



Case Study

Optimizing operations through yield forecast automation with data SSOT and AI/ML

Client: Large scale agricultural player

Key Highlights



30%

Productivity gain for developers due to Data Ingestion Automation by the platform



30%

Increased forecasting accuracy in net pounds production



20%

Reduction in waste of product per harvest cycle



20%

Improvement in Greenhouse Capacity Utilization



20%

Increase in operational efficiency due to automation



30%

Reduction in planning simulation time



Background

The client is one of the largest growers of premium fresh tomatoes in North America. Their operations comprise over 1,000 acres of greenhouse facilities with year-round production.

Yield forecast is one of the most important projects for the client that aimed to provide 6 weeks yield forecast capabilities to the manufacturing and planning team by deploying a Data-as-a-Service platform, using Artificial Intelligence, to manage, process and create accurate yield forecasting based on sets of variable inputs. They also required this intelligence to be made available on a configurable user front end to create insights and reporting.

Automation of yield forecast would help them to improve accuracy, eliminate human error and provide a better client service. It would also help to manage allocation or excess volume more efficiently within a 6 weeks' time frame and avoid unexpected volume variations.

Pain Point

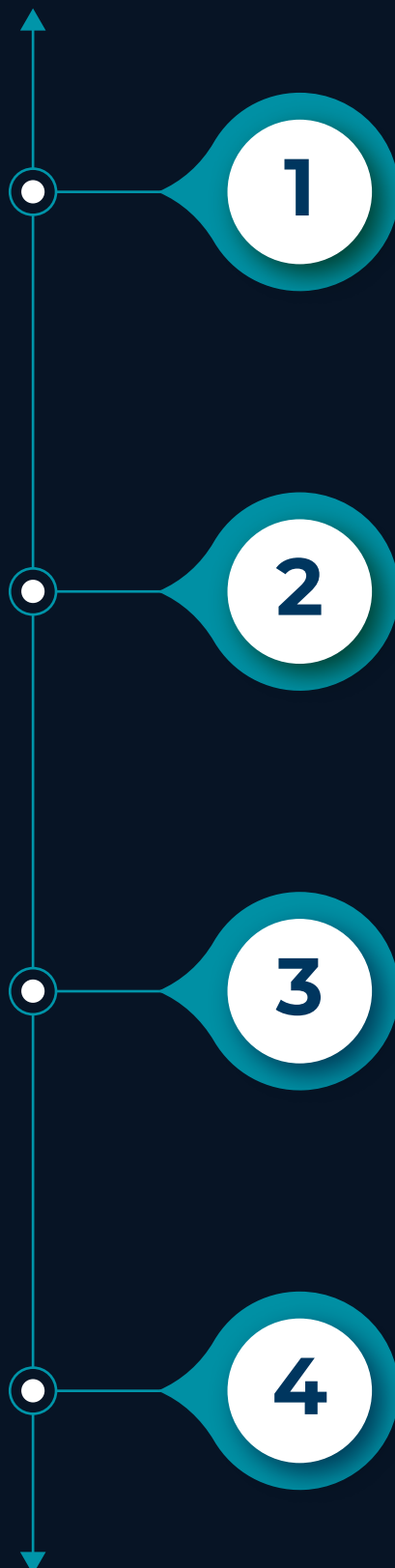
The client predominantly used manual methods for yield forecasting relying heavily on the expertise of harvest planners. This overlooked crucial variables and failed to incorporate the vast amount of available data, resulting in a mere 82% accuracy rate for snacking products. This inadequacy not only falls short of meeting client expectations but also has a detrimental impact on OTIF (On-Time-In-Full) performance.

By implementing automated systems, multiple variables can be effectively correlated and generate predictions that are consistently reliable and accurate. Such improved accuracy enables valuable insights to the client with the ability to take proactive measures on optimizing operations.

Solution

Altimetrik devised an innovative solution leveraging advanced data science and forecasting techniques. The primary objective was to automate the data pipeline, minimizing manual efforts and enhancing forecast accuracy. The newly developed solution encompasses comprehensive yield forecasting across all facets of the business, including seven facilities, 700 greenhouses, and eight seed varieties.

Key Objectives



Develop a Machine Learning Model

- Create a Single Source of Truth (SSOT) by consolidating data from all relevant sources.
- Gather greenhouse data from all plants to ensure comprehensive input for the model.
- Establish a data ingestion pipeline on the Calibo-lazsa cloud platform for efficient data management.

Perform Exploratory Data Analysis, Model Building, and Deployment

- Identify the key variables within the dataset that significantly influence the model's performance.
- Train the Machine Learning Model using the relevant data and deploy it on the Calibo-lazsa cloud infrastructure.
- Develop a user-friendly dashboard to visualize the model's insights and predictions.

Monitor Key Metrics (Accuracy & Standard Deviation) and Establish Baseline

- Aim for a target accuracy of 95% at Week 1 (W1) and 90% at Week 6 (W6) at the plant level.
- Continuously track the accuracy at both plant and greenhouse levels.
- Analyze the variation in accuracy across different greenhouses within each plant.
- Establish the current Non-System (NS) Forecast accuracy as the baseline for comparison.

Continuously Improve the Model through Iterative Processes

- Conduct weekly meetings with the client team to analyze the model's results and performance.
- Identify actionable items for improving the model's accuracy and effectiveness.
- Iterate on the model based on feedback and insights gained from the collaboration with the client.

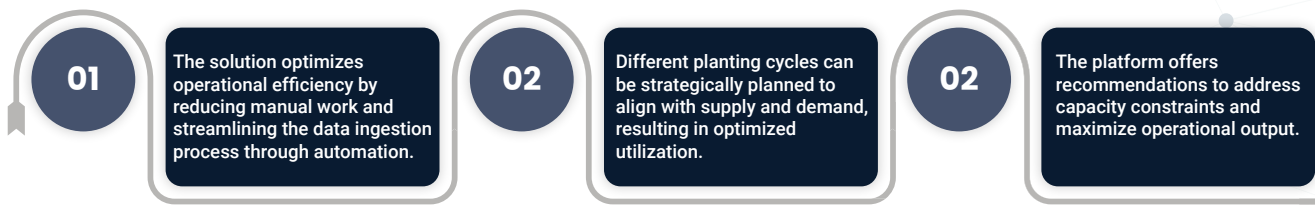
Outcomes

The farming data, sourced from diverse channels, is seamlessly collected, and ingested through an automated data pipeline into a self-service platform. This platform enables users to execute data science algorithms and provides intuitive UI dashboards for businesses to review and analyze yield patterns across various parameters. By leveraging robust and customizable AI/ML models within the platform, the accuracy of yield predictions increased by up to 30%.

User Experience:



Operational Efficiency:



By leveraging Altimetrik's expertise and solutions, the client witnessed significant improvements across various key performance indicators. These outcomes translate to enhanced productivity, accuracy, waste reduction, and operational efficiency, ultimately driving overall success in their agricultural operations.

About Calibo

Calibo is a leading digital product and platform company. It created the first end-to-end, cloud-based, self-service platform, which helps enterprises simplify and accelerate software application development and data engineering from ideation to operationalization. Enterprises across the world of all sizes can realize faster time to market for their digital and data initiatives by leveraging Calibo's platform. It improves developer experience and productivity by leveraging best-in-breed technology, toolchains, out-of-the-box processes, and intelligent automation. Learn more at calibo.com.