Sight Machine Drives Quality for Major Global Automotive Manufacturer

BACKGROUND

A major global automotive manufacturer had been experiencing unusually high failure rates of its highly engineered, aluminum engine blocks, resulting in increased scrap costs. This quality issue also impacted production schedules leading to increased labor costs for inspection and added production time.

THE SITUATION

Quality issues lead to higher costs and production delays

The production of this engine block starts with the injection of molten aluminum into a die-cast mold in one factory and continues through to two additional factories for machining and other computer numeric control (CNC) processes. During the die-cast process alone, over 50,000 data points are collected about the engine block including conditions about each process, such as injection speed, temperature, and pressure.

In the third factory, the engine block makes its way for final inspection and, if quality requirements are met, is then moved on to the assembly plant.

It was during this final inspection stage that the automaker started noticing unusually high levels of failure rates, often as high as 25%. Failed blocks could not be remanufactured and were ultimately discarded, resulting in an increase in both scrap and labor costs.

THE CHALLENGE

Collecting, organizing, and making sense out of data.

Although massive amounts of part, process, and machine data were produced during the manufacturing process of the engine block, there was no easy way to actually collect and organize all of the data. Dozens of different types of data were stored on multiple systems across three different plants.

The plant quality team spent four months manually collecting the necessary data and then matching parts data with process and machine data for a specific engine block, hoping to find the source of the quality problem. Traditional data capture, conditioning and analysis methods proved too costly and time consuming. In the end, the correct data wasn't collected to perform meaningful analysis and the root cause of the engine block failures was still unknown, even after months of analysis and several iterations of troubleshooting.

THE SOLUTION

Applying Root Cause Analysis to ALL of the data

Sight Machine was brought in to help address the quality challenge. Within thirty days, Sight Machine's manufacturing analytics platform had been fully implemented and was being used to collect, clean, and organize all of the data. Then, Sight Machine developed a digital representation of the complete engine block process using its purpose-built manufacturing data models and started using its Root Cause Analysis (RCA) function to identify the real source of the quality issue.

Sight Machine identified data cleanliness to be a persistent problem. For example, through Sight Machine's software, the manufacturer was able to detect the die-cast machine was generating inaccurate data which created downstream inaccuracies in both performance and reporting. Armed with this new insight, the plant updated the controls code and started monitoring the manufacturing process using clean, accurate data.

Sight Machine's platform also provides the automaker with a unified view of and deep insights across its entire manufacturing operations, no matter how the data is structured or where it is located. Additionally, the platform provides the manufacturer with push-button multivariate root cause analysis on more than sixty data fields relating to the part. The manufacturer is currently looking at several statistical correlations as possible root causes.