

A White Paper Analysis from Orasi Software

Requirements Management

How requirements management can improve testing results for application environments



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Introduction: The Significance of Requirements Management

Requirements management is not only part of the software development process—it is integral to the overall success of a given project. From the point at which a customer or user provides their needs, or once the overall development phase begins, requirements management comes into play.

As requirements change, the management process becomes essential to minimize errors, defects, and other software deficiencies. After all, creating software that does not meet the basic functions of the end user can lead to customer dissatisfaction and poor quality that can drain time, money, and resources.

Establishing clear requirements management in the beginning project stages is critical for improving testing outcomes. Testers are not only pressed for time but they aren't typically responsible for catching poor requirements. However, establishing clear requirements is not always a straight-forward process, as requirements can mean different things to different users.

For example, a customer may have a business requirement; a vendor could have a system requirement; and a tester or developer may have a specification requirement that needs to be met. All of these parties should be able to have their requirements written, established, and managed to ensure a smooth development process.

Another important piece to sound requirements management is consistency. All requirements that are developed and agreed upon should be the basis for all subsequent work—this includes testing, design, and all other software development stages. Downstream deliverables should map back to the agreed-upon requirements, creating a single version of the truth throughout the life of the project.

What it Takes to Improve Requirements Management

In defining and optimizing requirements, there are several areas that should garner attention, including:

- Forming elicitation techniques/teams
- Developing use cases
- Creating test cases from use cases
- Classifying and defining requirements
- Writing high quality requirements
- Reviewing formal requirements
- Finding missing requirements

While organizations are mindful of the importance of requirements management, many do not prioritize requirements management as they should. The problem with taking requirements management lightly is that roughly half of all project defects originate in the requirements phase.

Specifically, Carnegie Mellon's SEI (Software Engineering Institute) cites industry studies which report that the percentage of defects originating from requirements ranges from 42% to 64%. Moreover, a high number of software and application rework efforts stem from requirements defects.

How Requirements Management Impacts Testing

While requirements management is certainly critical to the overall application development lifecycle, it is particularly important for enhancing the testing stage. A good requirements management plan integrated with proactive test management activities can help testers and developers mitigate risk up front, before it spreads to later development stages. However, if potential problems persist, the lack of consistency and quality for requirements can have a major impact on the outcome of a project.

The following project setbacks could result without a well-defined and executable plan:

- Projects can run over budget
- Projects can run significantly past schedule
- Projects can expand in scope
- Projects can produce poorer quality
- Projects could ultimately not be used or cancelled altogether
- Projects can fail to meet the original intended purpose

Bringing Requirements Management and Testing Together

Reliable testing largely depends on determining the project requirements in the initial development stages so that processes can run concurrently. The integrated approach is commonly referred to as a Requirements Driven Test Management (RDTM) Process. In applying requirements management to testing, there are critical factors that need to be established to achieve success:

Early Testing

If both testing and requirements parties are brought together during an initial review, there will be ample time to spot missing requirements and correct requirements that need to be more specific for testers. The earlier testing and requirements are applied, the sooner flaws in design and coding can be prevented.

Use Cases vs. Test Cases

It's not enough to only outline the positive test outcomes; both use case scenarios and negative scenarios should be mapped out in combination.

Independent Test Teams

Instead of relying on developers or analysts to juggle testing duties with their other priorities, dedicated testing teams should be appointed for the responsibility.

The Testing Benefits from Requirements Management

With the testing parameters in place, businesses can derive greater value from requirements management. The key testing areas in which requirements management can make the biggest difference include:

- Traceability
- Compliance
- Visibility
- Testing Coverage
- Testing Time and Quality
- Testability and Project Costs

Traceability

The ability to measure changes in requirements is simplified when all requirements are traced from inception. Traceability enables the testing parties to measure the impact of requirement changes— or impact analysis— even before they are made. On the other hand, if the change is already put into place, then the ability to meet requirements can be reevaluated. Previous tests can also be reassessed for impact.

Compliance

Traceability can also help auditors determine the relevance of certain requirements and confirm their importance in adhering to industry regulations. All a company has to do is refer to the traceability trail to confirm that certain standards and mandates are being addressed.

Visibility

In a number of ways, visibility and traceability are closely related. If requirements are fully visible from the onset of testing, then it will be easier to incorporate all requirements. Ideal visibility would entail having requirements sorted, filtered, and catalogued on an individual basis. With visibility, there can also be clearer elicitation, analysis, and communication of requirements.

Testing Coverage

With traceability established, the test ratio coverage can be accurately monitored at every point within the project structure. Overall, requirements coverage can also be used to assess key performance indicators (KPIs) for test teams and should be a big piece of the test exit evaluation.

Testing Time and Quality

Testing time can vary but depending on how the project progresses, it can be shortchanged, severely hampering the quality output. However, by laying the foundation of requirements management, testers can stay on schedule and take the full amount of time required for testing. Instead of taking a few days, testing can be conducted over the course of a couple of weeks.

Also, a set of prioritized requirements helps the testing organization focus their resources better. Being able to better utilize resources is important to maximize testers' overall efficiency and output.

Testability and Project Costs

By linking each requirement with its own verification and validation criteria, each requirement will have high quality. Also, the testing process can be initiated much earlier. The net effect is a project that encounters fewer delay and ultimately ensures less project cost overage.

Automation Can Bridge Requirements Management and Testing Gaps

Even if organizations have a sound requirements management and testing system in place, a lot of processes remain manual and error-prone in nature. With an application lifecycle management (ALM) solution, businesses can cut down on inefficiencies and streamline integration practices from a single dashboard. From requirements to testing, users can manage the entire lifecycle process and make strategic changes as needed.

Key Benefits:

- Manage and create traceability between requirements, tests, and defects
- Increase visibility with milestones and KPIs to better align business and IT
- Unify functionality, performance, security, and quality management
- Standardize requirements processes and set the table for a more consistent software development process in general
- Improve the overall organization of quality checks and testing
- Enhance decision making with a set of cohesive metrics
- Reuse requirements and testing artifacts for repeatable testing

Orasi's Requirements Management Expertise and Training Services

For more than 16 years, Orasi has consistently helped customers successfully implement and integrate requirements management and software testing best practices to reduce the cost and risk of software failures. Orasi offers proven solutions for software testing services.

Backed by a dedicated staff of experts and consults, Orasi can help you optimize your testing environments. Orasi's industry-leading training for requirements can help you establish:

- Traceability
- Impact Analysis
- Risk Assessments
- Business Requirements
- Software Requirements Specifications
- Use Case Development

About Orasi Software, Inc.

Orasi is an award-winning software reseller and provider of software training, support and professional services. To help companies focus on a complete software quality lifecycle, Orasi offers market-leading consulting services and solutions to support automated testing, application performance management/intelligence, mobile technologies, DevOps pipeline efficiency, and operational excellence. Orasi continues to expand its offerings across the entire software delivery spectrum, from data analytics to continuous delivery and open source tooling. Orasi maintains strategic partnerships with Micro Focus (formerly HPE), Chef, Delphix, SAP, XebiaLabs, and others. For more information, please visit www.orasi.com.



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