Requirements management for semiconductor design

“Building-in” the voice of the customer

Benefits

• Facilitates total quality improvement by providing your enterprise with a metrics-driven definition for determining whether the products you deliver comply with customer expectations
• Ensures marketplace success by making certain that your product lifecycle is rigorously and relentlessly driven by the requirements, needs and preferences of your target markets and customer base
• Accelerates time-to-market by allowing you to avoid unexpected problems that might otherwise arise late in your product lifecycle (e.g., providing product developers with immediate feedback when program constraints are in danger of being violated)
• Improves cross-discipline collaboration by providing all of the participants in your product lifecycle with a common language for understanding a program’s business objectives
• Facilitates lean design by providing product developers with design for testability and manufacturability capabilities

Summary

Semiconductor products are becoming increasingly complex, requiring tighter integration of the multiple engineering disciplines, including analog, digital, embedded software and packaging teams. Teamcenter® software’s requirements management capabilities provide your enterprise with a systematic and repeatable solution for semiconductor solution design, as well as for engineering, managing and leveraging product requirements. By allowing you to understand each design in terms of its evolving customer requirements and design complexity, Teamcenter enables you to build the voice of the customer directly into your product lifecycle – thereby facilitating requirements-driven design, design for testability, design for manufacturability and other highly valued business initiatives.

Business issues

Traditionally, companies used many diverse sources of information to capture and manage their product requirements, including spreadsheets, custom-built databases, linked documents and document tracing tools. Unfortunately, these approaches usually result in isolated requirements that end up in documents that never get read or databases that cannot be linked or applications systems that have nothing to do with the product lifecycle.

Teamcenter changes the way you manage product requirements by enabling you to capture and organize multiple types of product requirements.
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Benefits continued

- Facilitates commonization and re-use by allowing requirements to be copied and replicated across platforms, programs and projects.

Features

- Ability to capture, manage and leverage disparate product requirements in the same single PLM environment that you can use to manage your product definitions and product configurations.
- Document import/export mechanism for requirements capture and generation using standard Microsoft Word import/export.
- Automatic document parsing and requirements identification.
- Ability to define program-related constraints, including cost and scheduling controls, as well as compliance-related metrics that pertain to performance, maintainability, reliability, manufacturability and usability.
- Ability to connect product requirements and program constraints to fine-grain design elements created by other Teamcenter members.
- Integration with project management, enabling you to consider requirements in the context of the project plan and giving you visibility to their impact on resourcing, cost and schedules.
- Familiar user interface that looks and acts like Windows Explorer/Outlook.

Teamcenter enables you to capture and organize your product requirements in a shared environment that allows team members to collect, view and edit requirements from geographically dispersed and widely diverse sources using interfaces they already employ. Teamcenter provides "live" Microsoft Office integrations that support viewing/editing through Microsoft Word, Excel and Visio – essentially elevating standalone Office applications to multi-user applications connected to an enterprise application. The Teamcenter environment ensures that the entitled users in your enterprise are working from the same set of requirements and product assumptions – while protecting the integrity of your requirements by "locking out" anyone who tries to access or modify a requirement that is already being accessed by somebody else.

The Teamcenter ability to digitally connect your requirements, program constraints and design elements is especially crucial when your enterprise is making time-critical design decisions. Because requirements are digitally connected to product structures, Teamcenter allows you to incorporate product requirements directly into the workflow-driven processes that drive your engineering, procurement, program execution management, change management, total quality and service/support initiatives.

Use case scenarios

Use case scenarios can apply to numerous use case scenarios, including:

- Multiple engineering standards
- Design for testability and manufacturability


Features continued

- Short learning curves facilitated by Microsoft Office integrations that support “live” viewing/editing through Microsoft Excel, Word and Visio
- Multi-user group environment that enables users to view and work on requirements concurrently in a controlled way
- Versioning/variant feature that supports a complete requirements-based configuration management capability, as well as change routing and approval
- “Lock-out” protections that prohibit users from accessing or modifying a given requirement when that requirement is already being accessed by someone else

Support for multiple commercial standards Teamcenter provides support for all major commercial, international, and government systems engineering processes. In the non-government arena the three typical standards are:
- EIA 632 (processes for engineering a system)
- ISO 15288 (system lifecycle processes) and ancillary standards (ISO/IEC 19760)

In the U.S. government arena, the main standard is MIL-STD-499B for DOD programs. While this was never formally issued, it is used as the basis for many other standards, including IEEE-1220.

The Teamcenter requirements management solution also supports CMMI, including both the staged and continuous representations.

Design for testability and manufacturability Many semiconductor companies have invested millions of dollars implementing quality initiatives only to discover they have “hit the wall” at 4-Sigma – the point at which the cost of quality improvement exceeds the benefit. This shortfall is largely attributable to the fact that quality initiatives cannot reach their full potential by only improving downstream lifecycle processes. Teamcenter enables you to connect testing and manufacturing quality goals and standards into your design and development cycle, thereby facilitating upstream design for testability and manufacturability initiatives. Industry analysts estimate that a 2-Sigma improvement reduces the cost of quality by as much as 25 percent of product sales. With these kinds of results, Teamcenter brings the value of connected requirements directly to your bottom line.