BIG DATA ANALYTICS IN ELECTRONICS MANUFACTURING

AUTOMATIC ROOT CAUSE ANALYSIS FOR THE TOMBSTONE EFFECT

Application for manufacturing industry and logistics
Offering for Software & IT and automation

SUMMARY

Definition of potential events that can cause a defect - development of a test scenario using a digital twin - discovery of correlations using data analytics.

PARTNERS

DUALIS, FUJI, Smart Electronic Factory

INITIAL SITUATION

Big data analytics in electronics manufacturing "Automatic root cause analysis for the tombstone effect"

How can I incorporate costly maintenance intervals for screen printers and placement machines into production in such a way that quality gain is maximized and disruption to production is minimized?

Fixing a tombstone defect costs around €6. In pre-series production, this can mean costs of around €30,000. If fixing the fault is not an option, as stipulated by the automotive industry for instance, the costs can increase tenfold.

Three most common defects:
Tombstone effect, solder bridge, inaccurate positioning, component missing.

PROJECT DESCRIPTION

Big data analytics is used to identify an event dependency from the data present in the MES. This is progressively enriched by other sensor data in order to further specify defect dependency. To test extreme conditions, a digital test twin is created, on which production conditions can be simulated. The aim is production-specific management of maintenance intervals that are quality-relevant so as to achieve higher quality and disruption-free production.

SOLUTION

• Prediction of maintenance intervals for enhanced quality (avoidance of defects)/predictive maintenance
• Reusability of the solution for other optimization steps
• Improved visualization of work steps for machine operators
• Better networking of information
• Efficiency

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INDUSTRIE 4.0 – FEATURES

• Potential to standardize correlations discovered and the associated algorithms.
• Transferability of solutions to other industries.
• Act as model for other medium-sized companies, etc.

STANDARDIZATION APPROACHES

The following standards are used: OPC-UA, PMML.