

Project Plan – Manufacturing Downtime And Performance Metrics



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1. Project Overview :

This Project Focuses On Analyzing Manufacturing Downtime And Performance Metrics To Optimize Production Efficiency, Minimize Losses, And Enhance Product Consistency.

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.

Python Will Be Used For Data Import, Transformation, And Cleaning, While Power BI Will Be Used For Interactive Dashboards And Visualization.

2. 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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3. Project Scope :

The Project Includes:

- **Receiving Manufacturing Data Provided By The Ministry.**
- **Cleaning, Transforming, And Processing Data Using Python.**
- **Conducting Analytical Modeling To Identify The Key Downtime Causes.**
- **Visualizing Insights And Kpis Using Power BI Dashboards.**

It Excludes Any Automation Or System Integration Beyond Reporting And Visualization.

4. Methodology :

1. Data Collection & Cleaning – Collect Raw Data And Handle Missing Or Duplicate Records Using Python (Pandas, Numpy).
 2. Data Transformation & Analysis – Apply Statistical And Analytical Techniques To Extract Insights And Calculate Kpis.
 3. Visualization & Dashboarding – Use Power BI To Build Interactive Dashboards That Display Downtime Trends And Performance Metrics.
 4. Reporting & Presentation – Summarize Findings, Create Final Documentation, And Present Recommendations.
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5. Tools And Technologies :

- Python (Pandas, Numpy) – For Data Import, Transformation, And Cleaning.
 - Power BI – For Visualization And Interactive Dashboards.
 - Microsoft Word & Powerpoint – For Documentation And Presentation.
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6. Team Members & Roles :

Name	Role / Responsibility
Abdelazim Mohamed Anwar	Data Collection & Cleaning
Samar Salah Osman	Data Collection & Cleaning
Omar Gaber Mostafa	Data Analysis & KPI Development
Meryhan Makram Hamed	Data Analysis & KPI Development
Esraa Galal Abdellatif	Dashboard Design & Visualization
Mahmoud Abdellateif Hamza	Team Leader – Dashboard Design & Final Review

All Team Members Contribute To Documentation And Presentation.

7. Timeline & Milestones :

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 Power BI Dashboard.	03/11/2025
Final Report & Presentation	Submit Final Report And Present Key Findings.	09/11/2025

8. Risk Management :

Potential Risk	Impact	Mitigation Strategy
Incomplete Or Inconsistent Data	High	Conduct Early Data Validation And Maintain Backup Copies.
Delay In Dashboard Development	Medium	Parallel Work Between Analysis And Visualization Teams.
Misinterpretation Of Kpis	Medium	Conduct Review Meetings Before Final Submission.

9. Kpis (Key Performance Indicators) :

- **100% Of Missing Or Duplicate Data Handled.**
 - **$\geq 90\%$ Of Analytical Questions Answered.**
 - **Dashboard Load Time < 3 Seconds.**
 - **$\geq 80\%$ Of Users Can Navigate Without Help.**
 - **100% Completeness Of Final Report.**
 - **≥ 3 Actionable Recommendations Provided.**
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10. Expected Outcomes :

- **Clear Identification Of The Main Causes Of Downtime.**
- **Improved Operator And Shift Performance Through Data-Driven Insights.**
- **Reduced Batch Cycle Time And Improved Production Stability.**
- **Actionable Recommendations To Enhance Overall Manufacturing Efficiency.**