Basetwo

Process Development and Scale-Up: Batch Distillation Process

Overview and Summary

This Basetwo customer was looking to optimize the development and scale up of a batch distillation processes while solving a few key challenges:

Existing Process Challenges

- Long cycle time that is delaying scale up to commercial scale batches
- Slow lab-based assays delay process decision-making and reduce real-time visibility into performance
- Extensive consumption of the chemicals (e.g. solvent) and of energy due to heating of jackets, vessels, etc.

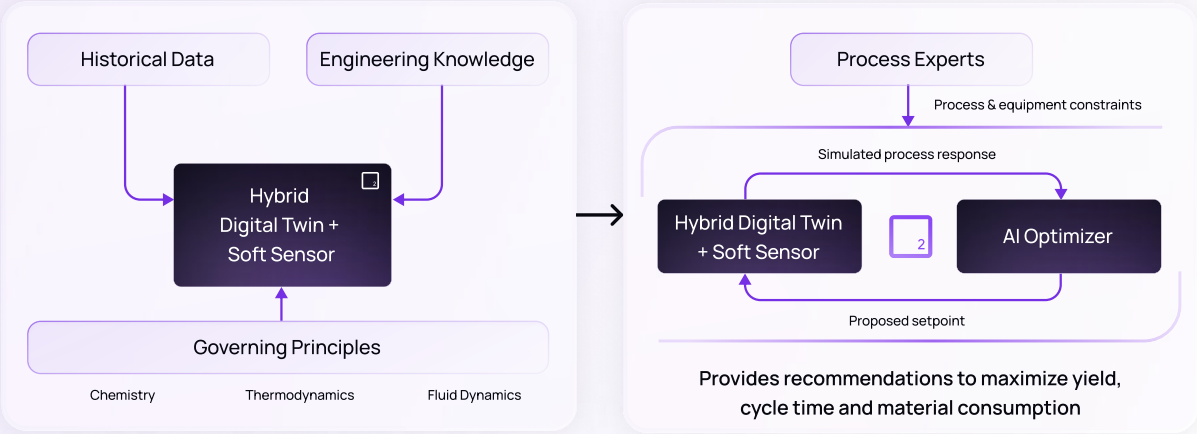
Success Criteria

- **Predict key quality attributes** and **process conditions** in real-time that impact final product quality
- **Reduce cycle time, costs,** and **energy consumption** throughout the batch
- **Optimization** of the batch distillation process while maintaining quality targets

Basetwo provides an all-in-one solution for soft sensing, simulation, and process development.

Hybrid Modeling for Accurate and Reliable Digital Twins

Basetwo's unique hybrid modeling approach empowered this customer to build and accurate and reliable digital twin of their distillation column when even when data is sparse, kinetics are unknown, or processes exhibit complex nonlinear behavior.



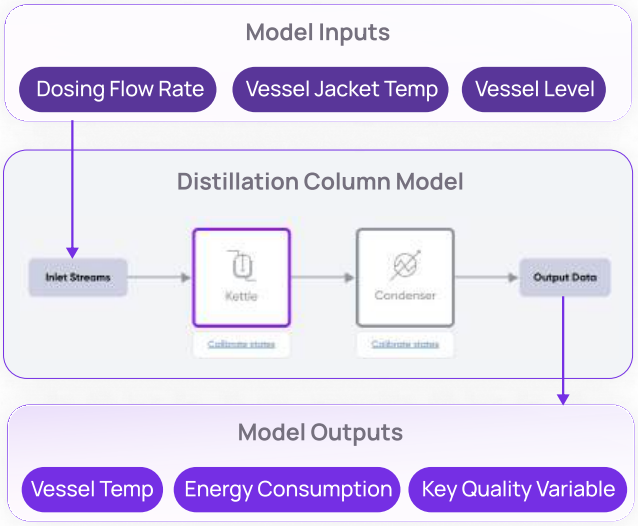
Interested in learning more?

Get in touch at
contact@basetwo.ai

Process Simulation and Control on Basetwo

The Digital Twin in Action

Using the Basetwo platform, this manufacturer first integrated their process data, quality metrics, and target specifications into the distillation column model template to simulate their real-world processes. They then leveraged the AI-optimizer to determine the optimal way to run their processes based on the success criteria.

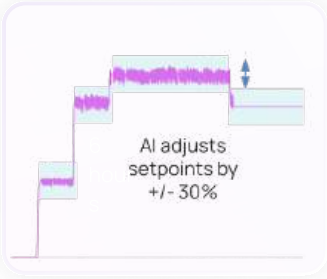


Strategies for Determining the Optimal Standard Operating Procedure

1

Constrained AI-Optimized SOP

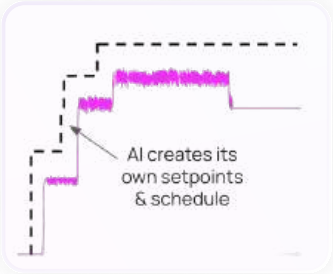
AI optimizes the current SOP by a maximum of +30% or -30% of the current protocol at each step.



2

AI-Generated SOP

The model creates its own SOP within pre-defined engineering constraints.



The Result

By leveraging the Constrianed AI-Optimized SOP approach, the customer was able to significantly reduce the material and energy consumption, turnaround time, and costs

44%
reduction in batch cycle time

47%
reduction in material consumption

25%
reduction in energy consumption

44%
reduction in total batch costs

Basetwo enables right first time manufacturing by identifying the optimal way to run process without the need for lengthly and expensive physical trials.

Reach out today →

contact@basetwo.ai