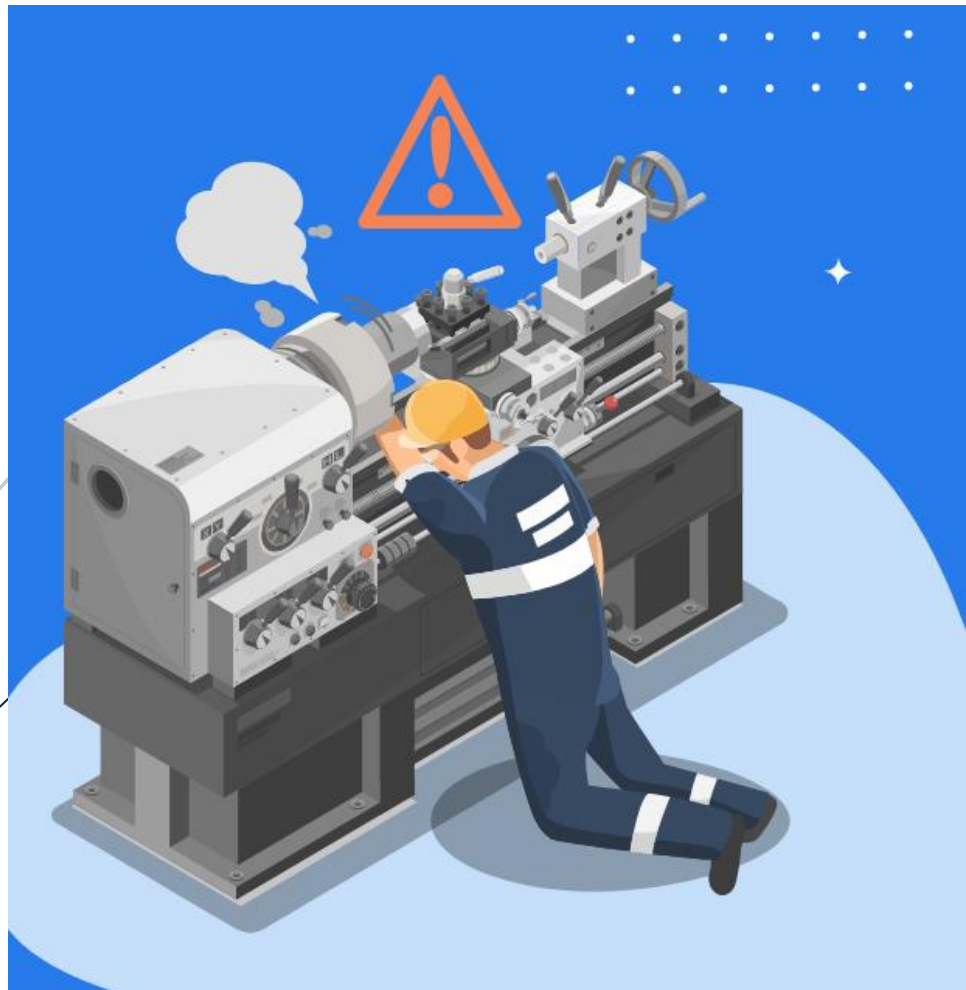# Manufacturing Downtime and Performance Metrics

This Project Is By Pattern Seekers Team

1. Project Description :

This Project Focuses On Analyzing Manufacturing Downtime And Performance Metrics To Optimize Production Efficiency, Minimize Losses, And Enhance Product Stability. Using Data Analytics And Visualization Techniques, The Project Aims To Identify Key Downtime Factors, Evaluate Operator And Shift Performance, And Monitor Efficiency Trends Across Products And Processes.
An Interactive Dashboard Will Be Developed To Support Data-Driven Decision-Making In Real Time.

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2. Group Members & Roles :

#	Name	Role / Responsibility
1	Abdelazim Mohamed Anwar	Data Collection & Cleaning
2	Samar Salah Osman	Data Collection & Cleaning
3	Omar Gaber Mostafa	Data Analysis & KPI Development
4	Meryhan Makram Hamed	Data Analysis & KPI Development
5	Esraa Galal Abdellatif	Dashboard Design & Visualization
6	Mahmoud Abdellateif Hamza	Dashboard Design & Visualization
#	All Team Members	Documentation & Presentation

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3. Team Leader :

Mahmoud Abdellateif Hamza
Responsible For Project Coordination, Task Assignment, And Final Review.

4. Objectives :

- **Identify Major Causes Of Downtime And Their Impact On Production Efficiency.**
- **Evaluate Performance Differences Between Shifts, Operators, And Product Types.**
- **Optimize Batch Cycle Times And Improve Overall Productivity.**
- **Develop Real-Time Dashboards For Management To Make Data-Driven Decisions.**

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5. Tools & Technologies :

- **Data Analysis:** Python (Pandas, Numpy)

- **Data Visualization:** Power BI

- **Documentation:** Microsoft Word & Powerpoint

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6. Milestones & Deadlines :

Milestone	Description	Deadline
Data Collection & Cleaning	Gather raw data and clean missing/duplicate values.	20/10/2025
Data Analysis & KPI Definition	Perform data exploration and define performance KPIs.	27/10/2025
Dashboard Design & Visualization	Build and test the interactive Power BI dashboard.	03/11/2025
Final Report & Presentation	Submit final report and present key findings.	09/11/2025

7. KPIs (Key Performance Indicators) :

Area	KPI Description	Target
Data Cleaning & Processing	100% of missing or duplicate data handled	100%
Analysis & Insights	Percentage of analytical questions answered	≥ 90%
Visualization & Reporting	Dashboard load time	< 3 seconds
Visualization & Reporting	Usability – % of users who can navigate without help	≥ 80%
Final Documentation & Presentation	Final report completeness	100%
Final Documentation & Presentation	Minimum actionable recommendations provided	≥ 3

8. Expected Outcomes :

- Identification Of The Top Downtime Causes Affecting Production Efficiency.

- Improved Operator And Shift Performance Based On Data Insights.

- Reduced Batch Cycle Time And Increased Production Consistency.

- Practical, Data-Driven Recommendations To Enhance Manufacturing Efficiency.