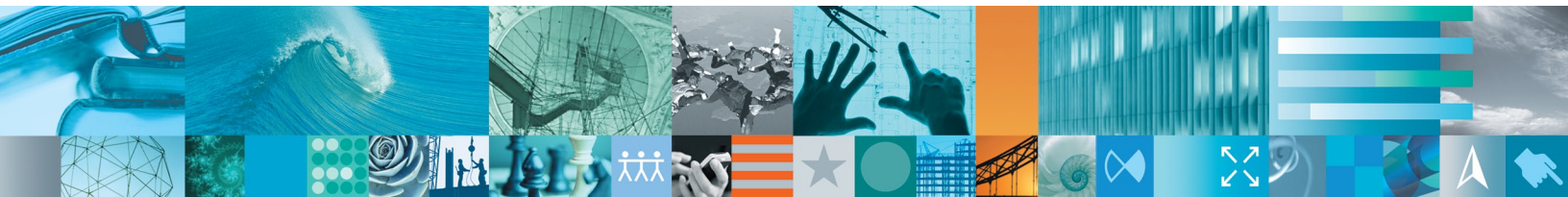


## Requirements engineering solutions for developing smarter products.



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### Highlights

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- ***Captures and prioritizes product requirements to help drive development decisions***
- ***Manages requirements throughout the development lifecycle to support traceability***
- ***Encourages collaboration from stakeholders***
- ***Maintains an audit history and preserves change records, helping support compliance with regulations and contractual agreements***
- ***Helps you respond to changes with robust change management capabilities***

Products are becoming smarter. There are now computer chips in everything from running shoes to cars to coffee makers. And as products become more interconnected, instrumented and intelligent, the marketplace becomes even more volatile and competitive.

That's why it's more important than ever to ensure that you're managing your development process properly. You need to make sure that if you invest in developing a complex product, it will pay off. Product success hinges primarily on how well the product addresses the needs of the marketplace. So capturing and prioritizing these requirements is essential. Adding to these challenges are growing numbers of regulatory compliance requirements. Managing them can be difficult, and there can be steep financial penalties for lack of compliance.

In the past, companies maintained separate sets of requirements for software, electrical or mechanical components, but this approach made it difficult to ensure that all of these components would work together effectively when the product was assembled. Companies developing complex product offerings need to make sure that all components work together to deliver the desired result. Requirements must drive development decisions throughout the product development lifecycle, so that when changes are made to the product design during development, they can be checked against existing requirements to ensure that all requirements are still being met. And product testing must be done against specified requirements to make sure you're not just delivering a system that works, but also the system that you set out to build.

*“The Best-in-Class are able to manage the challenges of systems engineering by providing for a multidisciplinary approach, improving collaboration across disciplines, testing the performance of the entire system earlier in development stages through simulation, and formally tracking design requirements.”\**

—Aberdeen Group

### **Managing requirements throughout design, development and testing**

IBM offers a requirements engineering solution that enables you to manage requirements throughout the entire design, development and testing lifecycle, helping to ensure you have end-to-end traceability. From ideas, requirements and feature definitions, product and system specifications and models to mechanical, electric and embedded software implementation, testing and maintenance, the IBM solution can help you deliver a high-quality system that meets your customers' needs.

The solution is built around IBM Rational® DOORS® software, a leading requirements management application that can help you reduce costs, increase efficiency and improve quality by enabling you to optimize requirements communication, collaboration and verification—throughout your organization and across your supply chain.

Rational DOORS software also integrates with other IBM products, giving you access to a broad range of features and capabilities. It integrates with:

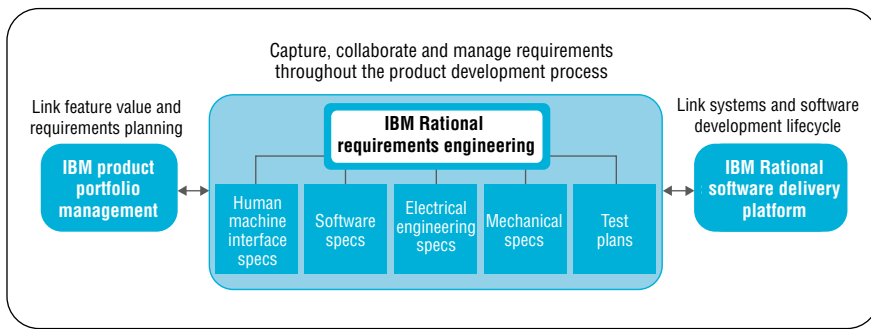
- **IBM Rational Focal Point™ software**, for capturing and evaluating ideas for new products or product features, and then feeding the chosen features into Rational DOORS software.
- **IBM Rational Change software**, which enables you to implement a customizable enterprise-wide change control process.
- **IBM Rational Synergy software**, for tracking requirements through to software implementation.
- **IBM Rational Quality Manager software**, which enables you to link your requirements with your test plans.
- **IBM Rational Rhapsody® software**, which provides modeling and simulation capabilities that enable you to visualize requirements scenarios and trace requirements back to designs.
- **IBM Rational Requirements Composer software**, for capturing requirements gathered via interviews and workshops with your customers or partners.

Plus, Rational DOORS software integrates with product development management solutions—such as PTC Windchill (using the Stoneworks Ambassador product), Dassault Systèmes ENOVIA and Siemens

Teamcenter technologies. It also integrates with BigLever Software Gears technology to provide requirements management capabilities for similar products in a product line, and with The MathWorks Simulink solution for model-based design and simulation of dynamic systems. These integrations help you use requirements to drive decisions throughout the design, development and quality assurance phases.

### **Uniting stakeholders through greater collaboration**

For your requirements to be truly valuable, you need to have input from all of the relevant stakeholders. Rational DOORS software helps you manage all of your requirements in a central repository, so all of your stakeholders have access to the most up-to-date version of the requirements. Plus, your teams can collaborate through informal discussions and lock document sections for editing, allowing multiple users to work in the same document without creating conflicts. Role-based access controls enable you to govern who can view and edit your company's projects, documents, requirements and attributes, so you can make sure only authorized users are making changes.



Using the Rational requirements engineering solution, you can link all your engineering disciplines to product requirements and business objectives.

### Using requirements to drive the development process with enhanced traceability

Your product development process needs to be driven by your requirements—requirements can't be an afterthought. Rational DOORS software enables you to trace requirements throughout the development process, so you can make sure that requirements are properly implemented. The application maintains an audit history and can preserve all changes. So you can monitor and report on overlooked requirements, over-engineering or "gold plating," and requirements creep—keeping everyone's focus on achieving the original project objectives. These reports help demonstrate compliance with regulations and standards, and conformance to contractual agreements.

### Responding to changes with robust change management capabilities

Product development is rarely a predictable process. The marketplace changes, customer needs change. That's why it's essential to be able to respond to these changes quickly and easily. Using Rational DOORS software, you can establish traceability links between requirements, models and test plans. You can then create dynamic views that help you to evaluate what will be affected by a requirement, model or test case change—before the change is made.

Plus, when an object is changed, related objects are flagged, so you can immediately see that they may be impacted by that change. You can then take the appropriate action to ensure that changes don't have unexpected and costly results. The integration with Rational change management software also enables automated notification, routing and approval processes for requirements change requests—helping ensure project control and accountability.

## Case study: Delphi unites global teams for more-cost-effective reuse

### Challenge

Delphi, a leading supplier of mobile electronics and transportation systems, needed to improve communication among globally diverse development teams so they could be more productive when working on parallel releases with shared requirements. The company sought an automated requirements management solution that could promote cost savings through component reuse.

### Solution

Delphi selected Rational DOORS software after running a year-long comparison with a third-party tool. Rational DOORS software helps give the company's global teams unprecedented accessibility to requirements, making it easier to share requirements for parallel development. They can also import requirements from the repository for reuse in new projects.

### Key benefits

- Improved ability to meet customer requirements
- More accurate management of costs
- Enhanced development team communication, resulting in faster time to market



## Why IBM?

IBM provides an integrated solution that enables you to manage requirements throughout the entire design, development and testing lifecycle, helping to ensure you have end-to-end traceability. Unlike “point solutions,” the solution based around IBM Rational DOORS software is designed to help manage complexity, address compliance with regulations and standards, scale to support large and complex projects, and enhance collaboration across engineering disciplines and with all stakeholders. The application offers capabilities that can help you reduce development costs, increase productivity, reduce time to market and improve product quality. Keep up with the rapidly evolving marketplace and take advantage of an integrated solution that can help you develop smarter products.

## For more information

To learn more about how IBM can help you develop the right requirements engineering solution for your company, contact your IBM representative or IBM Business Partner, or visit:

[ibm.com/software/applications/plm](http://ibm.com/software/applications/plm)

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\* Michelle Boucher and David Houlihan, *System Design: New Product Development for Mechatronics*, Aberdeen Group, January 2008.