



WHITE PAPER

Better Product Development: Five Tips for Traceability

Products have become smarter. They have more requirements and interdependencies, and more complexities than ever. As a result, the product development process has become a matter of managing complexity. Traceability, which documents the life of a requirement, is one key used to manage the complexity challenge. When traceability is carried out correctly, teams can accurately assess the impact of changes, track the full history of product development, keep everyone in sync, and consistently improve the quality of the products being built – every project, every release. This paper looks at five tips that will help you produce the kind of traceability that helps manage the complexity of the product development process.

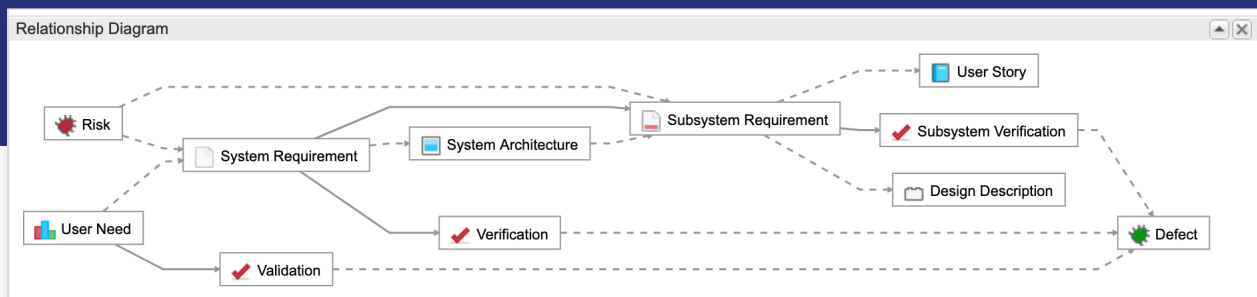


Figure 1. Example of a common process flow

01. Connect Everyone and Everything with Trace Relationships

Each product you develop has customers, stakeholders, and members of your team associated with it. Analysts define it. Developers build it. Quality assurance engineers test it. And stakeholders and customers care about the success of the product.

When one product requirement or item changes in the development process, it has a ripple effect on other related items and the people associated with it. Keeping track of this ripple effect is crucial to the success of the product. It's one of the primary reasons organizations use traceability. Trace relationships are as much about connecting the people involved as they are about connecting all the items (see Figure 1).



TRACEABILITY AND RELATED TERMINOLOGY DEFINED

Traceability

A subdiscipline of requirements management, traceability documents the life of a requirement, tracks every change, and links its relationships with other items within a project.

Trace Relationship

A link between items within the scope of a project, a trace relationship helps to assess impact on other items when a change occurs.

Upstream Relationships

Also known as “backward traceability,” upstream relationships look at the links between detailed functional requirements and the original customer need and the high-level requirements captured. You use it to ensure that the product remains on track to its original goals. It also helps to avoid scope creep.

Downstream Relationships

Also known as “forward traceability,” downstream relationships look at the links between detailed functional requirements, test cases, tasks, defects, and more. You use it to ensure that you’re building the right product.

Impact Analysis

Capture traceability links between requirements, specifications, design, and tests and analyze them to determine the scope of initiating a change.

Version History

Used for change control, version history provides detailed documentation of each requirement and other items stored in a unified system of record, enabling complete audit trails over the lifecycle of the requirement. Specific industries such as aerospace and medical devices require it for compliance.

Market Requirements

Save

0 items selected

1 level and 1 item type filtered

Clear filters

1 LEVEL DOWN

Filter items

Set columns

System Requirement (9)

ID	Name	Priority	Status
CL3-SR-1	Waterproof	High	Approved
CL3-SR-2	iOS Integration	High	Completed
CL3-SR-3	Android Integration	High	Completed
CL3-SR-4	Durable	High	Approved
CL3-SR-5	Haptic Feedback	Medium	Draft
CL3-SR-1	Waterproof	High	Approved
CL3-SR-2	iOS Integration	High	Completed
CL3-SR-3	Android Integration	High	Completed
CL3-SR-4	Durable	High	Approved
CL3-SR-5	Haptic Feedback	Medium	Draft
CL3-SR-7	Windows Integration	Low	Approved
CL3-SR-1	Waterproof	High	Approved
CL3-SR-2	iOS Integration	High	Completed
CL3-SR-3	Android Integration	High	Completed

2 LEVELS DOWN

Filter items

Set columns

Validation (5)

ID	Name	Description	Test Case Status
CL3-VAL-1	Underwater immersion		Not Scheduled
CL3-VAL-4	iOS Validation	In a focus group of 10 ...	Passed
CL3-VAL-5	Android Validation	In a focus group of 10 ...	Failed
CL3-VAL-2	Dust Test		Not Scheduled
Add Coverage for CL3-SR-5			
CL3-VAL-1	Underwater immersion		Not Scheduled
CL3-VAL-4	iOS Validation	In a focus group of 10 ...	Passed
CL3-VAL-5	Android Validation	In a focus group of 10 ...	Failed
CL3-VAL-2	Dust Test		Not Scheduled
Add Coverage for CL3-SR-5			
CL3-VAL-6	Windows Mobile Valid...	In a focus group of 10 ...	Blocked
CL3-VAL-1	Underwater immersion		Not Scheduled
CL3-VAL-4	iOS Validation	In a focus group of 10 ...	Passed
CL3-VAL-5	Android Validation	In a focus group of 10 ...	Failed

Figure 2. Trace View in Jama Connect

02. Ensure Traceability and Proper Coverage

It's important that your solution visually represents your product and system, helping you align users, maintain quality, meet compliance regulations, and understand the impact of change. Users should be able to view related requirements and understand the status of those requirements.

For example, they should be able to verify that their requirements have downstream test cases and see what percentage of those test cases have passed.

Figure 2 shows a list of requirements along with their status in the first column. The second column lists the downstream validation tests for each requirement. From this view, teams can see what validation coverage they have and where validation tests are missing, and get high-level verification results.

Users can access every test case, comment, and activity stream. Testers and contributors can capture decisions, answer questions, and transparently and responsively resolve issues.

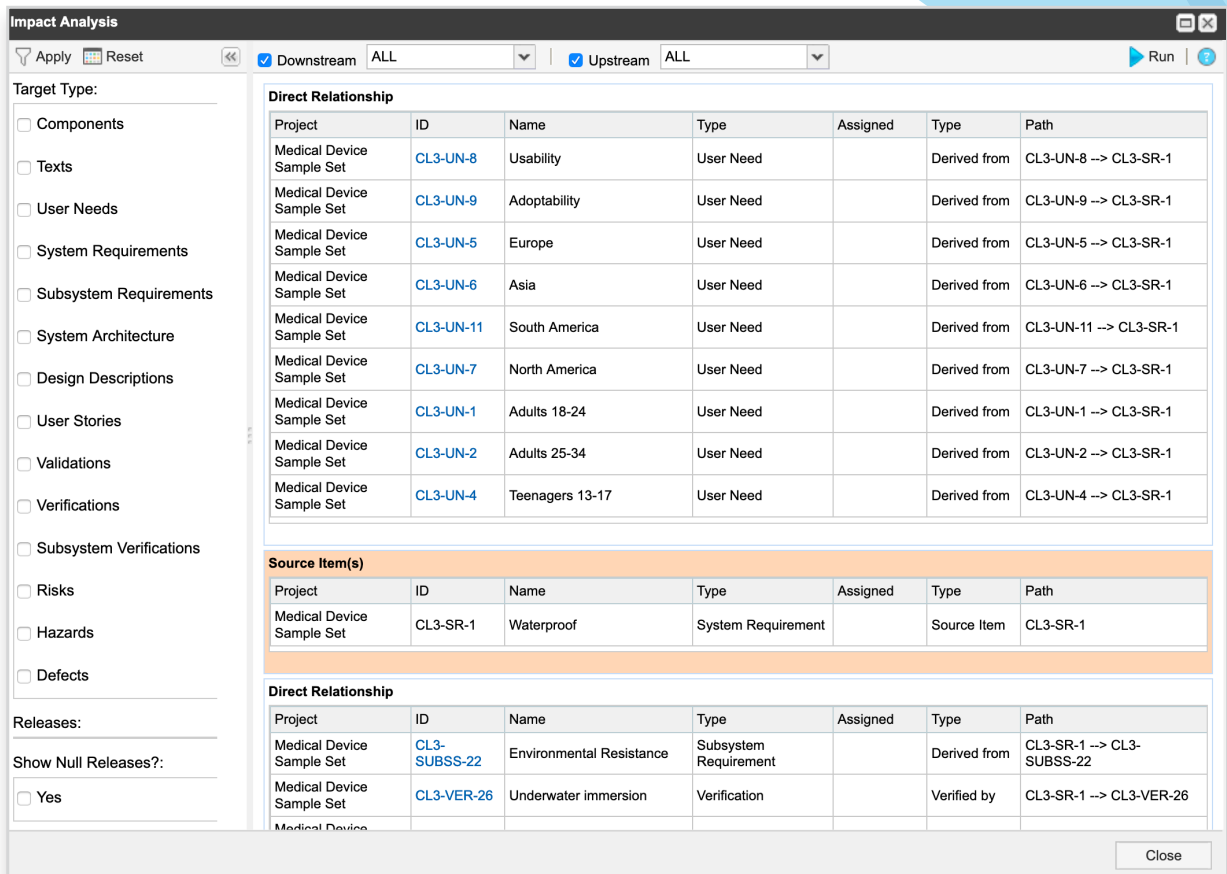


Figure 3. Impact analysis report in Jama Connect

03. Assess the Impact of a Change Before You Implement It

A good product development solution will help you anticipate the impact a change will have on your product and your entire team. Relying on the trace relationships you set up, the solution reports on the complete picture of all the items that are affected — both directly and indirectly.

Figure 3 shows an example of an automated impact analysis report for a high-level business requirement in Jama Connect™. If this requirement changes, it will affect three directly-related system requirements, downstream software requirements, and numerous verification tests.

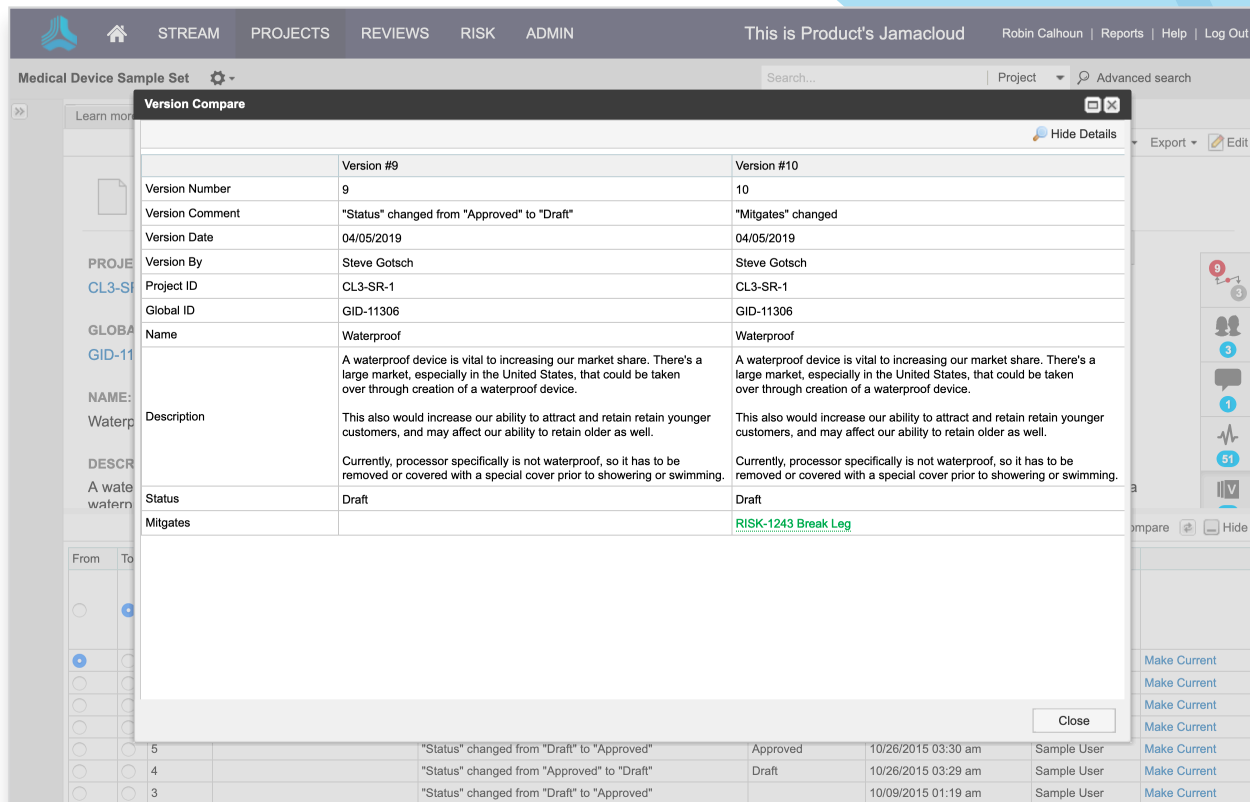


Figure 4. Compare View in Jama Connect

04. Document Changes for Complete Visibility and a Detailed Audit Trail

With traceability, there is a comprehensive audit trail of changes, so you can analyze who, what, when, and why a change occurred. This is especially important for companies that need to meet industry compliance standards in specific fields such as aerospace and medical devices.

Traceability allows you to easily roll back to an earlier version because everything is stored in a unified system of record. Figure 4 shows a side-by-side comparison of two versions of changes to a product, using an automated process within Jama Connect.

To improve efficiency, the feature highlights a specific field in yellow so you can see the changes without having to hunt around the full requirements specification document to pinpoint and understand precisely what changed.

As with the other aspects of traceability, you can track version history manually through static documents, but it's more cumbersome and time consuming to manage complex projects that way.

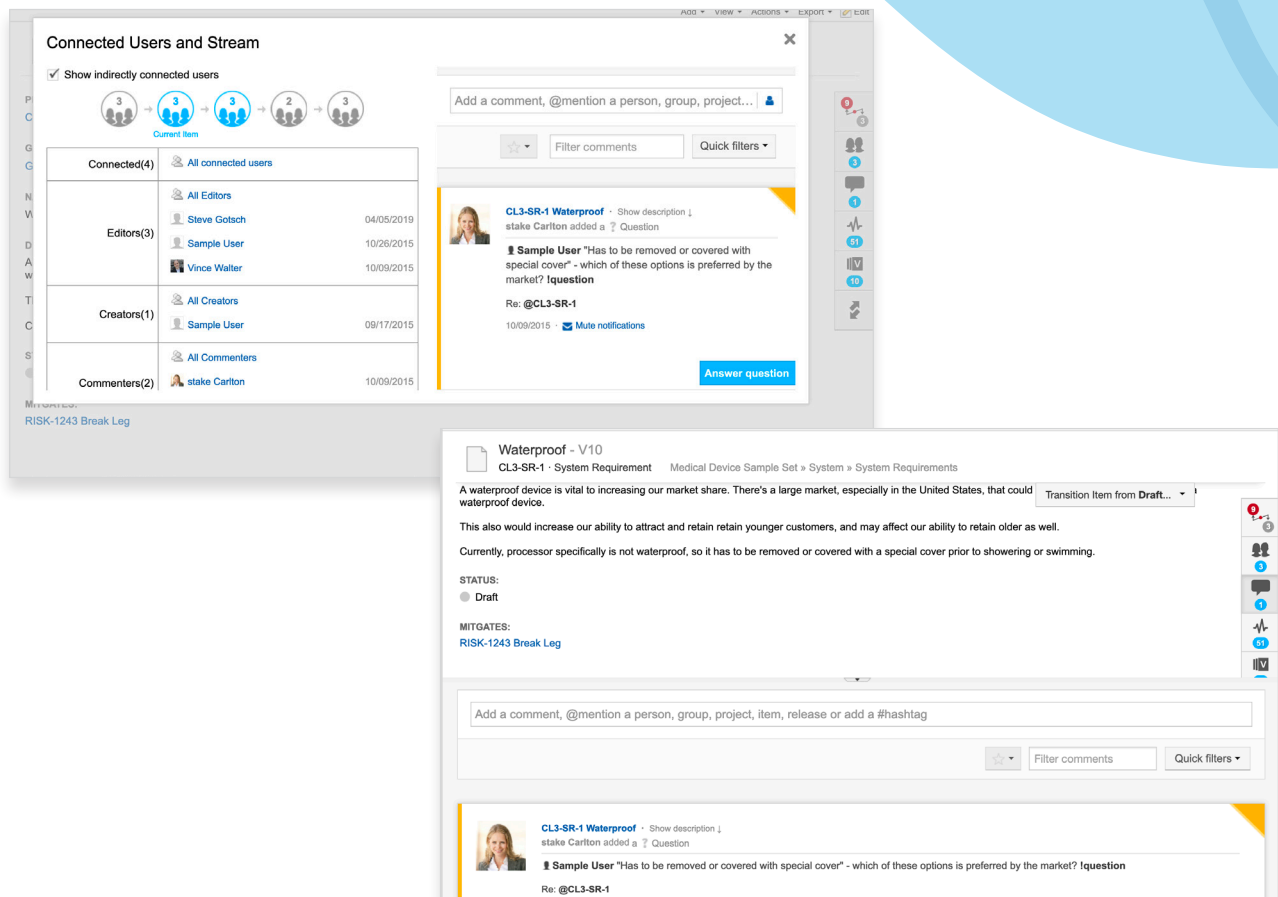


Figure 5. Connected Users

05. Keep the Team in Sync with Real-Time Communications

How often have you been involved in a project where you experienced email inbox overload? Often it occurs when the project manager emails the entire team a huge software requirements specification document every time a change occurs. Team members waste time hunting in the requirements spec to determine if the latest change is relevant to them, which is costly.

Or they ignore the email barrage and miss a change that is important to them, which is even more costly.

A good requirements management solution can instantly send a direct link to the specific requirement that changed with version notes to just the relevant groups or individual users it affects. The notification step is then part of the overall change management workflow (see Figure 5).



Conclusion

If your product development process is complex (many requirements, frequent scope changes, or remote teams), automation can provide a huge boost to productivity. It greatly improves your ability to organize and visualize data and minimizes the risk of human error, which is always possible despite the best intentions of skillful staff.

An effective and efficient requirements management solution translates into a strong return on investment. By automating traceability, most organizations can conservatively expect to speed development cycles by at least 50 percent and improve

quality by 100 percent or more within the first six months of using a web-based requirements management solution like Jama Connect.

Traceability reflects your complex product data and simplifies the process of delivering a high-quality product. You save time and money, accelerate development cycles, reduce the risk of error, and improve quality and compliance. A good requirements management solution makes it easy to perform and report on traces so you stay on time, on budget, and within scope.

ABOUT JAMA SOFTWARE

Jama Software provides the leading platform for requirements, risk, and test management. With Jama Connect and industry-focused services, teams building complex products, systems, and software improve cycle times, increase quality, reduce rework, and minimize effort proving compliance. Jama's growing customer base of more than 600 organizations includes companies representing the forefront of modern development in areas such as automotive, medical devices, financial services, industrial manufacturing, and aerospace.