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Experiment 6 : Agile Methodology

Aim :

To Study Agile Methodology and Test case Management using JIRA Tool.

Theory :

1.1. Agile Overview

Agile is a methodology focused on delivering small, incremental improvements to a product through short, iterative cycles called **sprints**. The idea is to break the project into smaller, manageable pieces that can be developed and delivered quickly, allowing the team to gather frequent feedback and make necessary adjustments.

The key benefits of Agile include:

- **Flexibility** to adapt to changing requirements.
- **Collaboration** between cross-functional teams.
- **Faster delivery** of product increments to get early feedback from customers.
- **Improved risk management** since any issues can be detected early in the iterative process.

1.2. Agile Manifesto and Principles

The **Agile Manifesto** lays out the philosophy behind Agile development, but it is also supported by 12 principles that further guide how to operate within the Agile framework:

1. **Customer satisfaction through early and continuous delivery** of valuable software.
2. **Welcome changing requirements**, even late in development.

3. **Deliver working software frequently**, with a preference to shorter timescales.
4. **Business people and developers must work together** daily.
5. **Build projects around motivated individuals**, give them the environment and support they need, and trust them to get the job done.
6. **Face-to-face communication** is the most effective way to convey information.
7. **Working software is the primary measure of progress.**
8. **Sustainable development**, where the pace of development can be maintained indefinitely.
9. **Continuous attention to technical excellence** and good design enhances agility.
10. **Simplicity**—the art of maximizing the amount of work not done—is essential.
11. **Self-organizing teams** produce the best architectures, requirements, and designs.
12. **Regular reflection** on how to become more effective, then tuning and adjusting behavior accordingly.

1.3. Popular Agile Frameworks

Scrum

Scrum is one of the most popular Agile frameworks, focusing on **fixed-length iterations** (called **sprints**) that typically last between 2–4 weeks. Scrum has defined roles and ceremonies that help teams organize and manage their work:

- **Roles:**
 - **Product Owner:** Responsible for defining the product backlog (a prioritized list of features and requirements).
 - **Scrum Master:** Facilitates the Scrum process, removes obstacles, and ensures the team adheres to Scrum practices.

- **Development Team:** A cross-functional group of individuals who work together to deliver product increments.

- **Ceremonies:**

- **Sprint Planning:** Define goals and break them down into tasks for the sprint.
- **Daily Standup (Daily Scrum):** A quick daily meeting to share progress and discuss any blockers.
- **Sprint Review:** A meeting held at the end of the sprint to demonstrate the work completed and gather feedback.
- **Sprint Retrospective:** A reflection meeting where the team discusses what went well, what could be improved, and actionable improvements for the next sprint.

Kanban

Kanban is a continuous flow-based methodology with an emphasis on **visualizing work** using boards to track the progress of tasks. It doesn't use fixed iterations like Scrum but instead focuses on limiting the number of tasks in progress to improve flow and efficiency.

Extreme Programming (XP)

XP is designed to improve software quality and responsiveness to changing customer requirements. It includes practices such as:

- **Pair programming:** Two developers work on the same code, which increases code quality and spreads knowledge.
- **Test-driven development (TDD):** Writing tests before the code to ensure that the software meets its requirements.
- **Continuous integration:** Frequent code integration to ensure that the software is always in a working state.

Lean

The Lean methodology focuses on eliminating waste, improving efficiency, and maximizing value. This means optimizing the flow of value through the system while

continuously eliminating steps that don't add value.

2. Test Case Management with JIRA

2.1. Introduction to JIRA for Test Case Management

JIRA, developed by Atlassian, is widely used for issue tracking, project management, and as a tool for managing Agile processes. However, JIRA is highly customizable, and when combined with plugins such as **Zephyr** and **Xray**, it becomes a powerful tool for managing test cases and test execution.

JIRA allows teams to:

- **Track bugs** and issues.
- **Organize tasks** and sprints.
- **Document test cases** and **log test results**.
- **Report on test execution** and project progress.

2.2. Key JIRA Features for Test Case Management

Issue Types:

- **Test Case Issue:** In JIRA, a Test Case is typically modeled as an issue, often with the issue type set to "Test". This allows the creation of detailed descriptions of the test case, such as steps, expected outcomes, and priority.
- **Defects (Bugs):** These are logged if a test case fails, helping track problems related to functionality.

Boards:

- **Scrum and Kanban Boards:** JIRA boards (whether Scrum or Kanban) help visualize the status of test cases, tasks, and bugs. You can customize these boards to track the progress of specific issues (such as test cases) through various stages, e.g., "To Do", "In Progress", "In Testing", "Done".

Filters and Dashboards:

JIRA allows the creation of **custom filters** to find specific test cases or bugs. For

example, you could filter by:

- Test cases linked to a specific Epic or User Story.
- Test cases with a status of "Failed".
- Test cases assigned to a specific tester or developer.

Dashboards allow you to create custom views where you can track important metrics like:

- Total number of test cases passed/failed.
- Number of defects reported per sprint.
- Burndown charts tracking test progress during the sprint.

2.3. Managing Test Cases in JIRA

Creating Test Cases:

- In JIRA, test cases are often created as individual **issues**. With **Zephyr** or **Xray** plugins, you can add more sophisticated attributes to each test case:
 - **Test Steps:** Each test case can include individual steps, expected outcomes, and actual outcomes.
 - **Test Data:** Details on the data required for testing.
 - **Priority:** Set the priority of the test case based on business importance.

Executing Test Cases:

- Once test cases are created, they are executed in **Test Execution** sessions.
- In **Zephyr**, testers can run the tests directly from the JIRA interface, and results are logged automatically.
- After execution, the results can be marked as:
 - **Pass** (if the test works as expected),
 - **Fail** (if the test does not meet expectations),

- **Blocked** (if there's an issue preventing the test from running, such as a dependency on another task or defect).

Defects Reporting:

- When a test case fails, JIRA allows testers to create a **Defect** issue, which is typically linked to the failing test case. This allows for traceability between test results and issues that need resolution.
- **Defects** can be assigned to developers, prioritized, and tracked through their lifecycle, ensuring that critical bugs are fixed in a timely manner.

Test Case Execution Reporting:

- JIRA generates various reports (e.g., **Test Execution Report**, **Test Summary Report**) to show how many test cases were executed, how many passed, and how many failed. This can be used for **Sprint Review** and to measure quality over time.

2.4. Best Practices for Test Case Management in JIRA

- **Use Custom Workflows:** Customize workflows to meet the needs of your testing process. For example, you can create a "Test Execution" workflow where each step (e.g., Test Passed, Test Failed, Defect Raised) has specific transitions and actions.
- **Version Control:** Ensure that test cases are versioned, especially when managing test cases across different releases. This helps avoid confusion when a test case changes, as teams can reference the test case by version.
- **Automation Integration:** Integrating JIRA with test automation frameworks like **Selenium** or **Cucumber** can provide real-time test results and save time in manual execution.
- **Traceability:** Ensure that each test case is linked to specific **User Stories**, **Epics**, or **Requirements** so that stakeholders can easily trace the test cases back to the original business requirements.

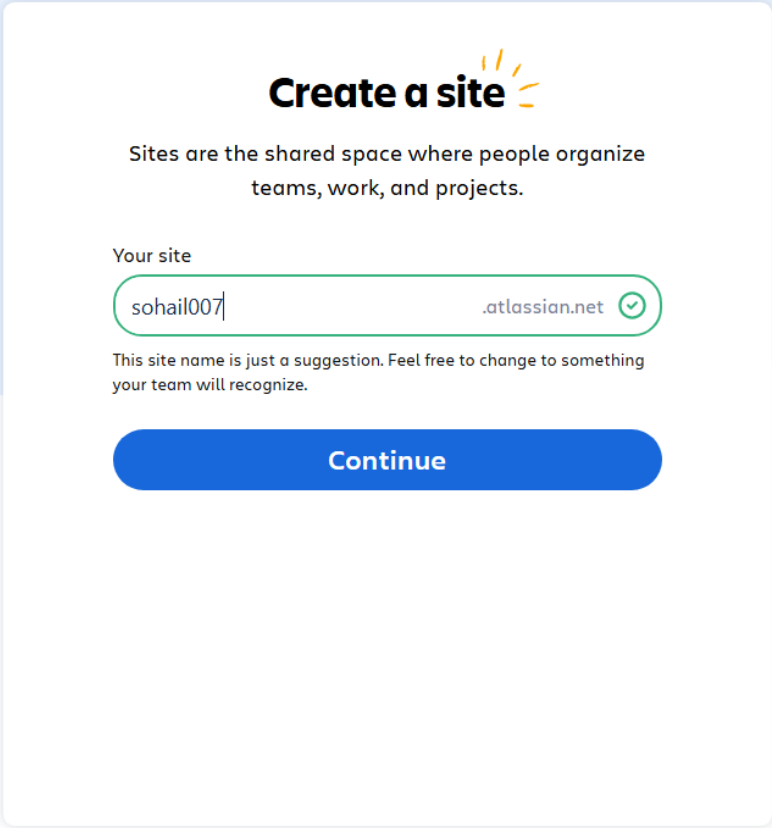
2.5. Reporting and Metrics

JIRA provides several out-of-the-box and customizable reports for **test case**

management:

- **Burndown Charts:** Track the progress of test case execution across sprints.
- **Test Execution Reports:** Provides a summary of how many tests have passed, failed, or are blocked.
- **Defect Reports:** Track defects linked to test failures, and see trends in defect resolution.

Output :



The image shows a Jira 'Create a site' dialog box. At the top, the Jira logo is displayed. Below it, the text 'Create a site' is followed by a small sun icon. A description states: 'Sites are the shared space where people organize teams, work, and projects.' There is a label 'Your site' above a text input field containing 'sohail007'. To the right of the input field is a dropdown menu showing '.atlassian.net' with a checkmark icon. Below the input field, a note says: 'This site name is just a suggestion. Feel free to change to something your team will recognize.' At the bottom of the dialog is a blue 'Continue' button. The Atlassian logo is visible at the very bottom of the screen.

Jira

Create a site

Sites are the shared space where people organize teams, work, and projects.

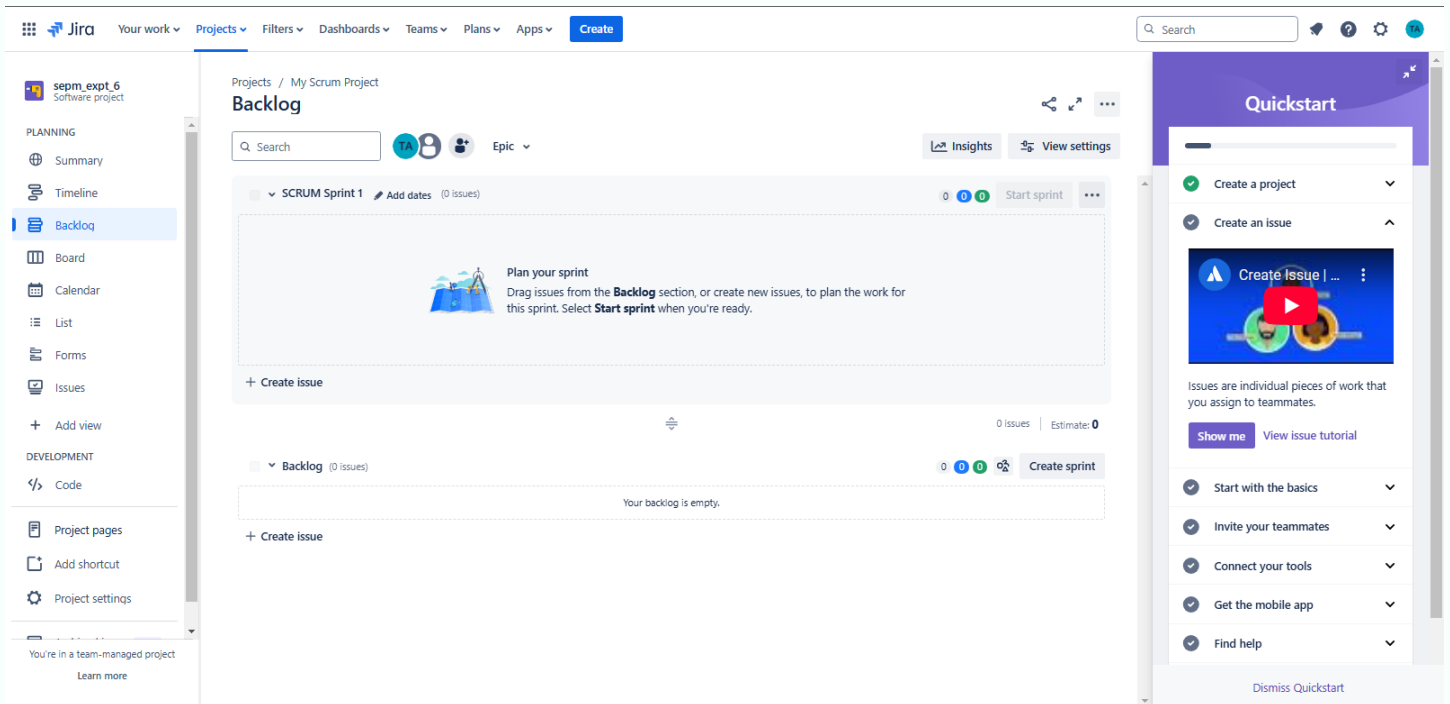
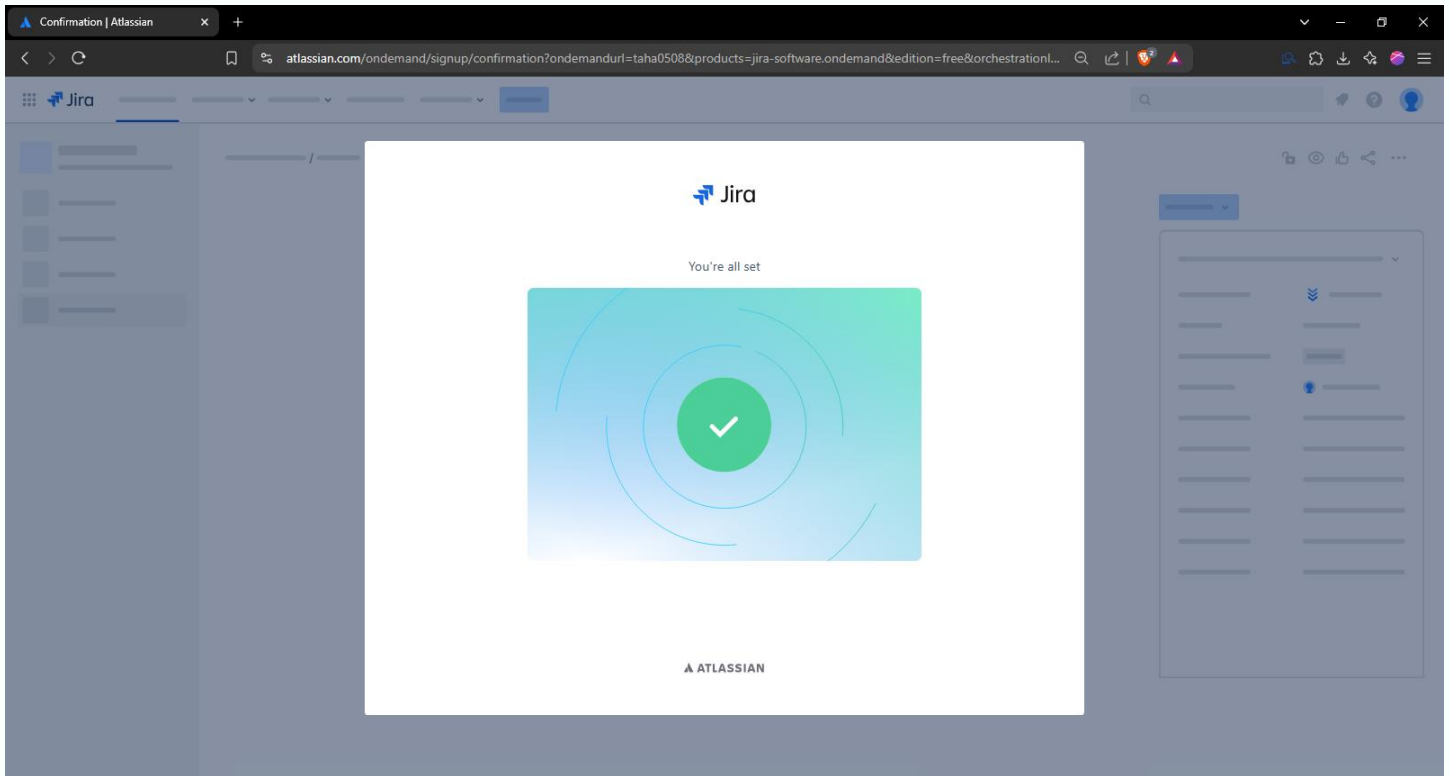
Your site

sohail007 .atlassian.net ✓

This site name is just a suggestion. Feel free to change to something your team will recognize.

Continue

ATLASSIAN



Jira

Your work

Projects

Filters

Dashboards

Teams

Plans

Apps

Create

create team

sepm_expt_6

Software project

PLANNING

Summary

Timeline

Backlog

Board

Calendar

List

Forms

Issues

Add view

DEVELOPMENT

Code

Project pages

Add shortcut

Project settings

You're in a team-managed project

Learn more

Projects / sepm_expt_6

Timeline

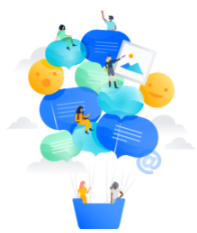
Search timeline

TA

Sprints

+ Create Epic

Create a team



Bring everyone together with one team you can @mention, filter, and assign work to. What's a team?

Required fields are marked with an asterisk *

Team name *

SEPM LAB

Who can see your team name? ⓘ

Who should be in this team? *

Taha A x Choose people

You can invite up to 50 people at once.

Membership controls

☐ Anyone can join this team without approval

Cancel Create a team

Export

Quickstart

Create a project

Map out your project goals

Identify small chunks of work

Monitor and manage risk

Create an issue

Create Issue | ...

Issues are individual pieces of work that you assign to teammates.

Show me View issue tutorial

Start with the basics

Invite your teammates

Dismiss Quickstart

Today Weeks Months Quarters 1

Jira

Your work

Projects

Filters

Dashboards

Teams

Plans

Apps

Create

create team

Teams

SEPM LAB

Add people

About

Good teams have good people, great teams have a description. Add yours here.


Members 3 ⓘ +

Taha A

Dhruv v

sannit

Agents 0



Team activity

There is no work to see here

Things the team created, edited or commented on in the last 90 days.

Jira issues assigned to team

Your team has no issues assigned

Work associated with your team in Jira will appear here.

×

Project templates

Made for you

Software development

Service management

Work management

Product management

Marketing

Human resources

Finance

Design

Personal

Operations

Legal

Sales

Analytics

IT

Facilities


Nonprofit

Project templates

Made for you

Templates for you based on how similar teams work.

Import data to a new project




Scrum

Jira

LAST CREATED

Sprint toward your project goals with a board, backlog, and timeline.




Product roadmap

Jira Product Discovery

TRY

Create custom roadmaps to share your plans with anyone.




Advanced IT service management

Jira Service Management

PREMIUM

Everything to handle service requests, track changes, and resolve incidents, plus post-incident reviews, approval workflows, and more.



Top-level planning


Jira

PREMIUM

Monitor work from multiple projects, and create an easy-to-share plan for

← Back to project templates

1 Project template



Scrum

Jira

Change template

Sprint toward your project goals with a board, backlog, and timeline.

2 Choose a project type


You'll need to create a new project if you decide to switch project types later.

Team-managed

Set up and maintained by your team.

For teams who want to control their own working processes and practices in a self-contained space. Mix and match agile features to support your team as you grow in size and complexity.

Simplified configuration



Get up and running quickly, with simplified configuration.


Select a team-managed project

Company-managed

Set up and maintained by your Jira admins.

For teams who want to work with other teams across many projects in a standard way. Encourage and promote organizational best practices and processes through a shared configuration.

Expert configuration



Benefit from complete control with expert configuration, automation, and flexibility.

Select a company-managed project

The last project you created was a team-managed project

10

Add project details

Explore what's possible when you collaborate with your team. Edit project details anytime in project settings.

Required fields are marked with an asterisk *

Name*

SEPM Expt 6

Key*

SE6

Access*

Private

Template

Change template



Scrum
Jira

Sprint toward your project goals with a board, backlog, and timeline.

Type

Change type



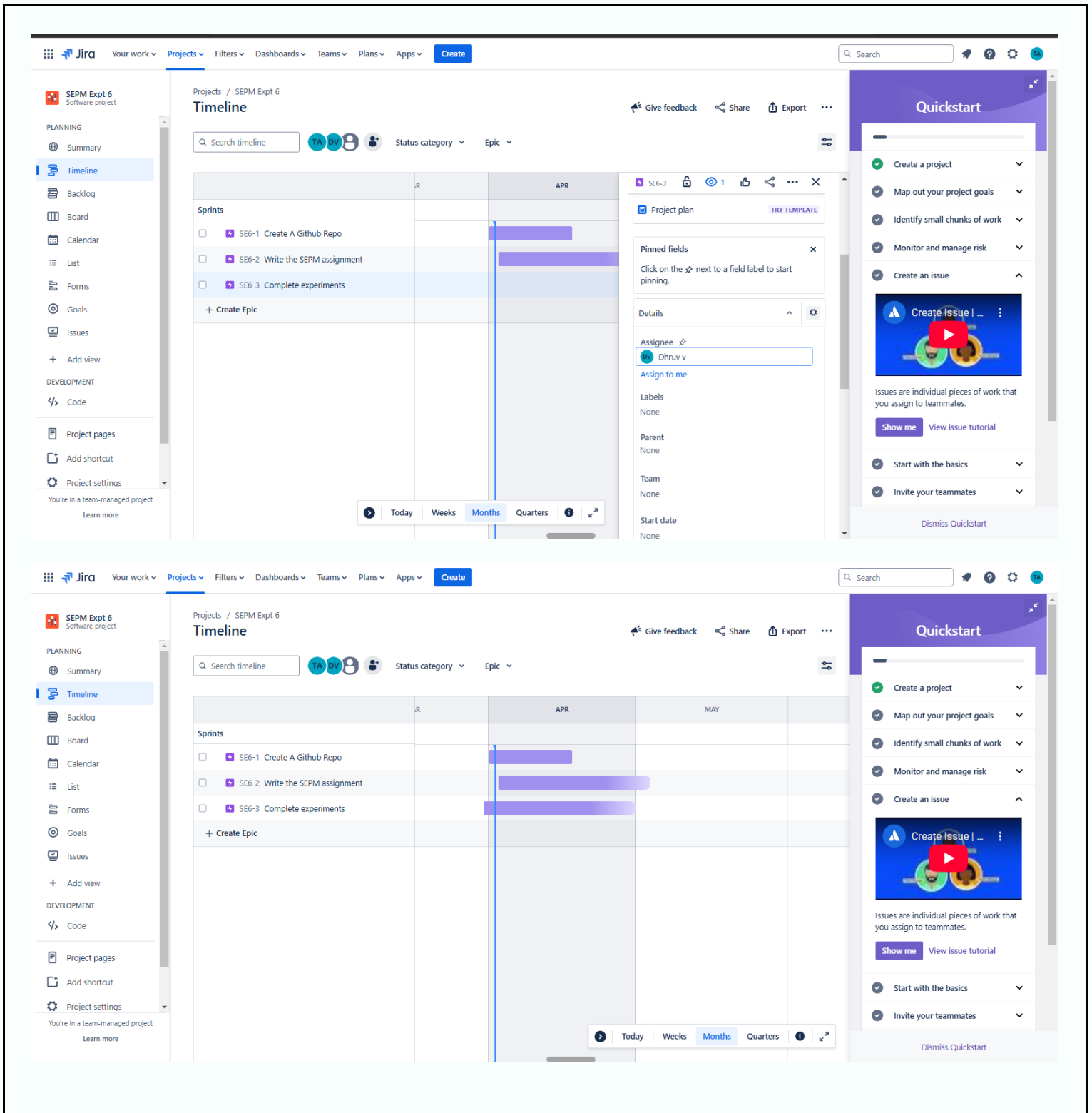
Team-managed

Control your own working processes and practices in a self-contained space.

Cancel

Create project

The screenshot shows the Jira web interface. At the top, there's a navigation bar with 'Your work', 'Projects', 'Filters', 'Dashboards', 'Teams', 'Plans', 'Apps', and a 'Create' button. Below this, the left sidebar shows project navigation options like 'Summary', 'Timeline', 'Backlog', 'Board', 'Calendar', 'List', 'Forms', 'Goals', 'Issues', 'Add view', 'Project pages', 'Add shortcut', and 'Project settings'. The main content area displays the 'SE6 board' for 'SEPM Expt 6'. It has a search bar and a 'Go to Backlog' button. A 'TO DO' section is visible with a 'Get started in the backlog' message. A 'Quickstart' panel on the right lists steps like 'Create a project', 'Customize your board', 'Create an issue', 'Start with the basics', 'Invite your teammates', 'Connect your tools', and 'Get the mobile app'. A modal dialog box titled 'Add people to SEPM Expt 6' is open in the center. It has a search bar with 'dhruv@gmail.' and a list of results showing 'Dhruv v' and 'dhruv@gmail.'. There's a 'Member' dropdown menu and 'Cancel' and 'Add' buttons at the bottom. A disclaimer at the bottom of the dialog states: 'This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply.'



The screenshot displays the Jira 'Timeline' view for a project named 'SEPM Expt 6'. The interface is divided into several sections:

- Left Sidebar:** Contains navigation options under 'PLANNING' (Summary, Timeline, Backlog, Board, Calendar, List, Forms, Goals, Issues, Add view) and 'DEVELOPMENT' (Code, Project pages, Add shortcut, Project settings).
- Main Area:** Shows the 'Timeline' view with a search bar and filters. It displays three sprints: 'SE6-1 Create A Github Repo' (DONE), 'SE6-2 Write the SEPM assignment', and 'SE6-3 Complete experiments'. Below the sprints, there are tabs for 'Today', 'Weeks', 'Months', and 'Quarters'.
- Right Sidebar:** Features a 'Quickstart' panel with steps: 'Create a project', 'Map out your project goals', 'Identify small chunks of work', 'Monitor and manage risk', and 'Create an issue'. Below this, there is a 'Create Issue | ...' button and a 'Dismiss Quickstart' link.
- Issue Details Panel:** On the right, there is a panel for the issue 'SE6-1 Create A Github Repo'. It includes a 'Description' field, 'Confluence content' (Project plan), 'Pinned fields' (Click on the x next to a field label to start pinning), and a 'Details' section with an 'Assignee' field.

Conclusion :

Hence, we have successfully implemented Agile Methodologies in JIRA.