



aizon

Smarter Root Cause Analysis with  
a Leading Pharma Company



## Performing an in-depth root cause analysis sheds light on opportunities for improvement to help optimize an already high level of production efficiency

A leading pharma company needed to find the root cause of several issues on one of their most advanced packaging lines: a highly automatized and sensorized plant that assembles and packages the insulin pen supply for several countries, including the United States.

Because of the importance of this line in the leading pharma company's supply chain, these issues resulted in a critical bottleneck that had to be fixed. The level of efficiency of the line was high, yet there were indications that improvements could be applied in order to optimize its production.

Aizon was given 8 weeks to find the root cause of their issues and improve the performance of the line.

## The Challenge, Gaining Data Insights in Order to Improve Overall Equipment Effectiveness (OEE)

The main issue with the line was that it did not meet its production targets, it was always behind and most importantly, nobody really knew what caused it. There were a large number of scraps and unplanned stops when processing the final product, for no obvious reason. The operators thought the IT systems were to blame, the IT department believed it was a lack of operational training and the mechanics blamed the line for not being efficiently built. There were lots of different indicators but no clear picture of what was really causing the line to underperform.

In addition, the setup was very complex. Data was generated from multiple sources, including warehouse, temperature sensors, machine PLCs, transports (AGV), MES systems, ERPs and IT infrastructure. Furthermore, most of this data was highly siloed, making it difficult to find clean batch data from which to gain insights.

All of this resulted in their Overall Equipment Effectiveness (OEE) being substantially lower than what was advertised by the manufacturer, which meant that plant workers were constantly pushing for increased efficiency.



## Using the Aizon GxP AI Platform to Ingest, Connect and Clean all Meaningful Data While Remaining Compliant.

The initial step was to ingest all the siloed assembly operation data from five different data sources into the Aizon platform. Next, Aizon's award-winning platform featuring flexible contextual models was used to link and relate information from these disparate data sources, which included performance data (OEE), process data (Critical Process Parameters), ERP planning data, etc., while ensuring the data was stored in a compliant way in Aizon's cloud data lake.

This was followed by cleaning all the reliable past batch data, identifying 124 clean batches from 2500 analyzed. Then the Data Science team at Aizon performed a Principal Component Analysis (PCA) of around 280 variables for all the selected batches. The results of the PCA highlighted the most relevant variables for the best and worst batches, which were identified as having a meaningful contribution to explain variations in the process, developing the basis for the Aizon team to train an Artificial Intelligence model. This model was then developed using a Random Forest Regressor algorithm and was trained to successfully predict the performance of the line with just a few critical parameters.

Once the model was produced, it was imported and deployed into Aizon. The AI-powered, GxP-qualified platform was then configured to both alert the leading pharma company operators when the real OEE deviated from the prediction, and detect what kind of issue was

affecting the batch performance and where they should look into to fix it. This was possible thanks to the fact that Aizon's Data Science team found that several specific variables, such as the time of the day, had a great impact on both the performance of the batches, and the part of the assembly line that had a higher incidence rate for each situation. Aizon's smarter root cause analysis revealed that the incidents were caused by many factors, including the time of year, the humidity and temperature of the environment and the operator shift.



## 10% Increase in Overall Equipment Effectiveness Across the Whole Line

After completing the analysis, Aizon was able to identify the optimal size, duration and several other aspects of the operation, create an advanced predictive dashboard that would alert and guide the operators in real time and provide a smarter root cause analysis tool for a faster identification and solution of any potential issue during the assembly.

The data discovery and visualization process enabled by the Aizon platform allowed the site to improve line performance by providing insights into root causes, causality detection, parameter trending, and performance visualization.

All of which resulted in an impressive 10% increase in Overall Equipment Effectiveness (OEE) and the detection of the root cause of the inefficiencies previously established.



# Unlock the Full Potential of Smart Pharma Manufacturing with Aizon

Talk to our Sales Team: [sales@aizon.ai](mailto:sales@aizon.ai)

Learn More: [www.aizon.ai](http://www.aizon.ai)

## About Aizon

Aizon is a software provider that transforms manufacturing operations with the use of IoT, cloud, advanced analytics, artificial intelligence, and Pharma 4.0 technologies focused on optimizing pharmaceutical and biotech companies. The Aizon analytics platform seamlessly integrates unlimited sources of structured and unstructured data to deliver actionable insights across all manufacturing sites. Aizon offers an intuitive way to gain meaningful operational intelligence with data by enabling real-time visibility and predictive insights in a GxP compliant manner with end-to-end data integrity. Aizon is based in San Francisco, California and also has a European office in Barcelona, Spain.

The logo for Aizon, featuring the word "aizon" in a lowercase, blue, sans-serif font.

sales@aizon.ai  
+1 628-243-2513

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