وزارة الاتصالات وتكنولوجيا المعلومات

رواد مصر الرقمية

FINAL PROJECT – PROPOSAL

PROJECT TITLE: MANUFACTURING DOWNTIME

Team Leader:

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Group Name: MNF3_DAT2_S1

Instructor: Eng/ Sherihan Ali

initiative: DEPI

Project Description:

This project analyzes operator performance and manufacturing downtime using Power BI dashboards.
The dataset contains information about operators, batch efficiency, product types, and downtime logs.
The goal is to identify inefficiencies, quantify downtime per operator, and uncover trends that can improve manufacturing productivity and cost efficiency.

Problem Statement:

Manufacturing lines often suffer from unexplained downtime and inconsistent operator efficiency, leading to production delays and financial losses.
The challenge is to determine which operators contribute most to inefficiencies and what factors cause downtime peaks.
This project transforms raw production logs into actionable insights that support operational decision-making and continuous improvement.

Objectives:

- Evaluate operator performance based on efficiency and downtime.
- Identify the most and least efficient operators.
- Quantify total downtime and its distribution across operators.
- Discover daily or shift-based inefficiency patterns.
- Provide data-driven recommendations for reducing downtime and improving throughput.

Scope & Limitations:

Scope:

- Focuses on six products and four operators within one production line.
- Analysis covers efficiency, downtime, and product-level variation.
- Dashboard visualizes KPIs and daily trends.

Limitations:

- Data limited to the current operational period (no historical comparison).
- Root-cause analysis depends on data availability for downtime reasons.

Tools & Technologies:

- Power BI: Data modeling, DAX calculations, and visualization.
- Microsoft Excel / CSV: Data preprocessing and cleaning.

Methodology:

1. Data Collection: Gather production logs, downtime sheets, and operator records.
2. Data Cleaning: Remove duplicates, correct operator names, and standardize timestamps.
3. Data Modeling: Build relationships between operators, batches, and products.
4. Analysis: Use DAX measures to calculate inefficiency and downtime KPIs.
5. Visualization: Create Power BI dashboard with interactive visuals and filters.
6. Reporting: Document insights and recommend actions to management.

Expected Outcomes:

- Identification of the least efficient operators and main inefficiency causes.
- Interactive dashboard summarizing operator and product performance.
- Insights into whether downtime is operator- or process-driven.
- Actionable recommendations for training, scheduling, and workflow redesign

Impact:

This project will enable the manufacturing team to reduce production downtime, increase efficiency by 10–15%, and enhance transparency in operator performance evaluation.
The Power BI dashboard will serve as a continuous monitoring tool for future production cycles.

Key Performance Indicators (KPIs):

#	KPI Name	Description / Purpose	Formula / Calculation
1	Total Downtime (min)	Measures total downtime per operator	Sum of downtime per operator
2	Inefficiency %	Percentage of inefficient batches per operator	(Inefficient Batches ÷ Total Batches) × 100
3	Downtime Share %	Operator's downtime contribution	(Operator Downtime ÷ Total Downtime) × 100
4	Efficiency Trend	Daily or shift-based performance trend	Line chart of efficiency rate by date
5	Overall Inefficiency Rate	Aggregated inefficiency across all operators	(Σ Inefficient ÷ Σ Total) × 100
6	Product Efficiency %	Efficiency per product	(Efficient Batches ÷ Total Batches per Product) × 100