ARROWHEAD TOOLS

PUTTING THE PRODUCTION SYSTEMS IN THE RIGHT CONTEXT

GOAL

Bosch production systems do not operate in a standalone environment but are linked to energy and ecological footprint goals together with societal objectives. The development is focused on creating interfaces between production systems and facility management systems.

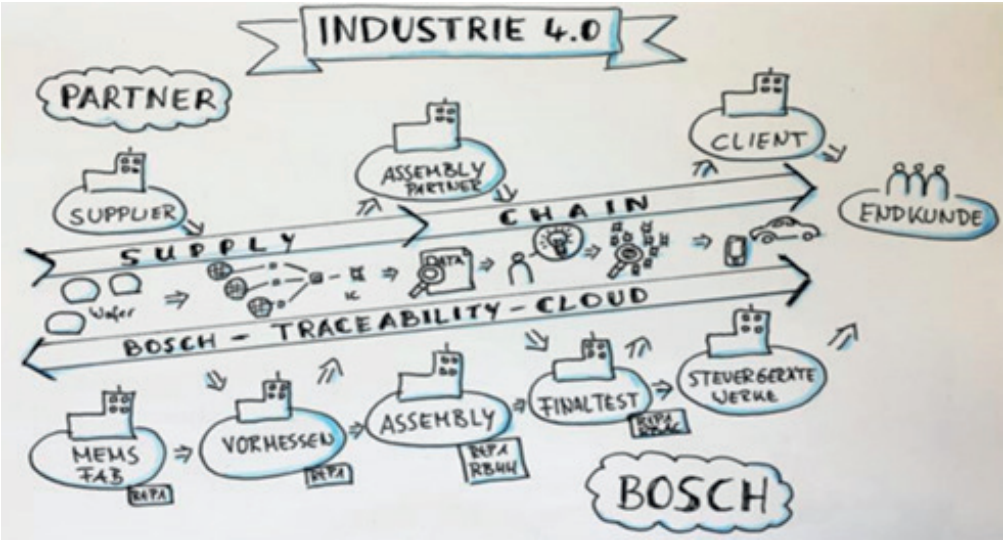
Challenge

Managing energy consumption in a smart way, to achieve cost goals, as well as societal goals, with respect to an optimised ecological footprint is becoming more important every day. Therefor Bosch will develop a solution to link the facility system data with the production system data. Solutions in terms of interfaces and connectivity have to be developed for equipment and facilities which are not able to provide such data today.

For such equipments, which do not have a suitable interface for external systems, we are unable to get certain information from them. Information that would be interesting is the state of the equipment, whether it is currently processing or not. That will enable Bosch to collect data necessary for the calculation of the equipments performance, which in turn allows us to compare those devices with each other. Secondly, Bosch would like to collect information about modules within the equipment itself, to be able to determine if a preventive maintenance should be performed.

Furthermore, Bosch will develop a smart maintenance system that it will allow linking information of the production system with equipment process data and context data as well as the warehouse data management system spare part information condition based and predictive maintenance according to individual user needs.

By gathering and combining all relevant information during production of a MEMS sensor, Bosch will get a new level of transparency of its production lines. For example can the now available traceability cloud can be used to link yield information of a group of products or individual devices to their production processes. By analysing the combined results of yield and production processes, Bosch can identify unexpected deviations of process parameters. An adaption of the relevant process parameters will support Bosch by improving yield, reducing cost and being competitive as a European semiconductor manufacturer on a global market. For this purpose, processes and technologies have to be developed that enable us to link divergent data across hierarchical levels. The following graphic symbolizes the complexity of the data in the MEMS value chain



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Engineering Phases

Results

Bosch seeks for transparency not only at production and at logistics of its products. Also, the efficient and sustainable use of resources is an important driver for more transparency based on connected energy and equipment data. Bosch works at the approach of combining online energy consumption data with equipment data by using IoT gateways and cloud solutions. Successful developed and implemented solutions will be transferred to other Bosch plants in Europe and Asia.

The results achieved by Bosch Reutlingen make it possible to benefit in different ways. By reducing energy costs in production areas through standardized use of the developed solution, production can be carried out with reduced and intelligently controlled energy requirements.

In the mid-term, the use of the smart maintenance system is intended to increase productivity through increased availability and capacity utilization of the production facilities. In the long term, the reduction of ramp-up costs through shorter product introduction times should be possible, thus enabling the introduction of new innovative products to the global semiconductor market.

The following graphic shows the Bosch plants, which are involved in the implementation of the application.

Partner Data

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