Manufacturing Downtime Analysis – Project Proposal

1. Project Description

This project focuses on analyzing manufacturing downtime events to identify the root causes and operational inefficiency. Using Power BI, we will clean, transform, and visualize downtime data to support data-driven decisions that enhance production performance and reduce losses.

2. Group Members & Roles

- Member 1: Eng, Ahmed Yehia, Data Cleaning & ETL.
- Member 2: Alaa, Data Modeling.
- Member 3: Zeinab, Dashboard Design.
- Member 4: Abdelrahman, Insights & Reporting.

3. Team Leader

Abdelrahman AbdElhakim Mohamed

4. Objectives

- Clean and prepare downtime data for analysis.
- Build a structured Power BI data model.
- Develop interactive dashboards showing downtime trends and insights.
- Identify key causes of downtime and high-impact events.
- Support operational improvements by highlighting actionable insights.

5. Tools & Technologies

- Microsoft Excel.
- Power Query &Power BI
- DAX (Data Analysis Expression)
- AI tools (Chat GPT & Deep Seek)

6. Milestones & Deadlines

- Data Cleaning & Preparation – Week 1
- Data Modeling – Week 2
- Dashboard Development – Week 3
- Insights & Final Report – Week 4

7. KPIs (Key Performance Indicators)

Below are the detailed KPIs that will be used to evaluate the performance and success of the project:

7.1 Data Quality Score

- Percentage of missing values before and after cleaning.

- Percentage of errors corrected during ETL.

- Data type consistency across all fields.

• Standardization rate (unit, naming, and format unification).

• Target: Achieve 95%+ data quality.

7.2 Data Refresh Performance

• Average dataset refresh time.

• Number of optimized query steps.

• Use of Incremental Refresh for large datasets.

• Performance of Power Query transformations.

• Target: Refresh time under 30 seconds.

7.3 Dashboard Load Time

• Time required to load the main dashboard page.

• Page-to-page navigation speed.

• Data model size optimization level.

• Target: Load time less than 3 seconds.

7.4 Usability & User Experience Score

• Clarity and accessibility of filters.

• Logical layout and visual hierarchy.

• User feedback collected from at least 5 users.

• Ease of discovering key insights.

• Target: User Experience Score of 4/5 or higher.

7.5 Operational Impact KPIs

• Reduction in average downtime duration.

• Reduction in repeated downtime events for the same cause.

• Improvement in machine-level reliability.

• Increase in production uptime after insight implementation.

• Target: Reduce downtime by 5–10%.

7.6 Visualization Effectiveness

• Use of appropriate chart types.

• Clear and consistent color themes.

• Avoiding overcrowded visuals.

• Strategic placement of hero KPIs.

• Target: Achieve 90% visualization clarity score.

7.7 Report Accessibility & Sharing

• Successful publishing on Power BI Service.

• Correct setup of user permissions.

• Availability of mobile layout.

• Monthly PDF export availability.

• Target: Ensure 100% accessibility rate.

This is an example of Manufacturing Downtime that we will do Inshallah.