

Swire Coca-Cola Business Problem Statement

Business Problem

Swire Coca-Cola is one of the five largest Coca-Cola bottlers in the US. Every year, they produce close to 192 million cases of beverages to sell in its markets in 13 states. Recently, Swire Coca-Cola is experiencing significant losses due to frequent and unplanned machine downtimes in its 6 production plants. These breakdowns lead to interruptions in production, preventing the company from fulfilling its total number of cases that need to be delivered on a basis order. The current maintenance strategy is inefficient, as machines are repaired only after breakdown occur, resulting in prolonged periods of inactivity. The primary problem faced by Swire Coca-Cola is to understand what causes a machine to break and how effectively they can foresee that. They also needs to understand how gravely their output is affected owing to these downtimes.

Analytics Approach

As per the Swire Coca-Cola historical downtime data from Internal Warehouse Controller (IWC) system, developing a predictive maintenance model will allow the production team to forecast machine failures and take preventive measures, minimizing downtime and optimizing production efficiency. The model will analyze various factors, starting with an analysis of key features such as location, breakdown descriptions, and package lines, the data exploration phase will provide insights into frequency and severity of machine failures. The model selection phase would involve mapping IWC work orders to specific machines and locations. Machine learning models will be employed to forecast potential failures and recommend preventive measures. Some techniques like, classification models and regression models will be implemented to predict whether a machine will fall within a given time frame or not, and also to determine the time until next breakdown. In addition, the project will also involve exploring correlations between machine age, workload, and the likelihood of breakdowns, providing prescriptive insights on when maintenance should be performed.

Benefit of a solution

The primary benefit of this predictive maintenance model would allow Swire Coca-Cola to proactively identify potential machine failures before they occur, enabling planned interventions and reducing downtime. This would not only minimize financial losses but also improve overall production output, ensuring that the company meets its delivery targets consistently. By maintaining a steady operational flow, the company can save money, increase productivity, and better serve its markets across 13 states. Additionally, early detection of mechanical issues can extend the machine life and reduce the costs associated with repairs.

Success Metrics

The project's performance will be evaluated using various performance indicators. First, the reduction in unplanned downtime will be a critical measure to understand the model performance. Second, the order fulfillment is improved and it aligns with real-time production capacity. Thirdly,

there is an improvement in the plant efficiency and cost savings from reduced downtimes and repair expenses. Other important success metrics include the accuracy of downtime predictions, the frequency of planned versus unplanned maintenance, and the speed with which repairs are completed.

Scope

The main scope of this project will be to deliver an end-to-end predictive maintenance pipeline that includes data analysis, model development, and a dashboard for business stakeholders. The main aim is to identify key factors that contribute to machine breakdowns, developing a model to predict downtimes, and creating visualizations to help the production team anticipate and prevent future disruptions. In future, Swire Coca-Cola existing enterprise systems, can be fully integrated with this solution and there is an increased production.

Details

- A cross-functional team of data scientists, production engineers and IT specialists within Swire Coca-Cola will execute this project.
- The timeline for this project is four months, with an expected completion by the end of Jan 2025
- The key milestones include initial data collection and exploration, focusing on cleaning and pre-processing historical data, Model development and testing, deployment of the pipeline and post-deployment review.
- Regular check-ins and reviews will occur at the end of each month to ensure the project stays on track.
- We will circulate a draft of the report for the comments by November 15.

In conclusion, Swire Coca-Cola can expect that within four months, it can increase their production percentage, by enhancing predictive maintenance pipeline, ensuring that they save money by increasing the production levels to meet the demand.