Test Case Management in Agile Software Development Using Jira

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Abstract

Managing test cases effectively is crucial in Agile software development to ensure continuous quality assurance and successful product releases. Jira, a popular tool for issue and project tracking, provides numerous ways to handle test case management, from native configurations to third-party integrations. With its customizable workflows, issue types, and reporting tools, Jira enables QA teams to collaborate efficiently with developers. This article explores the various approaches to managing test cases in Jira, covering everything from manual workflows to automated integration using plugins like Zephyr and Xray. The goal is to empower testers with a comprehensive understanding of test management in Jira, enabling them to optimize their workflows and improve overall product quality.

1. Introduction

In Agile software development, Quality Assurance (QA) is a critical component in delivering high-quality software. As teams work in sprints, testing needs to be continuous and integrated into the development lifecycle to ensure fast feedback and quick identification of defects. Jira, primarily known for issue tracking, has become a widely used tool for test case management as well.

While Jira doesn’t natively include test case management features, it provides several flexible ways to manage testing efforts. Jira’s customizable fields, issue types, and workflows allow it to be adapted to track test cases, link them with user stories, manage test executions, and handle defect tracking. Additionally, a variety of plugins and integrations enhance Jira’s capabilities, making it a powerful test management tool [1].

This article discusses all possible ways test case management can be handled in Jira, from manual approaches to more sophisticated methods using third-party tools.

2. Methods for Managing Test Cases

A. Using Jira’s Native Features

While Jira does not offer out-of-the-box test management, it can be adapted to create test cases using custom issue types, workflows, and labels. This approach is suitable for smaller teams or projects that don’t require a complex test management system [2].

a) Custom Issue Types:

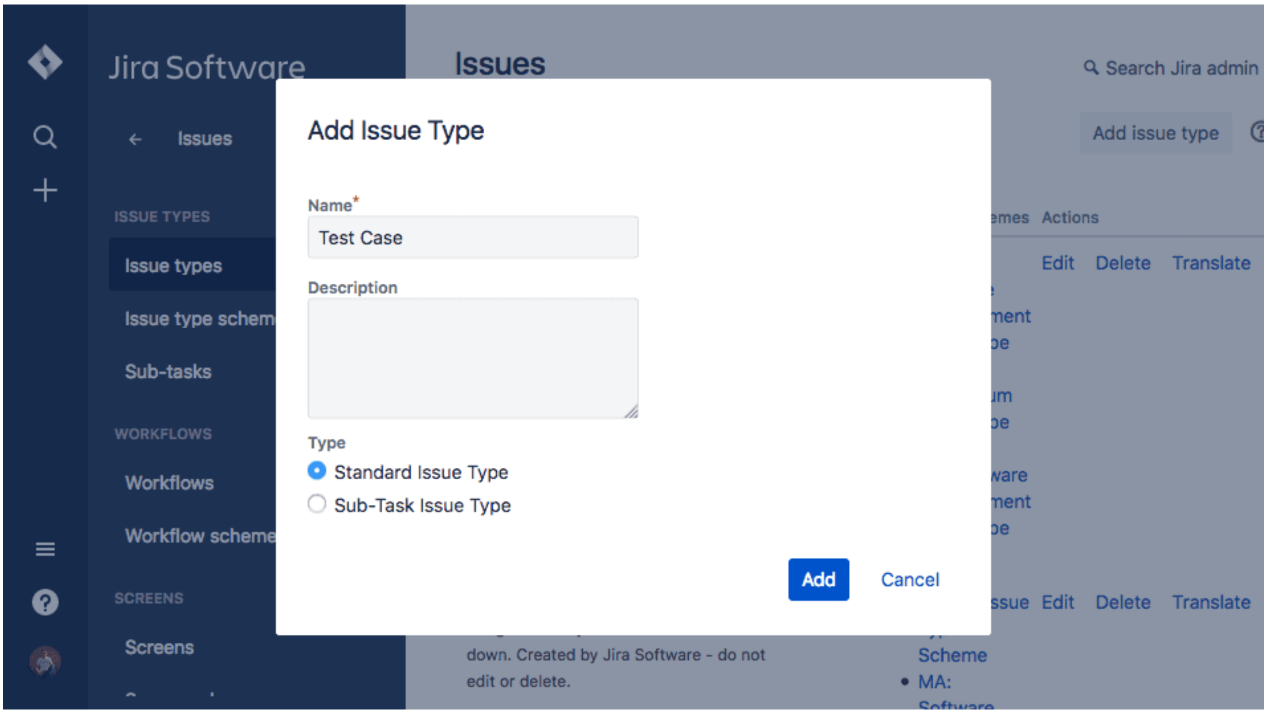
Create a custom issue type called "Test Case" to define test cases, steps, and expected results. A typical workflow involves creating a test case, linking it to user stories or epics, and assigning it for execution.

b) Steps:

- **Create a Test Case Issue Type:**

1. Navigate to Jira Settings > Issues > Issue Types

2. Click "Add Issue Type"
3. Name: "Test Case"
4. Description: "Used for defining test cases and steps"
5. Type: Standard Issue Type



Add Issue Type

Name* Test Case

Description

Type
● Standard Issue Type
○ Sub-Task Issue Type

Figure 1: Creating custom Issue Type "Testcase."[8]

- **Create Test Execution Issues:**

1. Follow the same steps as above.
2. Name: "Test Execution"
3. Description: "Used for tracking test case execution" [3].

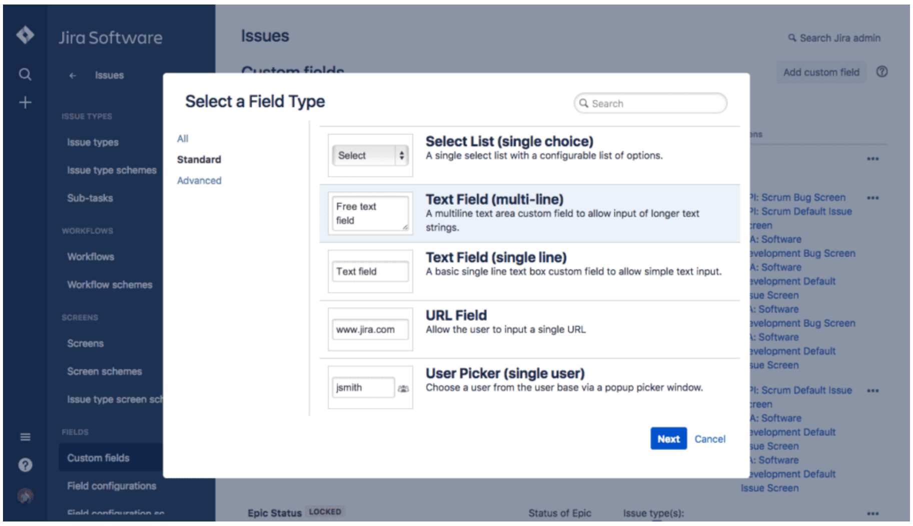
- **Add Custom Fields:**

Create custom fields to capture test-specific information:

- Go to Jira Settings > Issues > Custom Fields
- Click "Add Custom Field"

Add the following fields:

1. Test Steps (Text Field, Multi-line)
2. Expected Results (Text Field, Multi-line)
3. Actual Results (Text Field, Multi-line)
4. Test Data (Text Field)
5. Test Status (Select List with options: Not Started, In Progress, Passed, Failed, Blocked)



Select a Field Type

Select List (single choice)
A single select list with a configurable list of options.

Text Field (multi-line)
A multiline text area custom field to allow input of longer text strings.

Text Field (single line)
A basic single line text box custom field to allow simple text input.

URL Field
Allow the user to input a single URL

User Picker (single user)
Choose a user from the user base via a popup picker window.

Figure 2: Creating custom Field Type [8]

- **Create a Test Case:**
- Click "Create" in Jira
- Select "Test Case" as the issue type.

Fill in the following:

1. Summary: Brief description of the test case
2. Description: Detailed description or preconditions
3. Test Steps: Step-by-step instructions.
4. Expected Results: What should happen when steps are followed.
5. Test Data: Any specific data required for the test.

- **Link Test Cases to User Stories:**

1. Open the User Story
2. Click on "Link Issue"
3. Select "Test Case" as the issue type.
4. Choose the appropriate test case(s)

- **Create Test Execution:**

1. Click "Create" in Jira
2. Select "Test Execution" as the issue type.
3. Link it to the corresponding Test Case
4. Assign to a tester.
5. Set a due date.

- **Execute and Update Test Cases:**

1. Open the Test Execution issue.
2. Update the Test Status field as you progress.
3. Fill in the Actual Results field.
4. If the test fails, create a bug issue, and link it to the Test Execution

- **Use Labels and Workflows:**

By adding custom labels and using workflows, teams can track the status of test cases (e.g., Draft, In Progress, Executed, Passed). This basic approach is effective for small projects with manageable test cases.

- Add labels to categorize test cases (e.g., "regression", "smoke-test")
- Create a custom workflow for Test Cases and Test Executions:

1. Test Case: Draft > Ready > In Review > Approved.
2. Test Execution: Not Started > In Progress > Completed.

- **Reporting:**
  - Use Jira's built-in reporting features to create dashboards.
  - Create filters for different test statuses, labels, or assignees.
  - Use the Jira Query Language (JQL) for advanced filtering.

B. Using Zephyr for Jira

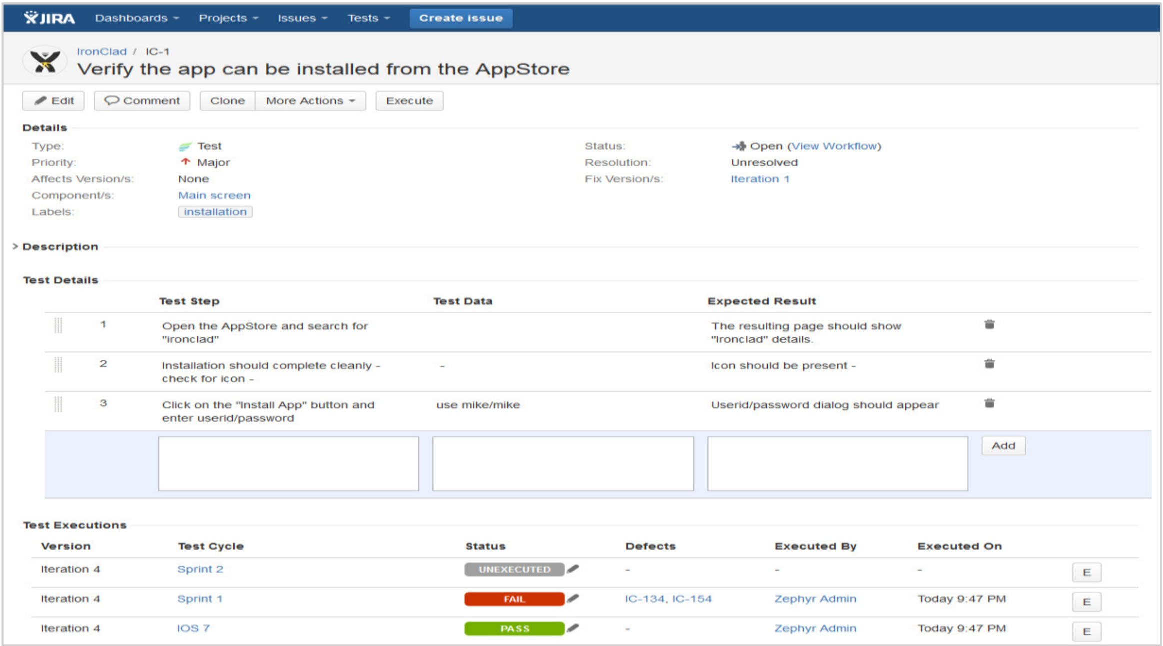
Zephyr is one of the most popular test management plugins for Jira, providing a structured way to manage test cases and test cycles. It seamlessly integrates into Jira's interface and adds a layer of test management functionality [7].

a) Creating Test Cases:

- Zephyr allows you to create, organize, and execute test cases directly in Jira, linking them to user stories for traceability.

b) Features:

- **Test Cycles:** Organize test cases into cycles for different sprints or releases.
- **Test Execution:** Execute tests directly in Jira and track their status.
- **Traceability:** Easily link test cases to defects, user stories, and epics.
- **Reporting:** Zephyr offers comprehensive reporting capabilities, enabling teams to view test execution results and overall project quality.



IronClad / IC-1

Verify the app can be installed from the AppStore

Details

Type:	Test	Status:	Open (View Workflow)
Priority:	Major	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	Iteration 1
Component/s:	Main screen		
Labels:	installation		

Description

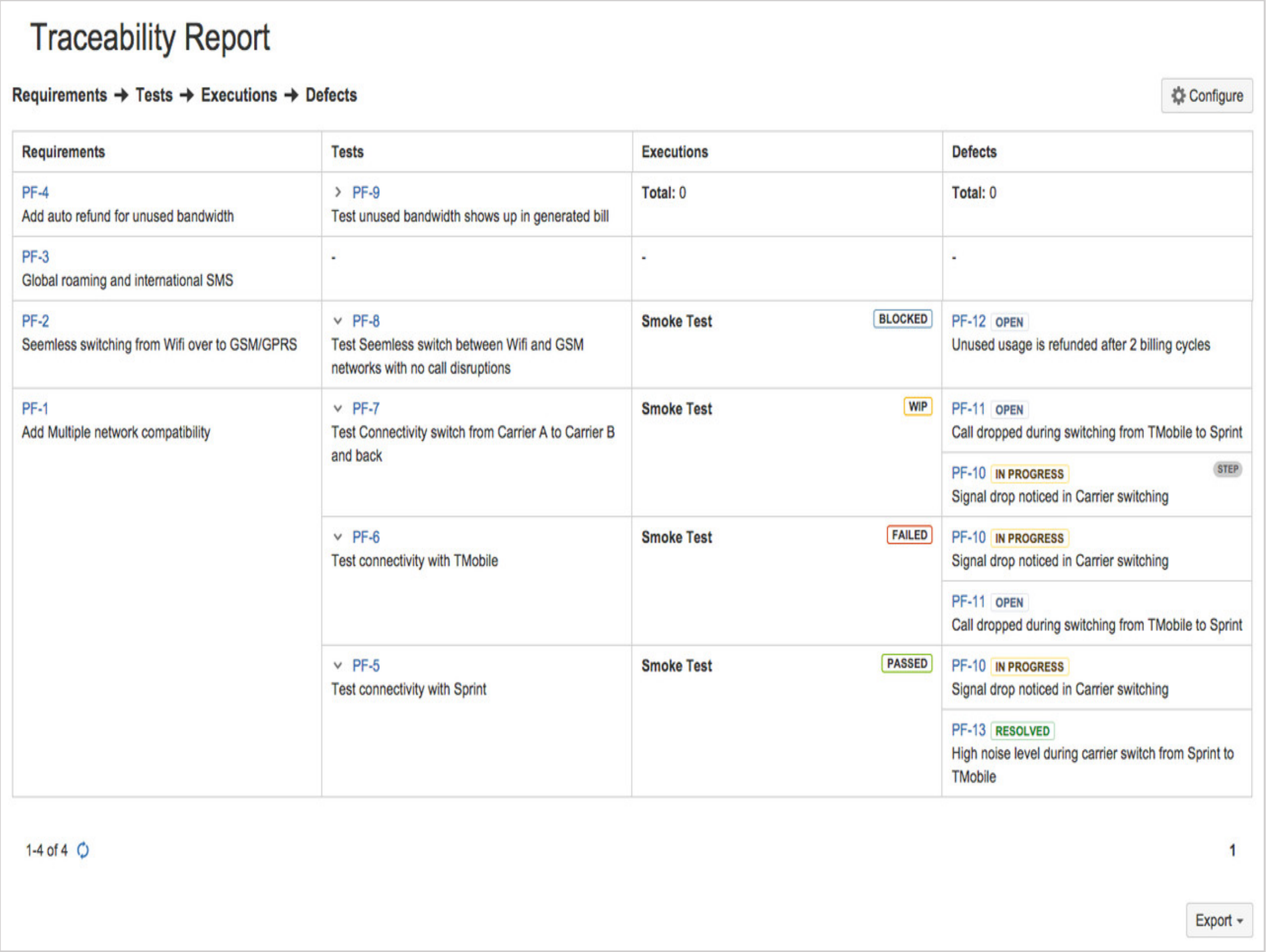
Test Details

	Test Step	Test Data	Expected Result
1	Open the AppStore and search for "ironclad"		The resulting page should show "Ironclad" details.
2	Installation should complete cleanly - check for icon -	-	Icon should be present -
3	Click on the "Install App" button and enter userid/password	use mike/mike	Userid/password dialog should appear

Test Executions

Version	Test Cycle	Status	Defects	Executed By	Executed On
Iteration 4	Sprint 2	UNEXECUTED	-	-	-
Iteration 4	Sprint 1	FAIL	IC-134, IC-154	Zephyr Admin	Today 9:47 PM
Iteration 4	IOS 7	PASS	-	Zephyr Admin	Today 9:47 PM

Figure 3: Zephyr Test Case Execution in Jira [7]



Traceability Report

Requirements → Tests → Executions → Defects

Requirements	Tests	Executions	Defects
PF-4 Add auto refund for unused bandwidth	› PF-9 Test unused bandwidth shows up in generated bill	Total: 0	Total: 0
PF-3 Global roaming and international SMS	-	-	-
PF-2 Seemless switching from Wifi over to GSM/GPRS	⌄ PF-8 Test Seemless switch between Wifi and GSM networks with no call disruptions	Smoke Test BLOCKED	PF-12 OPEN Unused usage is refunded after 2 billing cycles
PF-1 Add Multiple network compatibility	⌄ PF-7 Test Connectivity switch from Carrier A to Carrier B and back	Smoke Test WIP	PF-11 OPEN Call dropped during switching from TMobile to Sprint PF-10 IN PROGRESS STEP Signal drop noticed in Carrier switching
	⌄ PF-6 Test connectivity with TMobile	Smoke Test FAILED	PF-10 IN PROGRESS Signal drop noticed in Carrier switching PF-11 OPEN Call dropped during switching from TMobile to Sprint
	⌄ PF-5 Test connectivity with Sprint	Smoke Test PASSED	PF-10 IN PROGRESS Signal drop noticed in Carrier switching PF-13 RESOLVED High noise level during carrier switch from Sprint to TMobile

Figure 4: Zephyr Traceability in Jira [7]

C. Xray Test Management for Jira

Xray is another powerful test management plugin for Jira, offering features for both manual and automated test case management [5]. Xray provides advanced test planning, execution, and reporting capabilities.

a) **Test Case Types:**

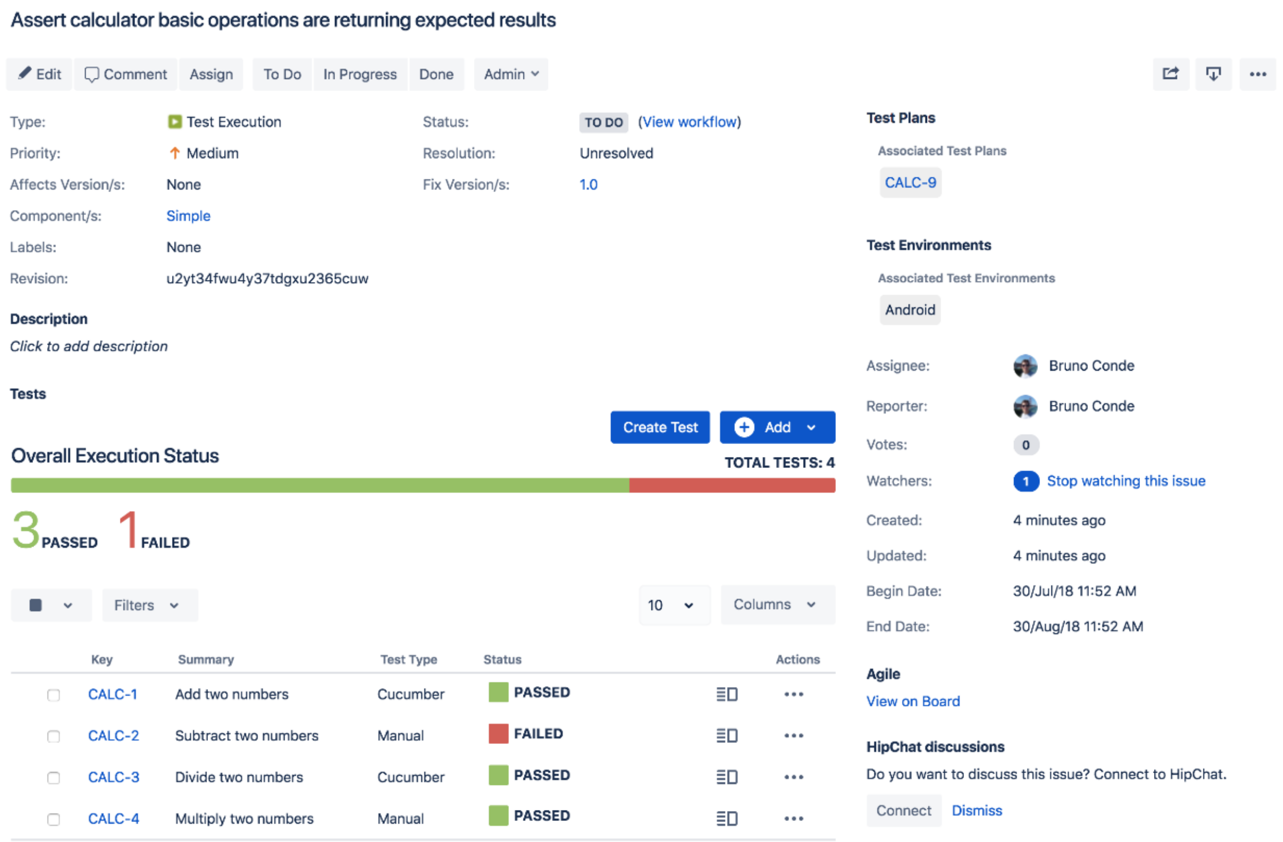
- Xray supports multiple types of tests (manual, automated, exploratory) and allows detailed test case creation with steps, data, and expected results.

b) **Test Plans and Test Executions:**

- Xray allows testers to organize test cases into test plans and executions, providing clear visibility into what needs to be tested for each sprint or release.

c) **Automation Support:**

- Xray integrates with CI/CD tools like Jenkins and Bamboo, enabling the execution of automated tests and the collection of test results directly within Jira.



Assert calculator basic operations are returning expected results

Type: Test Execution
Priority: Medium
Affects Version/s: None
Component/s: Simple
Labels: None
Revision: u2yt34fwu4y37tdgxu2365cuw

Status: TO DO (View workflow)
Resolution: Unresolved
Fix Version/s: 1.0

Description
Click to add description

Tests

Overall Execution Status
TOTAL TESTS: 4
3 PASSED 1 FAILED

10

Key	Summary	Test Type	Status	Actions
CALC-1	Add two numbers	Cucumber	PASSED	•••
CALC-2	Subtract two numbers	Manual	FAILED	•••
CALC-3	Divide two numbers	Cucumber	PASSED	•••
CALC-4	Multiply two numbers	Manual	PASSED	•••

Test Plans
Associated Test Plans
CALC-9

Test Environments
Associated Test Environments
Android

Assignee: Bruno Conde
Reporter: Bruno Conde
Votes: 0
Watchers: 1 Stop watching this issue
Created: 4 minutes ago
Updated: 4 minutes ago
Begin Date: 30/Jul/18 11:52 AM
End Date: 30/Aug/18 11:52 AM

Agile
View on Board

HipChat discussions
Do you want to discuss this issue? Connect to HipChat.

Figure 3: Xray Test Execution Dashboard [3]

2. Best Practices for QA Testers in Jira

a) **Define Clear Test Case Templates:**

- Establish a consistent format for test case documentation to improve readability and maintainability.

b) Linking Test Cases to User Stories:

- Always associate test cases with their corresponding user stories to maintain traceability throughout the development lifecycle [6].

c) Regularly Review and Update Test Cases:

- Conduct periodic reviews of test cases to ensure they are relevant and up to date with the latest project requirements.

d) Utilize Jira Filters and Dashboards:

- Create filters to quickly access test cases by status, priority, or assigned testers. Utilize dashboards for a visual representation of testing progress.

e) Encourage Collaboration:

- Foster communication between developers and testers within Jira by commenting on issues, tagging team members, and using @mentions to facilitate discussions [6].

3. Conclusion

- Jira offers flexible test case management capabilities, allowing teams to adapt the tool to their specific needs.
- Plugins like Zephyr and Xray enhance Jira's functionalities, making it easier for teams to manage test cases effectively.

- Establishing a clear process for test case management is crucial to ensure quality in Agile projects.
- Regular reviews and updates of test cases help maintain their relevance and effectiveness.
- Collaboration and communication within Jira contribute to improved testing outcomes and faster resolution of issues.

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