Deliver the right products

SIEMENS

White Paper

Getting started with collaborative requirements management to better meet the needs of customers

Best-in-class companies distinguish themselves from the competition by closely aligning the products they deliver with customer-defined needs. This white paper describes a best-practice collaborative requirement management solution that enables you to develop and deliver the right products to market – products that meets the needs of your customers, as well as your company's revenue, performance, quality and compliance-related objectives.

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Overview

Successful new product development starts by understanding what your customers want and need. Industry research repeatedly indicates that best-in-class companies are successful because they have better insight into customer needs than their competitive rivals.

But gaining this insight is not easy. Today's global markets are defined by a plethora of ever-changing market demands, customer profiles, regulatory requirements and consumer preferences. In addition, requirements are often disconnected from actual product deliverables, making it difficult to know how they are satisfied by design, engineering and manufacturing. Without being able to connect customer needs to the design, engineering and manufacturing systems that execute these requirements, decision makers not really able to make the right product decisions.

What companies need is a systematic and repeatable solution they can leverage to ensure that they deliver the rights products to market. This solution should enable you to:

• Deliver products that meet customer needs

• Achieve your revenue, performance and quality targets

• Manage risk, recalls and compliance

• Minimize time and cost of requirements management

A best-practice collaborative requirements management solution addresses these issues by providing a single source of clearly defined customer needs that you can leverage to facilitate better product planning and provide visibility into changing requirements. More specifically, a collaborative requirements management solution should provide robust capabilities to:

• Capture and manage customer needs

• Connect all product lifecycle stakeholders

• Manage changing requirements

• Trace and re-use requirements
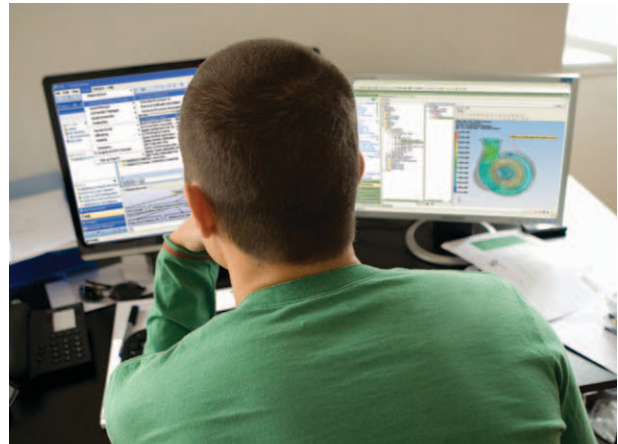
Business challenges

Companies use a variety of different methods to capture and maintain the customer needs, market requirements, industry standards and compliance-related regulations that apply to new product development – including spreadsheets, custom-built databases and documents that can be parsed by document-oriented tracing tools. These approaches typically result in isolated requirements that are retained across multiple computer systems in diverse documents that nobody reads, or behind user interfaces that require lengthy learning curves, or inside databases that don't reflect a product-related context.

At best, this profusion of requirements sources results in a disconnected requirements process that inhibits product teams from properly aligning their product decisions with the customer needs that ultimately determine market success.

Just as importantly, a disconnected requirements process fails to deliver these requirements to key stakeholders within an overarching new product development process. Successful new product development requires both upstream and down-stream participants in the product lifecycle to understand what the customer needs. When requirements management is independent from your portfolio planning, project management, engineering management and production planning processes, decision makers at these levels are unable to make informed product decisions. This lack of visibility

typically results in unnecessary rework, missed delivery schedules, added cost or even worse, a finished product that fails to sell because it does not meet your customers' needs.

Problems also rise when change is not properly communicated during the course of the product lifecycle. Requirements frequently change as new marketing opportunities arise, new regulations materialize or consumer preferences shift. Similarly, engineering and manufacturing issues can become apparent as the product lifecycle evolves. In these instances, a disconnected requirements process makes it difficult for product stakeholders to see and assess the impact of proposed changes.

Compliance management is also hindered by the lack of connection between requirements and product development. The final product's deliverables can be difficult to track back to their original requirements and proof of compliance can be arduous and time-consuming to document.

Just as importantly, this disconnect inhibits product managers from re-using design intent and product knowledge from one project to another. Significant time and cost savings can be realized in new and future projects if product managers are able to understand what design features/changes were implemented to comply with a given requirement and then use these lessons again without the need to "reinvent the wheel."

Best-practice solution

In order to make the right product decisions, companies need a best-practice collaborative requirements management solution that enables them to address the following business issues.

Benefits of a best-practice collaborative requirements management solution

Business issue	Benefits
Deliver products that meet customer needs	In today's highly competitive global economy, companies cannot expect to be financially successful unless their products align with the requirements, preferences and expectations of their customers. To ensure that the products you deliver are aligned with current customer needs, all of the stakeholders in your new product initiatives need to understand how their decisions will impact these requirements.
Achieve revenue, quality and performance targets	While meeting customer needs is essential to product success, your finished products also must be able to meet your company's strategic business objectives. Typically, these objectives include revenue, cost, profit, quality and performance targets that vary from one new product introduction to the next. Program stakeholders must be able to repeatedly consider the impact of their decisions on these objectives (just like they must be able to understand how their decisions influence customer needs). Product success depends on your ability to optimally satisfy a mix of both customer needs and program-related targets.
Manage risks, recalls and compliance	Landmark research indicates that the failure to understand customer needs results in runaway new product development costs 70 percent of the time. Just as importantly, it can result in product recalls and noncompliance issues that also result in costly consequences. What is needed then is a requirements management solution that can manage these risks and influence product decisions as early as possible (for example, while product development is actually happening rather than later in the product lifecycle where change becomes much more expensive).
Minimize cost and time of requirements management	Requirements management is time consuming and costly when customer needs and program targets are spread across too many applications and information silos. In these instances, manual synchronization is required to stay up-to-date. Companies need an integrated solution for requirements management that facilitates faster planning, immediate corrective action and total impact visibility.

To deliver these kinds of business benefits, your company needs a best practice collaborative requirements management solution that facilitates both information integration and process collaboration. In other words, you need a collaborative requirements management solution that enables you to:

Capture and manage customer needs The solution should enable you to consolidate requirements from all of the isolated applications that currently define your customer needs and program targets, regardless of how these requirements were initially created. Once these requirements have been captured, they should be validated, finalized and released as a set of baseline requirements that can be managed and made seamlessly available to your entire enterprise through a single accessible web source.

Connect stakeholders Every stakeholder in your new product development processes should have visibility to your consolidated requirements and be able to interact with each other by sharing their product and process knowledge, communicating product decisions and revealing design intent. The key here is to connect the participants in your portfolio planning, project management, engineering and manufacturing processes so that they understand the impact of their product decisions.

Manage changing requirements A best practice solution should provide built-in versatility to enable you to establish a closed loop change process where changes are automatically exchanged among product managers, concept designers, engineering and manufacturing teams when new requirements arise, established requirements change or program targets are in danger of being violated. As changes take place, the baseline requirements should be updated to stay current and credible as a source for decision-making, as well as a source of history for future audits.

Trace and re-use requirements Traceability should be in place to relate each product requirement to its associated product information and track these relationships across the entire product lifecycle. This type of traceability is especially valuable since it enables product managers to prove requirements compliance, as well as minimize warranty costs and avoid product recall. Just as importantly, traceability should be powerful enough to tie given requirements to specific development insights. By tracking baseline requirements throughout the product lifecycle to see how they evolved, product managers can evaluate delivered products to understand what requirements are driving a product and how these requirements are satisfied. Traceability enables product teams to re-use requirements and variations/derivatives for future product development, speeding the process of creating a new requirements baseline.

Key capabilities

While the preceding section is helpful in conceptualizing a best-practice collaborative requirements management solution, the following table describes detailed capabilities that this kind of solution should provide.

Key capabilities for a collaborative requirements management solution

Functionality	Required capabilities
Capture and manage business needs	A collaborative requirements management solution must be able to establish a single source of customer requirements for your enterprise. The solution should be able to capture and manage all of your requirements, regardless how they were created. To facilitate this, the solution should enable you to: • Capture customer needs from diverse applications, authoring systems and databases, including Microsoft Word and Excel • Create and edit new requirements through the use of familiar Microsoft Office tools, thereby maximizing user productivity • Release the correct set of baseline requirements as input to product development and manufacturing • Track requirements in an organized structure back to their original source and maintain this traceability as the product evolves across its entire lifecycle • Decompose requirements to the fine-grain design elements in your product configurations and their related definitions, thereby enabling your product teams to communicate planning and design intent
Connect stakeholders	All of the people who participate in your product lifecycle must have visibility to the customer needs and program targets that comprise the product's requirements. Entitled users should be able to access these requirements through standard internet browsers. Since the solution connects requirements to their related design elements, product configurations and product definitions, you are able to integrate your planning, engineering and manufacturing processes through requirements visibility. This connection also enables you to: • See how downstream product decisions relate to customer needs • Align downstream decisions with upfront planning and design intent • Keep baseline requirements up-do-date and credible • Communicate product decisions and share product and process knowledge across all lifecycle disciplines

Functionality	Required capabilities
Manage changing requirements	Your collaborative requirements management solution should be able to implement best practices consistent with established conventions for change planning (conducting what-if analysis), change execution and change verification and communication. To facilitate this, your solution must be able to provide two-way change traceability that can be automated to send changing requirements to your engineering and manufacturing teams and changing engineering/manufacturing impacts to your product managers. These capabilities are essential for establishing a closed-loop change process that enables your enterprise to: • Quickly respond to changing customer, market and regulatory requirements • Communicate change for immediate response • Assess the impact and manage the cost of change • Turn late changes into a competitive advantage
Trace and re-use requirements	Versatile traceability enables your collaborative requirements management solution to facilitate requirements compliance and improve your company's re-use initiatives. With respect to requirements compliance, traceability enables you to relate requirements to specific product configurations and trace this design impact through the product lifecycle to prove actual compliance. With respect to re-use, traceability enables you to re-use requirements and all related product information from one program to the next. For example, you can understand the design approach that one product team took to satisfy requirements for a particular product. Once that is known, other product teams that face similar requirements can re-use this design insight much earlier in the product development process. You can also determine the specific configuration that was used to satisfy a requirement and simply create and re-use variations of that configuration in your next product. From an overall perspective then, you can leverage requirement traceability to: • Verify actual results against customer needs • Prove regulatory compliance and avoid warranty impact and recall issues • Make better product decisions by gaining insight from earlier programs • Streamline product planning by re-using requirements and their related information • Improve development decision-making by linking the requirements baseline with product structure, parts and processes

Next steps

Siemens PLM Software has extensive experience helping companies like yours deliver the right products. With more than 5 million users worldwide, Siemens PLM Software's Teamcenter® suite provides a proven collaborative requirements management solution that enables you to align your product decisions with the needs of your customers.

Contact us today – we can help you and your new product introduction teams deliver the products you need to meet your strategic business goals.

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Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with 6.7 million licensed seats and more than 69,500 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies to deliver open solutions that help them turn more ideas into successful products. For more information on Siemens PLM Software products and services, visit *www.siemens.com/plm*.

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