

visplore

How engineers of a chemical manufacturing company diagnose and optimize batch processes
10-100x faster using Visplore



Challenge: batch data too complex for analysis in daily operation

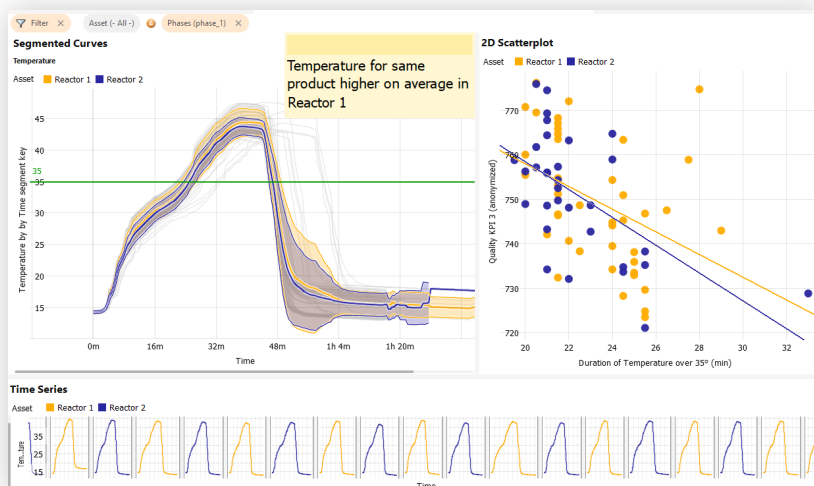
A global supplier of chemical products had largely digitalized data collection from their manufacturing, but the use of data by process- and maintenance engineers was still in its early stages. Diagnosing production issues involved manually searching data of single batches and inspecting them using Excel. The number of variables often exceeded the capacity for manual analysis.

For instance, explaining sudden increases in batch cycle times easily took hours to days. Consequently, root cause analysis and process optimization were often performed based on experience rather than data-driven insights. Moreover, trend analyses over longer periods or across reactors for optimization and maintenance purposes was hardly feasible.

Solution: self-service tools for deep batch analytics by engineers





Visplore enabled the process engineers to ingest months of process data from multiple reactors at once. Batches and phases were automatically segmented, enabling comparisons of many batch profiles (see image). KPIs per batch, such as average flow rates or durations of pressure drops, were easily computed and revealed trends indicating a need for cleaning or maintenance.

A particular step forward for the process engineers was the possibility of correlating batch profiles and KPIs per batch, such as quality or cycle time. This accelerates root-cause analysis by an automatic search for correlated process parameters. With a few clicks, the process engineers could graphically markup good batches and turn them into “golden” batch profiles for live monitoring.



Comparing batch profile curves across two reactors reveals different temperature levels for making the same product, indicating optimization potential.

Highlights

-  10x – 100x speedup of root-cause analysis by engineers
-  Maintenance need identified, resulting in 3% efficiency increase
-  6% energy saving potential found by comparing reactors
-  Live monitoring with golden batch profile per phase

Results: massive time savings and deep insights for process improvement

All process engineers emphasized massive time savings in their daily work with the batch data (minutes rather than days) and the value of insights for process improvement. For example, comparison of profile curves for 3 reactors showed longer cycle times for one reactor, revealing a maintenance need. After treatment, the efficiency of the reactor was 3% higher. In a joint effort with maintenance engineers, a comparison of temperature profiles across reactors revealed possible energy savings of up to 6%. Last but not least, dashboards for regular monitoring of profile curves (golden batch) were set up in Visplore and led to significantly shortened time-to-action during production.

In summary, the engineers feel empowered by Visplore, to combine their subject-matter expertise with data-driven insights in daily operation, making a significant step forward in digitalization.

“Our engineers like working with Visplore. Linking batch phases, trends and product quality data brings many improvements to our daily operation and maintenance.”

– Lead of Digitalization for Manufacturing, chemical manufacturing company

