Requirements Gathering

Manufacturing Downtime Analysis

2.1 Stakeholder Analysis

Stakeholder	Role	Needs/Interests
Production Manager	Decision Maker	Needs high-level overview of line efficiency and major bottlenecks.
Shift Supervisors	Operational User	Needs to compare shift performance (Day vs. Night) and operator metrics.
Maintenance Team	Technical User	Needs specific data on "Machine Failure" and "Adjustments" to plan repairs.
Data Analysts	Power User	Needs access to the underlying data model for ad-hoc reporting.

2.2 User Stories

1. **As a Production Manager,** I want to see the **Overall Production Efficiency** percentage so that I can gauge if we are meeting monthly targets.
2. **As a Supervisor,** I want to filter downtime by **Operator** so that I can identify who needs specific training.
3. **As a Maintenance Engineer,** I want to see the top **Downtime Factors** so that I can prioritize fixing the most frequent machine issues.
4. **As an Analyst,** I want to drill down into specific **Batches** so that I can understand why outliers (e.g., 200+ minute batches) occurred.

2.3 Functional Requirements

FR1: Overview Analysis

- The system must calculate Total Production Time vs. Total Productive Time.
- The system must identify the Top Downtime Product and Top Downtime Factor.
- The system must display downtime trends by Hour of Day and Day of Week.

FR2: Batch Analysis

- The system must compare Actual Batch Duration against Target Batch Time.
- The system must visualize the relationship between Production Time and Downtime using a scatter plot.

FR3: Operator Analysis

- The system must segregate data by Shift (Day/Night).
- The system must calculate specific downtime minutes per operator (Charlie, Dee, Mac, Dennis).
- The system must distinguish between "Operator Error" and "Machine/Environment" factors.

2.4 Non-Functional Requirements

- **Accuracy:** DAX calculations must match source Excel data to within 2 decimal places.
- **Performance:** Dashboard visuals must load in under 3 seconds.
- **Usability:** Dashboard must follow the wireframe design with clear navigation buttons (Home, Back).
- **Scalability:** The data model must support the addition of new monthly logs without breaking relationships.