

Business Problem Statement

Prepared by: Scott Silverstein, Rylan Tribush, Charlie Vandel, Ahsan Ahmad

Problem Statement

Swire Coca-Cola operates six facilities that produce approximately 192 million cases of beverages annually. However, the plants experience a production shortfall, producing only 94.4% of the total intended cases due to unplanned mechanical breakdowns and maintenance issues. This gap, costing the company approximately \$60 million in lost productivity annually, results from unanticipated downtimes caused by machinery failures across various production lines. The current process relies on reactive maintenance through an Internal Warehouse Controller (IWC) system, which issues work orders only after machinery failures occur, leading to significant delays in repairs and downtime.

Benefit of a Solution

A predictive maintenance solution would allow Swire Coca-Cola to anticipate and mitigate these downtimes. By predicting when and why machinery failures are likely to occur, the company can schedule proactive maintenance, reduce unplanned downtimes, increase production efficiency, and save millions annually. In addition, such a system would help Swire Coca-Cola maintain optimal production levels to meet demand and reduce maintenance costs by ensuring parts are stocked in advance.

Success Metrics

The success of the project will be measured by the reduction in unplanned downtimes, improved production output, and the corresponding financial savings. Specific metrics will include:

- Reduction in downtime by X% (target to be determined with stakeholders).
- Increase in production output from 94.4% to a target of 98% or above.
- Financial savings from reduced downtime, with a goal of cutting the \$60 million loss by at least half.

Analytics Approach

The approach will involve building a predictive model using historical downtime data from the IWC system. The model will predict when and why a machine will fail based on key factors such as machine age, component wear, and environmental factors. The analytics will include feature engineering on attributes like time-to-failure, machine conditions, and maintenance records to forecast future breakdowns and identify high-risk components.

Scope and Deliverables

- **In Scope:**
 - Development of a predictive maintenance model.
 - Data analysis of machine breakdowns and maintenance history.
 - Insights into machine conditions and failure patterns.
- **Out of Scope:**
 - Real-time integration with the IWC system (to be considered for future phases).
 - Implementation of physical maintenance processes or stock management.
- **Deliverables:**
 - A predictive model with validation and testing results.
 - A detailed report on findings and actionable insights.

Project Details

The project will be executed by Scott Silverstein, Rylan Tribush, Charlie Vandel, and Ahsan Ahmad with a deadline of 11/27 . The project will follow the outlined milestones:

- Data exploration and preprocessing: 10/6
- Model development: 11/3
- Final report and presentation: 11/27

This project aims to build a predictive maintenance pipeline that reduces downtime and enhances Swire Coca-Cola's production efficiency, potentially saving the company significant time and money in unplanned repairs and lost output.