



Siemens AG

Key facts: MES

- Manufacturing execution systems (MES) in general address three execution levels:
- ▶ Business planning and logistics
 - ▶ Process control
 - ▶ Manufacturing operations

■ Integration of manufacturing execution system and requirements management

Fab automation

Siemens IT Solutions and Services has a long tradition in manufacturing execution systems (MES) for semiconductor industries.

Today Siemens has a large international team providing solutions and services worldwide, contributing to the shortest possible delivery times with a new approach to requirements engineering, based on a high level of partnership, cooperation built on trust, and transparency in software development. This article reports on a semiconductor customer whose collaboration with Siemens in the field of MES is well established. The MES solution covers all the production phases: front end, back end, and raw material production – epitaxy. The whole system consists of a kernel based on standard product, supplemented by many modules tailored to the customer’s needs. The MES includes interfaces to the automation and enterprise resource planning (ERP) levels.

Introduction of new technologies

The rapid introduction of new technologies within the semiconductor industry requires that manufacturing execution go hand in hand with the implementation of new production equipment. The effectiveness and flexibility of the production line steering are the keys to the whole software development process. The speed of new requirements implementation, together with the quality of the solution and robust service-oriented architecture (SOA), applicable in all production sites worldwide, has a crucial impact on production effectiveness and costs.

The demand for shortest possible delivery times requires a new way of requirement engineering, based on mutual cooperation, high level of partnership, trusty cooperation and complete transparency of the software development processes. The traditional “analyze – design – develop (eventually surprise)” method does not reflect the current needs of

fab automation and must be replaced by more agile approaches.

Requirements workflow reengineered

The new requirements engineering system ensures that every single requirement is first sufficiently defined by all involved persons on all levels. The completeness of the definition is managed by the requirements workflow, which ensures that none of the required roles can be skipped. The loops for requirement refinement, implemented in the workflow, prevent underspecified requirements.

After acceptance, the requirements can be transferred in the detail development tasks and then included in the respective project planning, configuration management, development, and testing systems. All these systems are integrated in the Microsoft .NET environment. The platform enables fully transparent continuous tracking, controlling, and online reporting of all open issues to all involved parties.

Effective requirements engineering; the process and domain know-how of the development team; professional services covering the complete software development lifecycle; robust, scalable architecture; and high flexibility – these are the attributes of the Siemens IT Solutions and Services solution, which is what brings manufacturing execution to the fingertips of the customer. ■

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