How decision-making processes and production yield can be boosted by connecting a Quality Execution System to a Production Data Warehouse

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Abstract

The production and processing of rolled aluminum products is a complex process in which the quality of the final products depends on numerous influencing factors. Some of these influencing variables are known to quality and process experts, others can only be assumed or are unknown. However, in all processing steps there are vast amounts of collected measurement data that could provide important insights if they could only be easily accessed and related to other data.

The first part of this presentation shows how this distributed data is brought together in a single central Production Data Warehouse and how its full potential is harnessed via a hierarchical data model. The genealogy is also recorded in full, which means that a product can be identified at every step of the process chain and its family tree can be created. Since all product transformations (cutting, slitting, change of orientation, etc.) are also recorded for this purpose, any quality and process data can be displayed side by side in the Quality Execution System, correlated with each other or tracked beyond process steps. A companywide Production Data Warehouse thus opens up previously unimaginably efficient access and views of data.

The second part of the presentation therefore uses practical examples from the Quality Execution System to show the possibilities of analyzing the quality and process data and using them for supporting decision-making processes, e.g. for automatic product grading. Based on rule engines, which can contain both simple limit value and complex script rules, as well as trained machine learning modules, any complex decision-making processes can be implemented. With this support, quality experts are largely freed from time-consuming routine activities during product release and can concentrate on proactive measures to increase product yield. Finally, the possibility of creating complex data dashboards, reports and data analyzes yourself quickly and without in-depth expert knowledge significantly expands the circle of participating users and can truly be culture changing.