

Quality management across the product and application life cycle

IBM solutions for a Smarter Planet



Introduction

The bottom line—success or failure often depends upon one thing: Whose product is of the highest quality?

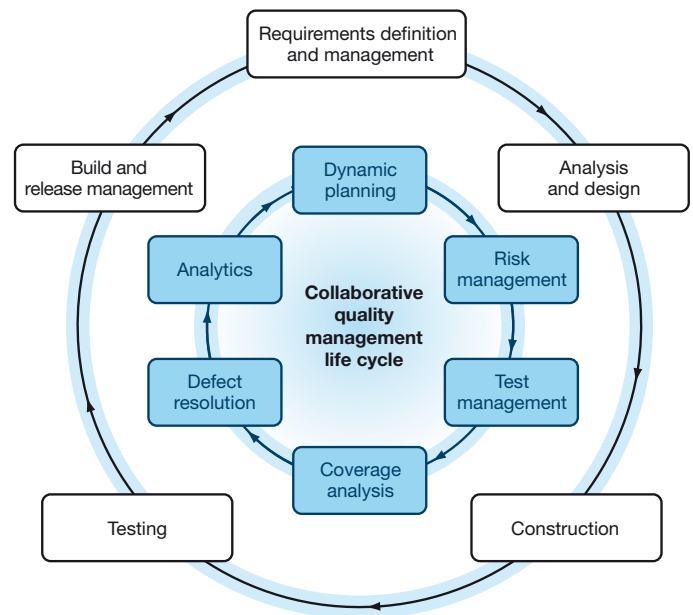
The quest for business transformation through innovation, and increasing reliance on software to deliver that innovation, while at the same time reducing risk and cost, mandates a more rigorous approach to managing software quality. Complexity is now a given in software and with many applications, products and systems getting smarter—meaning they can do more for us—the traditional approach to managing software quality can no longer deliver.

Consider the potential effect of quality issues: large sums of money, the entire success of organizations—and in some cases lives—can hinge on consistently getting complex things right.

- In the automotive industry, concerns over potential defects in software-controlled safety-critical systems have led to massive recall actions—harming both immediate profitability and brand equity.
- In the financial sector, software issues have caused a number of significant stock market shifts resulting in costs of many billions of dollars to investors.
- In the healthcare industry, software problems and poor quality control in cancer treatment systems designed to deliver precise radiation doses have led to tragic consequences for a number of patients.

IBM software solutions for delivering enduring quality can help you to balance these conflicting business needs throughout the software development life cycle—from concept to launch to retirement. This helps you maintain the functionality, reliability,

and performance of your products and applications in development and production. A life-cycle approach to managing quality helps you make quality a shared responsibility—not siloed and disconnected—that can help you to achieve greater consistency, efficiency and predictability in your delivered solutions. With this approach, you can help your organization exceed your customer’s expectations by accelerating time to market while minimizing the risks and costs of complex software and systems delivery.



The quality management life cycle within the software development life cycle

Challenges for software development

Quality issues add up to poor business performance and predictability in a number of areas:

- Difficulties in product and application development and delivery that cause missed deadlines, release dates and budget overruns due to miscommunication, inefficient processes, scope changes, defects and excessive rework.
- Operational and in-service costs due to unplanned fixes, updates, recalls, warranty claims and at the extreme, litigation.
- Decline in long-term business value through erosion of brand equity, customer confidence and market share.

Although quality is fundamental to business success, it cannot be considered in isolation—perfect quality cannot make up for a missed market window of opportunity or a budget overrun that threatens the commercial viability of your project. To succeed you have to deliver the right quality at the right time and for the right cost.

That means adopting quality strategies to minimize risk in your software development projects. This requires that you start managing quality at the beginning of your projects rather than trying to build it in at the end. In this way, operational predictability can be improved, resulting in lower costs and improved quality without time penalties. By adopting such a life-cycle approach, quality improvements can help deliver a quantifiable return on investment—satisfying your business objectives.

Key quality management strategies to focus on throughout the software development project include:

- Enable collaboration so the whole team stays in synch, working together more efficiently with integrated processes, information and tooling available to the entire team.
- Achieve end-to-end life-cycle traceability from idea to delivery by linking requirements, build, code and test assets—so you can test the right things and predictably deliver the right results by providing teams with accurate knowledge of test results and coverage status.
- Incorporate risk management to help enable more predictable cost, timing and quality in development projects by understanding and controlling risk and optimizing resources to deliver high priority functionality with confidence.
- Initiate smart defect management—integrate and automate defect resolution and change processes with capabilities such as duplicate defect detection to help delivery teams efficiently and effectively work together to address project requirements and achieve quality objectives.
- Automate reporting and analytics so that timely, accurate, reliable information is always available to help improve project management through informed decision-making.

Implemented with the right processes, information and tooling, each strategy can produce a measureable improvement and return on investment. For example: full, automated traceability that links requirements and tests, even for a medium-sized

project with 5,000 requirements and 10,000 test cases can reduce project cycle time from around 10 person-months to a few person-weeks. An IBM client has seen a reduction of 60 percent in the time spent on building traceability through such automation. The most effective results are delivered by combining strategies in a coordinated and integrated approach based upon the right processes, information flows and tooling.

“We have better visibility for all aspects of testing, which mitigates risk. On the test management side, Rational Quality Manager has saved me about 20 percent of my time, and we spend about 60 percent less time on requirements traceability across the team.”

—Tracie Stapp, Practice Leader, Software Testing, Fujitsu New Zealand

IBM software solutions for quality management

IBM believes that quality management should be a fundamental element of software development and delivery activities.

IBM quality management solutions help to optimize software quality across the many disciplines that make up the software delivery life cycle.

Quality management hub

IBM® Rational® Quality Manager software forms the core in managing a collaborative approach to software quality across the product and application life cycle. It helps organizations optimize project quality with a single, shared hub that provides integrated life cycle support across virtually any platform and type of test. It offers quality professionals a customizable, role-driven solution for quality and test management planning, execution, measurement, reporting and defect management to help drive better business alignment and overall project quality

Integrated requirements management

IBM Rational DOORS® software and IBM Rational Requirements Composer software can be integrated with Rational Quality Manager software to facilitate complete, end-to-end traceability across the life cycle, from requirement to build to code to test.

Lean collaborative development

IBM Rational Team Concert™ software provides a lean collaborative life-cycle management solution that connects distributed development teams to help increase individual and team productivity, compress development cycles, and rapidly deliver high-quality software.

Software testing

As the test management hub, Rational Quality Manager software integrates out-of-the-box with many IBM testing solutions to help enable different types of testing to be managed in a common environment, including:

- IBM Rational Performance Tester software for helping ensure application scalability and identifying system bottlenecks.
- IBM Rational Functional Tester software for automated functional regression testing.
- IBM Rational Service Tester for SOA Quality software for functional and performance testing of web service based applications.
- IBM Rational Test RealTime software for embedded, real-time and cross-platform application testing.
- IBM Rational AppScan® software family for scanning and testing for web application vulnerabilities.

Rational Quality Manager software also supports integrations with third-party and home-grown testing solutions through open interfaces.

Analytics

IBM Rational Insight software helps measure, monitor, analyze and trend project and process performance to make the best decisions for your business and for continual process improvements.

Conclusion

In the face of ever smarter products and applications, increasing competition and customer expectations, quality has become a business-critical issue for application and product development organizations. Successful organizations are realizing that it is vital to invest in quality rather than just spend money on it. Implemented effectively, a life-cycle approach to managing quality can offer a positive return on investment through operational efficiencies—helping you realize benefits in delivered quality, customer satisfaction and brand equity—while simultaneously helping to reduce business risk and cost.

For more information

To further explore the possibilities offered by IBM quality management solutions for your organization, contact your IBM sales representative or IBM Business Partner, or visit: ibm.com/software/rational/offerings/quality/

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