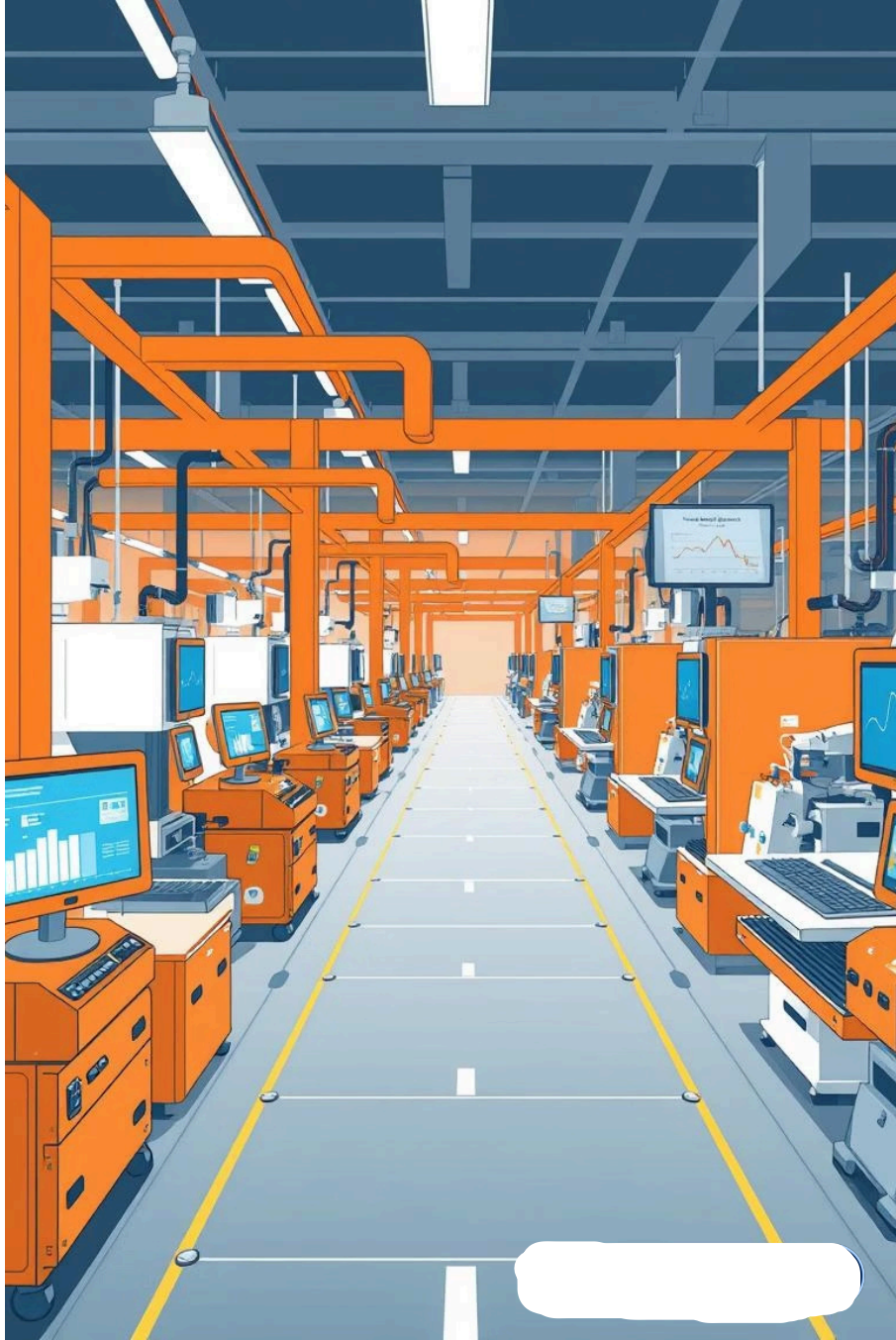
SAvantage: Analyzing Production Downtime

Maintenance Insights for SA Line

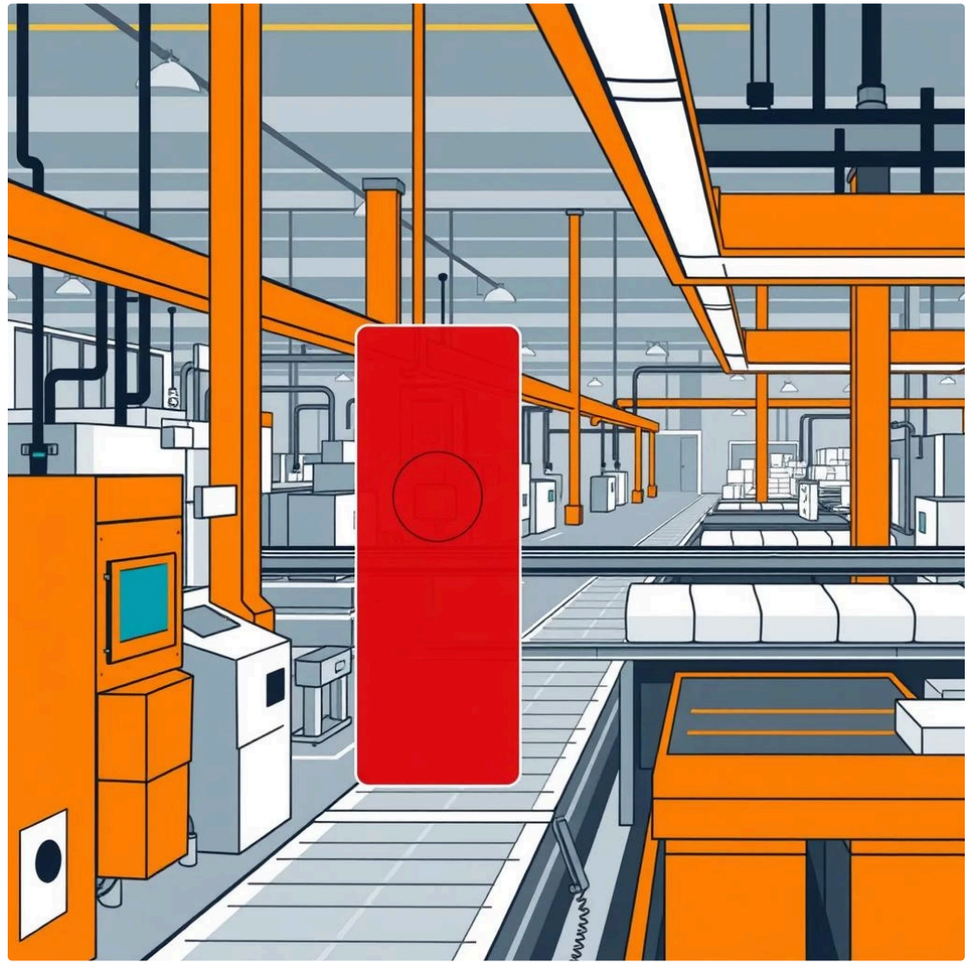
Presented by Aliaa Gamal, August 2025



The Challenge: Meeting Demand with Limited Capacity

Our current production capacity is struggling to keep pace with sales demand. A deep dive into our operational data reveals a critical bottleneck: **excessive downtime across our production lines.**

While all lines experience this, the SA Line stands out with the lowest availability at just 80.86%. This directly impacts our ability to deliver.



Our immediate goal: Identify and resolve the core issues on the SA Line to significantly boost capacity.

Data-Driven Insights: Our Approach

1

Time Period

90 days of continuous 24/7 operations, totaling 2,160 hours.

2

Data Source

Comprehensive failure records (tbl_Failures_Record) including Line Name, Machine Name, and precise Duration of each incident.

3

Sample Issues

From persistent conveyor jams and intermittent sensor failures to complex control panel malfunctions, we analyzed a diverse range of downtime events.

4

Analysis Scope

Our analysis focuses on Availability, Mean Time Between Failures (MTBF), Mean Time To Repair (MTTR), and detailed machine-level downtime.

This robust dataset provides the foundation for pinpointing operational inefficiencies and driving targeted improvements.

Performance at a Glance: Key Metrics

Line Availability

- SC: 93.74%
- EU: 84.36%
- SA: 80.86% (Our primary focus for immediate improvement)

MTBF / MTTR (Hours)

Line	MTBF	MTTR
SC	15:27:23	1:01:56
EU	4:24:05	0:48:57
SA	3:53:23	0:55:16

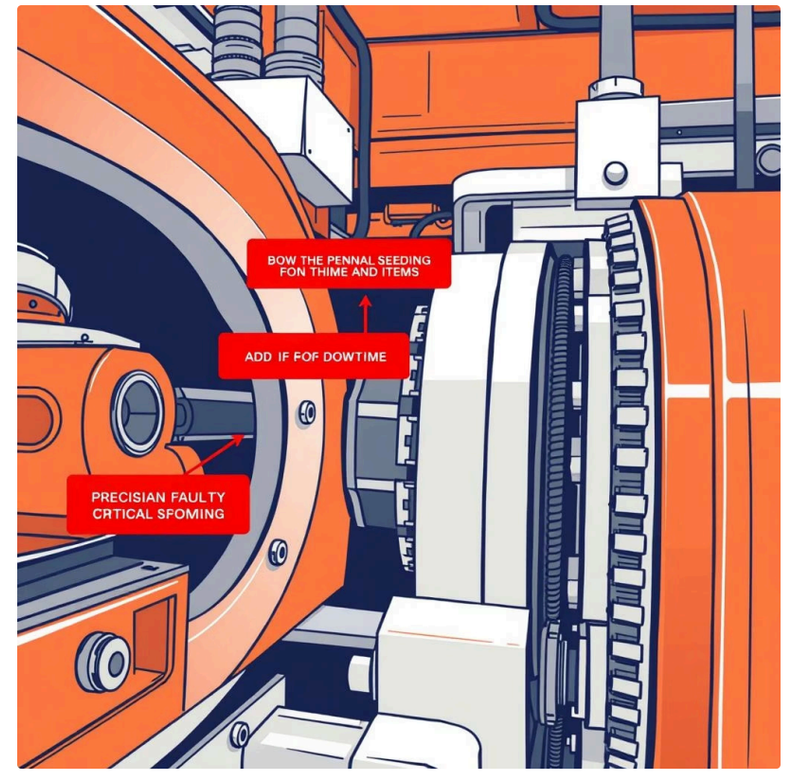
Key Insight:

The SA Line experiences failures far more frequently (lower MTBF) than other lines, despite a comparable repair time (MTTR). The SC line, conversely, shows excellent reliability but has longer repair durations when issues do occur.

Pinpointing the Problem: Critical Equipment on SA Line

A Pareto analysis on the SA Line reveals that approximately 20% of machines account for 80% of total downtime . Identifying these critical few is crucial for targeted intervention.

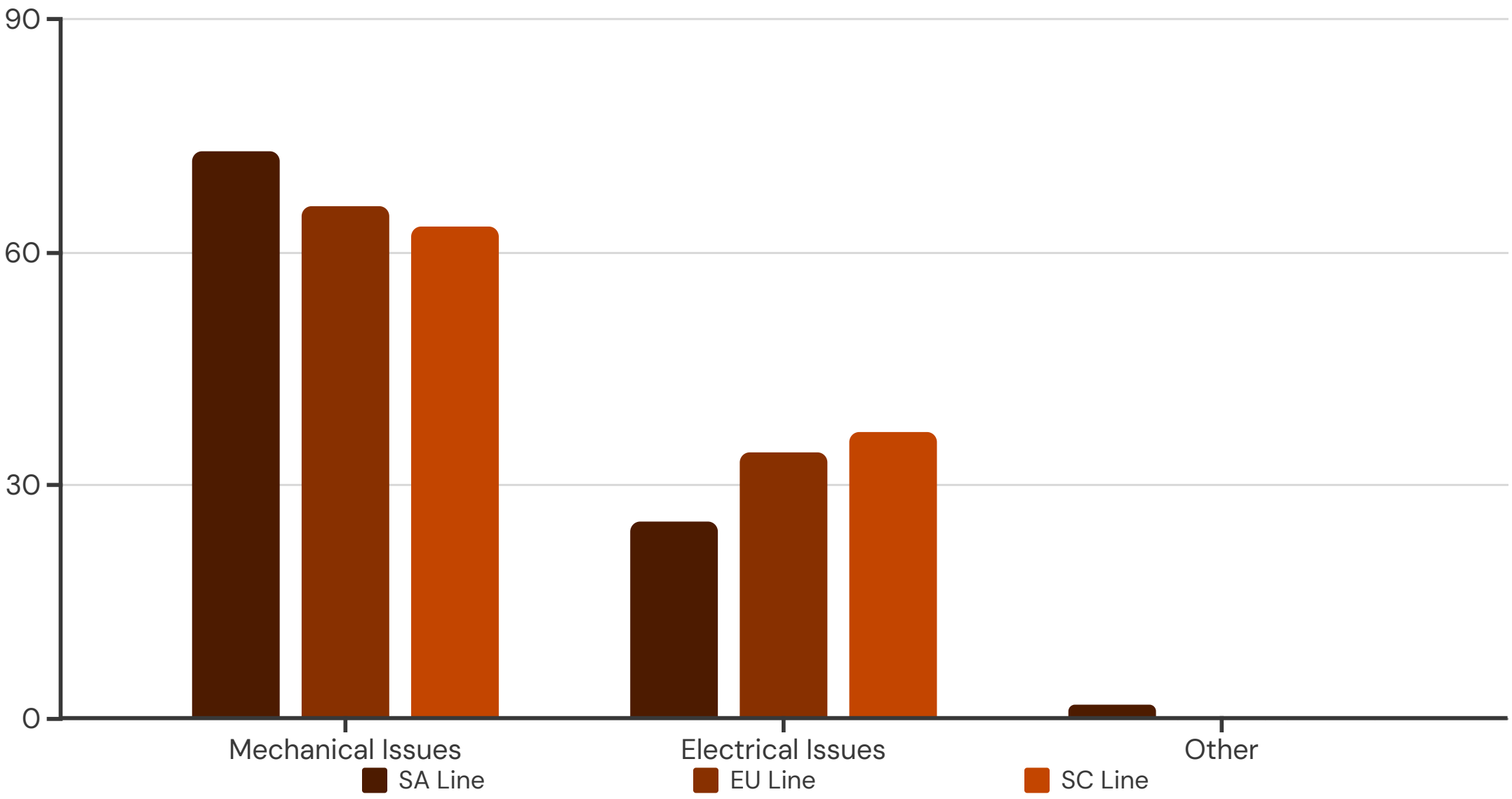
Machine Name	Downtime (Hours)	Failures
Automatic Injection Machine - Comas	20.95	14
Packaging Machine - Vienna	17.00	2
Date Machine (1)	7.08	4
Total SA Downtime (Past 90 Days)	**413.53**	



These three machines are the primary drivers of SA Line's underperformance, collectively contributing a significant portion of its total 413.53 hours of downtime over the analyzed period.

Uncovering the Cause: Root Failure Analysis

Beyond identifying which machines fail most, we analyzed the nature of these failures to determine the primary root causes across all lines.



⚠ Key Finding:

Mechanical issues are the dominant cause of downtime across all lines, particularly pronounced on the SA Line at 73.1%. This suggests a critical area for focused maintenance and engineering efforts.

Visualizing Impact: SA Line Pareto Chart

The Pareto chart clearly illustrates the distribution of downtime on the SA Line. This visual confirms our data-driven insight:

The chart highlights that the Automatic Injection Machine - Comas , Packaging Machine - Vienna , and Date Machine (1) are the primary culprits, accounting for approximately 80% of the total SA Line downtime. This reinforces our focus for intervention.

Interactive Analysis: Power BI Dashboard Overview

The dashboard provides a dynamic and interactive platform to explore these insights further, allowing for real-time monitoring and deeper dives into operational performance.

Key Visuals:

- **Pareto Chart:** Machine downtime for the SA Line, clearly showing critical assets.
- **Performance Table:** Availability, MTBF, and MTTR across all production lines (SC, EU, SA).
- **Key Performance Indicator Cards:** Total downtime and top contributing machine for quick assessment.

Conclusion & Next Steps: Boosting Capacity

SA Line Potential

With the lowest availability (80.86%), the SA Line presents our most significant opportunity for immediate production capacity improvement.

Target Machines

Focusing on Automatic Injection Machine - Comas, Packaging Machine - Vienna, and Date Machine (1) will address ~80% of SA Line downtime.

Root Cause Priority

Mechanical issues, accounting for 73.1% of SA Line failures, must be our top priority for maintenance and engineering efforts.

By targeting these key areas ,The project a potential capacity boost of up to 20% on the SA Line.

Contact Aliaa Gamal for further analysis