

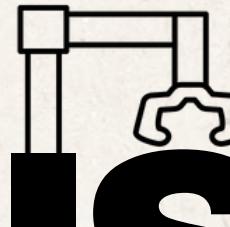


Digital Egypt Pioneers Initiative - DEPI
Round 3, 2025

CLS Learning Solutions
Training businesses and people Since 1995

CAPSTONE PROJECT

MANUFACTURING DOWNTIME ANALYSIS



A data-driven look into production efficiency and downtime causes

TRACK:
Data Analytics

MAJOR:
Microsoft Power BI Specialist

PRESENTED BY:
CLS-CAI3-DAT2-G5 Team 1

PRESENTED TO:
DEPI

INSTRUCTOR:
Mahmoud Seraj



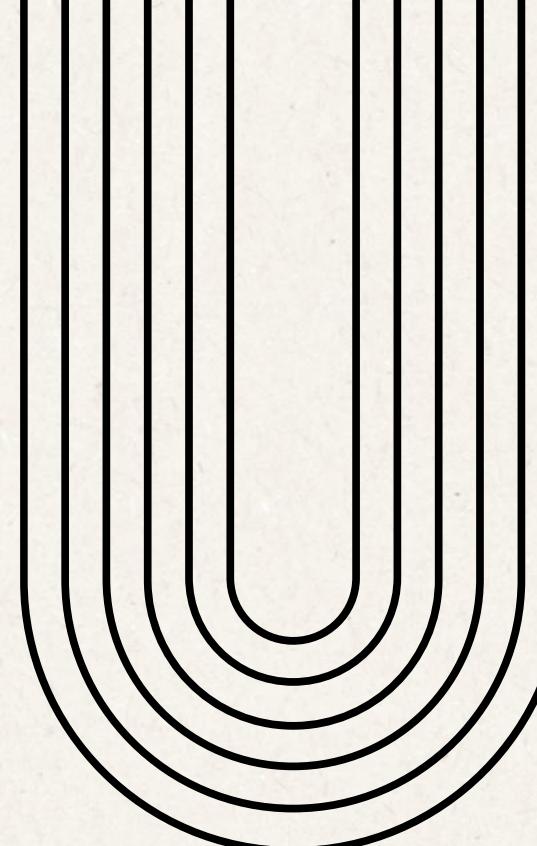
Agenda



02	Project Overview
03	Timeline
04	Data Sources & Structure
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06	Tools Used
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Project Overview

This project analyzes manufacturing downtime using **Power BI** to identify key causes and improve production efficiency



1. OBJECTIVE

Reduce downtime and improve efficiency

1 Line

2. SCOPE

Covers multiple products and batches and capturing incidents across operators

6 Products

38 Batches

61 Incidents

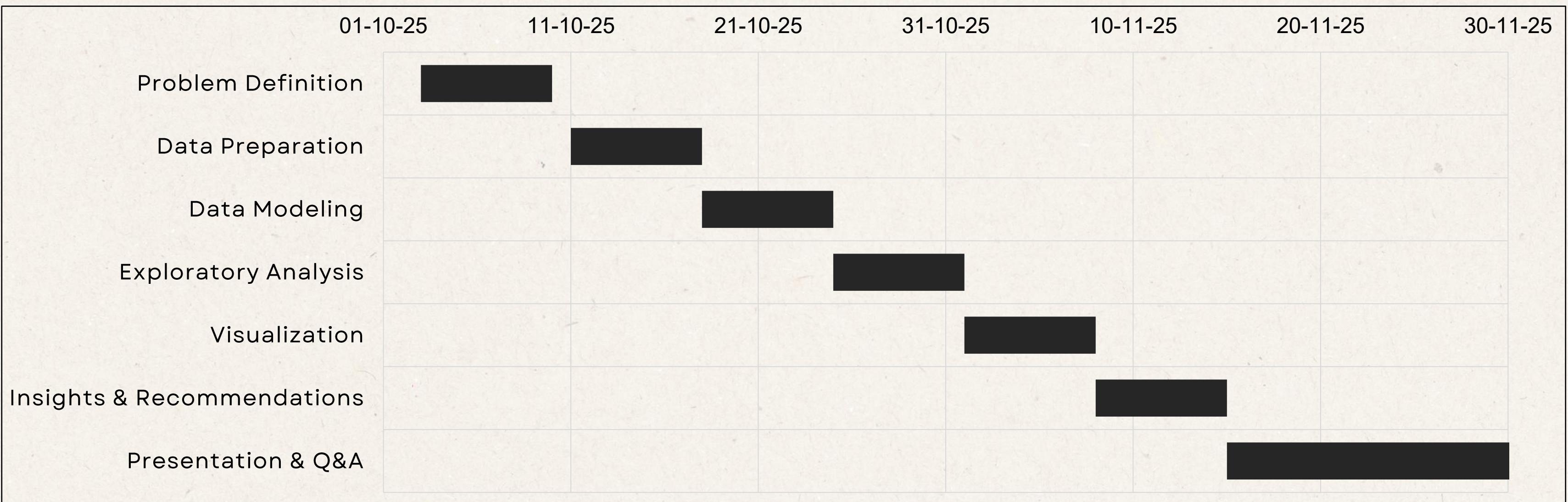
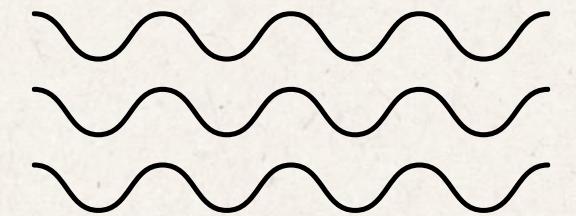
3. OUTCOME

Identify root causes and suggest improvements

5 Days

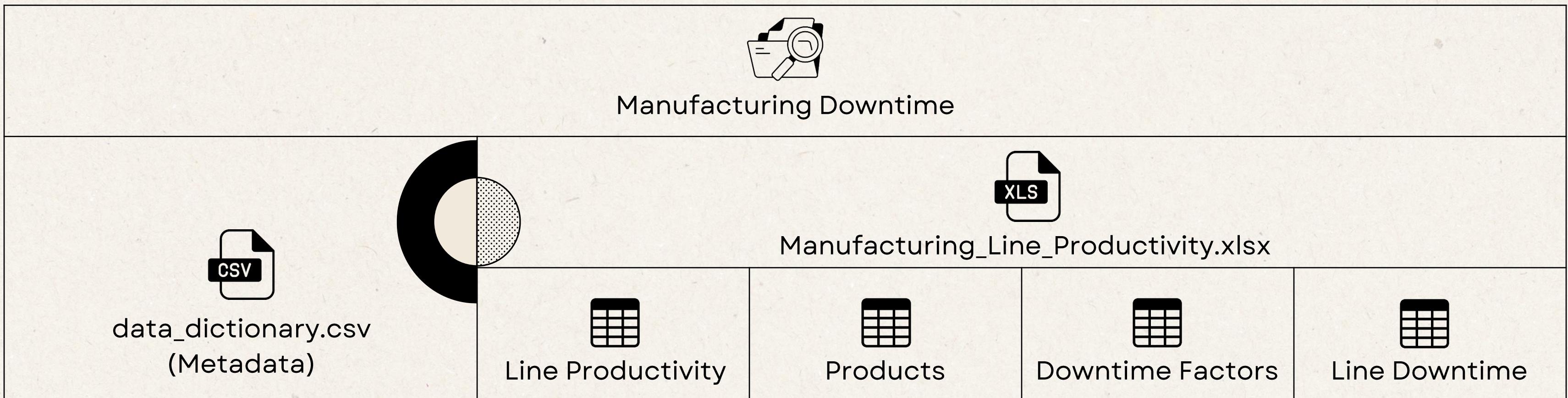
Timeline

Structured timeline ensured systematic progress toward reducing downtime



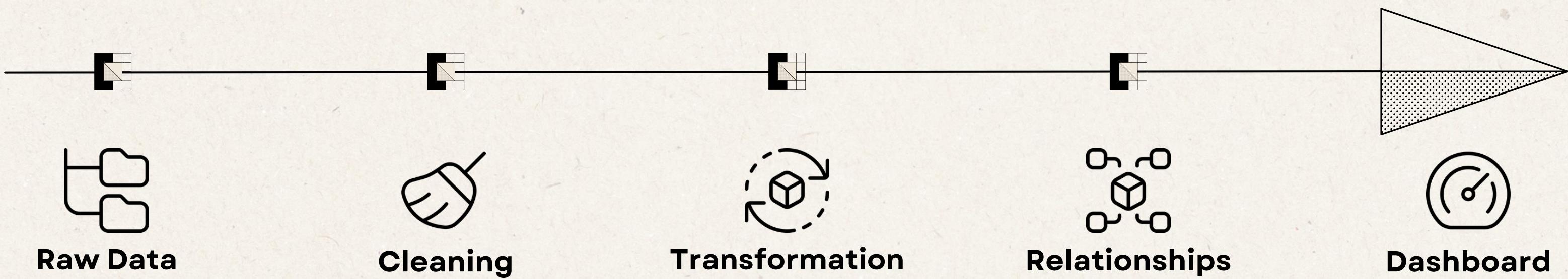
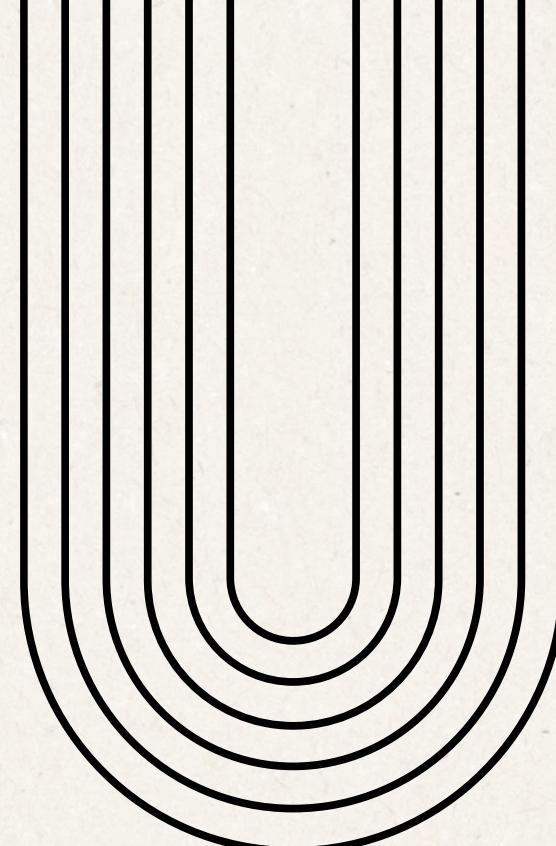
Data Source & Structure

This dataset was provided by the Initiative Management team and includes supporting files such as Excel sheets and metadata for analysis



Data Preparation Process

Structured preparation ensured reliable insights for downtime analysis



Tools Used



Analytical Workflow: From Data to Decisions

DATA PREPARATION

- › Excel
- › Power Query



DESIGN & VISUALIZATION

- › Figma
- › Power BI Desktop



MODELLING & ANALYSIS

- › Data Analysis eXpressions – DAX
- › Chat-GPT
- › DAX Studio



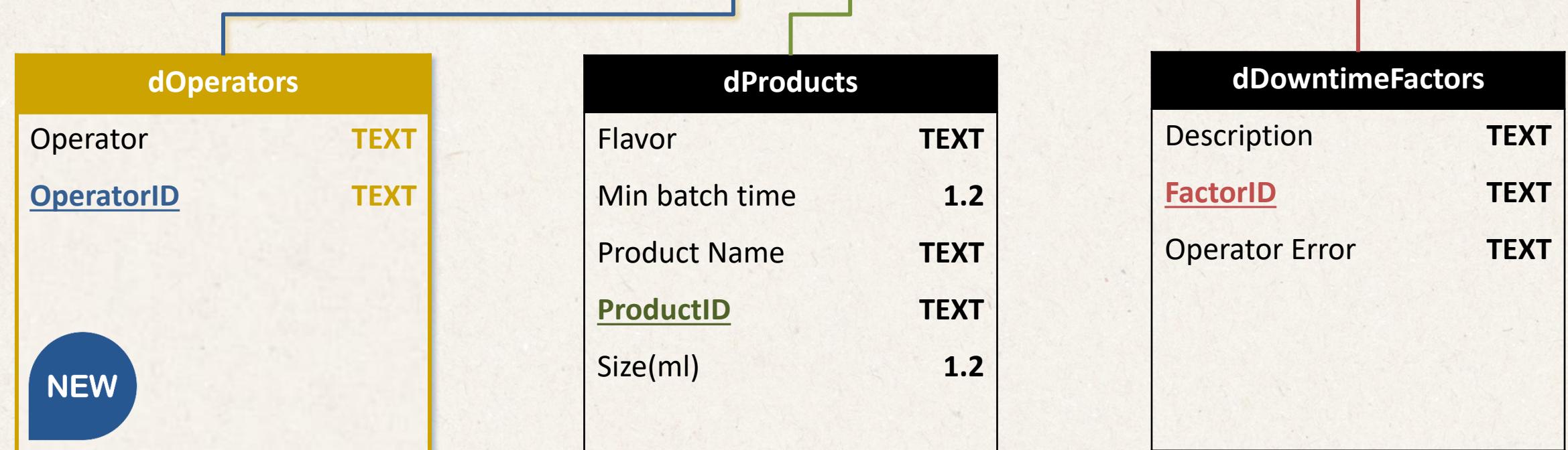
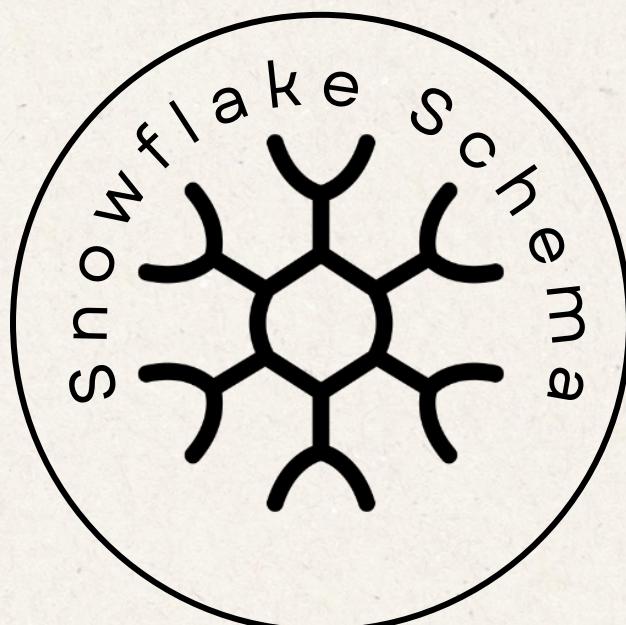
COLLABORATION & SHARING

- › Power BI Service
- › GitHub



Data Model & Relationships

This model allowed us to connect downtime incidents with specific operators and products, enabling root cause analysis



Key Performance Indicators

Our target is to Increase the line availability by **20%**

Line Availability %

Present: **64%**
Target: **84%**

We need a 20% increase to achieve higher operational efficiency.

Operator Error %

Present: **56%**
Target: **36%**

Reducing operator errors will directly improve productivity

AVG Downtime

Present: **00:23**
Target: **00:18**

Lowering downtime is essential to boost overall output

09/22



Downtime Operational Dashboard

Interactive visuals to track downtime trends and identify root causes

SKILLS SHOWCASED:

Figma Design

Buttons and Bookmarks

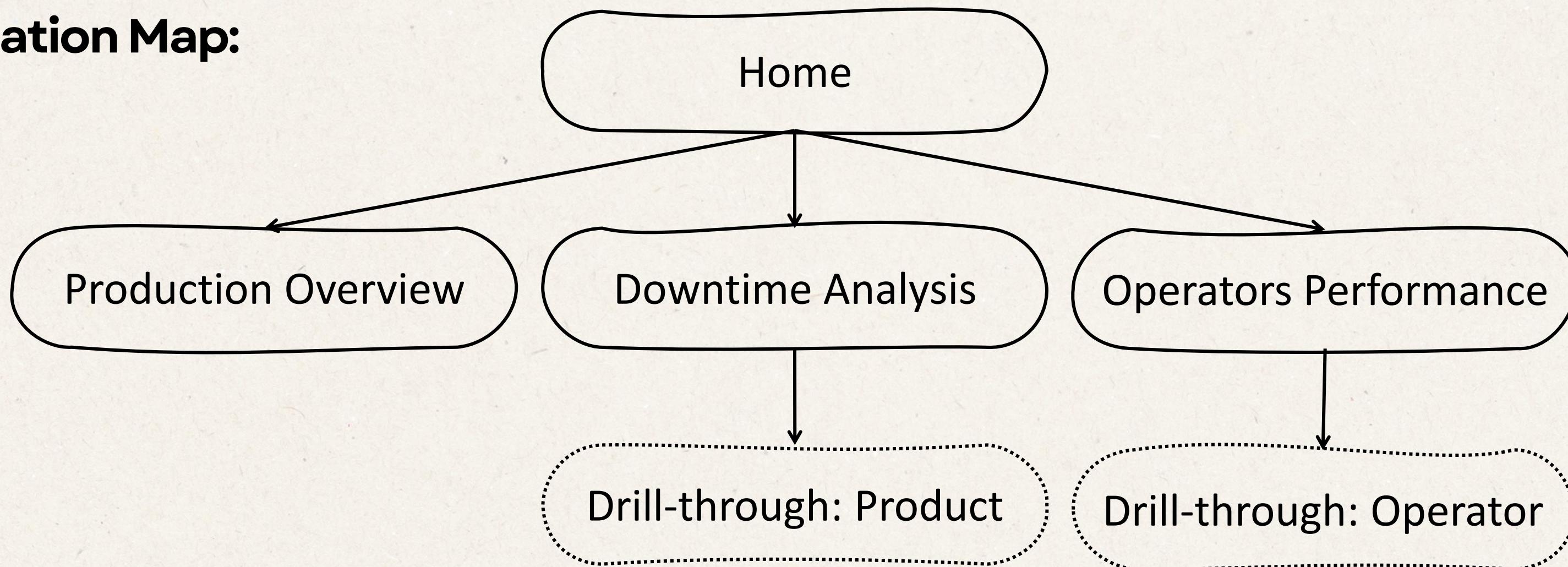
Drill-through & Filter

Tool Tip

Calculated Tables & Measures

Downtime Operational Dashboard

**Wireframe &
Navigation Map:**

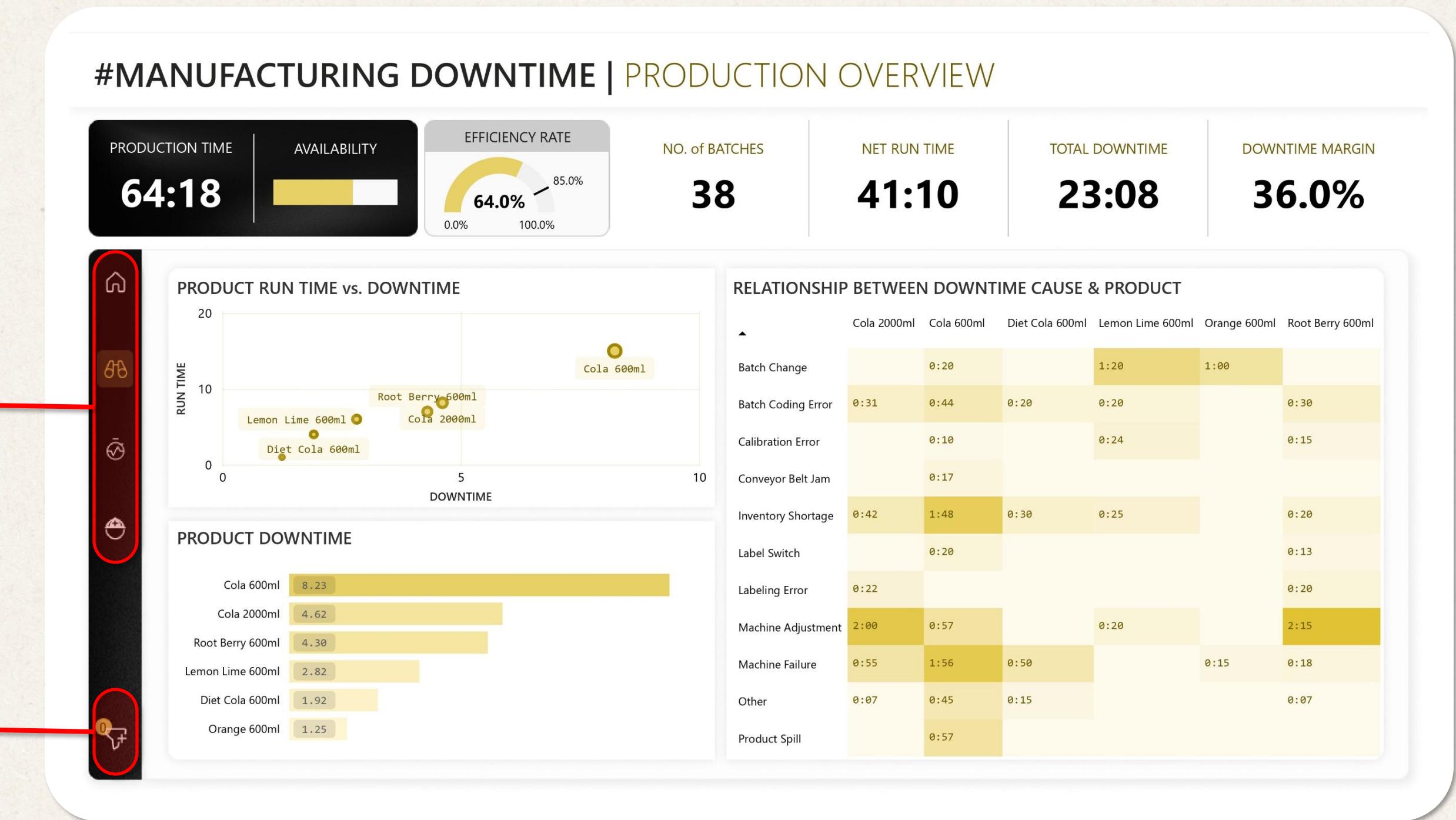


Downtime Operational Dashboard

Page 1: Production Overview

Main page navigators

Filter button & counter



Downtime Operational Dashboard

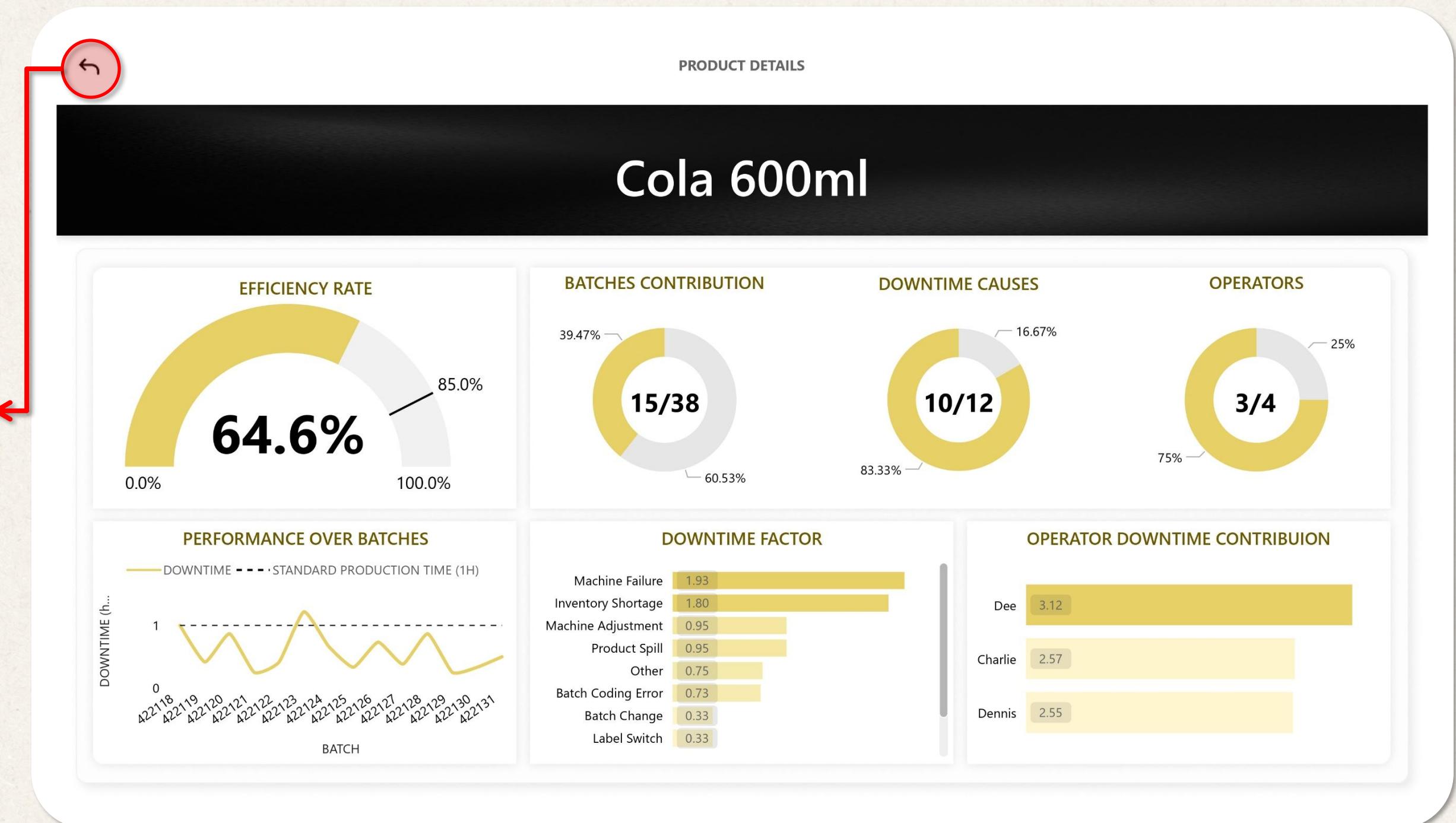
Page 2: Downtime Analysis



Downtime Operational Dashboard

Page 2.1: Product Details

“Downtime Analysis” page



Downtime Operational Dashboard

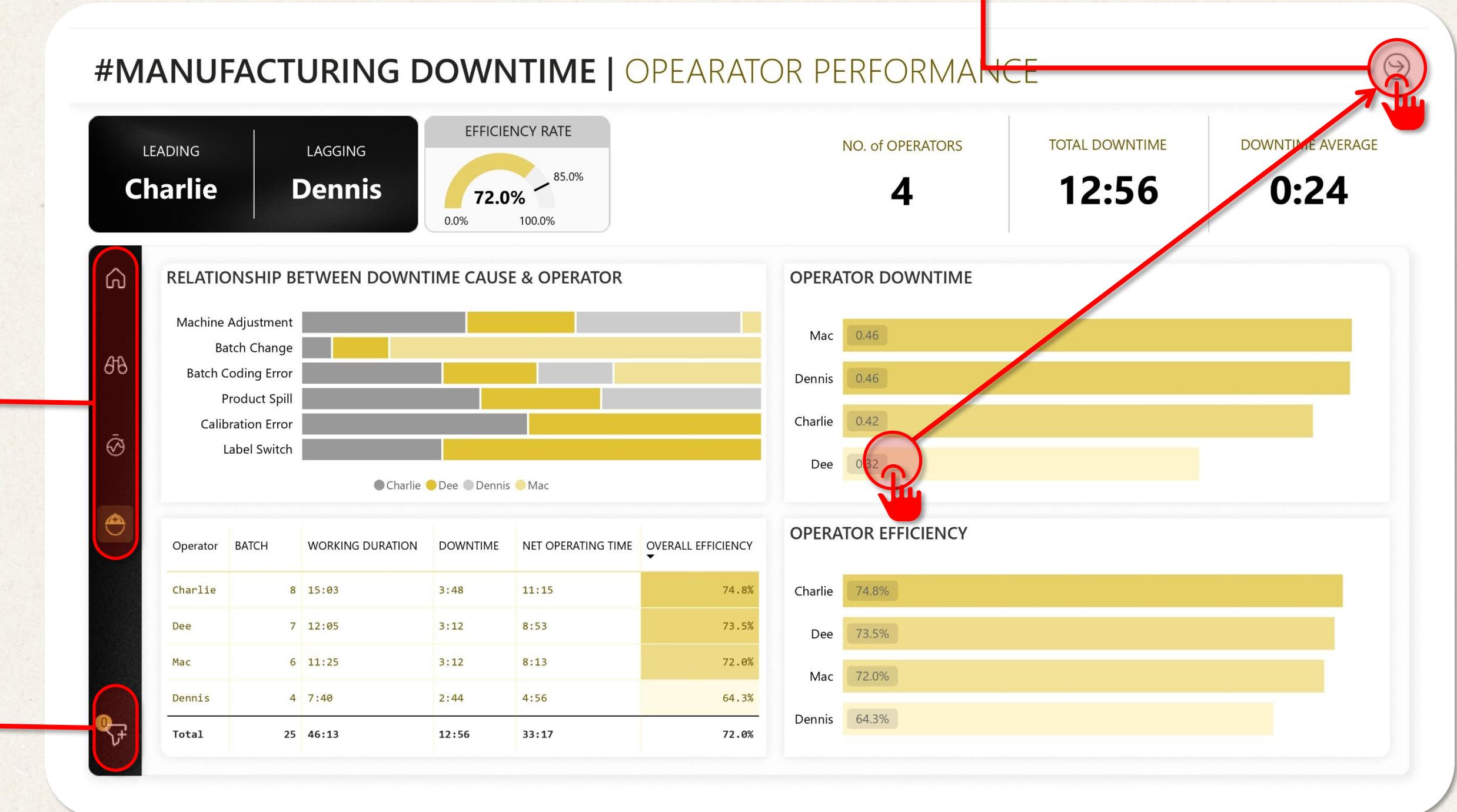
Page 3: Operator Performance

Main page navigators

Filter button & counter

Operator drill-through page

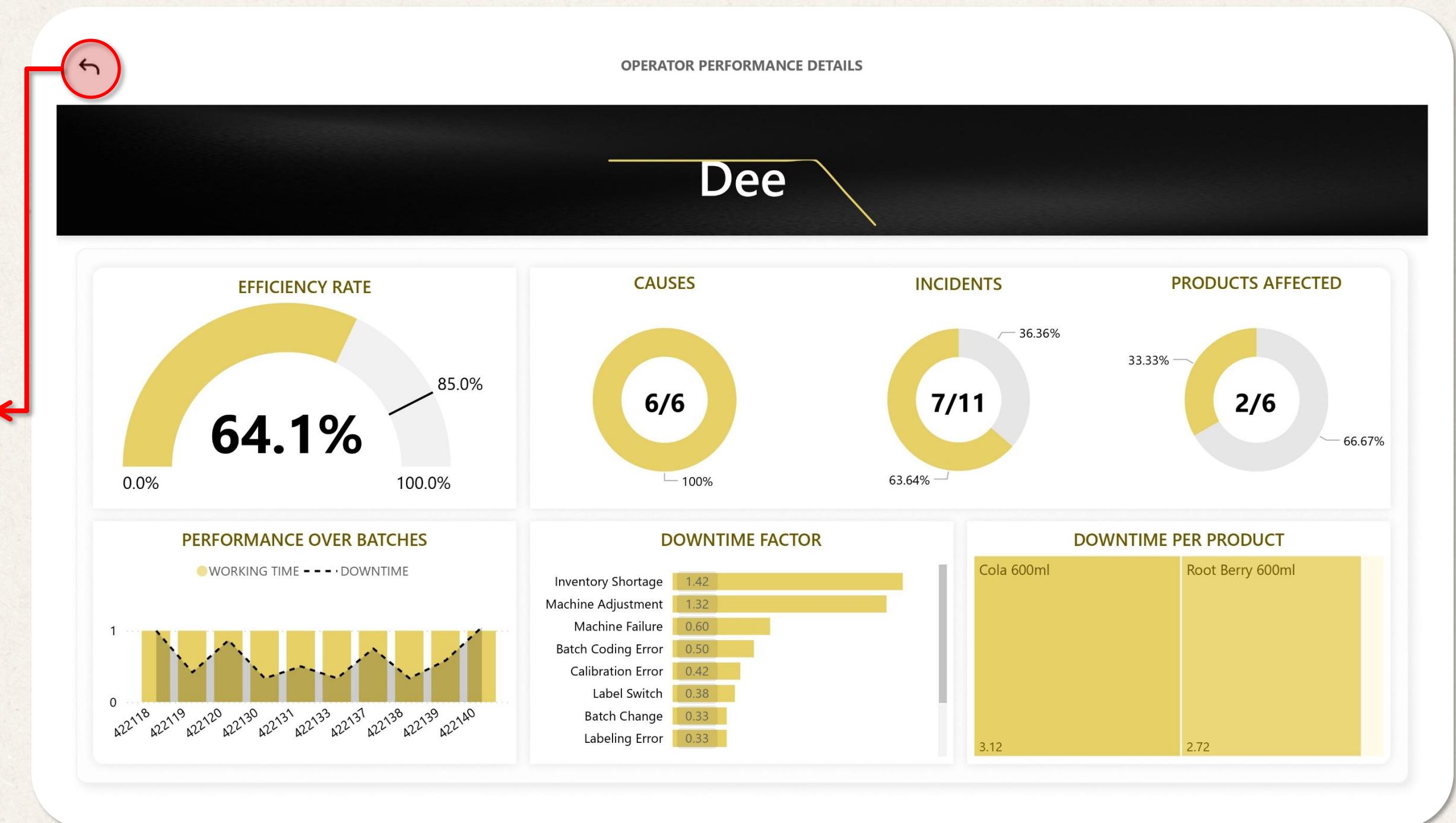
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Downtime Operational Dashboard

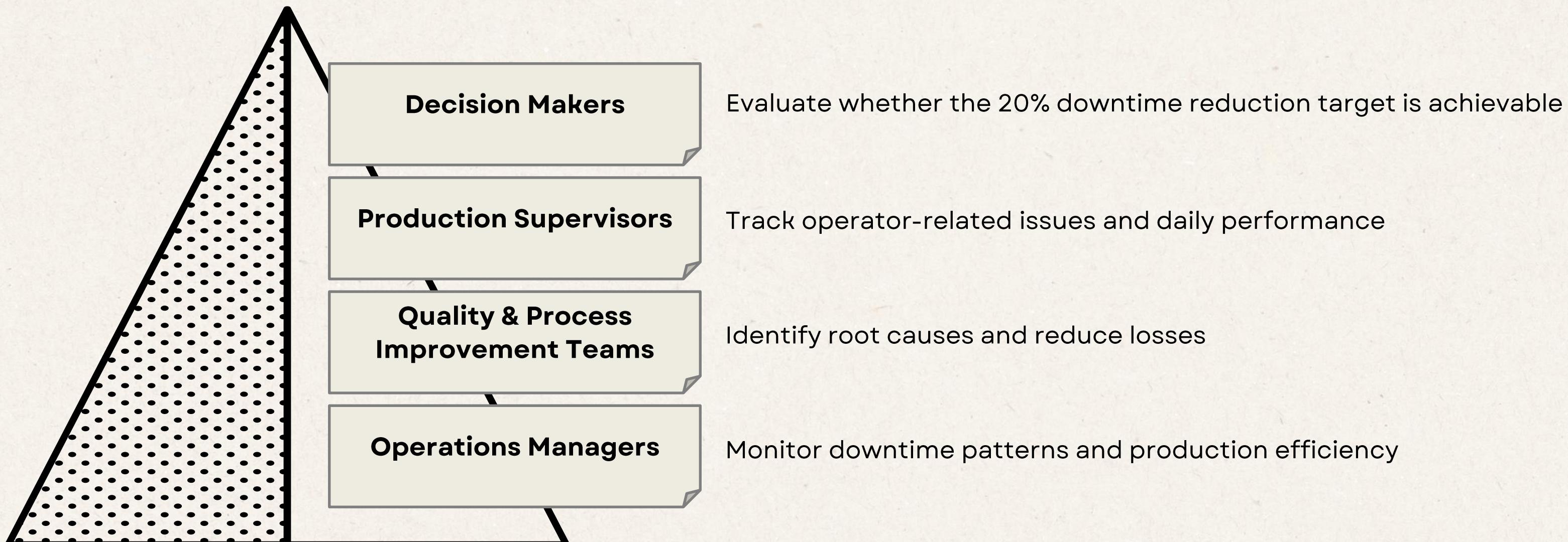
Page 3.1: Operator Details

“Operator Performance” page



Audience

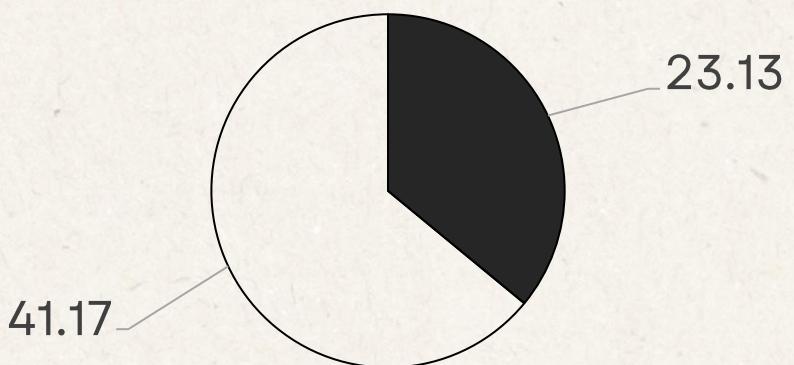
Our findings directly support the needs of key stakeholders across all levels of production



Key Insights

Our analysis revealed the main drivers of downtime and efficiency gaps

1. Downtime Is Significantly Above Normal Operational Limits



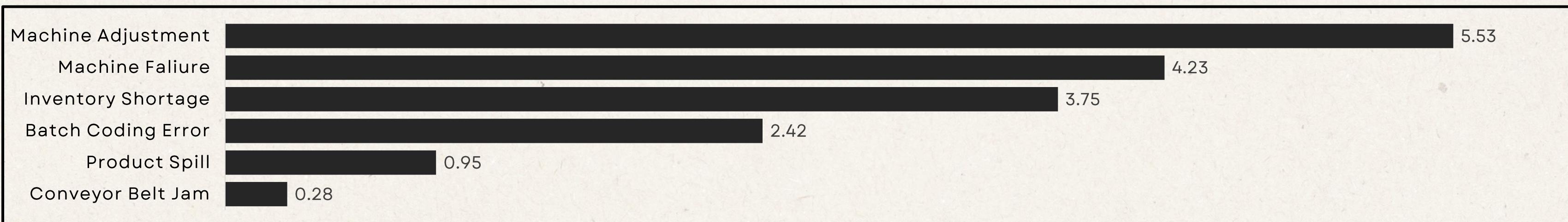
- › Total downtime recorded was 36%, limiting line availability to 64%!

Why It Matters?

- › Reduced availability puts pressure on delivery schedules and reduces total output capacity.

Key Insights

2. Machine-related Issues Account For Most Non-operator Downtime, Led By ‘Machine Adjustment’



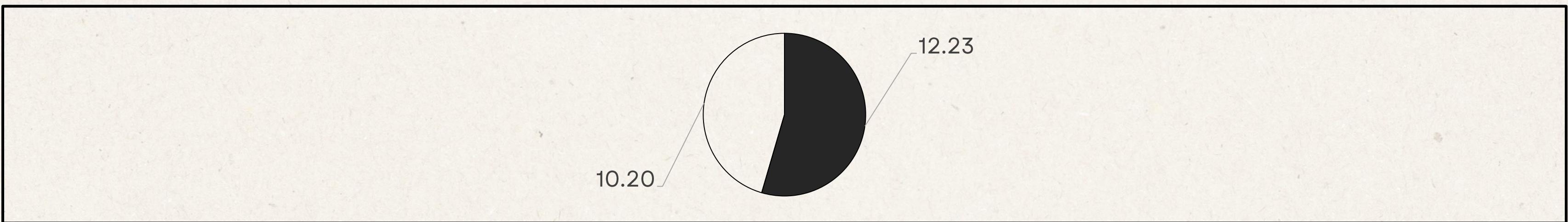
- › “Machine Adjustment” alone causes almost a quarter of total losses.
- › “Machine Failure” and “Inventory Shortage” together add over 8 hours of extra downtime.

Why It Matters?

- › Recurring mechanical problems slow production, reduce output, and increase maintenance workload.

Key Insights

3. Operator Errors Are the Main Driver



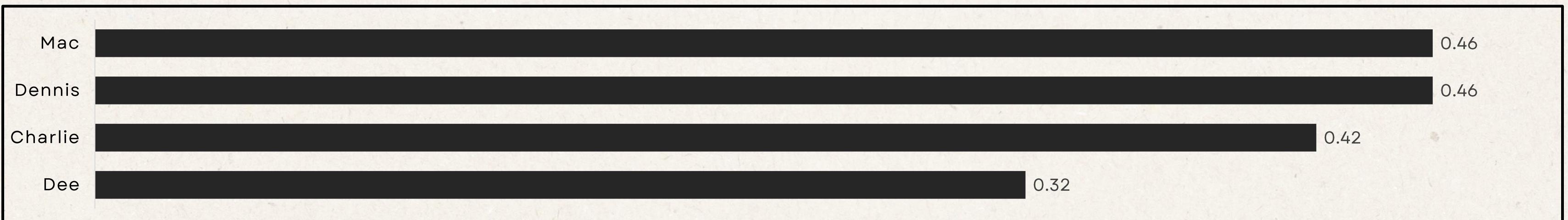
- › 54% Operator Error – 46% Other Causes.
- › More than half of all incidents came directly from operator mistakes.

Why It Matters?

- › This makes operator performance the most critical factor affecting overall downtime.

Key Insights

4. Some Operators Consistently Contribute More Downtime Than Others



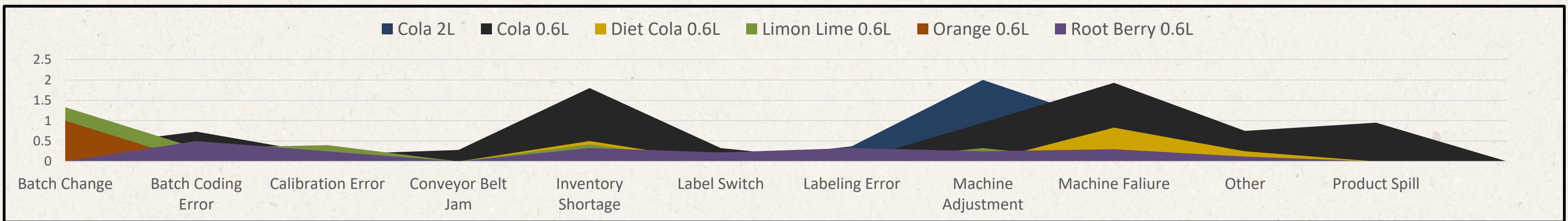
- › Downtime per operator varies, with Mac & Dennis at the highest levels

Why It Matters?

- › Targeted coaching can reduce error rates and stabilize performance across the team.

Key Insights

5. Certain Downtime Causes Are Concentrated on Specific Products



- › There is a strong relationship between the “Cola 2L” and the “Machine Adjustment”.
- › “Cola 600ml” -in particular- appears across multiple downtime.

Why It Matters?

- › This suggests that targeted troubleshooting for these products can significantly reduce overall downtime.

Recommendations

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Team Members



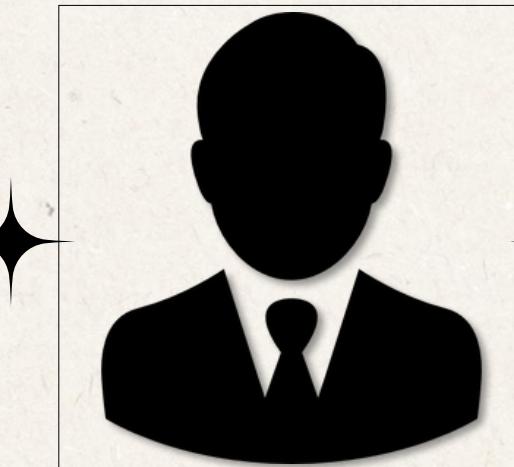
Hamza Bahgat

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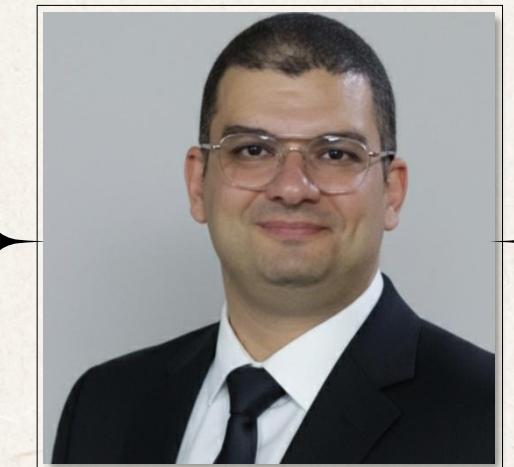
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DEC 2025



THANK YOU

[Visit the GitHub Repo](#)

Please get in touch if you have any questions
or concerns about this report.