Planning, optimization, and root-cause-analysis (RCA) are critical processes in ensuring efficient production and preventing recurring issues in manufacturing. However, these processes are often time-consuming and manual, making them prone to error and requiring domain experts to spend countless hours tracing back root causes of issues.

Despite the company having an abundance of data available from process development and manufacturing, the data was high dimensional in nature and made it challenging for humans to spot relationships. As such the data was hardly used to support these processes leading to inefficiencies.

Without an efficient and automated approach, the company’s engineering team was wasting valuable time tracing back root causes of issues and rarely finding the problem. This led to increased downtimes, scrap rates, and customer returns, affecting the company’s reputation and bottom line.
OVERVIEW CONT.

While machine learning and predictive approaches can help forecast when a part may be scrap, they cannot explain why and how to avoid it. The company needed a causal approach to identify the true root cause of an issue, so they turned to open-source causal discovery tools.

However, they faced additional challenges with open-source approaches that are not production ready and struggle with high-dimensional data, unobserved variables, and cannot leverage knowledge from process engineers.

SOLUTION

• The causaLens tool leveraged the manufacturing data to create a causal graph that described the full process line.
• Using decisionOS’ HGCD app engineers and process experts were empowered to embed their unique knowledge of the manufacturing line into the discovery process achieving results that merge the best of data-driven approaches and expert knowledge.
• The tool leverages this graph to automatically trace back the root causes of different scrap parts, batches of scrap parts or parts that were wrongly identified as not scrap.
• Results are shown through a user friendly decisionApp that can be easily customized to each process line workflow.

RESULTS & BENEFITS

• Industry experts estimate the cost of poor quality (COPQ) to be as high as 20% of revenue for manufacturers - even a 1% improvement will create enormous value.
• Automated fault analysis and root cause analysis can deliver a significant return on investment for our manufacturing clients - projected to be well over 10x their investment in causaLens when applied at scale.
• They empower the client to address the most significant cost of quality drivers
  Waste: Performance of unnecessary work or increased holding of stock
  Scrap: Defective product or material that cannot be repaired, used, or sold
  Rework or rectification: Correction of defective material or errors
  Repairs and servicing: Of both returned products and those in the field
  Warranty: Failed products that are replaced or services performed under a guarantee
  Complaints: All costs associated with handling and servicing customers’ complaints
  Returns: Handling and investigation of rejected or recalled products, including transport costs
• The flexibility of the platform allows our clients to quickly and easily adapt the solution for new process lines and manufacturing plants - further enhancing the financial return on their causaLens investment.