ADVANCED ANALYTICS STREAMLINES ROOT CAUSE ANALYSIS

Root cause analysis (RCA) is critically important to the ongoing success of any manufactured product. Detecting design defects, raw material problems, build issues, and quality control shortfalls as early as possible fosters continuous product improvement, increased reliability and performance, and allows a company to maintain a strong reputation for its product. RCA enables R&D personnel, purchasing agents, quality control inspectors, and the warranty team to find the fundamental cause of problems that may only become evident once products are in customers' hands. Managing the RCA process properly will reduce the number and cost for warranty claims, improve profitability for the entire organization, and increase customer satisfaction.

Fix the Cause, Not the Symptoms

A strategic RCA process identifies the fundamental causes of problems, not merely symptoms. Consider this hypothetical example: A manufacturer of cast metal parts experiences an excessive scrap rate. The proximate cause is determined to be contaminants in metal powders being fed into the casting machines; however, the root cause is a poor inspection process in the firm's purchasing and receiving operation. Correcting the problem requires improved documentation for the incoming raw materials inspection process and switching suppliers.

To be effective, RCA must be an ongoing, continuous process. Whenever problems are found, it's important to move quickly to define exactly what the problem is, gather as much relevant data as possible (including data from suppliers, the channel, and customers in many cases), separate symptoms from ultimate causes, and develop and test approaches to solve the problem. Finally, document and communicate the knowledge gained from each RCA process in order to reduce the time needed to correct similar problems that may arise in the future.

Maximize Business Impact: Focus on Critical Issues

In large manufacturing firms, there are typically thousands of components and finished goods that may suffer from quality problems of various types. Simply working on the most recently observed issues or those that are causing the most concern within the organization is not only impractical, it can also result in the most serious problems being ignored for too long. The "squeaky wheel" may not actually need grease; in fact, it may be the road surface or the tire that is creating the issue. For this reason, prioritizing issues systematically is essential.

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A properly prioritized root cause analysis process is essential in every manufacturing operation. It's never enough to know what the problems are; you must understand the causal relationships that create the problem so you can truly fix it once and for all.

Sam Mahalingam, CTO, Altair

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Machine learning can streamline RCA prioritization with strategically-selected algorithms to recognize patterns, clusters, and trends in huge amounts of warranty claims, quality control, shipping, purchasing, and other data sets automatically. For example, the analytics team can apply interactive decision trees to strategically segment datasets in seconds, seeing hidden groups and understanding common features. Further, machine learning tools can identify how many small issues may be contributing incrementally to create what appears to be a single large problem.

Altair® RapidMiner® for Root Cause Analysis
Leveraging more than 30 years of experience in manufacturing and machine learning, Altair RapidMiner provides an automated, repeatable, and sustainable solution that is easy to deploy and supports the complete data life cycle.

Altair enables manufacturing teams to access all the data they need, develop and use machine learning algorithms to detect and prioritize problems suitable for RCA, and visualize historical, current, and predicted future impacts of successful and unsuccessful RCA interventions.

Altair RapidMiner is a unified analytics and AI platform that connects data, reveals insights, and drives innovation. Key capabilities include:

Data Fabric: Access and unify data sources from across the organization, including warranty and service data from CRM, ERP, and other integral business systems. Ensure seamless integration and data consistency regardless of source, building a connected data estate for comprehensive analysis.

Artificial Intelligence: Leverage powerful artificial intelligence to enhance insights and decision making. Build reusable workflows in a code-optional interface, leveraging state of the art machine learning algorithms, and automating complex tasks. Collaborate on projects, and deploy in real time for immediate results.

AI Fabric: Leverage the latest generative AI and AI agents technology to build autonomous AI systems that can perform data analysis, comprehend and summarize documentation and free text, and take independent corrective action.

CLEAN DATA MAKES IT EASIER TO FIND CAUSED FOR REPEATED PROBLEMS

MACHINE LEARNING ALGORITHMS CAN SORT AND CATEGORIZE ISSUES AUTOMATICALLY

OBSERVE TRENDS IN REALTIME TO MOVE FROM REACTIVE TO PROACTIVE SOLUTIONS.

OPTIMIZE THE RCA PROCESS USING ALTAIR RAPIDMINER TO AUTOMATE DATA MINING, MODEL BUILDING, AND MODEL COMPARISON.