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A Scalable Analytics Platform for Enterprise Level Quality Management

Statistical Quality Control (SQC) plays a critical role in modern manufacturing processes by enabling early detection of process deviations, quantification of variability, and consistent delivery of products that meet customer specifications. To keep up with evolving customer demands and market dynamics, manufacturing networks grow in scale and complexity. Classic SQC workflows struggle to provide timely, consistent, and actionable insights across sites, materials, and suppliers etc. This creates a need for scalable digital platforms that embed rigorous statistical methods into everyday quality management.

This paper presents an enterprise level analytics platform designed to modernize SQC and process capability analysis across raw materials, intermediates, and finished products. This SQC platform integrates quality control data into a centralized Power BI environment, enabling standardized yet flexible analysis of process capability indices (Cpk), control charts, and statistical process control (SPC) rule violations. The platform supports granular slicing by plant, material, characteristic, and supplier, while maintaining a consistent analytical framework aligned with corporate quality metrics.

The system has been successfully applied to routine quality monitoring, cross site benchmarking, and identification of improvement opportunities, supporting both operational teams and leadership decision making. By modernizing SQC workflows and embedding advanced analytics into daily quality management, the presented SQC system demonstrates how scalable digital platforms can enhance process understanding, consistency, and continuous improvement in large scale manufacturing environments.

The next steps involve optimizing data flow to boost refresh rates, bringing the tool towards real-time operation to alert QC managers for process deviations.

Special/ Invited session

Classification

Both methodology and application

Keywords

SQC QM

Primary author: MARTIN, Manuel (Lubrizol)

Co-authors: LEO, Chiang; ZHENYU, Wang

Presenter: MARTIN, Manuel (Lubrizol)

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