

# **RuleStream Standards Based Engineering (SBE) for Requirements Management**

CIMdata Commentary

## **Common Requirements Challenges**

All organizations produce myriad information about their products. However, transforming that information into accessible knowledge is difficult. In product development, understanding how a product is intended to function and how to apply that understanding to create an appropriate product is knowledge; and capturing, managing, and reusing that knowledge effectively is a competitive advantage. The history of the design process is embodied in CAD models. However, this history doesn't convey all of the knowledge about how or why the product was created in a specific way or what requirements such as specifications, standards or regulations drove that development.

Requirements play a critical role in product development today. The reach of requirements extends from conceptual ideas that are based on customer needs to the techniques used to create a product on the shop floor. A hierarchy of interrelated requirements, or requirements that define a next level of requirements, exists and must be maintained and managed. It is critical to the product development process that companies know what requirements drive the design, assure that those requirements have actually been incorporated into the design, and understand what impact design changes have on requirements and vice versa. To do this successfully, requirements and their relationships to the design and to each other must be managed and made available to all participants in the product development who need to make decisions based upon them.

## **RuleStream's Standards Based Approach to Requirements**

RuleStream's Standards Based Engineering solution, when integrated into a PLM environment, provides an infrastructure that extends existing systems of record (e.g., PLM data managers) for storing requirements and facilitating their use throughout the product design process. RuleStream's standards-based requirements management approach captures, manages and reuses corporate intellectual property, best practices and lessons learned to help automate complex engineering processes.

RuleStream's database of requirements forms a repository of best practices, while offering a detailed representation of individual requirements. A feedback loop solution ensures that requirements are continuously refined, updated, and applied throughout the product development process and that a manufacturer's standards are adhered to in the intended manner.

By capturing standards as engineers execute the product development process, they are automatically made accessible to be applied to new designs. A validation process creates a comprehensive series of compliance/ and assessment reports to ensure designs are in concert with best practices and defined requirements.

Generating a requirements model based on a database of best practices allows requirements to be effectively linked to other related requirements and data models. RuleStream allows subject matter experts to create and maintain a database of generic

requirements. The system can automatically assess requirements within the context of a specific program based on data from a PLM system through trace links that are defined by designers.

Using RuleStream's SBE solution, manufacturers can capture the knowledge that is an inherent part of all design activities in order to help them:

- Capture and reuse the organization's intellectual property or knowledge from previous design efforts
- Assure that product requirements are fulfilled
- Reduce design and manufacturing errors
- Improve product quality
- Ensure adherence to internal, industry and regulatory standards

### **RuleStream Value for Requirements Management**

RuleStream's SBE solution provides a bridge between past product development efforts and future designs. By capturing intellectual value from product development, RuleStream provides that knowledge to product designers in a form that can be adapted and reused.

For program-driven manufacturers, RuleStream ensures that design work is done in compliance with requirements and corporate standards, offering early warning detection when standards and requirements are not met, even earlier than product simulation. RuleStream's approach facilitates Six Sigma and Lean Manufacturing methodologies across all engineering disciplines.

Program startup times are reduced because domain experts can define and maintain a single super-set of generic requirements, including rules about the requirements and their applicability. These rules and requirements can be automatically applied to any specific new program and automatically compute applicability based on program and context data.

RuleStream manages requirement assessment and compliance through a bidirectional link to a company's existing PLM system, providing a centralized, uniform way to manage requirements validation throughout and across programs.

A number of benefits derive from the use of a solution like RuleStream's:

- Designers, systems engineers, and others involved in product development have a tool they can use to manage the complex requirements and constraints required by customers, regulators, and others.
- The solution allows rules to be developed so that requirements are applied to designs in valid ways.
- New designs can be accomplished more quickly, since designers can work faster without having to worry that they are violating customer and other requirements.
- Intellectual property is captured and preserved so that companies have a base of knowledge that supports rapid development and allows time for innovation.
- Product quality is improved by design and quality stops in manufacturing are avoided.

It is CIMdata's opinion that RuleStream's SBE solution for requirements management, when combined with a robust PLM solution, enhances, complements, and extends the overall product development process beyond the capabilities of current PLM solutions. This synergistic approach provides a strong platform upon which companies can manage and assure the use of product requirements, thus helping streamline product development efforts.

### **About CIMdata**

CIMdata, an independent worldwide firm, provides strategic consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. Visit <http://www.CIMdata.com> for more information.