



Low Level Design Document

Introduction

This Low Level Design (LLD) document outlines the implementation details for **ShopLens - E-commerce Sales Overview**. The project aims to deliver a Tableau dashboard for analyzing e-commerce sales data, featuring top products, sales by region, customer segments, and interactive filters for product categories.

1. System Components

Component	Description	Key Responsibilities
Data Source	Raw sales data (CSV/DB/Tableau Extract)	Store and provide sales data
Data Preparation	ETL scripts or Tableau Prep flows	Clean, transform, and aggregate data
Tableau Dashboard	Tableau workbook (.twb/.twbx)	Visualize data, provide interactivity
User Interface	Tableau dashboard UI	Enable user interaction and filtering

2. Class/Interface Overview

Class/Interface	Description	Key Methods/Attributes
DataConnector	Connects Tableau to data source	<code>connect()</code> , <code>fetch_data()</code>
DataModel	Represents sales data schema	<code>product_id</code> , <code>region</code> , <code>customer_segment</code> , <code>sales_amount</code> , <code>category</code>
DashboardView	Tableau dashboard components	<code>render_charts()</code> , <code>apply_filters()</code>
FilterControl	Interactive filter interface	<code>on_filter_change()</code> , <code>selected_category</code>

Relationships:

- `DataConnector` feeds data to `DataModel`
- `DataModel` is visualized by `DashboardView`
- `FilterControl` interacts with `DashboardView` to update charts

3. Data Structure Overview

Field Name	Type	Description
<code>product_id</code>	String	Unique product identifier
<code>product_name</code>	String	Name of the product



category	String	Product category
region	String	Sales region
customer_segment	String	Customer segment
sales_amount	Float	Sales value
order_date	Date	Date of sale

4. Algorithms/Logic

Data Preparation Flow (Pseudocode):

```
for each record in sales_data:
    clean missing/invalid fields
    map product/category/region
    aggregate sales by product, region, segment
output prepared_data
```

Dashboard Logic:

- Load prepared data into Tableau
- Create charts: Top Products, Sales by Region, Customer Segments
- Add category filter controls
- On filter change, update all relevant charts dynamically

5. Error Handling

Scenario	Handling Approach
Data source unavailable	Show error message, retry connection
Data format mismatch	Log error, skip invalid records
Filter selection yields no data	Display “No data available” message
Dashboard load failure	Show fallback/error screen

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