High Level Design Document

Introduction

This High Level Design (HLD) document outlines the architecture and core components for the **ShopLens - E-commerce Sales Overview** project. The purpose of this project is to develop a Tableau dashboard that enables analysis of e-commerce sales data, highlighting top products, sales by region, and customer segments, with interactive charts and category filters.

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1. System Architecture Overview

Architecture Description:
The system consists of three main layers: Data Source, Data Processing, and Visualization. Data is extracted from the e-commerce database, processed and transformed as needed, and visualized through a Tableau dashboard.

Module/Component	Role/Responsibility
Data Source	Stores raw e-commerce sales data
Data Processing Layer	Extracts, transforms, and loads (ETL) data for Tableau
Tableau Dashboard	Visualizes data with interactive charts and filters

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2. Component Interactions

Step	Source Component	Target Component	Interaction Description
1	Data Source	Data Processing Layer	Data extraction (sales, products, regions, customers)
2	Data Processing Layer	Tableau Dashboard	Load transformed data into Tableau
3	Tableau Dashboard	End User	User interacts with dashboard (charts, filters)

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3. Data Flow Overview

- **Data Extraction:** Sales data is periodically extracted from the e-commerce database.
- **Data Transformation:** Data is cleaned, aggregated (e.g., by product, region, segment), and formatted for Tableau.
- **Data Loading:** Processed data is loaded into Tableau as data sources.
- **Visualization:** Tableau dashboard presents interactive charts and filters for user exploration.

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4. Technology Stack

Layer/Function	Technology/Framework

Data Storage	E-commerce Database (SQL/CSV)
Data Processing (ETL)	Tableau Data Prep / SQL
Visualization	Tableau Desktop / Tableau Server
User Access	Tableau Web Interface

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5. Scalability & Reliability

- **Scalability:**
  - Data extracts and dashboard can be refreshed on a schedule to handle growing data volumes.
  - Tableau Server supports multiple concurrent users and large datasets.
- **Reliability:**
  - Data integrity ensured via ETL validation.
  - Tableau provides user access controls and audit logs.
- **Security:**
  - Access to dashboards and data sources is managed via Tableau permissions.

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