652	14-05-2017	91	14-05-2017	102236	P01	63113
10009907	06-11-2017	786.6	06-11-2017	117815	P01	38050
10010884	19-06-2017	499.44	19-06-2017	105615	P01	38007
10010884	08-07-2017	409.77	08-07-2017	107052	P01	28401
10010884	08-07-2017	186.43	08-07-2017	107052	P01	26361
10010884	08-07-2017	349.78	08-07-2017	107052	P01	20910
10010884	08-07-2017	325.53	08-07-2017	107052	P01	45880
10010884	08-07-2017	313.27	08-07-2017	107052	P01	29394
10010884	08-07-2017	174.7	08-07-2017	107052	P01	36001
10010884	08-07-2017	338.2	08-07-2017	107052	P01	25300
10010884	08-07-2017	2788.64	08-07-2017	107052	P01	26502
10010884	08-07-2017	352.68	08-07-2017	107052	P01	26749
10010884	08-07-2017	2760.82	08-07-2017	107052	P01	47801
10013188	05-09-2017	381.99	05-09-2017	100415	P01	37172



### 3.5 Deployment

In Power BI, you can directly publish the report online to your workstation. If you do not have the work email-id then you can save the file in '.pbix' version. This helps another viewer see your work and understand the story or insights you're communicating.



## 4. Unit Test Cases

TEST CASE DESCRIPTION	EXPECTED RESULTS
Year slicer	When clicked on the slicer, the shows results for that particular year
Month Slicer	When clicked on the slicer, a dropdown occurs which lists the name of months. This helps us see data by each month.
Monthly Trend for Sales	This chart showcases trend for monthly sales. Top performing months and low performing months in a year can be easily segmented.
Yearly Trend for Sales	This chart displays which year has been best one so far in regards to the sales.
Yearly monthly Trend for Sales	This line chart shows continuous sales trend for yearly monthly. Top performing month and low performing month in overall 3 years can be easily segmented.
Relation between Sales Amount and Discount Amount	The visual shows a line chart displaying relation between Sales Amount and Discount
Detail Sales Analysis	This Tree Chart shows decomposition of sales with respect to years, quarter, month, weeks of month and days of week.
Detail Profit Analysis	This Tree Chart shows decomposition of profit with respect to years, quarter, month, weeks of month and days of week.
Top 5 Sales Representatives	This horizontal bar chart shows top 5 Sales Representative with respect to Sales.

Top 5 Customer	This horizontal bar chart shows top 5 Customer (Customer Key) with respect to Sales.
Top and Bottom 5 Items by Sales	These horizontal bar charts show Top and Bottom 5 Items by Sales.
Top and Bottom 5 Items by Profit	These horizontal bar charts show Top and Bottom 5 Items by Profit.
Relationship between Sales Cost and Total Sales	A scatterplot that helps us understand relationship between sales cost and total sales.
Relationship between Sales and Profit	This visual has a scatterplot that helps us understand relationship between sales and profit.
Sales same period last year	This tabular visual shows sales of same period last year in comparison to a year ahead.
Item wise sales difference by year 2017 and 2019	This tabular visual shows item wise in year 2017 and 2019 and sales difference.
MTD, QTD & YTD for orders and Sales Quantity	These tabular visual shows month to date, quarter to date and year to date total orders and sales quantity.
Orders and Sales Quantity by Year & Quarter	These line charts show orders and Quantity sold trend yearly & quarterly.
Top Margin Items	This chart displays higher margin items. Also, Tabular visual display items with high sales, profit, sales quantity and orders.
Sales Segmentation by Total Sales, Total Profit, Total Orders & Sales Quantity	These Donut charts show Sales Segmentation by Total Sales, Total Profit, Total Orders & Sales Quantity.

