

RAJALAKSHMI ENGINEERING COLLEGE
RAJALAKSHMI NAGAR, THANDALAM - 602 105



RAJALAKSHMI
ENGINEERING COLLEGE

CS23432
SOFTWARE CONSTRUCTION

Laboratory Record Note Book

Name :

Year / Branch / Section :

Register No. :

Semester :

Academic Year :



RAJALAKSHMI ENGINEERING COLLEGE (AUTONOMOUS)
RAJALAKSHMI NAGAR, THANDALAM – 602 105

BONAFIDE CERTIFICATE

NAME GOKULA SRINITHI M REGISTER NO. 2116231001048

ACADEMIC YEAR 2024-25 **SEMESTER- IV** **BRANCH:** B. Tech Information
Technology [AD/AE]. This Certification is the Bonafide record of work done by the above
student in the **CS23432- Software Construction** Laboratory during the year 2024-2025.

Signature of Faculty -in – Charge

Submitted for the Practical Examination held on _____

Internal Examiner

External Examiner

LAB PLAN

CS19442-SOFTWARE ENGINEERING LAB

Ex No	Date	Topic	Page No	Sign
1	21/01/2025	Study of Azure DevOps		
2	28/01/2025	Problem Statement		
3	04/02/2025	Agile Planning		
4	18/02/2025	Create User Stories		
5	25/02/2025	Sequence Diagram		
6	04/03/2025	Class Diagram		
7	11/03/2025	Use Case Diagram		
8	18/03/2025	Activity Diagram		
9	25/03/2025	Architecture Diagram		
10	01/04/2025	User Interface		
11	08/04/2025	Implementation		
12	15/04/2025	Testing – Test Plan And Test Cases		

Course Outcomes (COs)

Course Name: Software Engineering

Course Code: CS23432

CO 1	Understand the software development process models.
CO 2	Determine the requirements to develop software
CO 3	Apply modeling and modeling languages to design software products
CO 4	Apply various testing techniques and to build a robust software products
CO 5	Manage Software Projects and to understand advanced engineering concepts

CO - PO – PSO matrices of course

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CS23432.1	2	2	3	2	2	2	2	2	2	2	3	2	1	3	-
CS23432.2	2	3	1	2	2	1	-	1	1	1	2	-	1	2	-
CS23432.3	2	2	1	1	1	1	1	1	1	1	1	1	2	2	1
CS23432.4	2	2	3	2	2	2	1	0	2	2	2	1	1	2	1
CS23432.5	2	2	2	1	1	1	1	0	2	1	1	1	2	1	-
Average	2.0	2.2	2.0	1.6	1.6	1.4	1.3	1.3	1.6	1.4	1.8	1.3	1.4	2.0	1.0

Correlation levels 1, 2 or 3 are as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) No correlation: “-”

Study of Azure DevOps

AIM:

To study how to create an agile project in Azure DevOps environment.

STUDY:

Azure DevOps is a cloud-based platform by Microsoft that provides tools for DevOps practices, including CI/CD pipelines, version control, agile planning, testing, and monitoring. It supports teams in automating software development and deployment.

1. Understanding Azure DevOps

Azure DevOps consists of five key services:

1.1 Azure Repos (Version Control)

Supports Git repositories and Team Foundation Version Control (TFVC).

Provides features like branching, pull requests, and code reviews.

1.2 Azure Pipelines (CI/CD)

Automates build, test, and deployment processes.

Supports multi-platform builds (Windows, Linux, macOS).

Works with Docker, Kubernetes, Terraform, and cloud providers (Azure, AWS, GCP).

1.3 Azure Boards (Agile Project Management)

Manages work using Kanban boards, Scrum boards, and dashboards. Tracks user stories, tasks, bugs, sprints, and releases.

1.4 Azure Test Plans (Testing)

Provides manual, exploratory, and automated testing. Supports test case management and tracking.

1.5 Azure Artifacts (Package Management)

Stores and manages NuGet, npm, Maven, and Python packages.

Enables versioning and secure access to dependencies.

Getting Started with Azure DevOps

Step 1: Create an Azure DevOps

Account Visit Azure DevOps.

Sign in with a Microsoft Account.

Create an Organization and a

Project. Step 2: Set Up a Repository

(Azure Repos)

Navigate to Repos.

Choose Git or TFVC for version control. Clone the repository and push your code.

Step 3: Configure a CI/CD Pipeline (Azure Pipelines)

Go to Pipelines → New Pipeline

Select a source code repository (Azure Repos, GitHub, etc.).

Define the pipeline using YAML or the Classic Editor. Run the pipeline to build and deploy the application.

Step 4: Manage Work with Azure Boards

Navigate to Boards.

Create work items, user stories, and tasks.

Organize sprints and track progress.

Step 5: Implement Testing (Azure Test

Plans) Go to Test Plans.

Create and run test cases

View test results and track bugs.

Result:

The study was successfully completed.

PROBLEM STATEMENT

AIM:

To prepare PROBLEM STATEMENT for given project.

Problem Statement:

Effective communication is a critical need in both personal and professional environments. In today's fast-paced world, users require a simple, reliable, and efficient method of sending and receiving messages. Despite the wide range of messaging platforms available, many users still face challenges when it comes to managing conversations, particularly when communicating with multiple contacts at once.

Traditional SMS systems often lack advanced functionalities such as group messaging, editable contact groups, message history management, and visibility controls. Existing solutions can be fragmented, unintuitive, or fail to meet the diverse needs of users who need to coordinate information quickly across several individuals or groups. This gap leads to inefficiencies, miscommunication, missed opportunities, and user frustration.

Our project aims to design and build a robust **SMS/Text Messaging System** that focuses on providing a seamless user experience with core features tailored to modern communication needs. Key functionalities will include:

- **Group Messaging:** Users will have the ability to create groups with multiple contacts, enabling them to send and receive messages within a group context.
- **Editable Groups:** Users can edit group names, add or remove members, and manage group settings dynamically.
- **Visibility and Transparency:** All group members will have access to the full message history and updates, ensuring transparency and improved collaboration.
- **Reliable Delivery:** Messages should be delivered promptly with clear status updates to avoid uncertainty in communication.

The system will be designed to prioritize **usability**, **security**, and **scalability**. It will provide a clean interface suitable for both individual users and organizations, supporting use cases like internal team communication, customer support via SMS, event coordination, and more.

By delivering a comprehensive, user-friendly SMS/Text Messaging System, this project seeks to bridge the communication gaps present in current solutions and create a platform that supports efficient, real-time interaction with flexibility and ease.

Result:

The problem statement was written successfully.

AGILE PLANNING**Aim:**

To prepare an AgilePlan.

THEORY

Agile planning is a part of the Agile methodology, which is a project management style with an incremental, iterative approach. Instead of using an in-depth plan from the start of the project—which is typically product-related—Agile leaves room for requirement changes throughout and relies on constant feedback from end users.

With Agile planning, a project is broken down into smaller, more manageable tasks with the ultimate goal of having a defined image of a project's vision. Agile planning involves looking at different aspects of a project's tasks and how they'll be achieved, for example:

- Roadmaps to guide a product's release ad schedule
 - Sprints to work on one specific group of tasks at a time
 - A feedback plan to allow teams to stay flexible and easily adapt to change
- User stories, or the tasks in a project, capture user requirements from the end user's perspective Essentially, with Agile planning, a team would decide on a set of user stories to action at any given time, using them as a guide to implement new features or functionalities in a tool. Looking at tasks as user stories is a helpfulway to imagine how a customer may use a feature and helps teams prioritize work and focus on delivering value first.

- Steps in Agile planning process
 1. Define vision
 2. Set clear expectations on goals
 3. Define and break down the product roadmap
 4. Create tasks based on user stories

5. Populate product backlog
6. Plan iterations and estimate effort
7. Conduct daily stand-ups
8. Monitor and adapt

Result:

Thus the Agile plan was completed successfully.

CREATE USER STORIES**Aim:**

To create User Stories

THEORY

A user story is an informal, general explanation of a software feature written from the perspective of the end user. Its purpose is to articulate how a software feature will provide value to the customer.

User story template

"As a [role], I [want to], [so that]."

Epic 1: to create a user account , login process, and the user data management

Feature:

forgot password options

User Story 1: forgot password option

as a user , I want forgot password option so if i forgot my password ,i can reset the password and access the service .

Acceptance Criteria:

- user verification through email id or phone number by providing a code or opt.
- the code or opt should match the users input
- allow user to change password and save the password .
- if the code or opt is wrong ,give option to repeat the process.

User Story 2: To create an user account

as a user , i want to create account so i can access the service .

Acceptance Criteria:

- allow user to enter the details required
- all mandatory fields should be filled.
- user details should be stored.
- allow user to login and logout.

Epic 2: Messaging Core System

Feature:

Group Messaging

Acceptance Criteria:

- ❖ **User can create a group with multiple contacts.**
- ❖ **Group messages are visible to all members.**
- ❖ **Group name and members are editable.**
- ❖

Feature:

One-to-One Messaging

User Story1 : One-to-One Messaging

As a user, I want to send and receive messages so that I can chat with my contacts.

Acceptance Criteria:

- **User can type and send text messages.**
- **Time stamp is displayed for every message**
- **Messages sent are visible in the chat.**

Feature : handling trash messages

User Story 1: Create product listing

As a user, I want to create groups to chat with multiple at once.

User Story 1: Messages in Trash

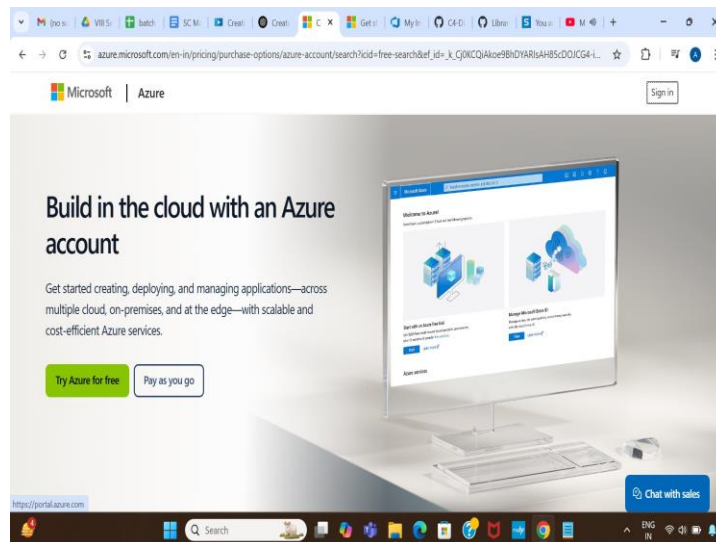
As a user, I want to push the unwanted messages to the trash.

Acceptance Criteria:

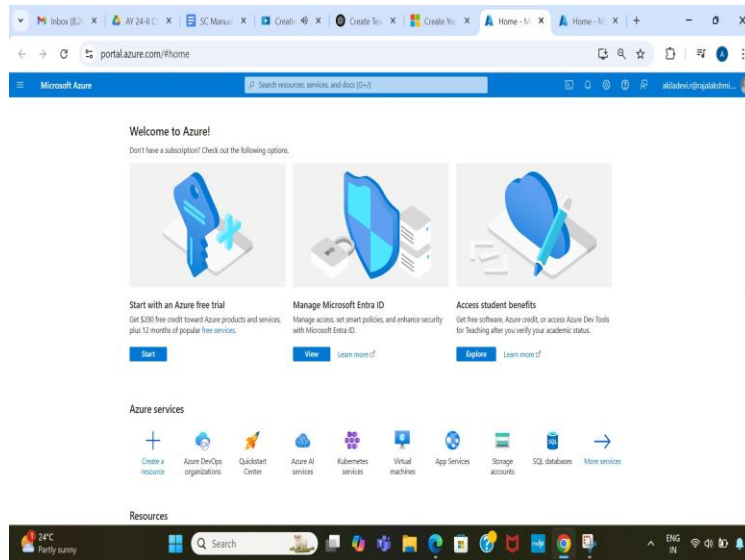
- 1.able to see the deleted messages or messages in the trash
- 2.able to restore the messages
- 3.able to permanently delete the message
- 4.able to see the count of messages in trash on the top of trash icon
- 5.messages in trash will be deleted automatically after a year
- 6.able to change the automatic delete option(6months/year)

Procedure:

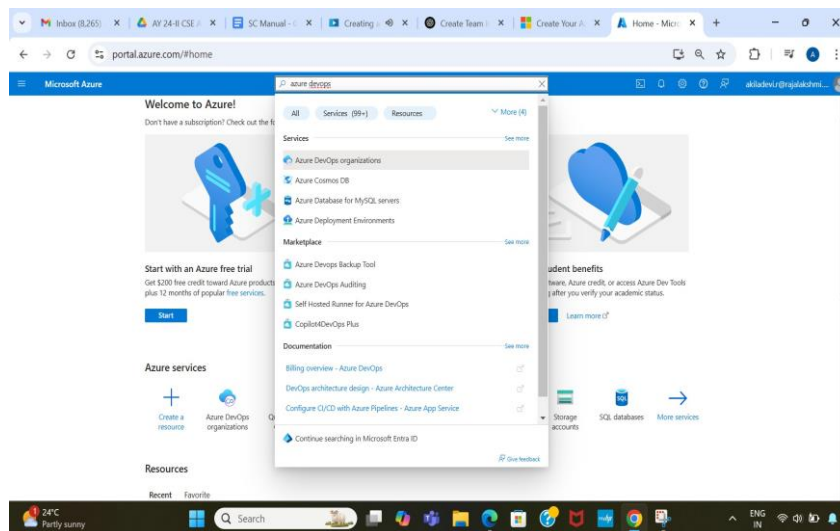
1. Open your web browser and go to the Azure website:
<https://azure.microsoft.com/en-in> Sign in using your Microsoft account credentials. If you don't have an account, you'll need to create one.
2. If you don't have a Microsoft account, you can sign up for
<https://signup.live.com/?lic=1>



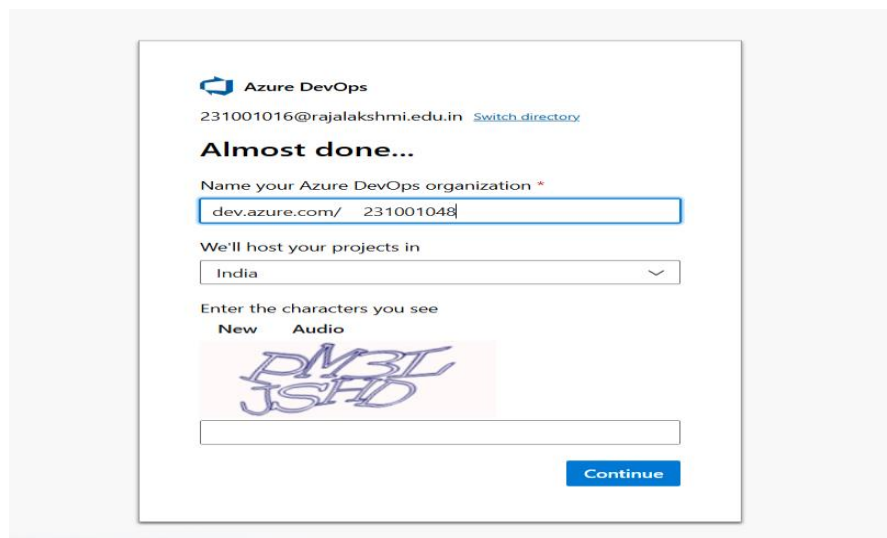
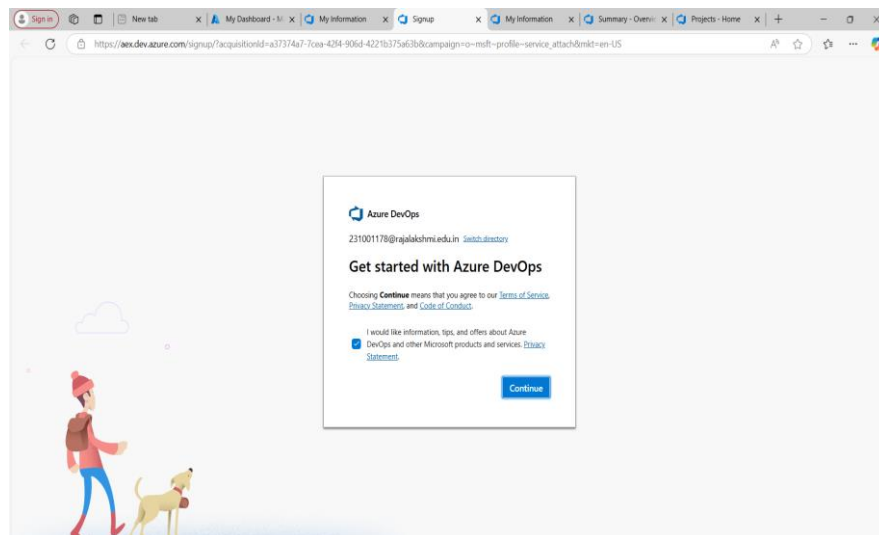
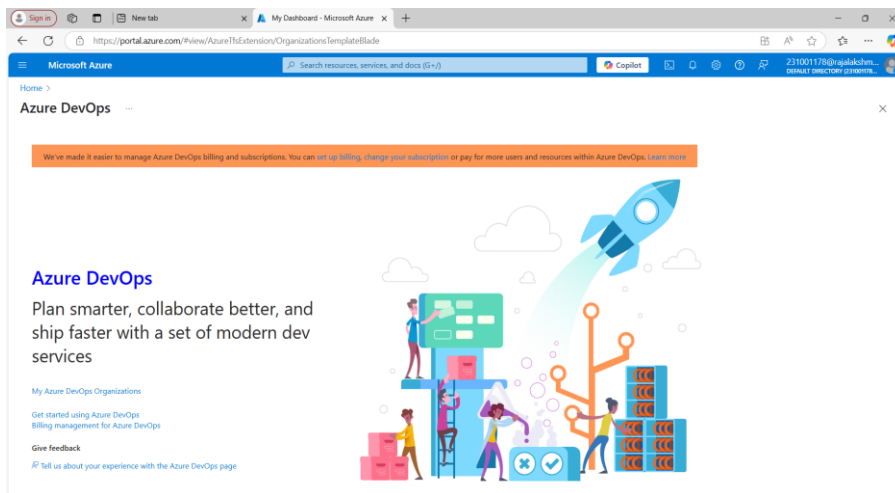
3. Azure home page



4. Open DevOps environment in the Azure platform by typing AzureDevOps Organizations in the search bar.



5. Click on the My Azure DevOps Organization link and create an organization and you should be taken to the Azure DevOps OrganizationHome page.



1. Create the First Project in Your Organization

After the organization is set up, you'll need to create your first **project**. This is where you'll begin to manage code, pipelines, work items, and more.

- i. On the organization's **Home page**, click on the **New Project** button.
- ii. Enter the project name, description, and visibility options:
 - o **Name:** Choose a name for the project (e.g., **LMS**).
 - o **Description:** Optionally, add a description to provide more context about the project.
 - o **Visibility:** Choose whether you want the project to be **Private** (accessible only to those invited) or **Public** (accessible to anyone).
- iii. Once you've filled out the details, click **Create** to set up your first project.

Create new project ×

Project name *

TEXT MESSAGNG SYSTEM

Description

Current communication systems often lack a centralized, simple, and reliable way for users to send and receive text messages, especially when managing communication with multiple contacts simultaneously. Businesses and individual users need an intuitive SMS/Text Messaging System that allows seamless one-on-one messaging, group messaging, message visibility controls, and editable contact groups.

The absence of such a system leads to fragmented communication, missed messages, and inefficient group collaboration. Our goal is to develop an easy-to-use, scalable, and secure messaging platform that addresses these needs and enhances real-time communication.

Visibility

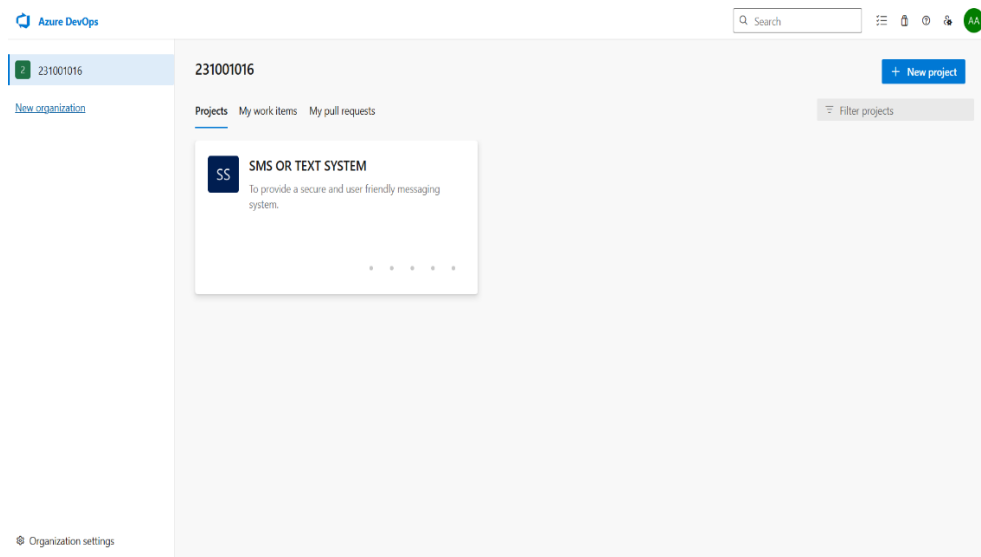
☒ **Public**
Anyone on the internet can view the project. Certain features like TFVC are not supported.

☐ **Private**
Only people you give access to will be able to view this project.

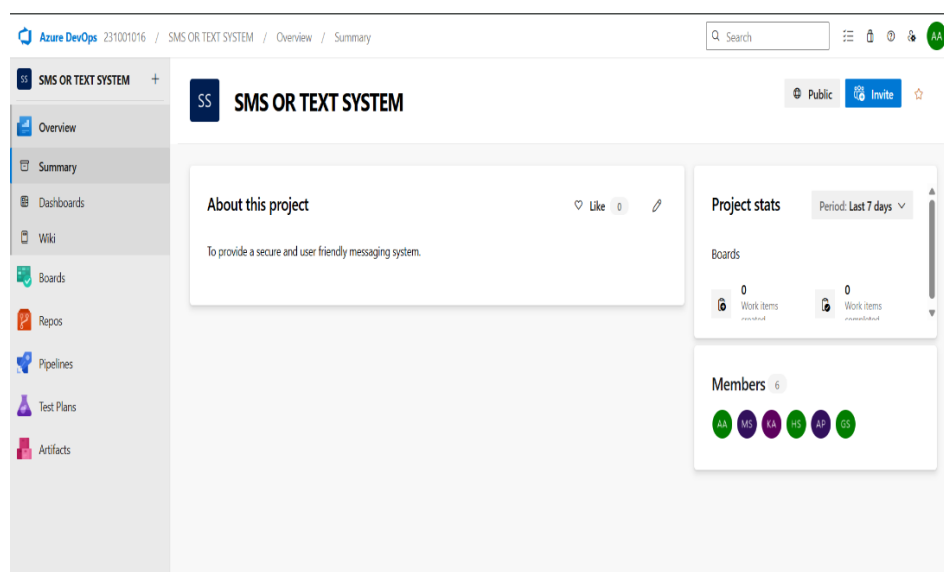
By creating this project, you agree to the Azure DevOps [code of conduct](#)

Advanced

2. Once logged in, ensure you are in the correct organization. If you're part of multiple organizations, you can switch between them from the top left corner (next to your user profile). Click on the Organization name, and you should be taken to the Azure DevOps Organization Home page.

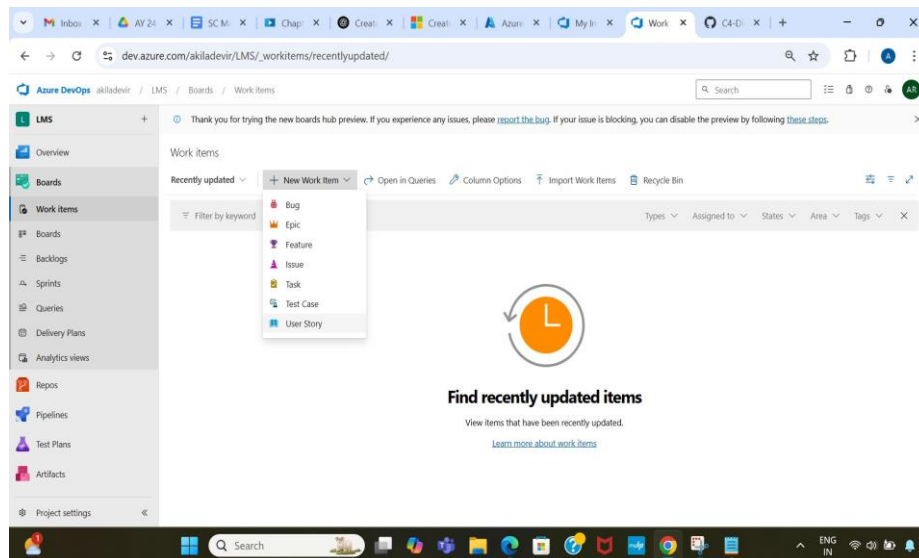


3. Project dashboard



4.To manage user stories

- a. From the **left-hand navigation menu**, click on **Boards**. This will take you to the main **Boards** page, where you can manage work items, backlogs, and sprints.
- b. On the **work items** page, you'll see the option to **Add a work item** at the top. Alternatively, you can find a + button or **Add New Work Item** depending on the view you're in. From the **Add a work item** dropdown, select **User Story**. This will open a form to enter details for the new User Story.



5.Fill in User Story Details

USER STORY 22

22 account creation

No one selected

0 Comments Add Tag

Save Follow

Updated by Archana A: 26

State: New Area: SMS OR TEXT SYSTEM Reason: New Iteration: SMS OR TEXT SYSTEM Details 1

Description

as a user , i want to create account so i can access the service .

Acceptance Criteria

1. allow user to enter the details required

2. all mandatory fields should be filled.

3. user details should be stored.

4. allow user to login and logout.

Discussion

Planning

Story Points

Priority

2

Risk

Classification

Value area

Business

Deployment

To track releases associated with this work item, go to [Releases](#) and turn on deployment status reporting for Boards in your pipeline's Options menu. [Learn more about deployment status reporting](#)

Development

Add link

Link an Azure Repos [commit](#), [pull request](#) or [branch](#) to see the status of your development. You can also [create a branch](#) to get started.

Related Work

Result:

The user story was written successfully.

SEQUENCE DIAGRAM**Aim:**

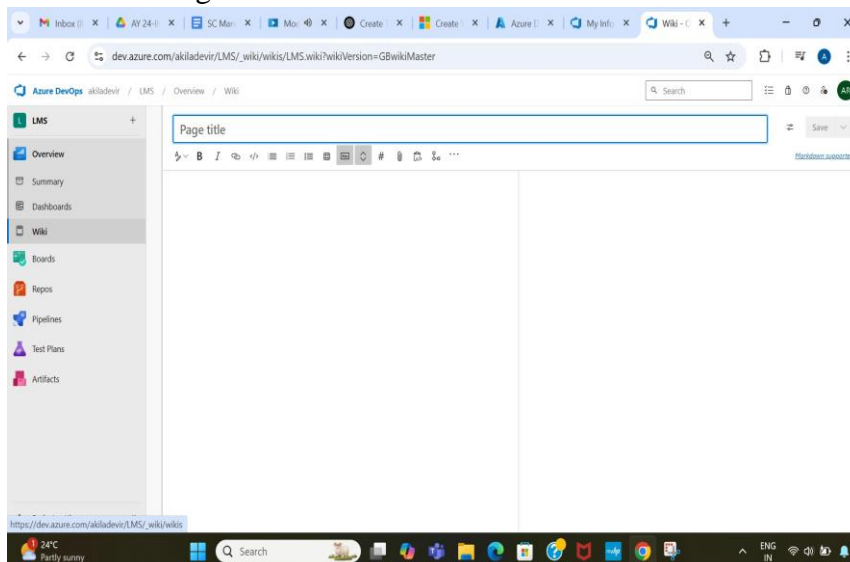
To design a Sequence Diagram by using Mermaid.js

THEORY:

A Sequence Diagram is a key component of Unified Modelling Language (UML) used to visualize the interaction between objects in a sequential order. It focuses on how objects communicate with each other over time, making it an essential tool for modelling dynamic behaviour in a system.

Procedure:

1. Open a project in Azure DevOps Organisations.
2. To design select wiki from menu



3. Write code for drawing sequence diagram and save the code.

```
sequenceDiagram
```

```
%% User Account Creation
```

```
participant User
```

```
participant AccountService
```

```
participant Database
```

```
User ->> AccountService: createAccount(name, phone, email, password)
```

```
AccountService ->> Database: storeUserData()
```

Database -->> AccountService: success

AccountService -->> User: accountCreated()

%% User Login

User ->> AccountService: login(phone, password)

AccountService ->> Database: validateCredentials()

Database -->> AccountService: validationResult()

alt valid credentials

AccountService -->> User: loginSuccess()

else invalid credentials

AccountService -->> User: loginFailed()

end

%% Forgot Password

User ->> AccountService: requestPasswordReset()

AccountService ->> Database: findUser()

Database -->> AccountService: userExists()

AccountService -->> User: sendResetLink()

%% One-to-One Messaging

User ->> MessagingService: sendMessage(receiver, content)

MessagingService ->> Database: storeMessage()

Database -->> MessagingService: messageStored()

MessagingService ->> SMSGateway: sendToReceiver()

SMSGateway -->> User: messageSent()

%% Group Messaging

User ->> GroupChatService: sendGroupMessage(groupId, content)

GroupChatService ->> Database: storeGroupMessage()

Database -->> GroupChatService: messageStored()

GroupChatService ->> GroupMembers: deliverMessage()

%% Message History & Sync

User ->> SyncManager: syncContacts()

SyncManager ->> Database: fetchContacts()

Database -->> SyncManager: contactList()

SyncManager -->> User: contactsSynced()

User ->> SyncManager: syncMessageHistory()

SyncManager ->> Database: fetchMessageHistory()

Database -->> SyncManager: messageHistory()

SyncManager -->> User: historySynced()

%% Trash & Deletion

User ->> TrashService: moveMessageToTrash(messageId)

TrashService ->> Database: updateMessageStatus()

Database -->> TrashService: updated

TrashService -->> User: messageMovedToTrash()

User ->> TrashService: restoreMessage(messageId)

TrashService ->> Database: updateMessageStatus()

Database -->> TrashService: restored

TrashService -->> User: messageRestored()

%% Notifications

MessagingService ->> NotificationService: triggerNotification(user)

NotificationService -->> User: displayNewMessageAlert()

Explanation:

participant defines the entities involved.

->> represents a direct message.

-->> represents a response message.

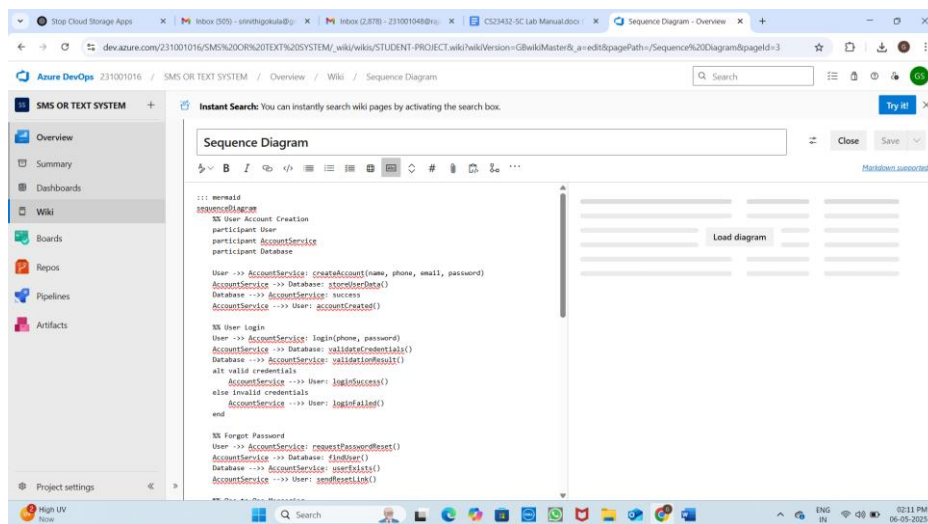
+ after ->> activates a participant.

- after -->> deactivates a
participant. alt / else for

conditional flows.

loop can be used for repeated actions.

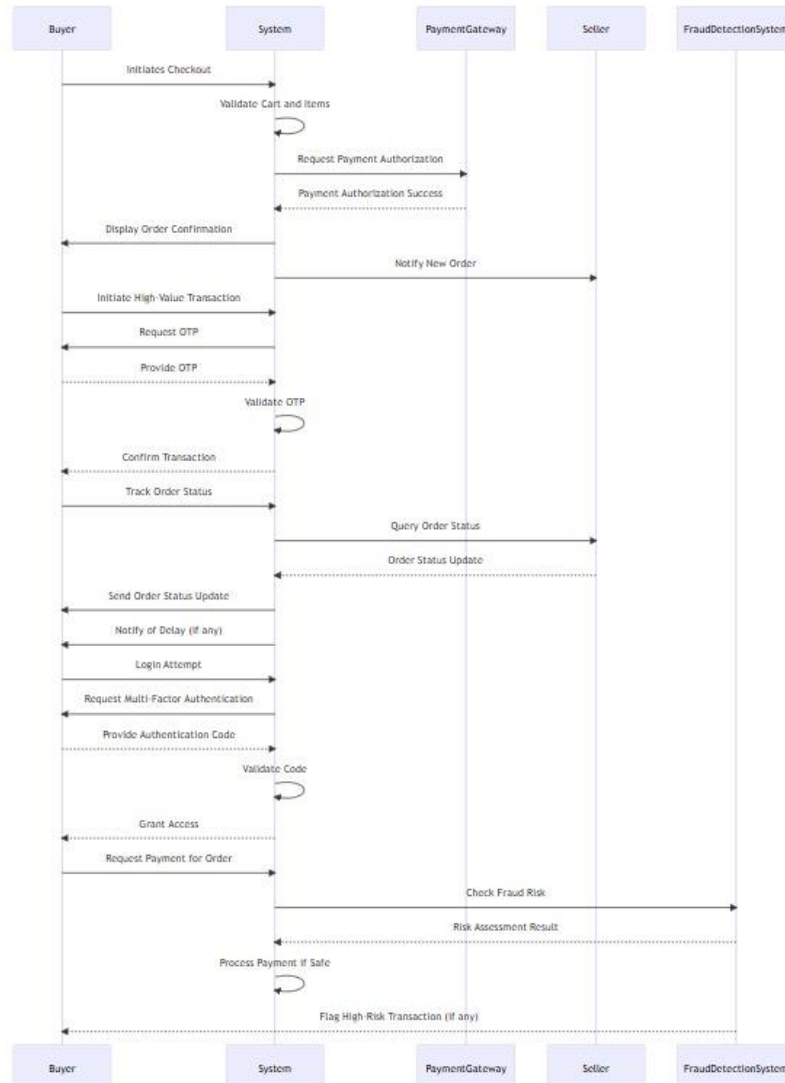
- > Solid line without arrow
- > Dotted line without arrow
- >> Solid line with arrowhead
- >> Dotted line with arrowhead
- <<->> Solid line with bidirectional arrowheads (v11.0.0+)
- <<-->> Dotted line with bidirectional arrowheads (v11.0.0+)
- x Solid line with a cross at the end
- x Dotted line with a cross at the end
-) Solid line with an open arrow at the end (async)
-) Dotted line with an open arrow at the end (async)



4. click wiki menu and select the page

Sequence diagram

Shiyatheshini V Apr 1



Result:

The sequence diagram was drawn successfully.

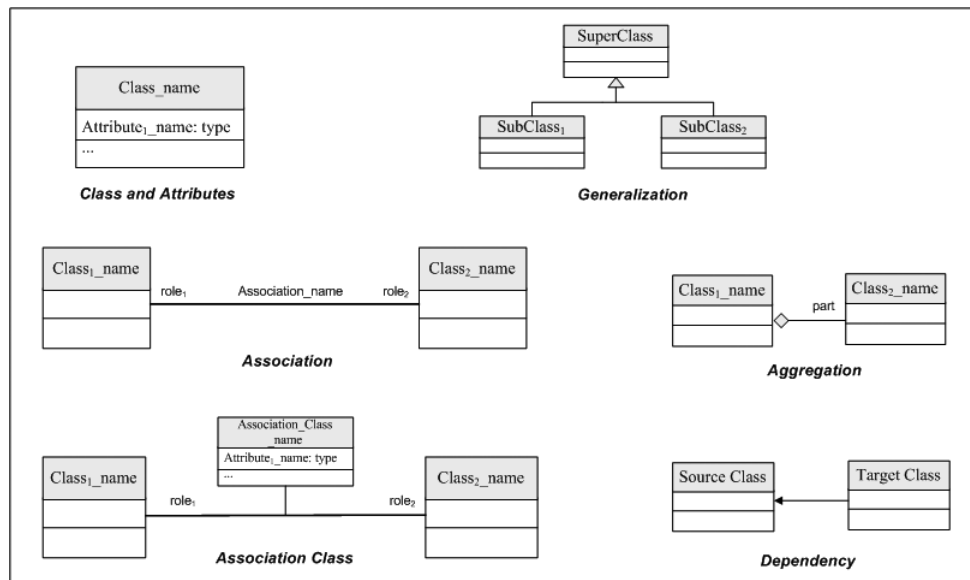
CLASS DIAGRAM

AIM :-

To draw a sample class diagram for your project or system.

THEORY

A UML class diagram is a visual tool that represents the structure of a system by showing its classes, attributes, methods, and the relationships between them.

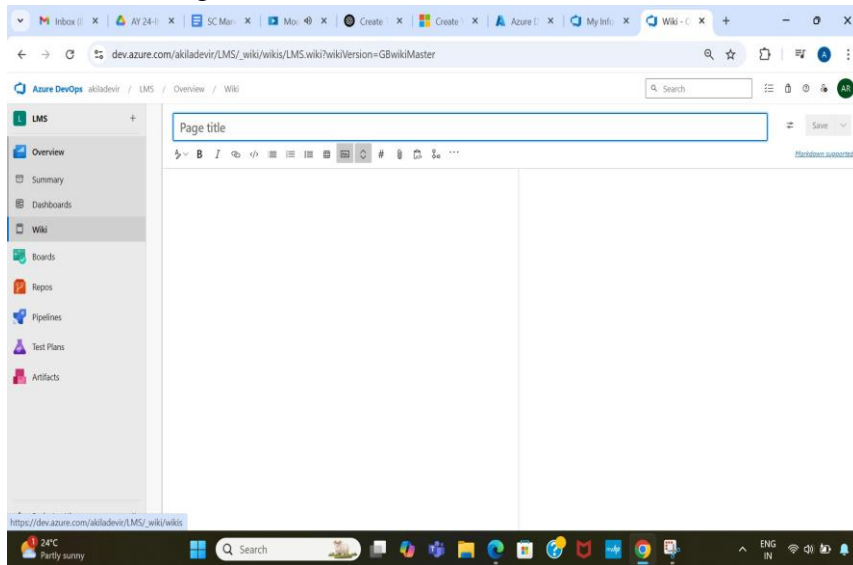


Notations in class diagram

Procedure:

1. Open a project in Azure DevOps Organisations.

2. To design select wiki from menu



3. Write code for drawing class diagram and save the code

classDiagram

%% User Management

```
class User {  
    +int userId  
    +String name  
    +String phoneNumber  
    +String email  
    +String password  
    +createAccount()  
    +login()  
    +resetPassword()  
    +manageData()  
}
```

```
class Contact {  
    +int contactId  
    +String contactName
```

```
+String phoneNumber  
+syncContacts()  
}
```

```
class AccountManagement {  
    +createUserAccount()  
    +loginUser()  
    +forgotPassword()  
    +manageUserData()  
}
```

%% Messaging System

```
class Message {  
    +int messageId  
    +User sender  
    +User receiver  
    +String content  
    +Date timestamp  
    +send()  
    +delete()  
    +moveToTrash()  
}
```

```
class Conversation {  
    +int conversationId  
    +List<User> participants  
    +addMessage()  
    +getMessages()
```

```
}
```

```
class GroupChat {  
    +int groupId  
    +List<User> members  
    +addMember()  
    +removeMember()  
    +sendGroupMessage()  
}
```

```
class Trash {  
    +List<Message> deletedMessages  
    +restoreMessage()  
    +deletePermanently()  
}
```

%% System Functions

```
class SMSGateway {  
    +String provider  
    +sendMessage()  
    +receiveMessage()  
}
```

```
class Notification {  
    +int notificationId  
    +Message message  
    +Boolean isRead  
    +notifyUser()
```

```
+markAsRead()
```

```
}
```

```
class SyncManager {
```

```
+syncContacts()
```

```
+syncHistory()
```

```
}
```

```
%% Relationships
```

```
Buyer --> Cart : Manages
```

```
Cart --> Order : Creates
```

```
Order --> Payment : Makes
```

```
Order --> Shipment : Ships
```

```
Buyer --> User : Authenticates
```

```
Seller --> Product : Owns
```

```
Product --> Inventory : Manages
```

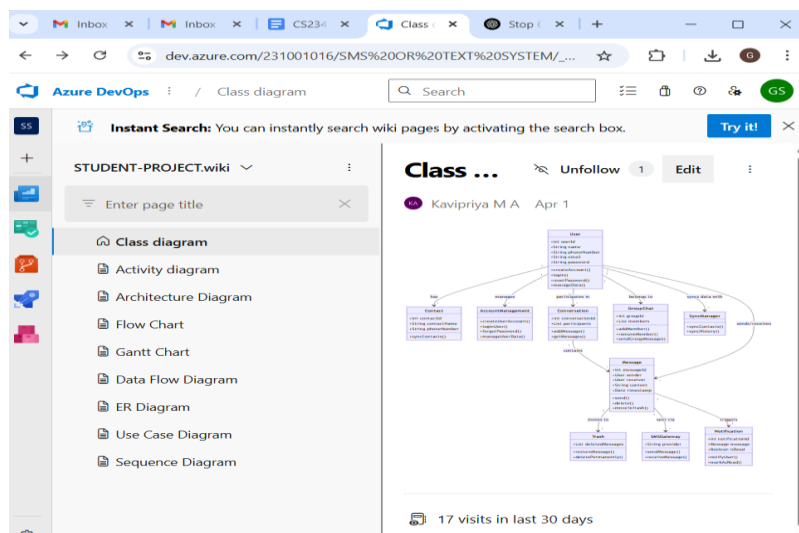
```
Seller --> Inventory : Updates
```

```
User --> FraudDetection : Uses
```

```
AutoScaling --> DatabaseOptimization : WorksWith
```

Relationship Types

Type	Description
<	Inheritance
*	Composition
o	Aggregation
>	Association
<	Association
>	Realization



Result:

The use case diagram was designed successfully.

USECASE DIAGRAM

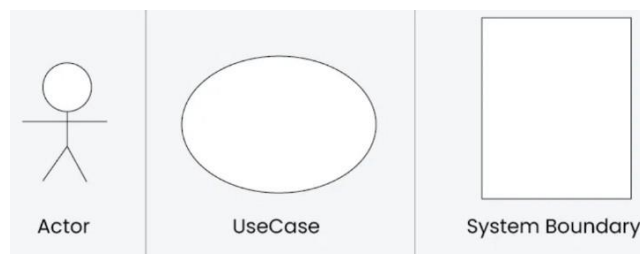
Aim:

Steps to draw the Use Case Diagram using draw.io

Theory:

• UCD shows the relationships among actors and use cases within a system which Provide an overview of all or part of the usage requirements for a system or organization in the form of an essential model or a business model and communicate the scope of a development project

- **Use Cases**
- **Actors**
- **Relationships**
- **System Boundary Boxes**



Procedure

Step 1: Create the Use Case Diagram in Draw.io

- Open Draw.io (diagrams.net).
- Click "Create New Diagram" and select "Blank" or "UML Use Case" template.
- Add Actors (Users, Admins, External Systems) from the UML section.
- Add Use Cases (Functionalities) using ellipses.
- Connect Actors to Use Cases with lines (solid for direct interaction, dashed for <<include>> and <<extend>>).
- Save the diagram as .drawio or export as

PNG/JPG/SVG. Step 2: Upload the Diagram to Azure DevOps

Option 1: Add to Azure DevOps Wiki

- Open Azure DevOps and go to your project.
- Navigate to Wiki (Project > Wiki).
- Click "Edit Page" or create a new page.
- Drag & Drop the exported PNG/JPG image.
- Use Markdown to embed the diagram:
 - ![Use Case Diagram](attachments/use_case_diagram.png)

Option 2: Attach to Work Items in Azure Boards

- Open Azure DevOps → Navigate to Boards (Project > Boards).
- Select a User Story, Task, or Feature.
- Click "Attachments" → Upload your Use Case Diagram.
- Add comments or descriptions to explain the use case.

```

::: mermaid
graph TD;

%% Actors
User["👤 User"]
Admin["👤 Admin"]
SMSGateway["📶 SMS Gateway"]

%% Use Cases for User
UC1["👤 Create Account"]
UC2["🔑 Login"]
UC3["🔑 Reset Password"]
UC4["📧 Send Message"]
UC5["📧 Receive Message"]
UC6["👤 Send Group Message"]
UC7["🗑️ Move Message to Trash"]
UC8["🔄 Sync Contacts"]
UC9["📜 View Message History"]
UC10["🔔 Receive Notification"]

%% Use Cases for Admin
UC11["🔑 Manage User Accounts"]
UC12["📊 View System Logs"]
UC13["🔄 Sync System Data"]

%% Use Cases for SMS Gateway
UC14["📶 Deliver Message"]
UC15["📶 Receive Message"]

%% Relationships (User)
User -->|Registers| UC1
User -->|Authenticates| UC2
User -->|Requests| UC3
User -->|Sends| UC4
User -->|Receives| UC5
User -->|Sends| UC6
User -->|Deletes| UC7
User -->|Syncs| UC8
User -->|Views| UC9
User -->|Receives| UC10

%% Relationships (Admin)
Admin -->|Manages| UC11
Admin -->|Monitors| UC12
Admin -->|Syncs| UC13

%% Relationships (SMS Gateway)
SMSGateway -->|Processes| UC14
SMSGateway -->|Receives| UC15

:::

```

Use Case Diagram

Follow 1 Edit

Kavipriya M A 1 Apr



Result:



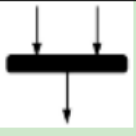


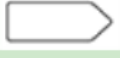





The use case diagram was designed successfully

ACTIVITY DIAGRAM**AIM :-**

To draw a sample activity diagram for your project or system.

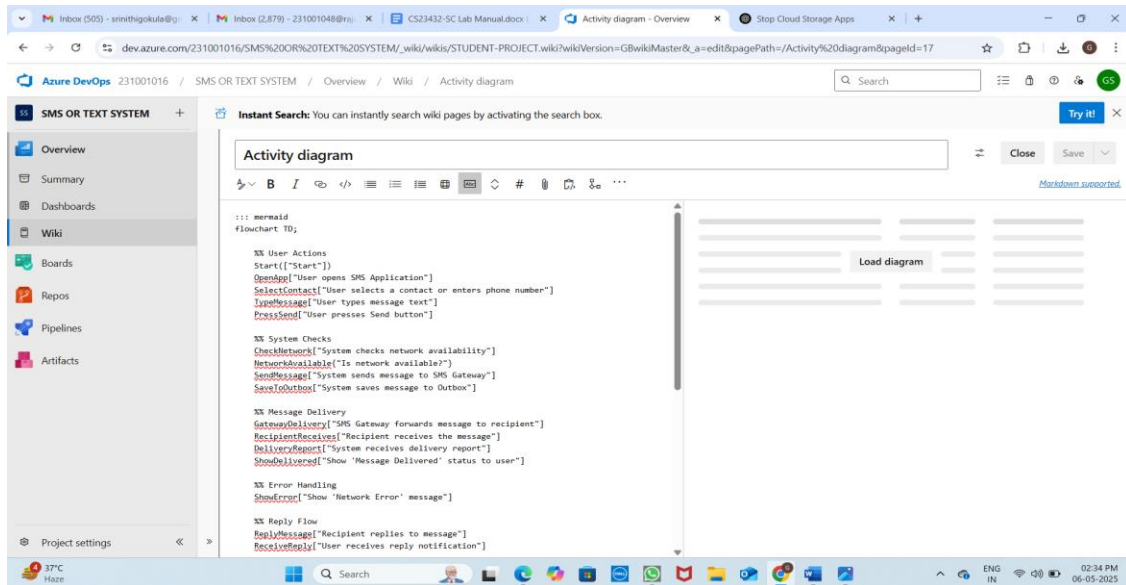
THEORY

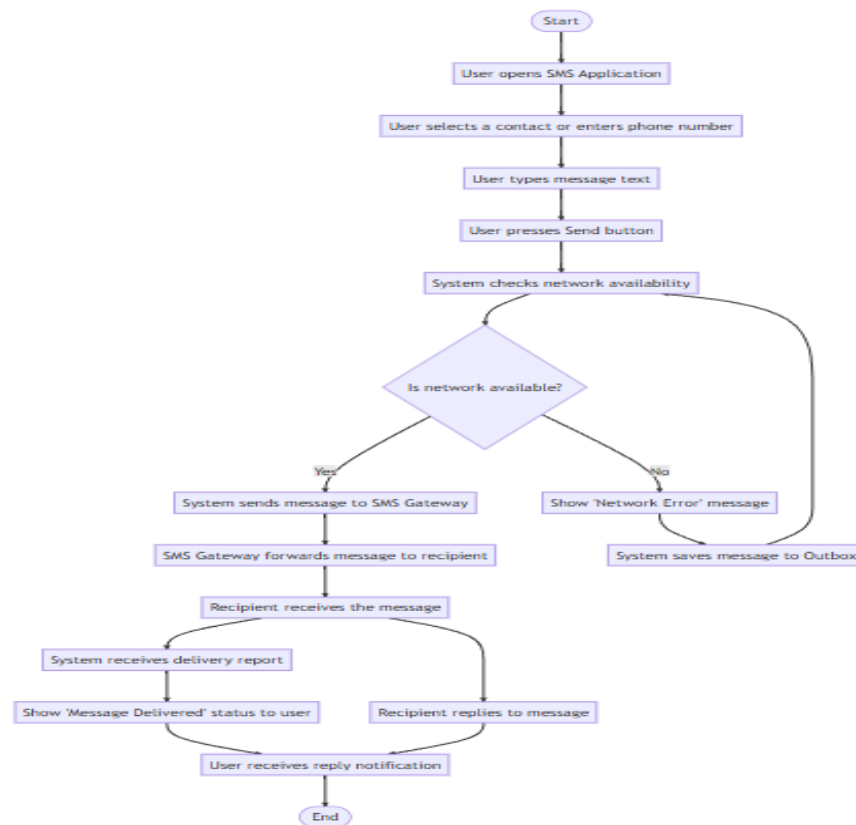
Activity diagrams are an essential part of the Unified Modelling Language (UML) that help visualize workflows, processes, or activities within a system. They depict how different actions are connected and how a system moves from one state to another.

Notations	Symbol	Meaning
Start		Shows the beginning of a process
Connector		Shows the directional flow, or control flow, of the activity
Joint symbol		Combines two concurrent activities and re-introduces them to a flow where one activity occurs at a time
Decision		Represents a decision
Note		Allows the diagram creators to communicate additional messages
Send signal		Show that a signal is being sent to a receiving activity
Receive signal		Demonstrates the acceptance of an event
Flow final symbol		Represents the end of a specific process flow
Option loop		Allows the creator to model a repetitive sequence within the option loop symbol
Shallow history pseudostate		Represents a transition that invokes the last active state.
End		Marks the end state of an activity and represents the completion of all flows of a process

Procedure

1. Draw diagram in draw.io
2. Upload the diagram in Azure DevOps wiki



**Result:**

The activity diagram was designed successfully

ARCHITECTURE DIAGRAM

Aim:

Steps to draw the Architecture Diagram using draw.io.

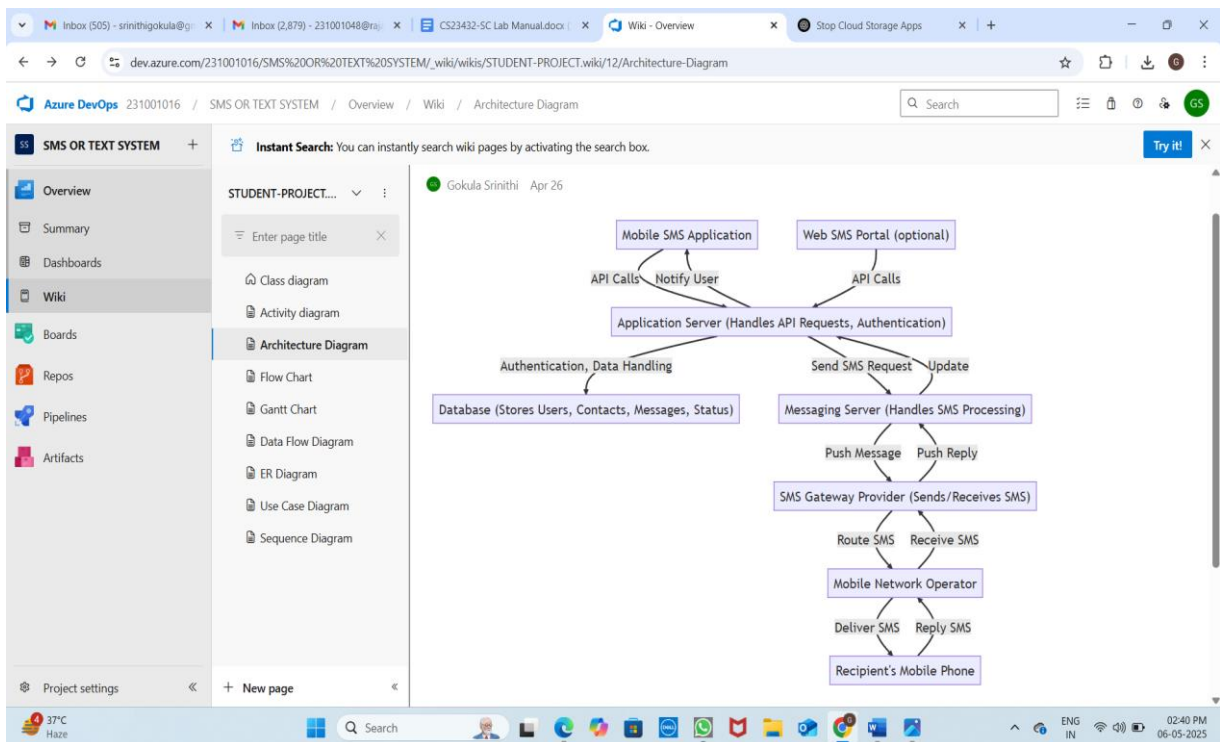
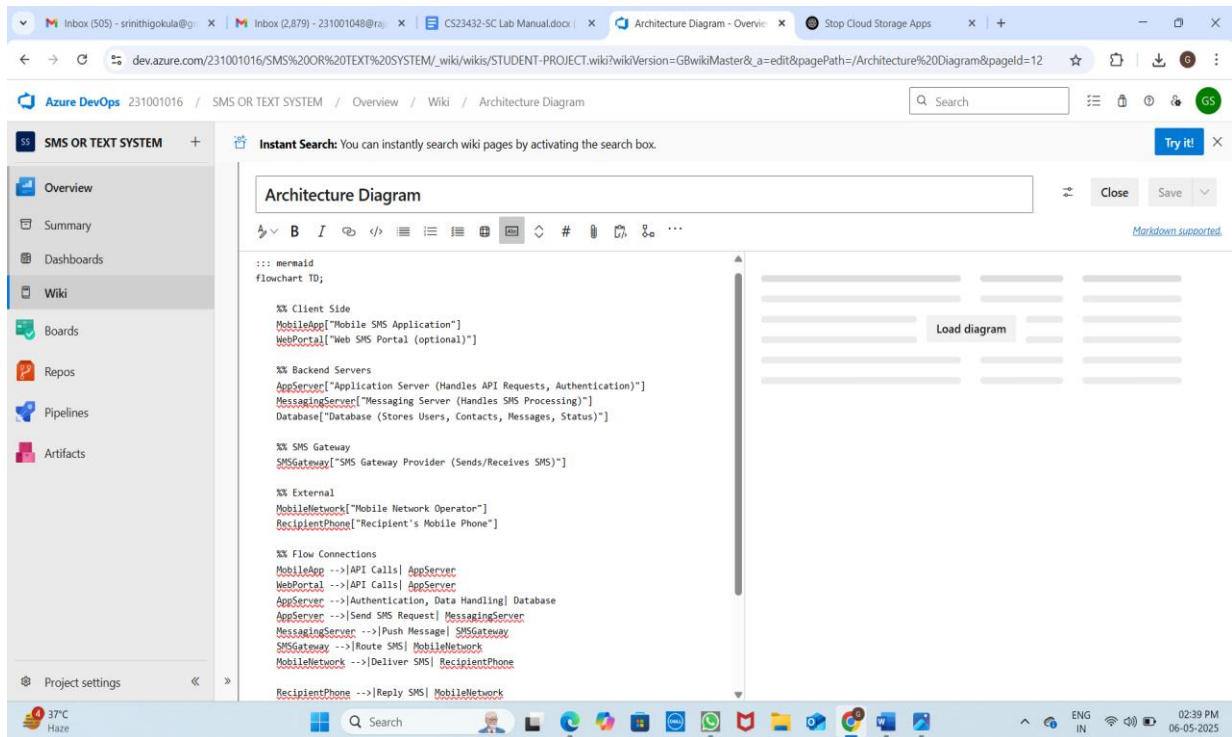
Theory:

An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element.



Procedure

1. Draw diagram in draw.io
2. Upload the diagram in Azure DevOps wiki

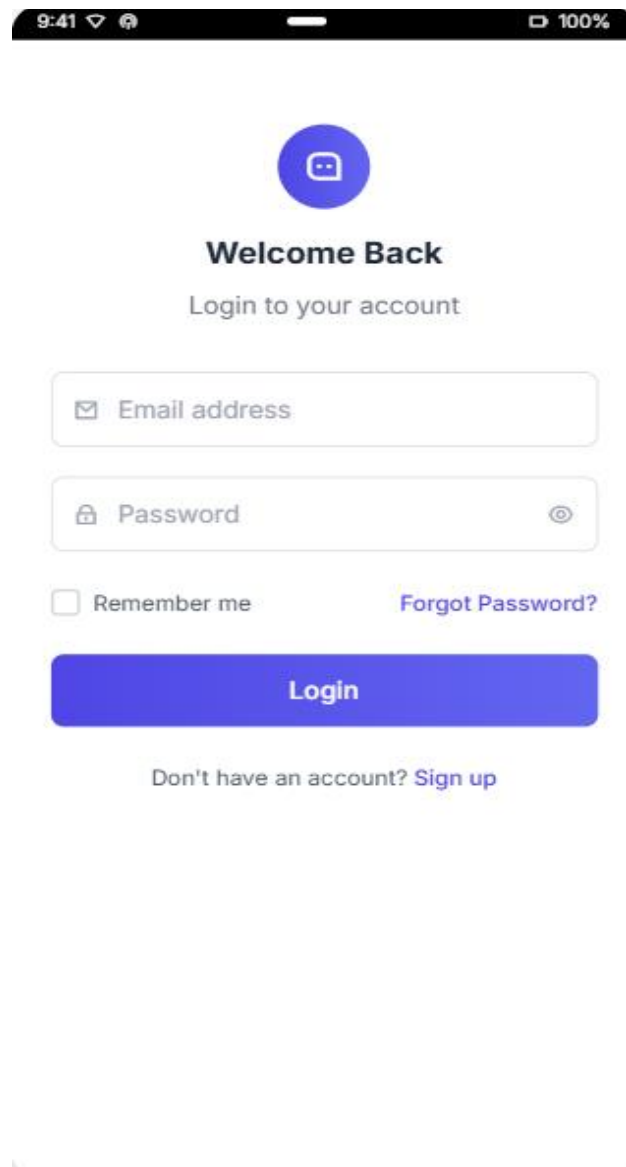


Result:

The architecture diagram was designed successfully

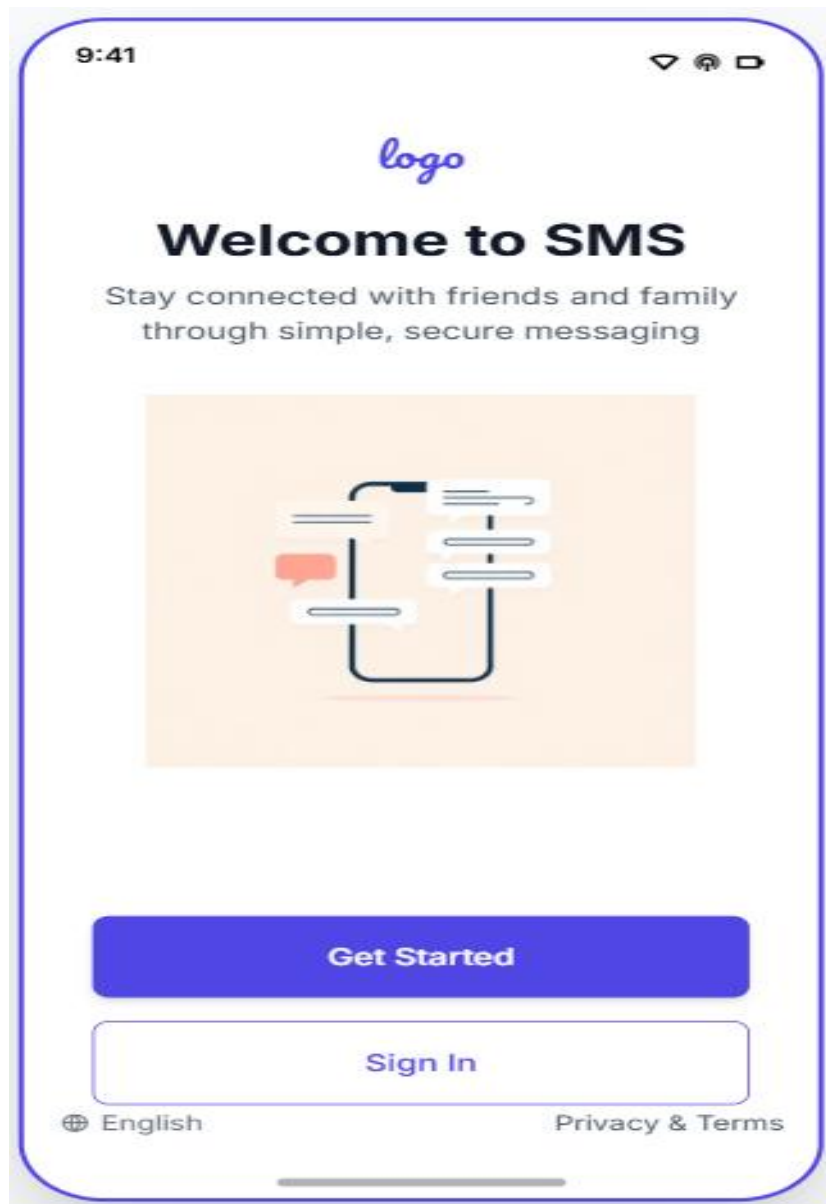
USER INTERFACE**Aim:**

Design User Interface for the given project

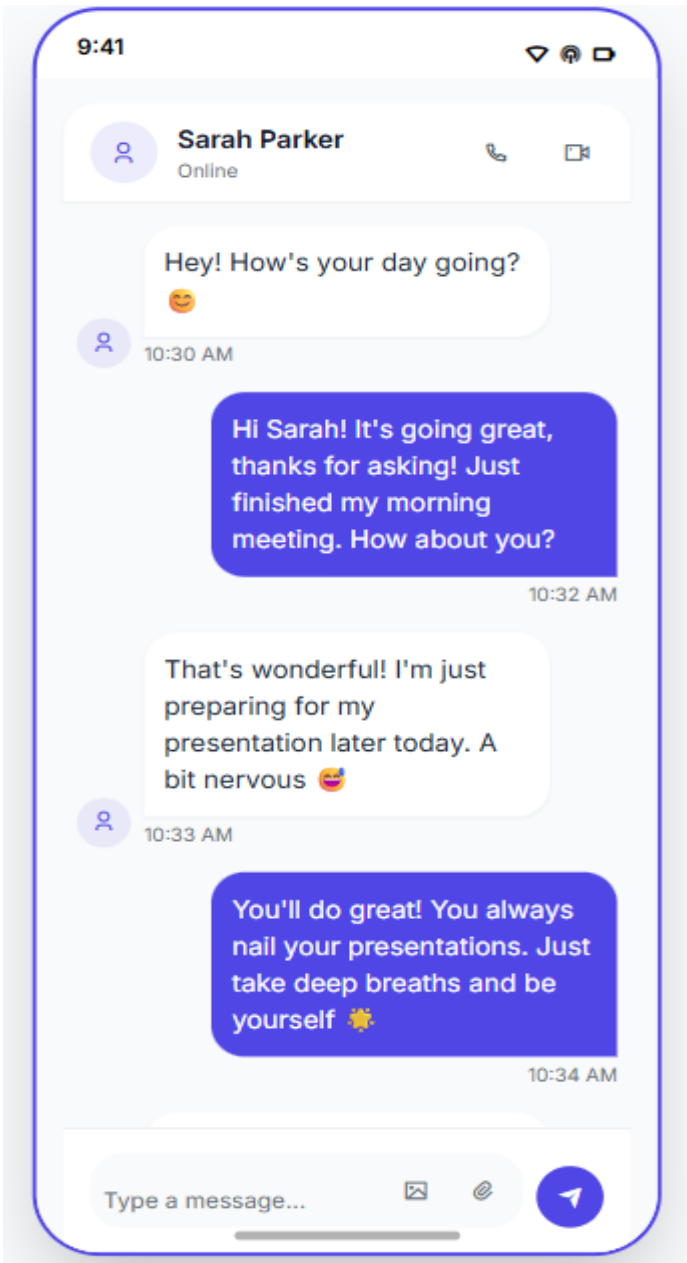
PROCEDURE:**1. Login page :**

A mobile application login screen mockup. At the top is a black status bar with white text showing '9:41', signal strength, and '100%' battery. Below this is a light gray background. In the center, there is a blue circular icon with a white speech bubble containing two dots. Below the icon, the text 'Welcome Back' is displayed in bold black font, followed by 'Login to your account' in a smaller, lighter gray font. There are two input fields: the first is labeled 'Email address' with an envelope icon on the left; the second is labeled 'Password' with a lock icon on the left and an eye icon on the right. Below the password field, there is a checkbox labeled 'Remember me' and a link 'Forgot Password?' in blue. A large blue button with the text 'Login' in white is positioned below these elements. At the bottom, there is a link 'Don't have an account? Sign up' in blue. The entire screen is framed by a thin gray border.

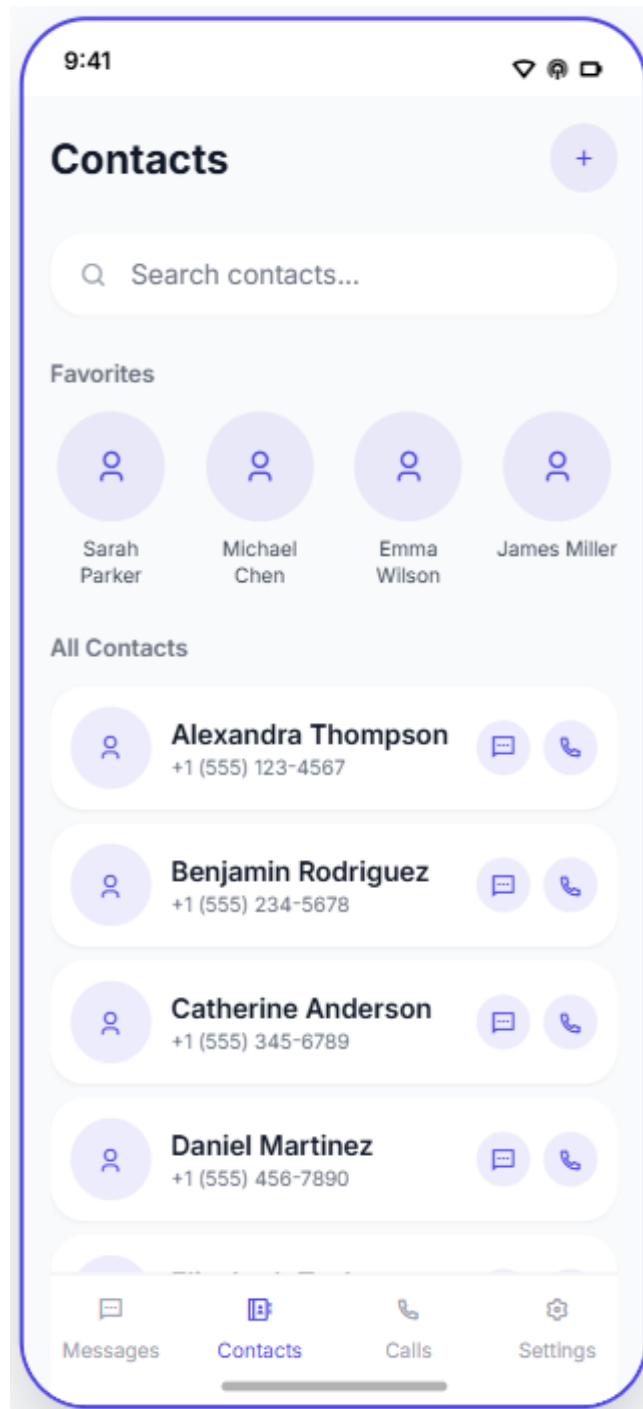
2 . LANDING PAGE:



3.CHAT PAGE:



4.SYNCING CONTACTS :



Result:

The UI was designed successfully.

IMPLEMENTATION

Aim:

To implement the given project based on Agile Methodology.

Procedure:**Step 1: Set Up an Azure DevOps Project**

- Log in to Azure DevOps.
- Click "New Project" → Enter project name → Click "Create".
- Inside the project, navigate to "Repos" to store the code.

Step 2: Add Your Web Application Code

- Navigate to Repos → Click "Clone" to get the Git URL.
- Open Visual Studio Code / Terminal and

```
run: git clone <repo_url>
cd <repo_folder>
```
- Add web application code (HTML, CSS, JavaScript, React, Angular, or backend like Node.js, .NET, Python, etc.).
- Commit & push:

```
git add .
git commit -m "Initial commit"
git push origin main
```

Step 3: Set Up Build Pipeline (CI/CD - Continuous Integration)

- Navigate to Pipelines → Click "New Pipeline".
- Select Git Repository (Azure Repos, GitHub, or Bitbucket).
- Choose Starter Pipeline or a pre-configured template for your framework.
- Modify the azure-pipelines.yml file (Example for a Node.js app):

trigger:

- main

pool:

vmImage: 'ubuntu-latest'

steps:

- task: UseNode@1

inputs:

version: '16.x'

- script: npm install

displayName: 'Install dependencies'

- script: npm run build

displayName: 'Build application'

- task: PublishBuildArtifacts@1

inputs:

pathToPublish: 'dist'

artifactName: 'drop'

Click "Save and Run" → The pipeline will start building app.

Step 4: Set Up Release Pipeline (CD - Continuous Deployment)

- Go to Releases → Click "New Release Pipeline".
- Select Azure App Service or Virtual Machines (VMs) for deployment.
- Add an artifact (from the build pipeline).
- Configure deployment stages (Dev, QA, Production).
- Click "Deploy" to push your web app to Azure.

Result

Thus the application was successfully implemented.

TESTING – TEST PLANS AND TEST CASES

Aim:

Test Plans and Test Case and write two test cases for at least five user stories showcasing the happy path and error scenarios in azure DevOps platform.

Test Planning and Test Case

Test Case Design Procedure

1. Understand Core Features of the Application

- User Signup & Login
- Viewing and Managing Playlists
- Fetching Real-time Metadata
- Editing playlists (rename, reorder, record)
- Creating smart audio playlists based on categories (mood, genre, artist, etc.)

2. Define User Interactions

- Each test case simulates a real user behaviour (e.g., logging in, renaming a playlist, adding a song).

3. Design Happy Path Test Cases

- Focused on validating that all features function as expected under normal conditions.
- Example: User logs in successfully, adds item to playlist, or creates a category-based playlist.

4. Design Error Path Test Cases

- Simulate negative or unexpected scenarios to test robustness and error handling.
- Example: Login fails with invalid credentials, save fails when offline, no recommendations found.

5. Break Down Steps and Expected Results

- Each test case contains step-by-step actions and a corresponding expected outcome.
- Ensures clarity for both testers and automation scripts.

6. Use Clear Naming and IDs

- Test cases are named clearly (e.g., TC01 – Successful Login, TC10 – Save Playlist Fails).
- Helps in quick identification and linking to user stories or features.

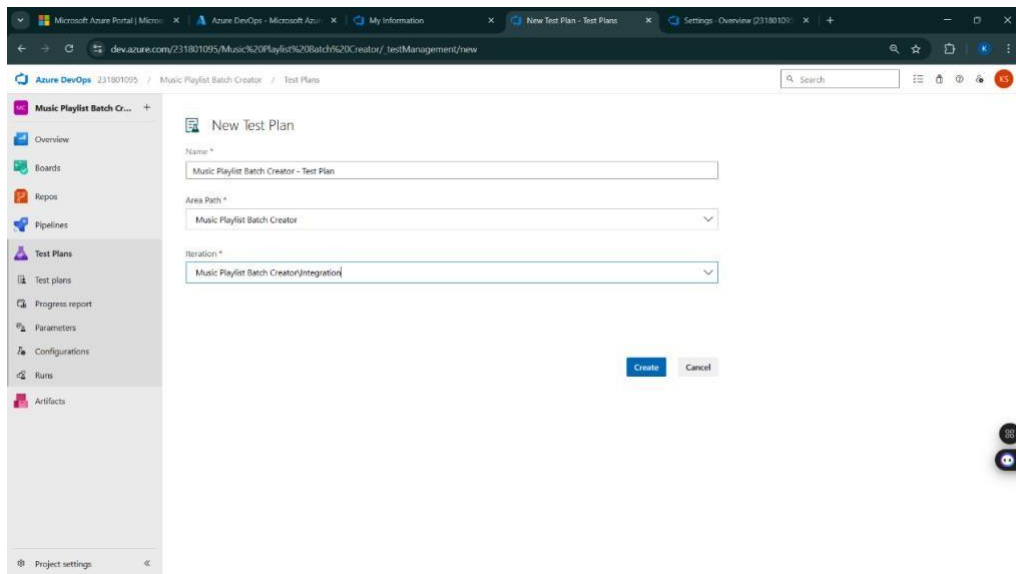
7. Separate Test Suites

- Grouped test cases based on functionality (e.g., Login, Playlist Editing, Recommendation System).
- Improves organization and test execution flow in Azure DevOps.

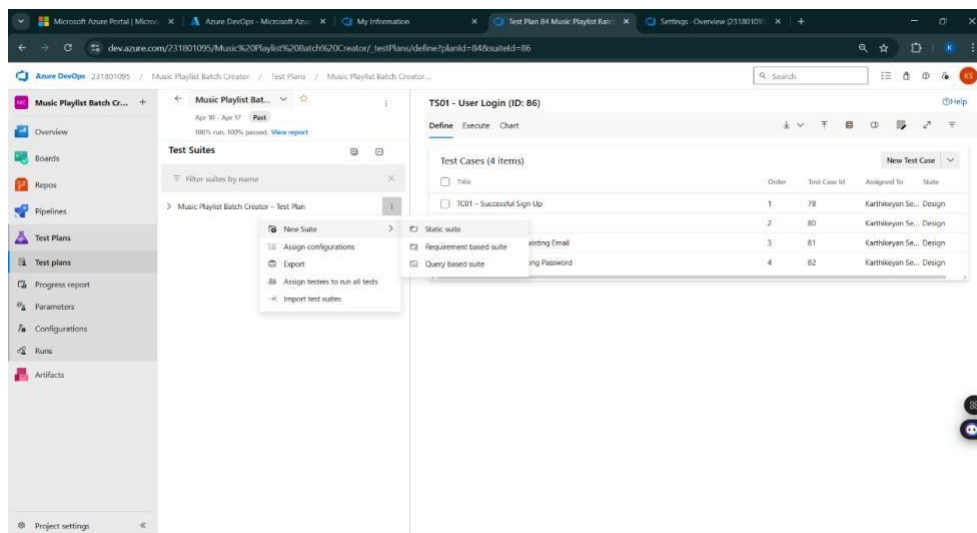
8. Prioritize and Review

- Critical user actions are marked high-priority.
- Reviewed for completeness and traceability against feature requirements.

1.New test plan



2.Test suite



3.Test case

Give two test cases for at least five user stories showcasing the happy path and error scenarios in azure DevOps platform.

Music Playlist Batch Creator – Test Plans

USER STORIES

- As a user, I want to sign up and log in securely so that I can access my playlists (ID: 79).
- As a user, I need to see my playlist in one place (ID: 76).
- As a user, I should be able to create an audio playlist as needed (ID: 73).
- As a user, I should be able to rename, record, and change the playlist (ID: 68).
- As a user, I need to have real-time metadata (ID: 65).

Test Suites

Test Suit: TS01 - User Login (ID: 86)

1. TC01 – Successful Sign Up ○ Action:

- Go to the Sign-Up page.
- Enter valid name, email, and password.
- Click "Sign Up".

○ Expected Results:

- Sign-Up form is displayed.
- Fields accept values without error.
- Account is created, and the user is redirected to the dashboard.

○ Type: Happy Path

2. TC02 – Secure Login

○ Action:

- Go to the Login page.
- Enter valid email and password.
- Click on "Login".

○ Expected Results:

- Login form is displayed.
- Fields accept data without error.
- User is logged in and redirected to the dashboard.

○ Type: Happy Path

3. TC03 – Sign Up with Existing Email

○ Action:

- Go to the Sign-Up page.
- Enter a name and an already registered email.
- Click on "Sign Up".

- **Expected Results:**
 - Fields accept data.
 - Error message "Email already registered" is displayed.
- **Type:** Error Path

4. TC04 – Login with Wrong Password

- **Action:**
 - Go to the Login page.
 - Enter valid email and incorrect password.
 - Click on "Login".
- **Expected Results:**
 - Input is accepted.
 - Error message "Invalid username or password" is shown.
- **Type:** Error Path

Test Suit: TS02 - View Playlists (ID: 87)

1. TC05 – View Playlist Page

- **Action:**
 - Log in successfully.
 - Navigate to "My Playlists" section.
- **Expected Results:**
 - All created playlists are displayed clearly.
- **Type:** Happy Path

2. TC06 – Playlist Loading Failure

- **Action:**
 - Disconnect from the internet.
 - Navigate to "My Playlists".
- **Expected Results:**
 - Network is offline.
 - Error message "Unable to load playlists" is shown.
- **Type:** Error Path

Test Suit: TS03 - Real-Time Metadata (ID: 88)

1. TC07 – Real-Time Metadata Display

- Play a song.
- Observe the metadata panel.
- **Expected Results:**
 - Metadata (title, artist, album, duration) is displayed and updates in real time.
- **Type:** Happy Path

2. TC08 – Metadata Not Updating ○

Action:

- Play a different song.
- Observe the metadata panel.
- **Expected Results:**
 - Metadata remains static or shows default/fallback message.
- **Type:** Error Path

Test Suit: TS04 - Playlist Editing (ID: 89)

1. TC09 – Rename Playlist Successfully ○ **Action:**

- Navigate to "My Playlists".
- Click "Rename" next to a playlist.
- Enter a new name and click "Save".
- **Expected Results:**
 - Playlist name updates successfully.
- **Type:** Happy Path

2. TC10 – Rename with Blank Name ○ **Action:**

- Click "Rename" on a playlist.
- Leave the field blank.
- Click "Save".
- **Expected Results:**
 - Error message "Playlist name cannot be empty" is shown.
- **Type:** Error Path

3. TC11 – Change Playlist Order ○

Action:

- Open a playlist.
- Drag and drop songs to reorder.
- Click "Save".
- **Expected Results:**
 - Playlist order is updated and saved.

- **Type:** Happy Path

4. TC12 – Change Playlist Order Fails ○ **Action:**

- Login and go to “My Playlists”.
- Select a playlist.
- Go offline or simulate server error.
- Reorder songs and click “Save Order”.
- **Expected Results:**
 - Error message: "Failed to update order. Please check your connection".
- **Type:** Error Path

Test Suit: TS05 - Smart Playlist Creation (ID: 90)

1. TC13 – Generate Playlist Based on Various Categories ○

Action:

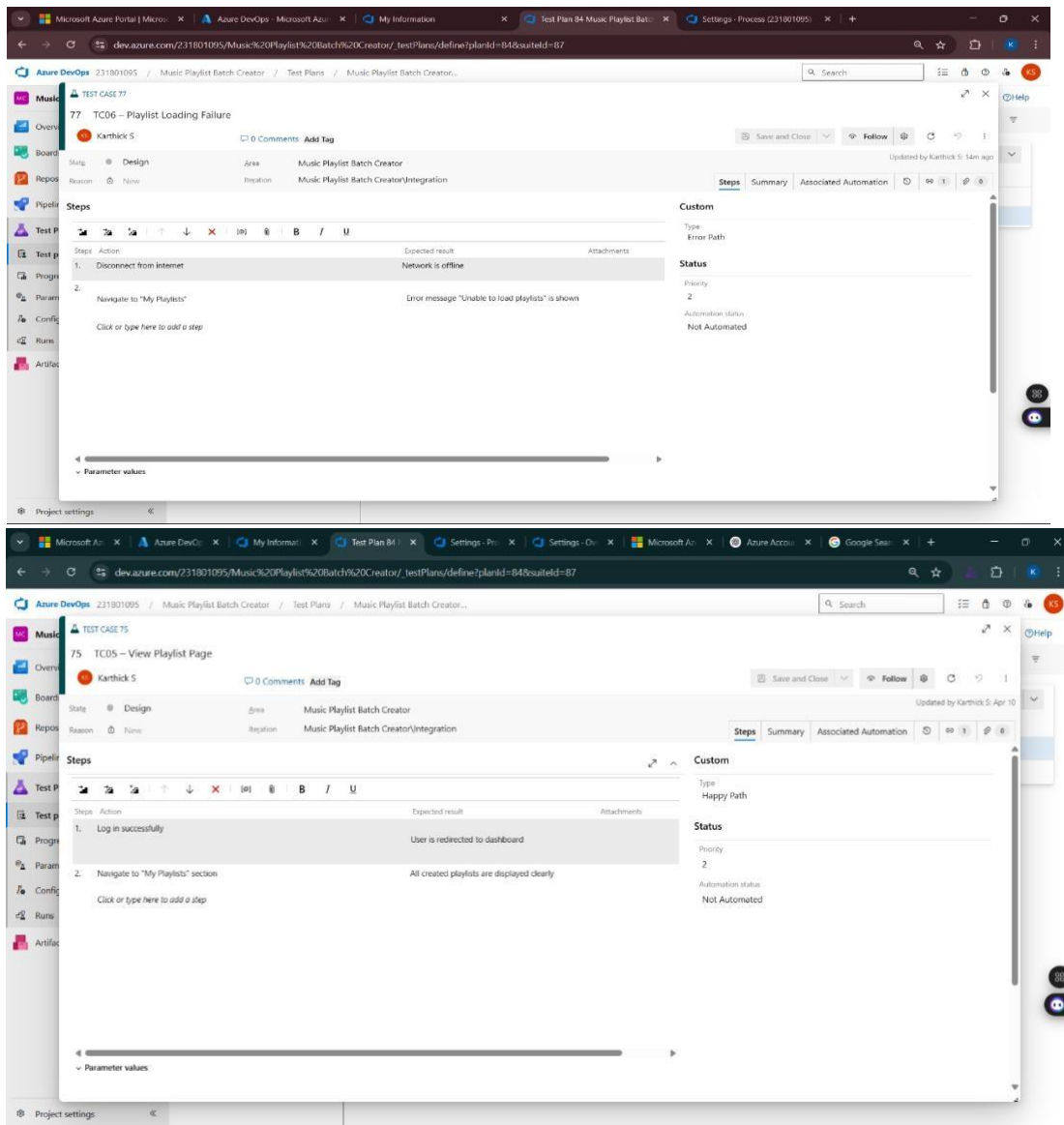
- Login with valid credentials.
- Click on "Generate Playlist".
- Select categories.
- Click "Generate Playlist".
- **Expected Results:**
 - Playlist is generated based on selected mood and categories.
- **Type:** Happy Path

2. TC14 – Fail to Generate Playlist Due to Missing Category Selection or Invalid Input ○

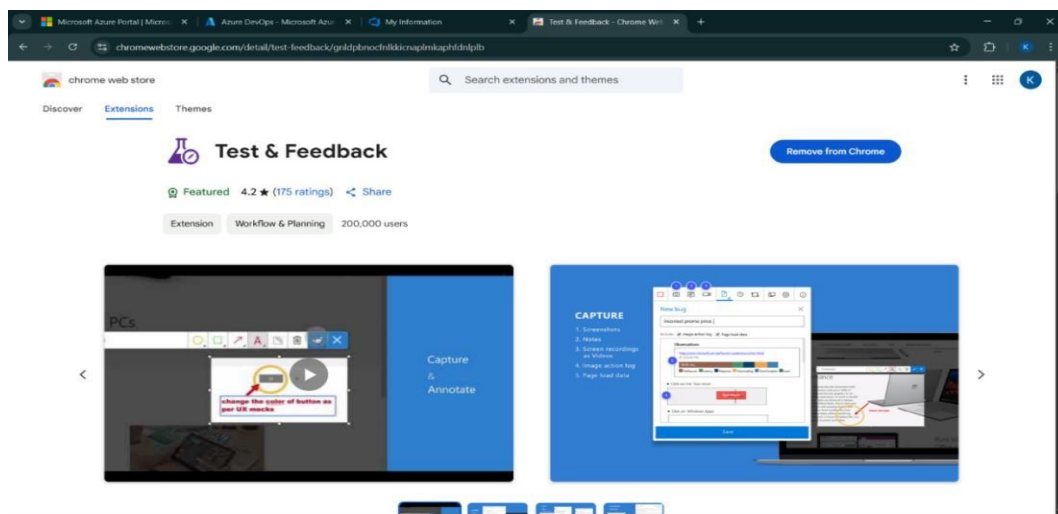
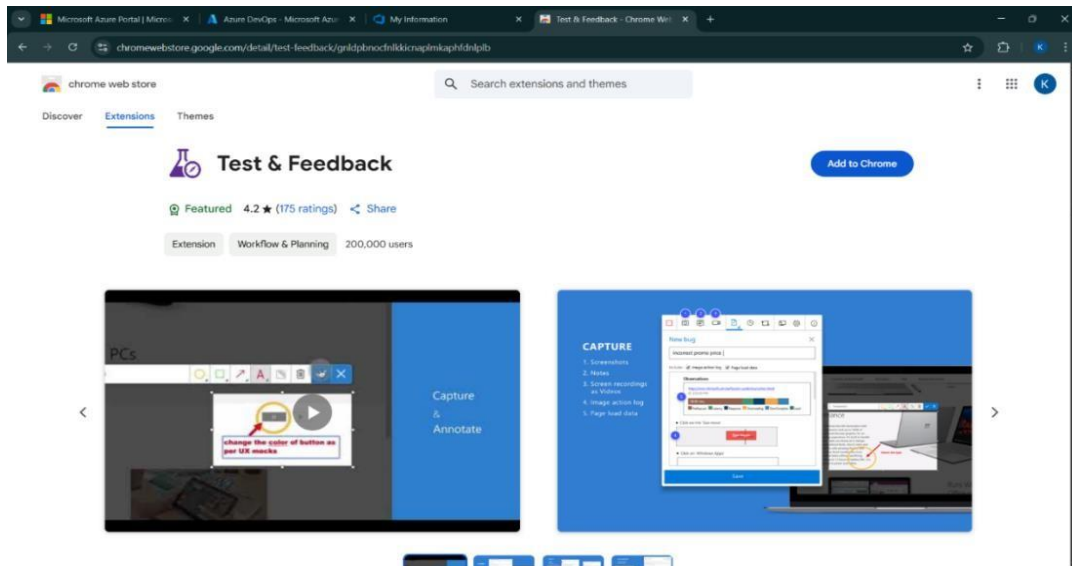
Action:

- Login with valid credentials.
- Click on "Generate Playlist".
- Select categories.
- Click "Generate Playlist".
- **Expected Results:**
 - Error message: "Please select at least one valid category" or "No recommendations found for the selected filters".
- **Type:** Error Path

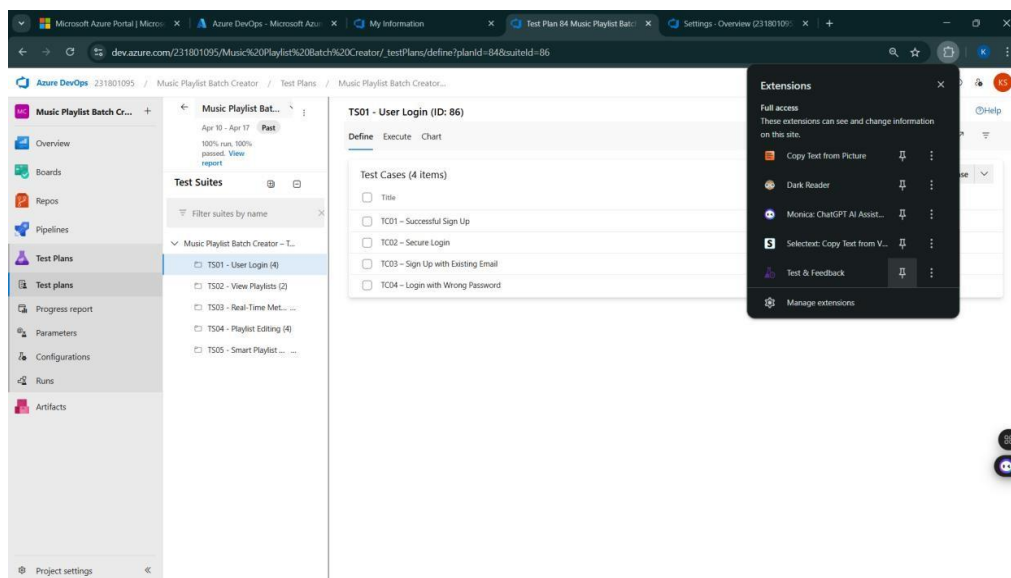
Test Cases



4.Installation of test



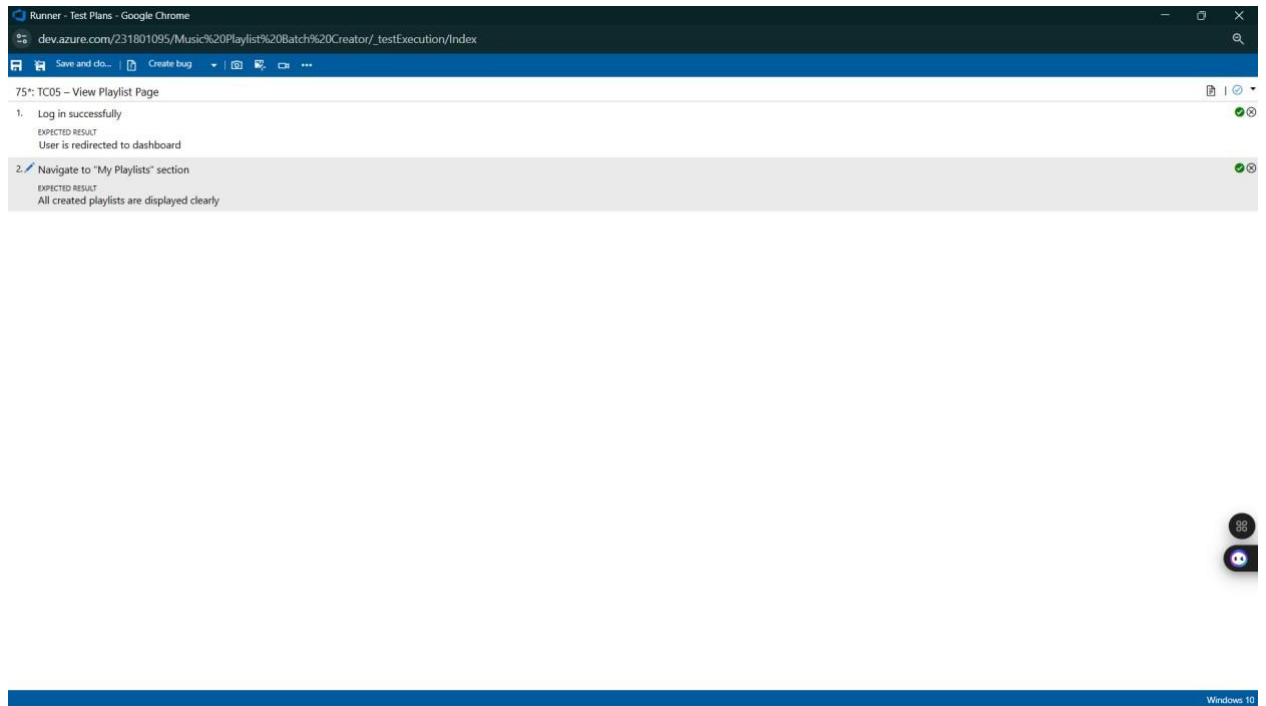
Test and feedback
Showing it as an extension



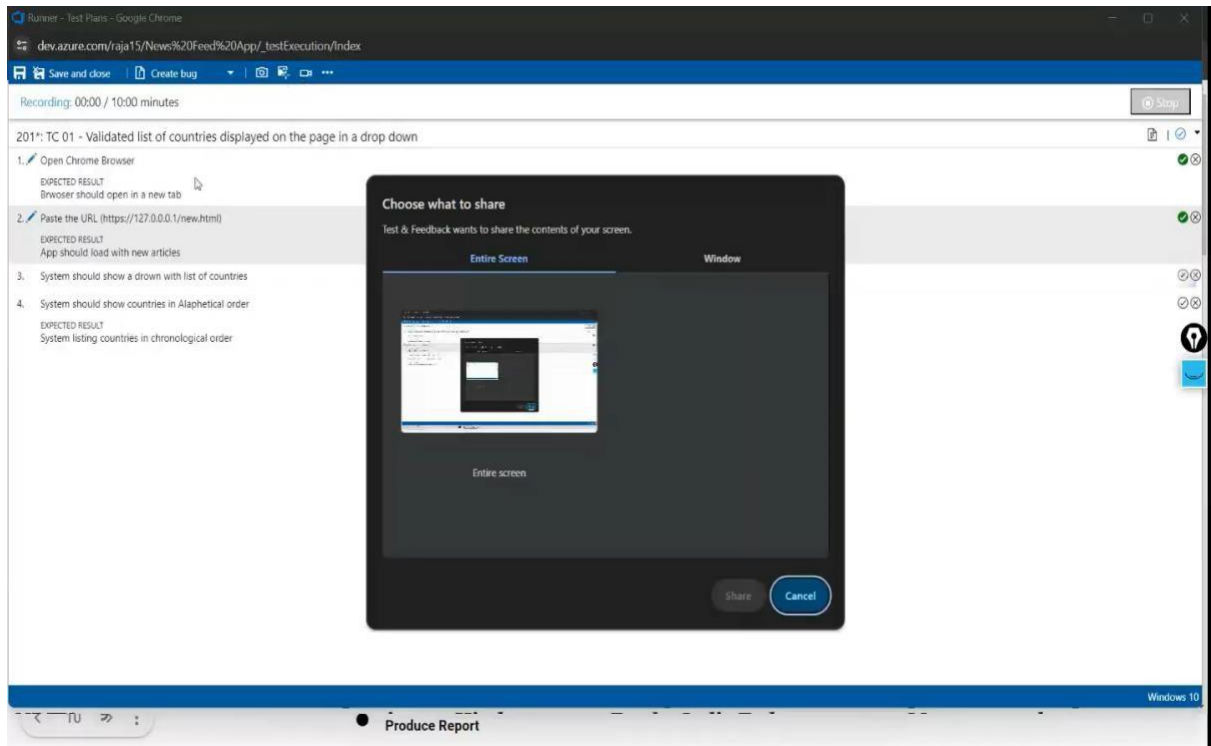
5. Running the test cases

The screenshot displays the Azure DevOps Test Plans interface. The left sidebar shows the navigation menu with 'Test Plans' selected. The main area is titled 'TS02 - View Playlists (ID: 87)' and shows a table of test points. The 'TC05 - View Playlist Page' test point is selected, and a context menu is open, showing options like 'View execution history', 'Mark Outcome', 'Run', 'Reset test to active', 'Edit test case', 'Assign tester', and 'View test result'. The 'Run' option is highlighted, and a sub-menu is visible with options: 'Run for web application', 'Run for desktop application', and 'Run with options'.

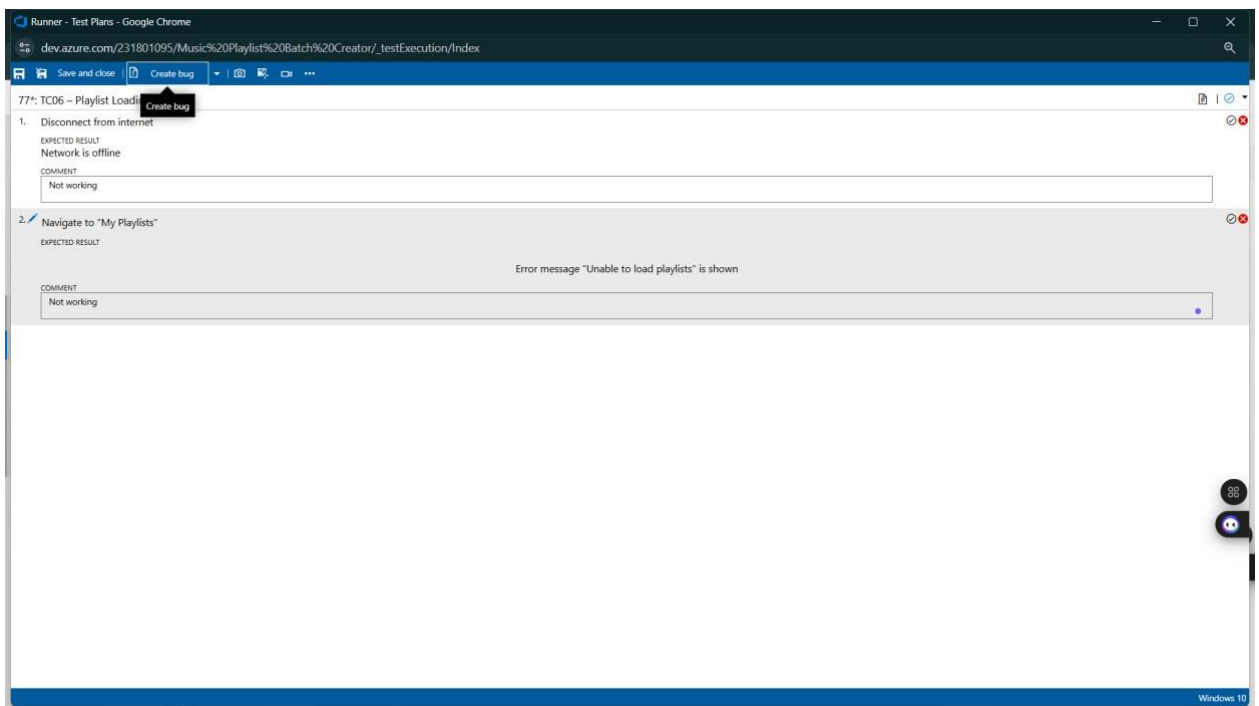
Title	Outcome	Order	Test Case Id	Configuration	Tester
TC05 - View Playlist Page	Passed	1	75	Windows 10	Malu karthick B...
TC06 - Playlist Loading Failure	Passed	2	77	Windows 10	Malu karthick B...



6. Recording the test case



7.Creating the bug



Runner - Test Plans - Google Chrome

dev.azure.com/231801095/Music%20Playlist%20Batch%20Creator/_testExecution/Index

77% TC06 - Playlist Loading Failure

1. Disconnect from internet

NEW BUG

TB01 - Playlist loading spinner keeps spinning indefinitely on poor network

Unassigned 0 comments Add tag TB01 - Playlist loading spinner keeps spinning indefinitely on poor network Save & Close

2. Naviga

Statg New Area Music Playlist Batch Creator

Reason New Iteration Music Playlist Batch Creator

Repro Steps

18-04-2025 03:23 Bug filed on "TC06 - Playlist Loading Failure"

Step no.	Result	Title
1.	Failed	Disconnect from internet
		Expected Result
		Network is offline
		Comments: Page Not loading
2.	Failed	Navigate to "My Playlists"
		Expected Result
		Error message "Unable to load playlists" is shown

Test Configuration: Windows 10

Planning

Resolved Reason

Story Points

Priority 2

Severity 3 - Medium

Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Deployment

To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting

Development

+ Add link

Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Related Work

+ Add link

Add an existing work item as a parent

Tested By

777 TC06 - Playlist Loading Failure Updated 10-04-2025. @ Design

System Info

Found in Build

Microsoft Azure Port Azure DevOps - Min My Information Test Plan 84 Music Runs - Test Plans Settings - Overview Bug Report Playlist

dev.azure.com/231801095/Music%20Playlist%20Batch%20Creator/_testManagement/runs?_a=resultSummary&runId=488&resultId=100000

Azure DevOps 231801095 / Music Playlist Batch Creator / Test Plans / Runs

Music Playlist Batch Cr... Enter Run ID... Run 48 - TS02 - View Playlists (Manual) / TC06 - Playlist Loading Failure

92 TB01 - Playlist loading spinner keeps spinning indefinitely on poor network

Unassigned 0 comments Add tag Save & Close Follow Updated by Karthick S: 8m ago

Statg New Area Music Playlist Batch Creator

Reason New Iteration Music Playlist Batch Creator

System Info

Browser - Name	Google Chrome 135
Browser - Language	en-IN
Browser - Height	894
Browser - Width	1536
Browser - User agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/135.0.0.0 Safari/537.36
Operating system - Name	Windows NT 10.0; Win64; x64
Operating system - Architecture	x86_64
Operating system - Processor model	11th Gen Intel(R) Core(TM) i3-1115G4 @ 3.00GHz
Operating system - Number of processors	4
Memory - Available	814784512
Memory - Capacity	8216240128
Display - Pixels per inch (X axis)	120
Display - Pixels per inch (Y axis)	120
Display - Device pixel ratio	1.25

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

System Info

Found in Build

Integrated in Build

Project settings

Name Size

SystemInformation-2025-04-18T03:23:58.168Z.json 1K

8. Test case results

The screenshot shows the Azure DevOps interface for a test plan. The left sidebar contains navigation options like Overview, Boards, Repos, Pipelines, Test Plans, Progress report, Parameters, Configurations, Runs, and Artifacts. The main area displays 'TS02 - View Playlists (ID: 87)' with a 'Test Suites' list on the left and 'Test Points (2 items)' in the center. A modal window titled 'TC05 - View Playlist Page' is open, showing 'Test Case Results' in a table.

Outcome	TimeStamp	Configuration	Run by	Tester	Test PI
Passed	4m ago	Windows 10	Karthick S	Mallu karthick Balaji ...	Music
Passed	12m ago	Windows 10	Karthick S	Mallu karthick Balaji ...	Music
Not Applicable	12m ago	Windows 10	Karthick S	Mallu karthick Balaji ...	Music
Passed	14m ago	Windows 10	Karthick S	Mallu karthick Balaji ...	Music
Passed	Tuesday	Windows 10	Karthikeyan Senthil	Mallu karthick Balaji ...	Music
Passed	Saturday	Windows 10	Mallu karthick Balaji ...	Mallu karthick Balaji ...	Music
Failed	Saturday	Windows 10	Mallu karthick Balaji ...	Mallu karthick Balaji ...	Music
Passed	Apr 11	Windows 10	Karthick S	Mallu karthick Balaji ...	Music
Passed	Apr 11	Windows 10	Karthick S	Mallu karthick Balaji ...	Music

9. Test report summary

The screenshot shows the Azure DevOps Work Items interface. The left sidebar contains navigation options like Overview, Boards, Work Items, Backlogs, Sprints, Queries, Delivery Plans, Analytics views, Repos, Pipelines, Test Plans, and Artifacts. The main area displays a bug report for '203 BG 01 - Countries Drop down Not Available on the page'. The bug is assigned to 'rajesh prabhu' and has a state of 'New'. The 'Repro Step' section lists three steps: 1. Open Chrome Browser (Passed), 2. Paste the URL (Passed), and 3. Screenshot should show a screen with list of countries (Failed). The 'Planning' section shows a priority of 2 and a severity of 3 - Medium. The 'Deployment' section includes a link to track releases and a link to add a link.

- Assigning bug to the developer and changing state

Bug 92 TB01 - Playlist loading spinner keeps spinning indefinitely on poor network

Created by Karthick S. 0 comments

Repro Steps

- 1. Failed** Disconnect from internet
Expected Result: Network is offline
Comments: Page Not loading
- 2. Failed** Navigate to "My Playlists"
Expected Result: Error message "Unable to load playlists" is shown

Test Configuration: Windows 10

Planning

- Resolved Reason
- Story Points
- Priority: 2
- Severity: 3 - Medium
- Activity

Effort (Hours)

- Original Estimate
- Remaining
- Completed

Deployment

To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting

Development

+ Add link

Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Related Work

+ Add link

Add an existing work item as a parent

Tested By

77 TC06 - Playlist Loading Failure
Updated 10-04-2025. @ Design

System Info

10.Progress report

Progress report

Music Playlist Batch Creator - Test Plan

Summary

- 1 Test plans
- 14 Test points
- 14 (14 / 14) Test points run
- 100% Run
- 100% (14 / 14) Pass rate
- 14 Passed

Outcome trend

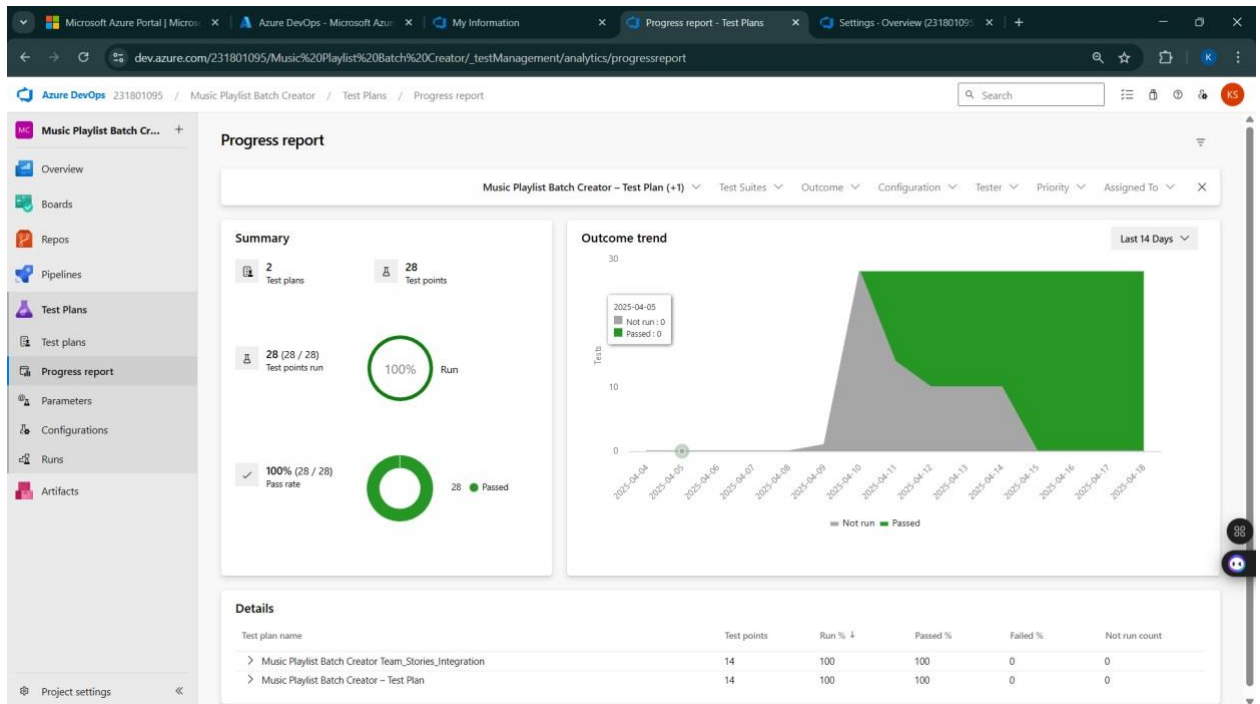
Last 14 Days

Tests

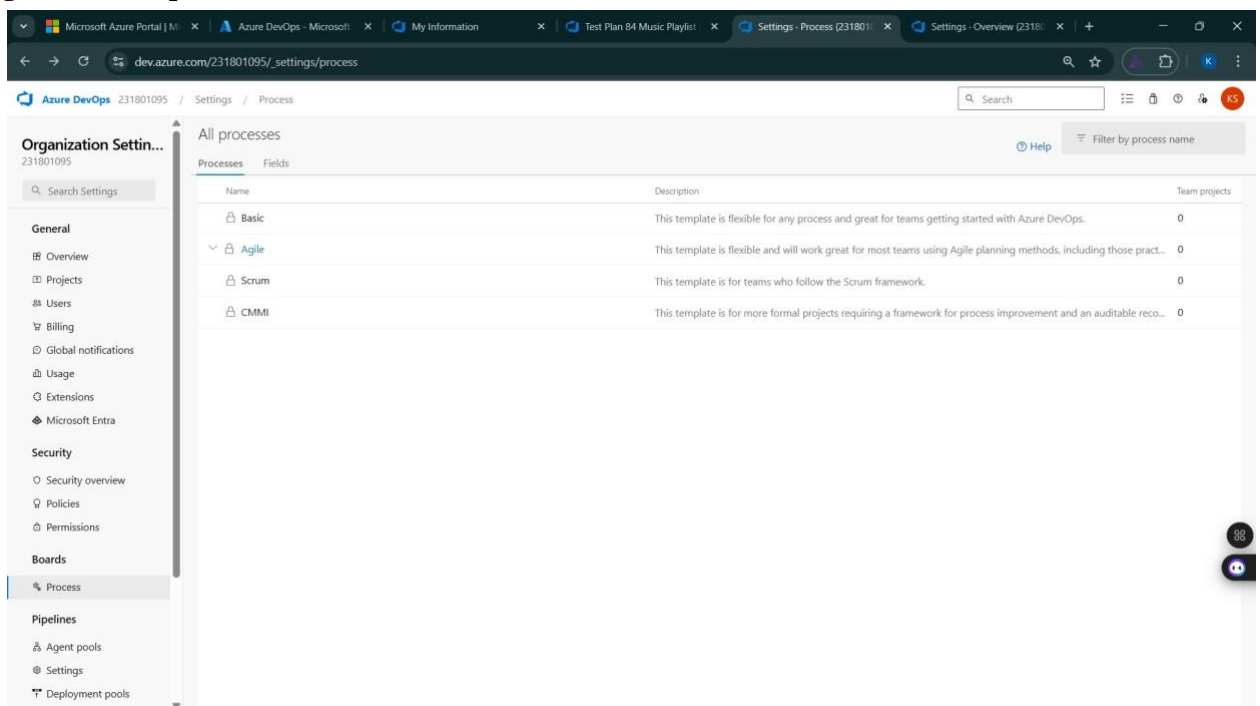
Legend: Not run (grey), Passed (green)

Details

Test plan name	Test points	Run %	Passed %	Failed %	Not run count
Music Playlist Batch Creator - Test Plan	14	100	100	0	0
TS01 - User Login	4	100	100	0	0
TS02 - View Playlists	2	100	100	0	0
TS03 - Real-Time Metadata	2	100	100	0	0
TS04 - Playlist Editing	4	100	100	0	0
TS05 - Smart Playlist Creation	2	100	100	0	0



11.Changing the test template



Microsoft Azure Portal | Microsoft Azure DevOps - Microsoft | My Information | Test Plan 84 Music Player | Settings - Process (231801095) | Settings - Overview (231801095) | +

dev.azure.com/231801095/_settings/process

Azure DevOps 231801095 / Settings / Process

Organization Settings 231801095

Search Settings

General

- Overview
- Projects
- Users
- Billing
- Global notifications
- Usage
- Extensions
- Microsoft Entra

Security

- Security overview
- Policies
- Permissions

Boards

- Process

Pipelines

- Agent pools
- Settings
- Deployment pools

All processes

Processes Fields

Name	Description	Team projects
Basic	This template is flexible for any process and great for teams getting started with Azure DevOps.	0
Agile	This template is flexible and will work great for most teams using Agile planning methods, including those practicing Scrum.	0
Scrum	This template is for teams who follow the Scrum framework.	0
CMMI	This template is for more formal projects requiring a framework for process improvement and an auditable record.	0

Microsoft Azure Portal | Microsoft Azure DevOps - Microsoft | My Information | Test Plan 84 Music Player | Settings - Process (231801095) | Settings - Overview (231801095) | +

dev.azure.com/231801095/_settings/process

Azure DevOps 231801095 / Settings / Process

Organization Settings 231801095

Search Settings

General

- Overview
- Projects
- Users
- Billing
- Global notifications
- Usage
- Extensions
- Microsoft Entra

Security

- Security overview
- Policies
- Permissions

Boards

- Process

Pipelines

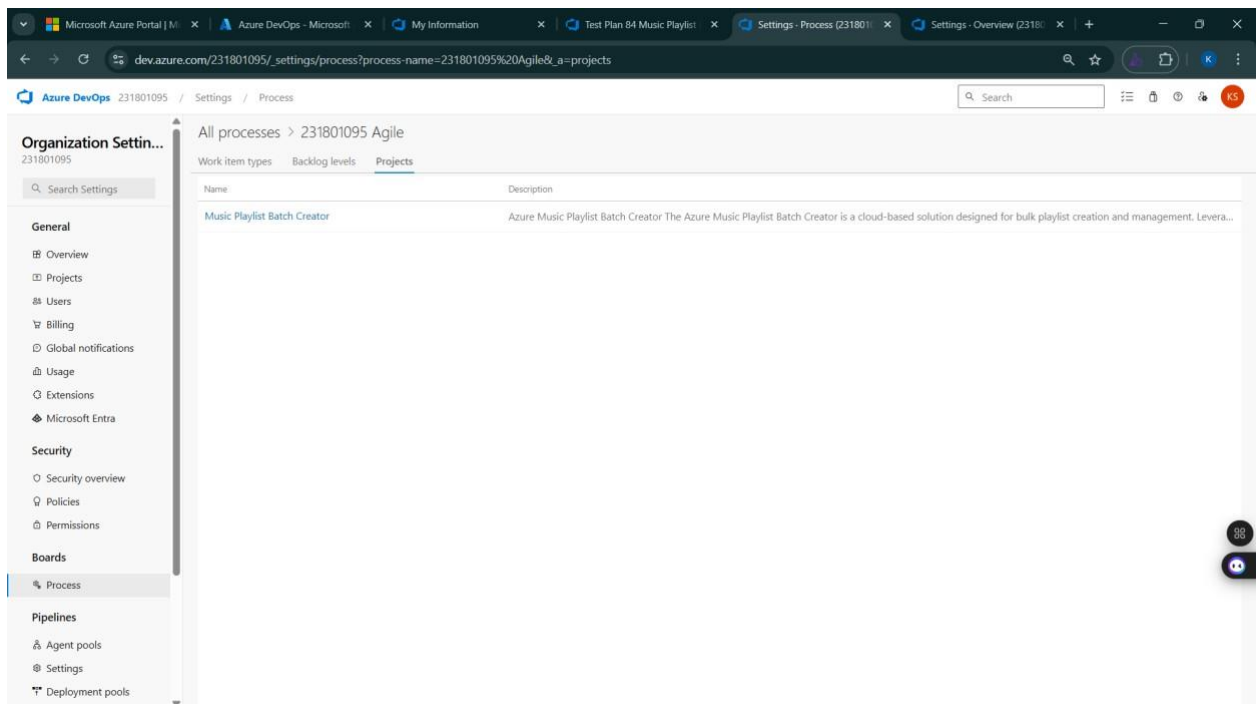
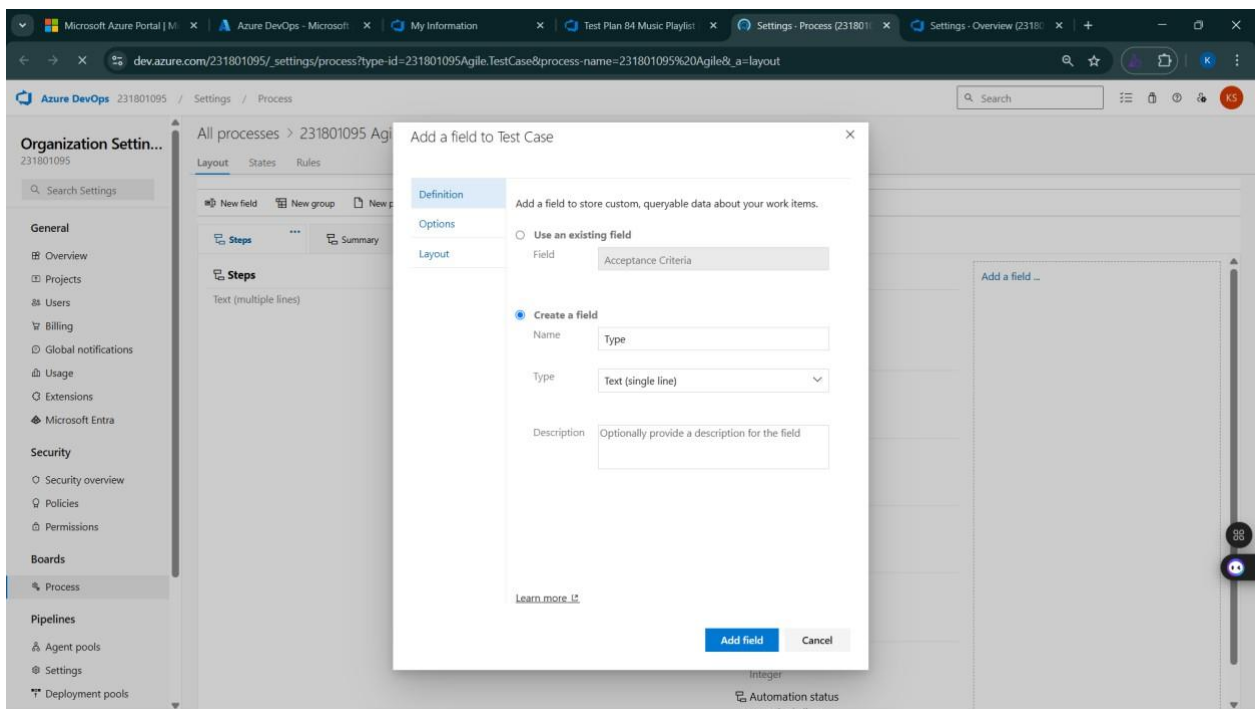
- Agent pools
- Settings
- Deployment pools

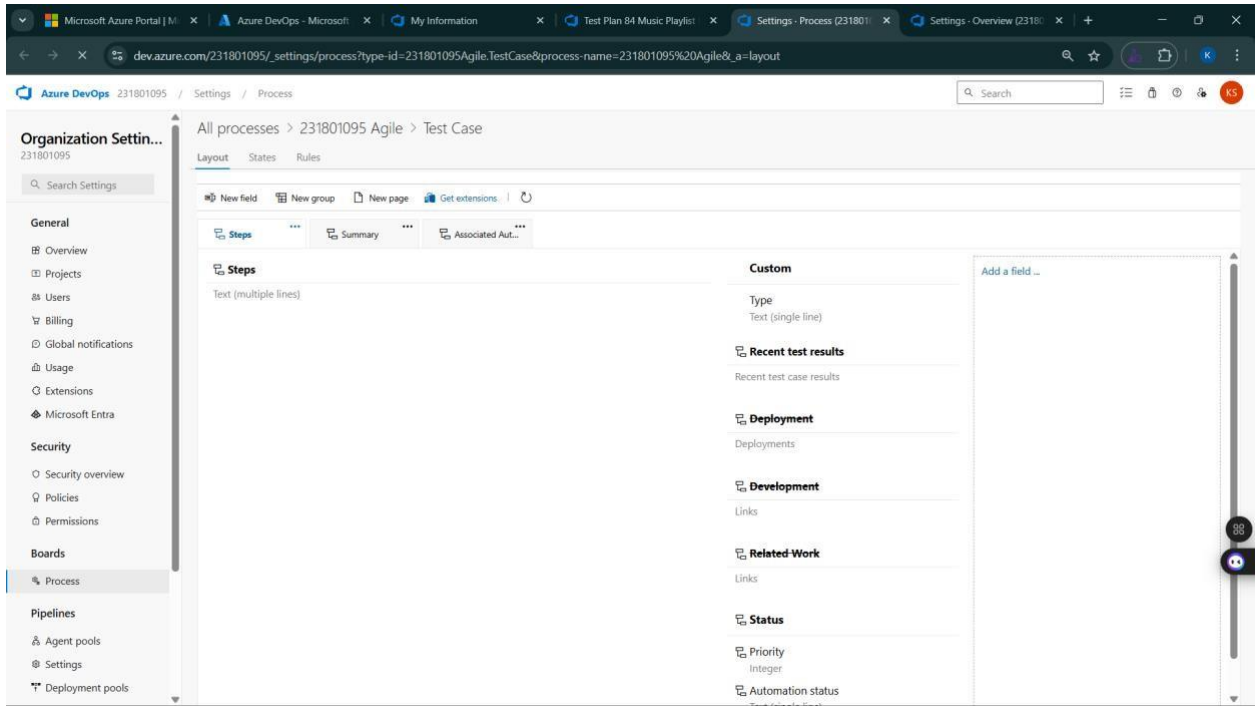
All processes

Processes Fields

Name	Description	Team projects
Basic	This template is flexible for any process and great for teams getting started with Azure DevOps.	0
Agile	This template is flexible and will work great for most teams using Agile planning methods, including those practicing Scrum.	0
231801095 Agile (default)		1
Agile Plus		0
Scrum	This template is for teams who follow the Scrum framework.	0
CMMI	This template is for more formal projects requiring a framework for process improvement and an auditable record.	0

12. View the new test case template





Result:

The test plans and test cases for the user stories is created in Azure DevOps with Happy Path and Error Path