

*Biotechnology Manufacturing*  
*Case Study:*

**Reducing Downtime with  
Predictive Analytics**

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How a global Biotechnology manufacturing company implemented Artificial Intelligence tools to reduce downtime and improve production capacity by 5.1%

## About the company

The U.S.-based company is a leader in Biotechnology which develops and manufactures nutritional ingredients using cutting-edge, proprietary technologies. The company has grown rapidly, generating sales worldwide through its diverse portfolio of innovative products.

**Product portfolio:** 2,040+ products

**Distribution:** 10 countries

**Employees:** 4500+ worldwide

**2017 Turnover:** \$450 Million

## The Challenge

The company's quarterly operations review revealed a 3.6% increase in downtime in the production line, compared to the previous quarter.

## Facts

The 3.6% quarterly increase in downtime stemmed from an unexplained, overly-high level of viscosity in the product solution, which resulted in pipe blockages between the reactor and the centrifuge (see image #1).

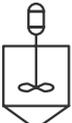
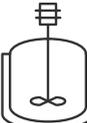
 <b>Mixing tank</b> Working range Time 35-45 min Agitator 0-70 RPM Temp 20-25 °C	 <b>Distillator</b> Working range Time 8-12 hr Agitator 0-50 RPM Distil temp 76-80 °C	 <b>Reactor</b> Working range Reaction Time: 24-40 hr Agitator 0-70 RPM Temp 37-45 °C	 <b>Pump</b> Working range Flow rate: 0-27 m <sup>3</sup> /hr	 <b>Centrifuge</b> Basket speed: 0-200 RPM
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Image #1 - Description of part of equipment's involved in the main production line

The blocked pipes led to more frequent equipment cleaning procedures and stoppage during the batch production, leading to high levels of waste, a decreased supply capacity, and lengthened time to market.

The investigative team could not identify a reason for the blockage, as all relevant production parameters were in the approved working range.

# The Opportunity

The company decided to invest in tools to predict and prevent future downtime.

They looked to Industry 4.0 for a solution with multiple capabilities:

1. Incorporate their subject matter expertise into data analytics and machine learning
2. Provide the operational team with simple and accurate insights
3. Deliver predictions on future downtime problems

# The Solution

## Automated, simple, accurate prediction with the Seebo Solution

Seebo analyzed historical & online data from the production line and identified the correlation of events which were causing blockage, while all equipment was working at the approved working range.

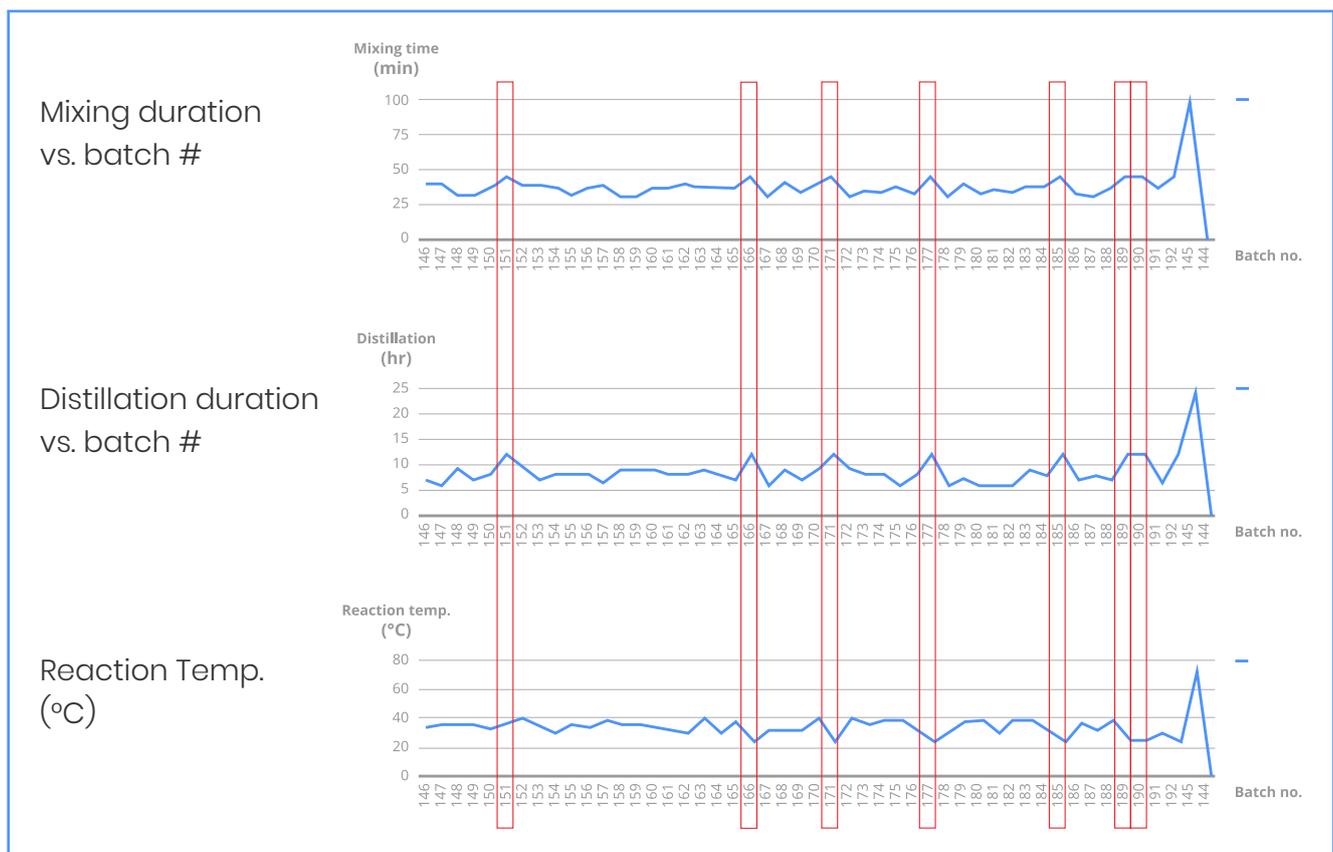


Image #2 - A combination of longer mixing, together with longer distillation time and low reaction temperature, led to a highly viscous solution which was difficult to transfer to the filtration stage.

The algorithm found that the problem regularly occurred one to two hours after a specific combination of parameters in the mixing vessel, the distillator and the reactor. (see image #2 above)

Based on these findings, the Seebo solution could provide a prediction alert to the operational team before the blockage occurred again.

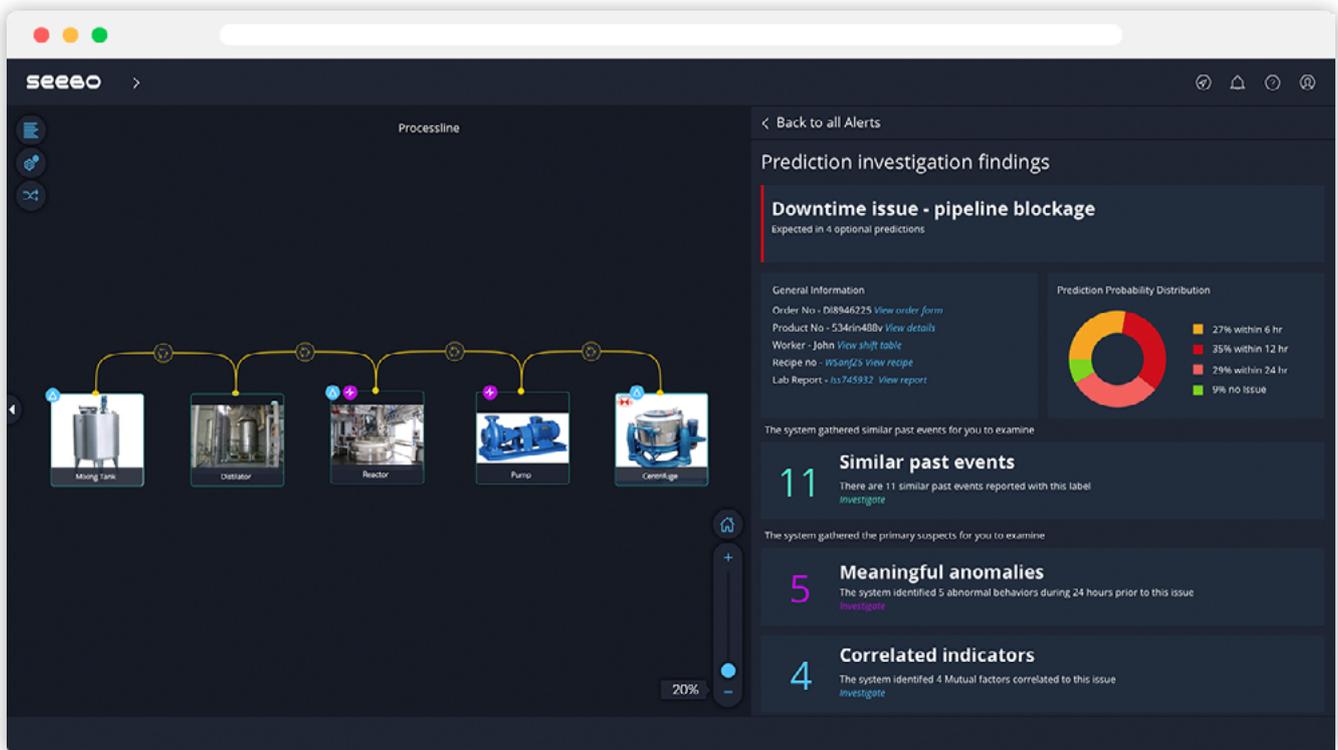


Image #3 - Example of the Seebo prediction investigation screen

*“ It’s unbelievable how much time and energy my shift spent on downtime and cleaning due to the blockage problems. My phone was on constant redial to the maintenance team.... It’s a relief to know that we finally solved a major recurrent problem and have a practical tool to use in the future.”*

**- Shift operator**

# Problem Solving Methodology Comparison

	Traditional	Seebo predictive solution
Frequency of cleaning procedures	After every batch	According to work plan
Production downtime due to blockage	Minimum 6 a quarter	Once a quarter
Cost of downtime	+11% of the plant expenses	3% of the plant expenses
Delay in lead time	14-21 days / quarter	1-2 days / quarter
Problem resolution	Didn't solve; offered workaround	Solved
Production line capacity	-3.6%	+5.1%

## Summary

As a result of the Seebo Solution, the factory returned to expected production capacity and the factory team was able to pinpoint the right predictive maintenance schedule.

**-83%**

In downtime events

**-72%**

In downtime costs

**98%**

On time delivery

**+5.1%**

Production capacity

*“Having the ability to predict quality and downtime problems is completely changing the way we work - moving from preventive and reactive maintenance to predictive maintenance. We dramatically reduced the overall costs of maintenance ...I even have some office time in the middle of the day!”*

**- Maintenance Manager**



Seebo is a pioneer in Model-based Industrial AI for manufacturers. Our solutions combine code-free tools for predictive analytics, automated root cause analysis, and digital twin analytics to predict and prevent disruptions in quality and downtime.

Using a visual Modeler, we infuse the customer's manufacturing expertise, together with data from OT and IT systems, into machine learning - without requiring the customer to master data science.

Manufacturers across industries – including Grundfos, Stanley, Procter & Gamble, Ralph Lauren, and many more – use Seebo to increase overall equipment effectiveness (OEE), minimize maintenance costs, and continually improve quality.

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