



Low Level Design Document

Introduction

This Low Level Design (LLD) document outlines the implementation details for the **AgriMetrics - Crop Yield KPI Dashboard** project. The purpose is to design a Power BI dashboard that tracks and visualizes crop yield KPIs across regions and seasons, utilizing DAX for data aggregation and trend analysis.

1. System Components

Component	Description	Key Responsibilities
Data Source	External data files (CSV/Excel/DB)	Provide raw crop yield data
Data Model	Power BI data model (tables, relationships)	Structure and relate data
DAX Measures	DAX formulas for KPIs and trends	Calculate aggregations, trends
Dashboard UI	Power BI report/dashboard	Visualize KPIs, enable filtering

2. Class/Interface Overview

Entity	Type	Relationships	Key Methods/Attributes
CropYieldTable	Table	Linked to Region, Season	CropType, Region, Season, Yield, Date
RegionTable	Table	One-to-many with CropYield	RegionID, RegionName
SeasonTable	Table	One-to-many with CropYield	SeasonID, SeasonName, Year
DAX Measures	Formula	Operate on CropYieldTable	TotalYield, AvgYield, YieldTrend

Key DAX Measures (Sample):

```
TotalYield = SUM(CropYieldTable[Yield])
AvgYield = AVERAGE(CropYieldTable[Yield])
YieldTrend = CALCULATE([TotalYield], DATESINPERIOD(CropYieldTable[Date], MAX(Cro
```

3. Data Structure Overview

Table Name	Fields	Description
CropYieldTable	CropType, RegionID, SeasonID, Yield, Date	Raw crop yield data
RegionTable	RegionID, RegionName	Region metadata
SeasonTable	SeasonID, SeasonName, Year	Season metadata



4. Algorithms/Logic

Data Aggregation and Trend Analysis (Pseudocode):

```
For each selected Region and Season:
  Filter CropYieldTable by RegionID and SeasonID
  Calculate TotalYield = SUM(Yield)
  Calculate AvgYield = AVERAGE(Yield)
  Calculate YieldTrend = Rolling sum/average over time (DAX)
  Display results in dashboard visuals (charts, tables)
```

5. Error Handling

Scenario	Handling Approach
Missing/Corrupt Data	Show "Data Unavailable" message in visuals
Data Model Relationship Errors	Validate relationships, display error notification
DAX Calculation Errors	Use IFERROR in DAX, show fallback/default values
Data Refresh Failures	Alert user, log error, retry refresh

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