Requirements engineering
To support your business objectives

Rational. software

IBM

Seven steps to achieving better requirements engineering in your organization.

Often perceived as a discipline concerned only with analyzing and documenting requirements, requirements engineering is an important part of systems engineering.

It's a multidisciplinary activity that affects and broadens the product development process, and it's essential if your organization deals with:

1. Complex products.
2. Globally distributed teams.
3. Conformance with standards and regulations.
4. Accelerated development cycles that provide little time to fix errors.
5. Experienced staff who are leaving or retiring and taking their experience with them.
6. Shrinking development budgets and diminishing resources.
7. Constantly changing customer and marketplace requirements.

Companies that successfully introduce a new requirements-engineering process not only change their process and technology but also change their thinking. While improving your requirements management and analysis practices, this step-by-step guide can help you accelerate change and process acceptance across your organization.

1 Assess your existing requirements-engineering process

Before introducing a new process to your staff, analyze your practices to determine what you are doing well and what you really need to change. A process maturity model such as Capability Maturity Model Integration (CMMI) or Software Process Improvement and Capability dEtermination (SPICE) can help you evaluate your existing process and serve as a framework for improvement.

2 Define a simple requirements-engineering process and choose a tool to support it

Integrating new practices incrementally and choosing a robust and reliable tool to automate and support those practices can improve your requirements-engineering process. Effective requirements definition and management practices include:

1. Elicit stakeholder needs and ensure that their requirements are met.
2. Link customer needs and user requirements to business strategies and processes.
3. Manage requirements and changes systematically and consistently.
4. Create traceability between user requirements and technical requirements.
5. Represent requirements in the form of use cases.
6. Link testing with user requirements to validate your requirements and identify gaps.
7. Use the appropriate tool to support your requirements-engineering process and ensure traceability across multiple levels of requirements.

3 Pilot your new requirements-engineering process on a small-scale project

To achieve cultural change and avoid unnecessary project risks, new practices should be introduced gradually and blended with existing methods. Select a motivated and talented team to implement the new process, and start with a small-scale pilot project that can demonstrate benefits without interrupting your product development process.

4 Adapt the new requirements-engineering process and tool to the needs of your organization

Your team is more likely to accept changes if it feels that its experiences are respected. During a facilitated workshop, team members should reflect upon the existing process and discuss the benefits of the new approach. When they realize that the new process and tool can be adapted to their needs—and that the solution can support them in their work and help them become more effective—they'll be more willing to integrate the approach in their daily routines.

5 Create awareness among peers, leaders and senior management

After completing your pilot project, you need to gather evidence of the benefits gained from your new process. This information can be used to promote best practices, persuade product development teams to adopt the process and secure the support of senior management. Communicate these practices through face-to-face discussions, staff meetings and newsletters so that everyone in the organization is informed.

6 Promote the systematic use of the new requirements-engineering process and tool

After you've defined and standardized your requirements-engineering process, you need to sustain improvements and allow the new process to evolve and grow within your organization. Promote best practices among your team members. Motivate, educate, train and communicate with them. If your staff is prepared to start working with the new tool and process, staff members are more likely to be effective with them.

7 Integrate the new requirements-engineering process with the product development lifecycle

Although requirements engineering deals with needs analysis and requirements management, it is a dynamic process that affects product development as a whole. In most cases, growth strategies can only be effective if requirements engineering is integrated into the product development process. So to fully realize the benefits of the approach, different divisions and cross-functional teams (for example, marketing, sales, quality assurance, manufacturing, legal) should integrate the new practices into their processes, too.

The IBM solution

The IBM requirements-engineering solution can support your company's specific process and help you meet today's challenges. IBM Rational® DOORS® software and the tool's centralized, collaborative platform can help your engineering and product development teams:

1. Manage complexity.
2. Enhance communication between globally distributed teams and suppliers.
3. Demonstrate conformance with standards.
4. Reduce delays and rework, and improve error detection.
5. Establish an enterprise-wide process and tool that stay with your company, not your retiring staff.
6. Increase the reliability and quality of developed systems and products.
7. Improve responsiveness.

For more information

To learn more about how you can improve your requirements-engineering process using IBM Rational DOORS software, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/software/rational

References

Aaltio, Tapani; Kauppinen, Marjo; Kujala, Sari; and Lehtola, Laura; *Introducing Requirements Engineering: How to Make a Cultural Change Happen in Practice*; Helsinki University of Technology; Software Business and Engineering Institute; Finland.

Gurd, Andy, *The Essential Guide to Effective Requirements Management within the CMMI*, Telelogic, December 2004.

Tavassoli, Dominic, *Ten steps to better requirements management*, IBM, October 2008.

Cohen, L.; Hutchings, T.; Hyde, M. G.; and Marca, D.; "Process Improvement that Lasts: An Integrated Training and Consulting Method"; *Communications of the ACM*, Vol. 36, No. 10; October 1993.

© Copyright IBM Corporation 2009

IBM Corporation
Software Group
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
June 2009

All rights reserved

IBM, the IBM logo, ibm.com, Rational, and DOORS are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at **ibm.com**/legal/copytrade.shtml

Other company, product, or service names may be trademarks or service marks of others.

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.

The information contained in this documentation is provided for informational purposes only. While efforts were made to verify the completeness and accuracy of the information contained in this documentation, it is provided "as is" without warranty of any kind, express or implied. In addition, this information is based on IBM's current product plans and strategy, which are subject to change by IBM without notice. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, this documentation or any other documentation. Nothing contained in this documentation is intended to, nor shall have the effect of, creating any warranties or representations from IBM (or its suppliers or licensors), or altering the terms and conditions of the applicable license agreement governing the use of IBM software.

IBM customers are responsible for ensuring their own compliance with legal requirements. It is the customer's sole responsibility to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws.

RAF14083-USEN-01