ADVANCED ANALYTICS FOR MANUFACTURING

CUSTOMER CASE STUDY: QUALITY CONTROL & DIAGNOSTICS ANALYTICS

Advanced analytics refers to the application of statistics and other mathematical tools to business data in order to assess and improve practices. In manufacturing, operations managers can use advanced analytics to take a deep dive into historical process data, identify patterns and relationships among discrete process steps and inputs, and then optimize the factors that prove to have the greatest effect on yield.

ALTRAN

CONTEXT SETTING

Client

- A global manufacturer of specialist materials
- Product market size > 8$bn pa
- Potential for 20% growth into an emerging industry

Business Challenge

- In the final manufacturing trial phase, there is unexplainable variance in product hardness.

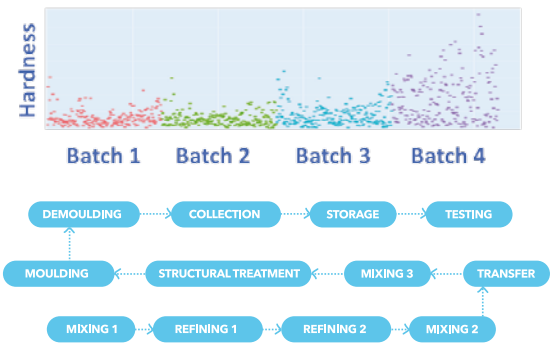
USING ANALYTICS BASED INSIGHTS TO TROUBLESHOOT PROBLEMS IN COMPLEX MANUFACTURING TRIAL PHASE

SOLUTION DETAILS

Our client had accumulated an enormous data set covering sensor data from all stages of their manufacturing process from product manufacture, curing, and storage, as well as many sets of sample data from different batches, and different parts of the process.

Tessella's data scientists worked closely with the client's scientists to frame hypotheses relating to where the problem may or may not be occurring from. Each hypothesis was structured into a clearly defined work package. **In total 30 packages were completed.** Hypotheses were selected such that results from each work package would usefully inform the design of new hypotheses. Each work package provided insights that enabled the client to rule out potential causes and narrow down the scope of future enquiry.

Working iteratively over a period of seven months, Tessella was able to identify two specific variables (out of a possible 300 variables) that were impacting over 80% of the observed variation in hardness. In addition to this we recognised that there was an issue in the methodology used by the client to test the hardness of products which was causing bias in the measurement. These deliverables enabled the customer to transition to the final phase of product development, preparing for mass production.



BENEFITS

Our client launched a new carbon-based product, and is now significantly increasing market share.

AGILE EXPLORATION OF PEOPLE, PROCESSES AND DATA

Our agile approach to client engagement was essential to success. Each new delivery of insight inspired our client's domain experts so they were confident in setting us new challenges, and sharing their knowledge, data and models with us.

Eventually our enquiry steered towards a mixing tank and by combining the outputs of tank simulation data with observed hardness we identified tank residence time to positively correlate with observed hardness.