Case Study Standardization

Back to the Future 4.0 with SAP ME

MES standardization with SAP Manufacturing Execution promises future innovations

HARMAN Infotainment Division

HARMAN the premium global audio, visual, infotainment, and enterprise automation group develops, produces and markets a wide spectrum of high-quality audio and infotainment systems for leading automotive companies like BMW, Mercedes, VW, Audi, Toyota, among others. At the production location in Straubing, HARMAN employs 700 people and delivers 1.7 million units per year. In addition to Germany, the main locations are in the USA and China. Whereas previously the three regions were largely independent and could each maintain a 1:1 customer relationship, global automotive companies increasingly demand a global supplier as their trusted partner. The production control systems in each country, each of which was handled very differently, were more of a hindrance. Therefore, it was decided to evaluate a solution which could serve as a uniform standard.

Global companies with global customers require ever more digitally networked structures and harmonized processes. HARMAN is just such a company, being one of the leading providers of audio and infotainment solutions for automobiles. The implementation of a new product provided the occasion to replace the ageing self-developed production control system with a standard SAP-MES solution. Successfully!

Photo: HARMAN

A little melancholy resonates in the voice of Torsten Melchert, Team Lead Business Systems, HARMAN Infotainment Division, when he speaks of the MES that will be replaced, a system developed and cared for over many years in-house. But the effort of keeping the software up to date and developing additional innovations was simply too high. That's why the decision was made two years ago to switch to a standard MES solution using a best-practice approach which, driven by the manufacturer and the community, will automatically be leveraged for Industry 4.0 in the future. "Programming production software is simply not our core business," sums up Melchert.

TREBING + HIMSTEDT

Software harmonization

SAP Manufacturing Execution (SAP ME) provided a solid basis for harmonizing the necessary requirements. A high degree of ERP integration is absolutely necessary for central master data management. A requirement that also needed to be supported by ERP integration was the process whereby customers provide final product approval, only after which production may begin. Horizontal and vertical integration along the value added chain to the customer could only be implemented with a completely digital, smart solution, for which SAP ME already provides a secure foundation.

Support was also needed for the high degree of automation, combined with communication which runs almost 100 % in the background. For machine integration, SAP ME communicates with the „HARMAN Machine Interface (HMI)" using modern web services."

Pilot phase

The introduction of a new product was taken as an opportunity to define the production process using SAP ME and to implement it as a pilot. For this, an external partner with the relevant SAP ME expertise and best-practice experience was intentionally sought – and found with Trebing + Himstedt. The objective was not simply to implement existing processes in a new software solution, but rather to consciously identify and exploit areas for improvement. The MES process modeling workshop "SpeziMES", during which the processes were jointly specified with the SAP MES experts Trebing + Himstedt using the Business Process Model and Notation (BPMN), revealed important insights. Issues already appeared in the theoretical phase that had to be resolved then, and not later during implementation, when they could cause problems. „The fact that processes had to be defined precisely already for a pilot project was new to us and had not been strictly practiced until this point. For example, work plans now had to be defined in advance, and suddenly, we managed to do so." remembers Melchert.

85 % Standard

In this way, approximately 85 % of processes could be modeled in standard, and the standard already supported functions which had not been previously available, for example, restrictive routing of materials through the production process. Here, the advantages of a standard software quickly became obvious to everyone involved. The production process at HARMAN is roughly divided into two areas. In the first section, standard components are manufactured for all modules in a Surface Mounted Devices (SMD) assembly line. In the second area, semi-automated, customer-specific final assembly takes place in the so-called cell. Process-specific data, for example torque, test data like currents and voltages, temperature curves during soldering, and non-conformance failure data (NC) are continuously stored in SAP ME, largely automatically.
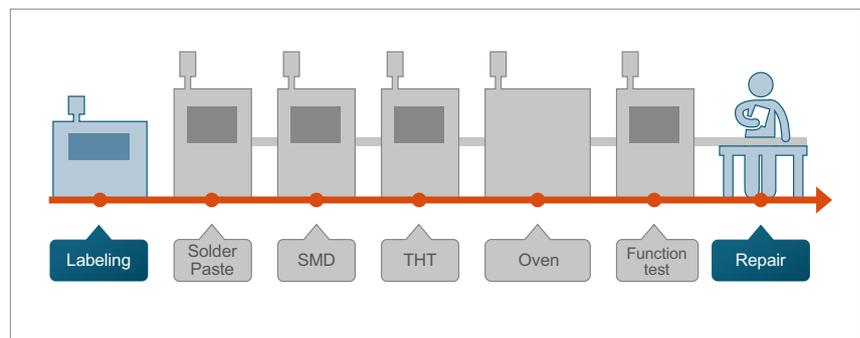
Data in the electronics production process are stored in SAP ME largely automatically

Photo: HARMAN

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Automatic electronic manufacturing and manual assembly must be linked in one digital process.

For the pilot, the entire production chain was modeled, from qualification to packaging. Implementation took place in close cooperation with the HARMAN developer team and involved a major transfer of expertise. Here, HARMAN assumed responsibility for the processes with strong HMI integration. Trebing + Himstedt assumed responsibility for the packaging department and customer-specific labeling. For example, it was investigated whether the step packaging is already allowed, which meant that all steps before run process conform without manual intervention.

In addition to data collection, SAP ME also takes over serialization and records the beginning and end of individual routing. Thanks to automated communication in the background, no changes were visible for the workers on the line, thus no additional training was required in the department. Planning, the repair area, and process engineering were trained in SAP ME and integrated into the planning process at an early stage in order to define what and how information needed to be recorded in SAP ME.

Next stage: Roll-out

After completing the pilot, it is clear that it was the right step. For the roll-out in the other regions, there will be close cooperation with the USA and China to optimize the standard software to meet their requirements. There is only one thing that Torsten Melchert would do differently today: He would have brought an external consultant like Trebing + Himstedt on board much earlier, someone who understands the system and the processes. Otherwise, the larger perspective is missing.

About Trebing + Himstedt

Trebing + Himstedt is a specialist for SAP MES solutions and a strategic partner for the area SAP manufacturing. We support corporations and small and medium-sized customers in different industries in implementing end-to-end processes from SAP ERP to individual machines. Our long years of experience on the shop floor and in automation combined with process know-how and expertise in business requirements make Trebing + Himstedt sought-after consultants for manufacturer-independent integration concepts. Trebing + Himstedt places particular emphasis on the core topics Plant Performance Management (KPIs), Variant Production and Traceability.As an SAP partner, Trebing + Himstedt implements and licenses the solutions of the SAP Manufacturing Suite: SAP Manufacturing Execution (SAP ME), SAP Manufacturing Integration and Intelligence (SAP MII), SAP OEE Management und SAP Plant Connectivity (SAP PCo).

Author

Dipl.-Wirtsch.-Ing. (FH) Ulf Kottig,
Senior Marketing Manager at the
SAP MES expert Trebing + Himstedt

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