



Low Level Design Document

Introduction

This Low Level Design (LLD) document outlines the implementation details for the **StaySmart - Hospitality Occupancy Dashboard** project. The dashboard will be built in Tableau to enable hotel chain stakeholders to monitor occupancy rates, average daily rates (ADR), and booking sources, with filtering by location and time period.

1. System Components

Component	Description	Key Responsibilities
Data Source	Hotel booking/occupancy data (CSV/DB/API)	Provide raw data to Tableau
Data Pipeline	ETL process (Tableau Prep/SQL)	Clean, transform, and load data
Tableau Dashboard	Interactive visualization	Display metrics, filters, and charts
User Interface	Tableau dashboard UI	Enable user interaction and filtering

2. Class/Interface Overview

Class/Interface	Description	Key Methods/Attributes
DataConnector	Connects to data source	<code>connect()</code> , <code>fetch_data()</code>
DataTransformer	Cleans/transforms raw data	<code>clean_data()</code> , <code>calculate_metrics()</code>
DashboardView	Tableau dashboard interface	<code>render_charts()</code> , <code>apply_filters()</code>
FilterComponent	Location/time period filters	<code>on_filter_change()</code> , <code>get_filter_values()</code>

Relationships:

- `DataConnector` → `DataTransformer` → `DashboardView`
- `FilterComponent` interacts with `DashboardView`

3. Data Structure Overview

Field Name	Type	Description
hotel_id	String	Unique hotel identifier
location	String	Hotel location/city
date	Date	Booking/occupancy date
occupancy_rate	Float	% of rooms occupied
average_daily_rate	Float	Average daily rate (ADR)



booking_source	String	Source of booking (e.g., OTA, Direct)
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4. Algorithms/Logic

Data Processing Flow:

```
connect_to_data_source()
raw_data = fetch_data()
cleaned_data = clean_data(raw_data)
metrics = calculate_metrics(cleaned_data)
load_to_tableau(metrics)
```

Dashboard Interaction:

```
on_filter_change(location, date_range):
    filtered_data = filter_data(metrics, location, date_range)
    update_dashboard(filtered_data)
```

5. Error Handling

Scenario	Handling Approach
Data source unavailable	Show error message, retry connection
Data format/schema mismatch	Log error, skip invalid records
No data for selected filters	Display "No data available" message
Dashboard rendering failure	Show generic error, log details

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