Low Level Design

**Expenditure Data Analysis**

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**1. Introduction**

**1.1 Why this LLD Document?**

The Low-Level Design Document (LLD) outlines the internal logic and components involved in the development of the Power BI dashboard for expenditure analysis. It defines the step-by-step data flow, transformations, KPIs, DAX formulas, and visuals implemented in the project.

**1.2 Scope**

This document presents the component-level design of:

* Data cleaning and transformation logic
* Dashboard KPIs
* Visualization charts and layout
* DAX measures
* Filters and drill-down functionalities

**2. Architecture**

**Tools Used:**

* Power BI
* Power Query
* DAX
* CSV/Excel (Data Source)
* GitHub (Documentation and version control)

**3. Architecture Description**

**3.1 Data Description**

The dataset includes the following fields:

* ORDERDATE (Date)
* PRODUCTLINE (Category)
* SALES (Revenue per transaction)
* MSRP (Expected price)
* COUNTRY (Geographical info)
* CUSTOMERNAME (Client-level info)

**3.2 Data Transformation**

Performed in Power Query:

* Converted mixed date formats into standard Date
* Created new columns:
  + Profit = SALES - MSRP
  + YearMonth = FORMAT(ORDERDATE, "yyyy-mm")
* Removed nulls and duplicates
  1. **ETL Workflow**

| **Step** | **Task** |
| --- | --- |
| Extract | Load .csv into Power BI |
| Transform | Clean and enrich via Power Query |
| Load | Visualize in Power BI |

**3.4 Power BI Dashboard Layers**

| **Layer** | **Description** |
| --- | --- |
| KPI Cards | Total Sales, Total Profit, Avg. Profit Margin |
| Line Chart | Monthly Revenue Trend (YearMonth vs Sales) |
| Bar Charts | Sales and Profit by ProductLine and by Country |
| Table | Customer-wise performance and loss-making transactions |
| Filters | Country, ProductLine, Date slicers |

**4. Deployment**

The final .pbix file is exported and saved locally and also pushed to a public GitHub repository. A walkthrough video will be recorded explaining insights, filters, and dashboard usage.

**5. Unit Test Cases**

| **Test Case ID** | **Description** | **Expected Result** |
| --- | --- | --- |
| TC01 | Filter by Country | All visuals update accordingly |
| TC02 | Apply slicer on YearMonth | Line chart shows relevant month data |
| TC03 | Click on ProductLine bar | Table and KPIs update for that category |
| TC04 | Highlight customers with negative Profit | Conditional formatting shows in red |
| TC05 | Export to .csv | Exported file has filtered data |