**Project Description:**

This project involves analyzing production efficiency data from a manufacturing line, with a focus on identifying key insights to optimize performance and reduce downtime. We will be using Power BI to visualize and analyze the data, helping decision-makers identify inefficiencies and areas for improvement.

**Group Members & Roles:**

1. **Mostafa Mohamed Mahmoud** – General Role
2. **Joseph Ibrahim Youssef** – Visualization
3. **Hossam Mahmoud Youssef** – Visualization
4. **Ahmed Mohamed Rezk** – DAX
5. **Mohamed Hamdy Ahmed** – DAX

**Team Leader:**

Mostafa Mohamed Mahmoud

**Objectives:**

* Calculate total up and down time for each product line.
* Count the number of batches for each product.
* Identify the most worked-on batch per product and by each operator.
* Calculate total working hours for each operator and all operators.
* Measure the efficiency of product lines and operators in terms of batch count and working hours.
* Identify the most frequent downtime factors and operator-related errors.
* Analyze the variability in batch processing times and identify the causes.
* Optimize workforce productivity by assessing operator performance on specific product lines.
* Analyze time-based performance trends and identify periods of high downtime.
* Identify the root causes of downtime and recommend waste reduction strategies.

**Tools & Technologies:**

* **Power BI**: Used for data visualization, dashboard creation, and report distribution.
* **DAX**: Used for creating complex metrics and calculations.
* **Excel**: Used for data preprocessing and cleaning.
* **Kaggle/DEPI Feedback**: Used to collect feedback on usability and insights from the dashboard.

**Milestones & Deadlines:**

1. **Project Kick-off** – **March 22, 2025**
2. **Data Cleaning & Preprocessing** – **March 29, 2025**
3. **DAX Formulas Development** – **April 5, 2025**
4. **Initial Power BI Dashboard Creation** – **April 10, 2025**
5. **Feedback Collection & Iteration** – **April 17, 2025**
6. **Final Presentation and Report Submission** – **April 24, 2025**

**KPIs (Key Performance Indicators):**

1. **Data Quality Score (Accuracy & Completeness)**:
   * Percentage of missing or incorrect data after cleaning. This will be assessed by reviewing data cleaning efforts and ensuring the dataset is complete.
2. **Dashboard Performance (Load Time)**:
   * The time it takes for the Power BI dashboard to load and refresh. Target: **under 10 seconds**.
3. **Interactivity & Usability Score (Positive Feedback)**:
   * Based on feedback from DEPI colleagues or Kaggle users, we will measure the clarity and ease of use of the dashboard.
   * Target: **80%+ positive feedback** on interactivity and usability.
4. **Number of Key Insights Generated (At least … meaningful insights)**:
   * Insights that help decision-making and business strategy will be tracked and evaluated.
   * Target: **At least 5 actionable insights** from the dashboard.
5. **Report Distribution & Access (Accessibility for Target Users)**:
   * Ensuring the Power BI report is accessible without technical issues.
   * Target: **100% accessibility across all intended users** (with no significant errors or issues).
6. **Visualization Effectiveness (Readability Score)**:
   * Based on user feedback and best practices in data visualization, we will assess how easily the dashboard conveys information.
   * Target: **90% readability score** based on feedback.