

CMPE 281 Sec-02: Cloud Technologies (Fall 2019)
Deliverable #3: Component
Implementation(Updated) & Demo

Mobile Test Service Platform (MTaaS)



Submitted To:
Dr.Jerry Gao

Submitted by:
Nehal Sharma(013849290)
Project Group 4

Contents

Sr.no.	Section Title	Page No.
1.	Introduction	2
2.	Component Overview: Purpose, Objectives, Function Scope and Usage	2
3.	Component API Interface and Parameter Description	3
4.	Component Functions and Behavior (Class Diagram, Sequence Diagram and Database Design)	9
5.	Component Business Logic (Use Cases and State Diagrams)	13
6.	Component Graphic User Interface Design	19

1. Introduction

Our project: Mobile Test Service Platform(MTaaS) has various components and, in this deliverable, each team member intends to provide a detailed description of the design of each component that we will be implementing as a part of the MTaaS application. For my part, I will be documenting the component overview, interface design and analysis, function design, DB design, business logic and GUI design for the Community Service Component.

2. Component Overview

The testing community service component has two primary groups:

- (i)**Project Oriented Community Group:** This group is dedicated to facilitate the project based communication
- (ii)**Tester Oriented Community Group:** this group is dedicated for the testers and allows exchange of information related to the current developments/trends in the software testing community.

Component Purpose: The main purpose of this component is to allow testers and project managers to communicate and collaborate with each other in a hassle-free and smooth manner.

Component Objective: To allow easy exchange of information with the community groups, this component would allow project managers and testers to post messages about projects for project managers, notifications to alert the tester about project information and direct messaging between users in a group.

Function Scope: The Community Service option would be a web-based feature on the MTaaS platform which would have the following functions:

(A)Project-Oriented Community Groups: This feature would allow testers and project managers to communicate and share information and status updates about the project they are working on. The Project managers can create groups for the projects and add and remove testers from the group. This allows for easy collaboration among all the members working on a particular project. Another important functionality incorporated in this feature is that any member of the group can directly message any other member of the group.

(B)Tester-Oriented Community Groups: This feature allows testers to create and join groups based on their interest areas (for example, AI based testing, Android Testing etc.) to enhance knowledge sharing about the ongoing developments in their field of interest.

Component Usage: This component will primarily be used by the Project Managers and Testers to keep each other updated about the related projects and enhance knowledge sharing among testers.

3. Component API Interface and Parameter Description

The APIs used in our application are based on RESTful services and are basically of the following four types:

- (i)**PUT:** To create a resource
- (ii)**POST:** To update a resource
- (iii)**GET:** To retrieve a single or a list of resources
- (iv)**DELETE:** To delete a particular resource

Given below is a list of the APIs that will be used in the Community Service Component:

The user would be prompted during sign-up to specify whether he/she wants to join the community service or not. Accordingly, they would have a 'Community Service Tab' on their dashboard which would allow them to view and participate in community related discussions.

(A)API Purpose: View the Community Dashboard by logging in to the community service

Request	http://localhost:3001/commdash
Type	GET
Details	Lets the user view the dashboard and choose to navigate either to the Project Discussion or Tester Discussion
Attributes:	username String username containing alpha-numeric and special characters usertype String to specify if the user is a tester or manager permission int 0 if not signed up for community service and 1 if a member of the community

(B)API Purpose: Navigate to the Project-Oriented Community Group

Request	http://localhost:3001/projcomm
Type	GET
Details	Lets the user navigate to the Project Oriented Community Group
Attributes:	username String username containing alpha-numeric and special characters usertype String to specify if the user is a tester or manager

(C)API Purpose: Navigate to the Tester-Oriented Community Group

Request	http://localhost:3001/testercomm
Type	GET
Details	Lets the user navigate to the Tester Community Discussion
Attributes:	username String username containing alpha-numeric and special characters

(D)API Purpose: Create a new project group in the Project-Oriented Community Group

Request	http://localhost:3001/projcreate
Type	PUT
Details	Lets the project manager create a new group for project related discussions in the Project Community Discussion
Attributes:	groupname String containing alpha-numeric and special characters members int to specify the maximum numbers that can be added in the group group_id String unique project id admin String username of the manager creating the group

(E)API Purpose: Delete a project group in the Project-Oriented Community Group

Request	http://localhost:3001/projdelete
Type	DELETE
Details	Lets the project manager delete a group after the project is completed in the Project Community Discussion
Attributes:	group_id String unique project id

(F)API Purpose: Create a discussion group in the Tester-Oriented Community Group

Request	http://localhost:3001/groupcreate
Type	PUT
Details	Lets a tester create a group for a specific interest in the Tester Community Discussion
Attributes:	groupname String name containing alpha-numeric and special characters group_id String unique project id topic String area of interest for discussion admin String username of the manager creating the group

(G)API Purpose: Delete a discussion group in the Tester-Oriented Community Group

Request	http://localhost:3001/groupcreate
Type	DELETE
Details	Lets a tester create a group for a specific interest in the Tester Community Discussion
Attributes:	group_id String unique project id

(H)API Purpose: Add members in a project group in Project-Oriented Community Group

Request	http://localhost:3001/add
Type	PUT

Details	Lets the project manager add members to the project group
Attributes:	group_id String unique project id admin String username of the manager creating the group username String username of the member being added

(I)API Purpose: Delete members from a project group in Project-Oriented Community Group

Request	http://localhost:3001/delete
Type	DELETE
Details	Lets the project manager add members to the project group
Attributes:	group_id String unique project id admin String username of the manager creating the group username String username of the member being added

(J)API Purpose: Message another member in the group

Request	http://localhost:3001/sendtxt
Type	PUT
Details	Lets a member message another member directly on personal text
Attributes:	group_id String unique project id sender_usr String username of the person sending the message reciever_usr String username of the person receiving the message message_id String unique message id content String content of the message

(K)API Purpose: Join a group in Tester-Oriented Community Group

Request	http://localhost:3001/join
Type	POST
Details	Lets a user add join a discussion group of his/her particular interest
Attributes:	group_id String unique project id username String username of the member joining the group

(L)API Purpose: Leave a group in Tester-Oriented Community Group

Request	http://localhost:3001/leave
Type	POST
Details	Lets a user leave a discussion group of his/her particular interest
Attributes:	group_id String unique project id admin String username of the manager creating the group username String username of the member being added

(M)API Purpose: Post a message in a project group in Project-Oriented Community Group

Request	http://localhost:3001/postproj
Type	PUT
Details	Lets a member message in the group for everyone to see
Attributes:	group_id String unique project id sender_usr String username of the person sending the message message_id String unique message id content String content of the message

(N)API Purpose: Post a message in a discussion group in Tester-Oriented Community Group

Request	http://localhost:3001/postdis
Type	PUT
Details	Lets a member message in the group for everyone to see
Attributes:	group_id String unique project id sender_usr String username of the person sending the message message_id String unique message id content String content of the message

(O)API Purpose: Delete a message

Request	http://localhost:3001/deletemsg
Type	DELETE
Details	Lets a member delete a message
Attributes:	message_id String id of the message to be deleted

(P)API Purpose: View messages in the inbox

Request	http://localhost:3001/viewmsg
Type	GET
Details	Lets a member view all the messages in his/her inbox
Attributes:	username String username of the member

(Q)API Purpose: Search for groups of particular interest in the Tester-Oriented Community Group

Request	http://localhost:3001/searchtopic
Type	GET
Details	Lets a member view all the existing groups related to a particular category/topic
Attributes:	topic String category which is to be searched

(R)API Purpose: Search for a particular project in the Project-Oriented Community Group

Request	http://localhost:3001/searchproject
Type	GET
Details	Lets a member view an existing project group
Attributes:	groupname String category which is to be searched

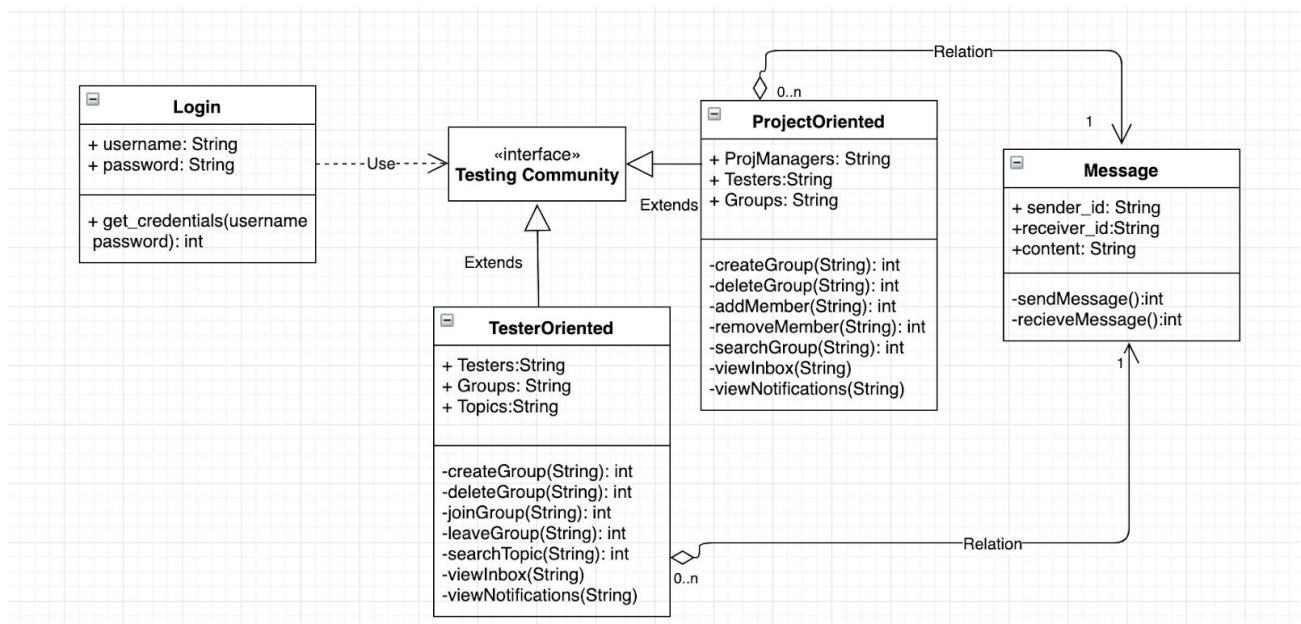
(S)API Purpose: View Notifications

Request	http://localhost:3001/notifications
Type	GET
Details	Lets a member view notifications
Attributes:	username String username of the member

4. Component API Interface and Parameter Description

(A) Component Class Diagram:

The component will take the login details using the **get_credentials()** function from 'Login' class. The interface 'Testing Community' will be implemented by the 'ProjectOriented' and 'TesterOriented' classes respectively, as per their requirements. They will have their own functions to create and delete groups/discussion forums, add and delete members to/from a group, search for a group to join or leave, view notifications and send and receive messages on groups/discussion forums. The 'Message' class functions will be used for sending/receiving messages on personal text.



(B)Sequence Diagrams:

The following is the sequence diagram for the **Project Oriented Community** Testing service wherein the project manager can create/delete groups and add and remove members from the same. The following diagram depicts the same.

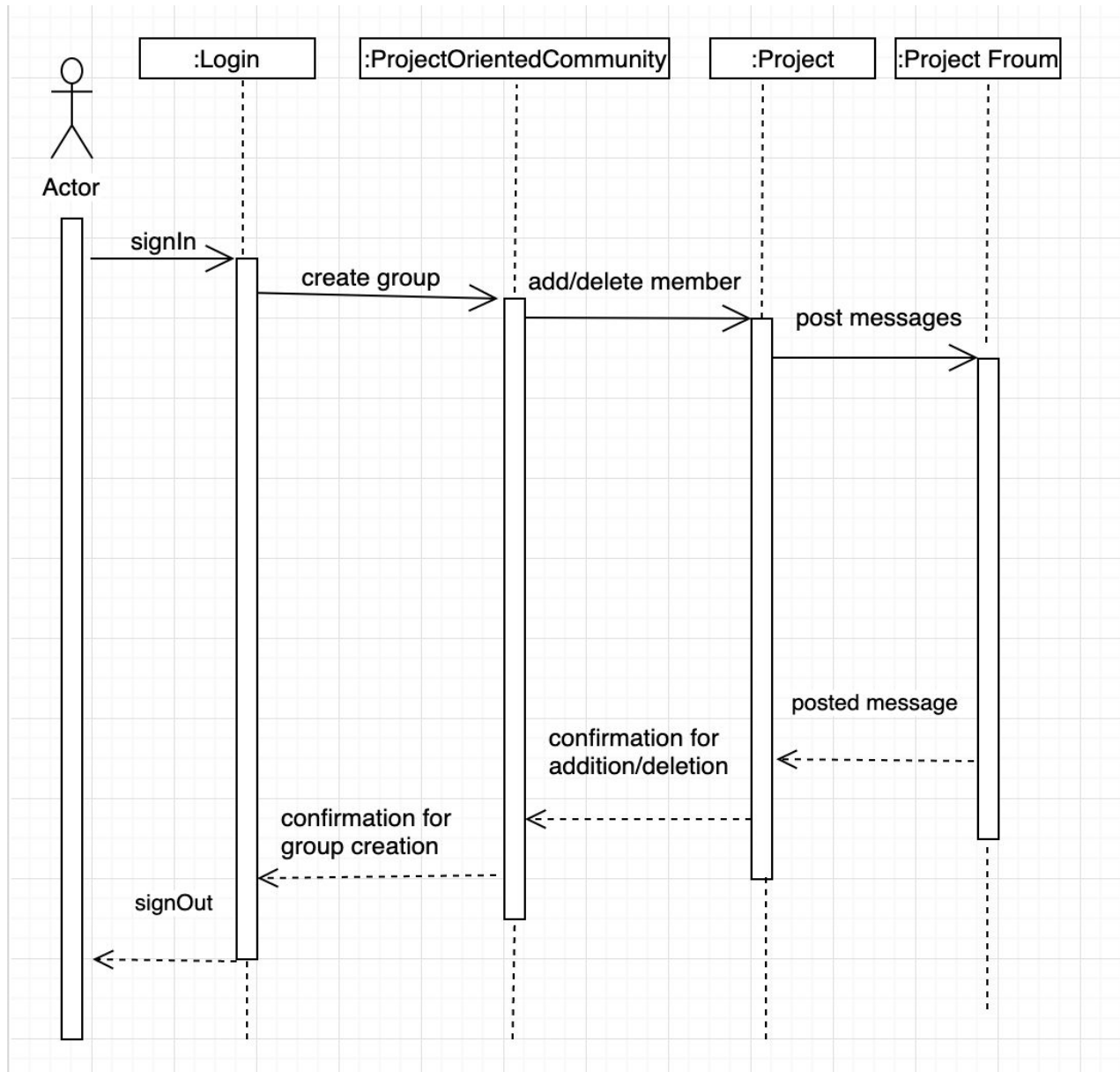


Figure 2: Sequence Diagram for Project-Oriented Testing Community Service

The following is the sequence diagram for the **Tester Oriented Service Community**

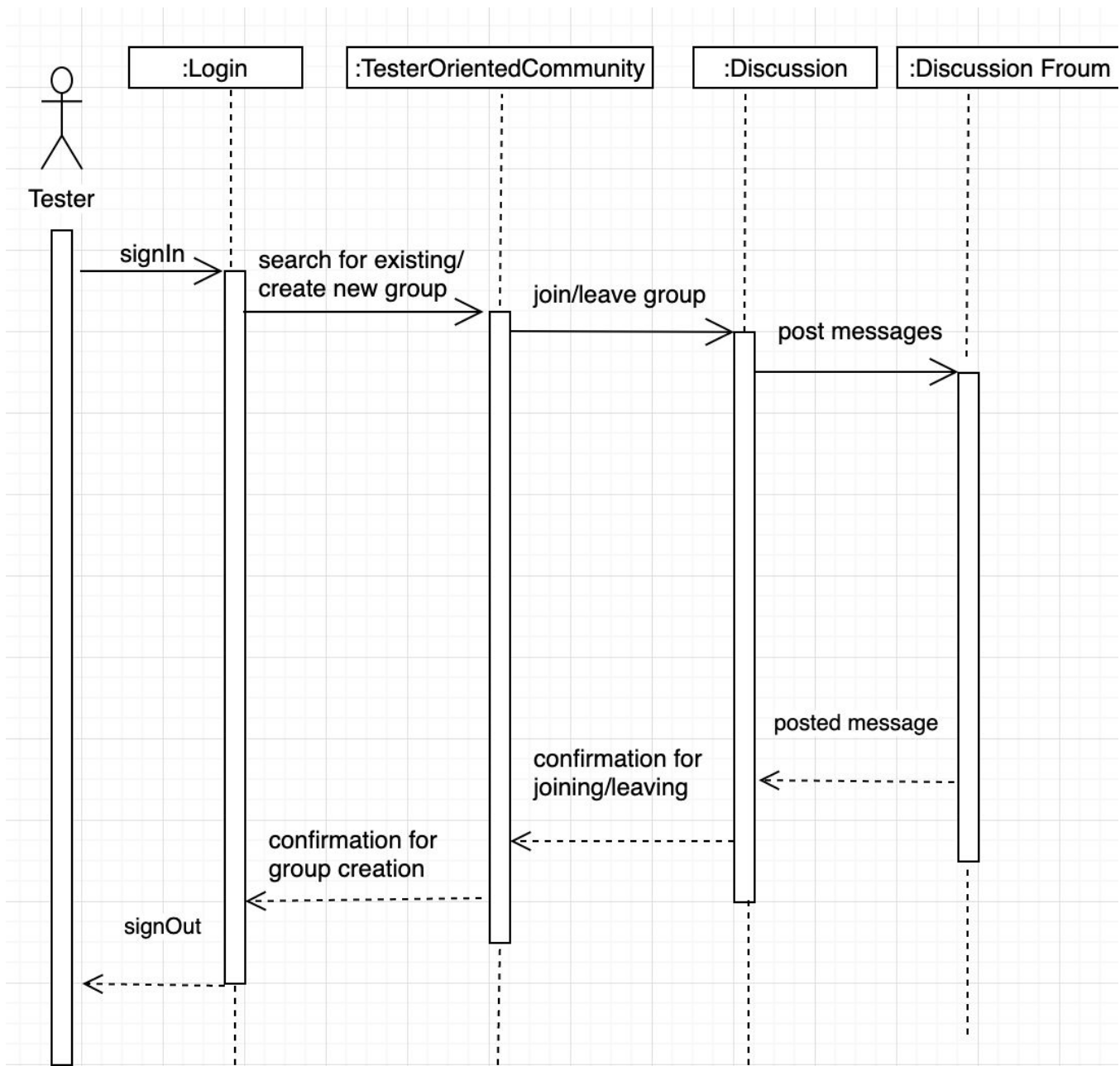


Figure 3: Sequence Diagram for Tester-Oriented Testing Community Service

(C)Database Design:

The primary database used for the Testing Community Service is MongoDB(NoSQL). We have used NoSQL database in our application for this component because chat feature does not have a specific structure and storing such data in SQL tables can create many null columns.Hence, we have chosen NoSQL database.The structure for it is defined below:

Element Name	JSON Schema
messages	<pre>{ "sender_id": "email" "receiver_id": "email" "date": Date "group_id": alphanumeric "content" : "String" }</pre>
proj_members	<pre>{ "membercount":int "project manager":{"username"="String"} "tester":{"username: "String"} }</pre>
groups_projcom	<pre>{ "group_id": "String" "group_name": "String" "proj_manager": int "admin_id": "String" "members":{"username": "String"} "grp_chat": { "message": "String" "sender_id": "String" "date": Date } }</pre>
discussion_testcom	<pre>{ "discussion_id": "String" "name": "String" "admin_id": "String" "members":{"username": "String"} "grp_chat": { "message": "String" "sender_id": "String" }</pre>

	<pre> "date": Date } } </pre>
--	---

5.Component Business Logic

The Testing Community Service has the following use cases

(A)UseCase 1.00

Use Case Name	Create a project group on the Project Oriented Community Group
Actors	Project Manager
Flow of Events	<ul style="list-style-type: none"> -Project manager signs in to the Testing Community Service -Project manager navigates to the Project Oriented Community Group -The manager clicks on the 'Create a Project' button -The system requires him to enter project details like group name, his username and the maximum number of members that can be added in the group -He clicks on the Create button -The system sends him a notification of the created group
Entry Condition	The project manager has access to the Testing community Service
Exit Condition	The project manager is successfully able to create the group

(B)UseCase 2.00

Use Case Name	Delete a project group on the Project Oriented Community Group
Actors	Project Manager and members of the group
Flow of Events	<ul style="list-style-type: none"> -Project manager signs in to the Testing Community Service -Project manager navigates to the Project Oriented Community Group -The manager clicks on the 'Delete a Project' button -The system requires him to enter project details like group name and his username -The system confirms whether he wants to delete the group or not -On his confirmation, the group is deleted

	-The system sends him a notification of the group deletion
Entry Condition	The project manager has access to the Testing community Service
Exit Condition	The project manager is successfully able to delete the group

(C)UseCase 3.00

Use Case Name	Add a member to the project group on the Project Oriented Community Group
Actors	Project Manager and the member to be added
Flow of Events	<ul style="list-style-type: none"> -Project manager signs in to the Testing Community Service -Project manager navigates to the Project Oriented Community Group -The manager clicks on the 'Add a new Member' button -The system requires him to enter his and the member's username. -The system checks if both members have access to the project Oriented Community Service -The member gets added
Entry Condition	The project manager and the member to be added have access to the Testing community Service
Exit Condition	The project manager is successfully able to add the member to the group

(D)UseCase 4.00

Use Case Name	Delete a member from the project group on the Project Oriented Community Group
Actors	Project Manager and the member to be deleted
Flow of Events	<ul style="list-style-type: none"> -Project manager signs in to the Testing Community Service -Project manager navigates to the Project Oriented Community Group -The manager clicks on the 'Delete a Member' button -The system requires him to enter his and the member's username. -The system asks for deletion confirmation -The member gets deleted
Entry Condition	The project manager has access to the Testing Community Service
Exit Condition	The project manager is successfully able to delete the member from

	the group
--	-----------

(E)UseCase 5.00

Use Case Name	Create a discussion group on the Tester Oriented Community Group
Actors	Testers having access to the Tester Oriented Community Group
Flow of Events	<ul style="list-style-type: none"> -Tester signs in to the Testing Community Service -Tester navigates to the Tester Oriented Community Group -The tester clicks on the 'Create a Discussion Group' button -The system requires him to enter details like group name, his username, the group category and the maximum number of members that can be added in the group -He clicks on the Create button -The system sends him a notification of the created group
Entry Condition	The tester has access to the Testing Community Service
Exit Condition	The tester is successfully able to create the group

(F)UseCase 6.00

Use Case Name	Delete a discussion group on the Tester Oriented Community Group
Actors	Tester who is the group admin
Flow of Events	<ul style="list-style-type: none"> -Tester signs in to the Testing Community Service -Tester navigates to the Tester-Oriented Community Group -The tester clicks on the 'Delete a Project' button -The system requires him to enter project details like group name and his username -The system confirms whether he wants to delete the group or not -On his confirmation, the group is deleted -The system sends him a notification of the group deletion
Entry Condition	The tester has access to the Testing Community Service
Exit Condition	The project manager is successfully able to delete the group

(G)UseCase 7.00

Use Case Name	Join a discussion group on the Tester Oriented Community Group
----------------------	--

Actors	Any tester having access to the Testing Community Service
Flow of Events	<ul style="list-style-type: none"> -The tester signs in to the Testing Community Service -Tester navigates to the Tester Oriented Community Group -The tester searches for the group -Tester clicks on the 'Join' button on finding the group -The member gets added and is notified via email
Entry Condition	The member to be added has access to the Testing community Service
Exit Condition	The member is successfully able to join the group

(H)UseCase 8.00

Use Case Name	Leave a discussion group on the Tester Oriented Community Group
Actors	Any tester who is a member of the group
Flow of Events	<ul style="list-style-type: none"> -Tester signs in to the Testing Community Service -Tester navigates to the Tester Oriented Community Group -Tester clicks on the 'Leave' button -The system asks for leaving confirmation -The member is able to leave the group
Entry Condition	The tester has access to the Testing Community Service
Exit Condition	The tester is successfully able to leave the group

(I)UseCase 9.00

Use Case Name	Message a member on personal chat
Actors	Any member who has access to the Testing Community Service
Flow of Events	<ul style="list-style-type: none"> -Member signs in to the Testing Community Service -Member navigates to the Tester Oriented Community Group or the Project Oriented Community Group -Member clicks on the 'Compose Message' button -Member enters the sender's username and the message content and clicks 'Send Message' button -The message is sent
Entry Condition	The member should have access to the group

Exit Condition	The member is successfully able to send personal message
-----------------------	--

(J)UseCase 10.00

Use Case Name	Message on a group
Actors	Any member who has access to the Testing Community Service
Flow of Events	<ul style="list-style-type: none"> -Member signs in to the Testing Community Service -Member navigates to the Tester Oriented Community Group or the Project Oriented Community Group -Member goes to the specific group on which he wants to send the message -Member types in the message content and clicks on 'Send' -The message is posted on the group
Entry Condition	The member should have access to the group
Exit Condition	The member is successfully able to post a message on the group

(K)UseCase 11.00

Use Case Name	View messages in the inbox
Actors	Any member who has access to the Testing Community Service
Flow of Events	<ul style="list-style-type: none"> -Member signs in to the Testing Community Service -Member goes to the inbox -All the messages in the user's inbox are displayed
Entry Condition	The member should have access to the group
Exit Condition	The member is successfully able to view messages in the inbox

(L)UseCase 12.00

Use Case Name	View projects in the Project Oriented Community
Actors	Any member who has access to the Testing Community Service
Flow of Events	<ul style="list-style-type: none"> -Member signs in to the Testing Community Service -Member navigates to the Project Oriented Community Group -Member types in the group name clicks on the 'Search' button

	-The list of retrieved projects is visible to the user
Entry Condition	The member should have access to the Project Oriented Community
Exit Condition	The member is successfully able to view projects

(M)UseCase 13.00

Use Case Name	View discussion groups in the Tester Oriented Community
Actors	Any member who has access to the Tester Oriented Community Service
Flow of Events	<ul style="list-style-type: none"> -Tester signs in to the Testing Community Service -Tester navigates to the Tester Oriented Community Group -Tester types in the category name clicks on the 'Search' button -The list of retrieved groups is visible to the user
Entry Condition	The member should have access to the Tester Oriented Community
Exit Condition	Member is successfully able to view discussion groups based on his choice

The flowchart diagram for this component is given below:

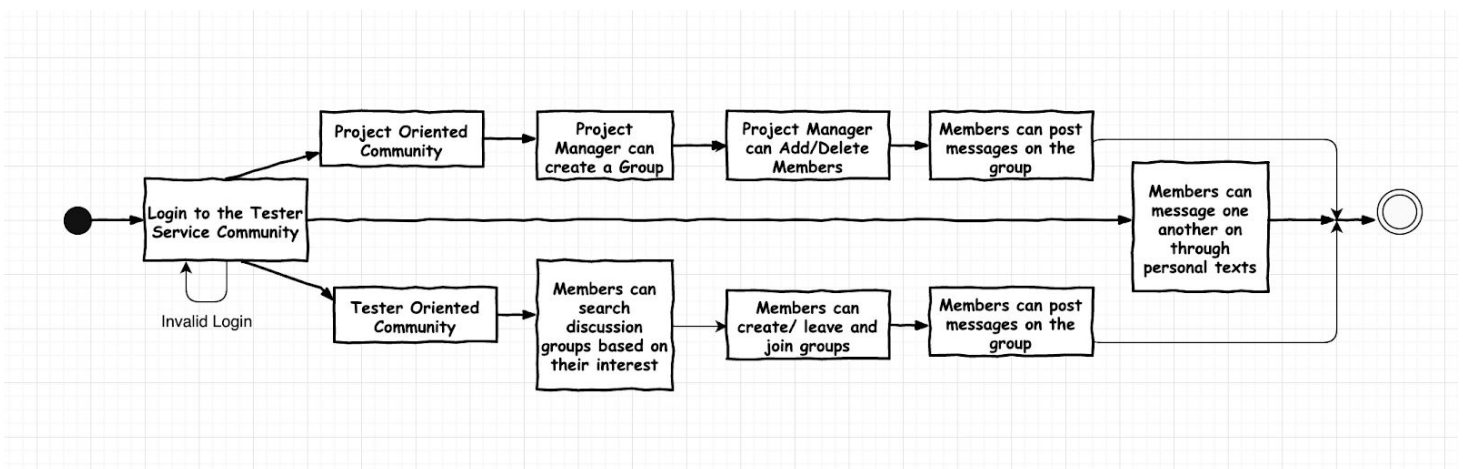


Figure 4: Flow chart for the Testing Community Service

6. Component Graphic User Interface Design

Presented below are the screenshots of the Community Service Module and its related functionalities and features.



Figure 1: Dashboard for the Project Manager which displays the number of projects that have been completed, number of bugs reported and the month-wise statistics for projects completed, bugs reported and payments

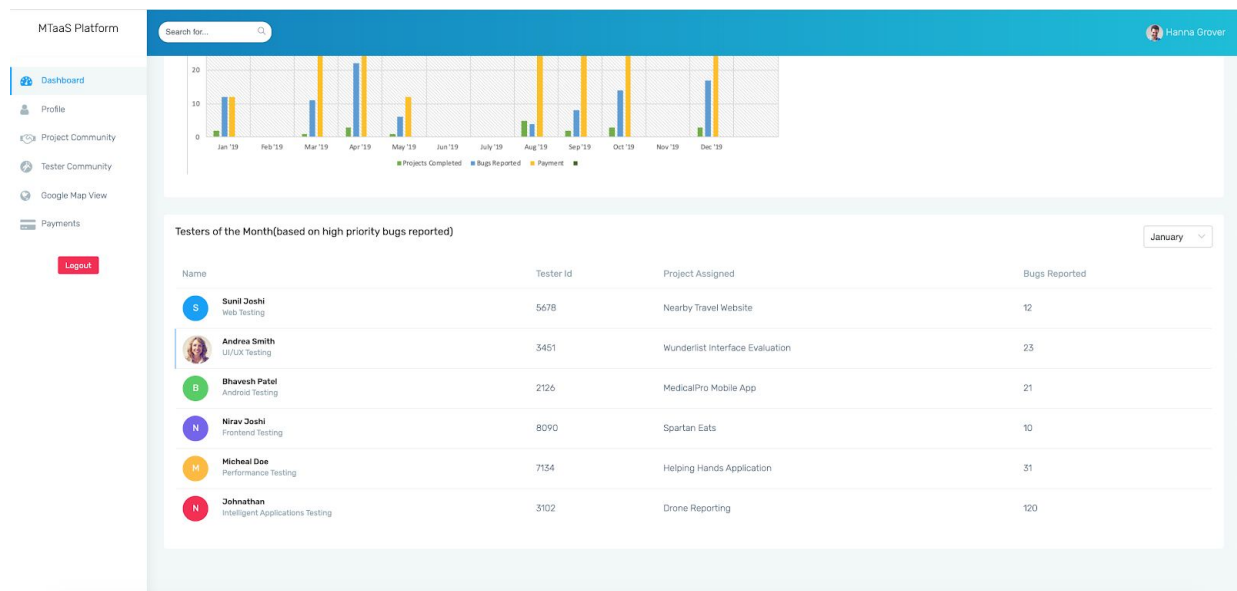


Figure 2: On scrolling down on the same page, the project manager can view top testers for each project

MTaaS Platform Search for... Hannah Grover

Profile
Home > Profile

Hanna Grover
Web Application Testing

Full Name
Hannah Grover

Profession
Freelance Tester

Email
hangrover9876@gmail.com

Password

Phone No
+1(123)-456-7890

Upload Resume:
Choose File | No file chosen
[View](#)

Select Country
London

[Update Profile](#)

Figure 3: The profile page which allows the tester and the project manager to update their information and upload a new resume.

MTaaS Platform Search for... Hannah Grover

Project Oriented Community
Home > Project Oriented Community

[Create New Group](#) [Chat](#)

Group Name	Admin Id	Member Count	Add Member	Delete Member	Delete Group	New Messages
Nearby Travel	5678	22	Add			
Ant Colony Optimization	1234	5	Add			No new messages
iOS Application	4020	18	Add			
Monuments Android Application	8090	11	Add			No new messages
Frontend Wunderlist	2356	36	Add			
Spartan Eats Website	2121	16	Add			No new messages
Stock Prediction Website	3485	15	Add			

Figure 4: This is a screenshot of the Project Community Screen, which allows project managers to create a new group for a project discussion, add/delete members to the group, delete the group and view new messages on the group. The 'Chat' tab on the upper corner of the screen allows the manager to send personal messages to members. Detailed functionalities of these features are shown in the following screenshots.

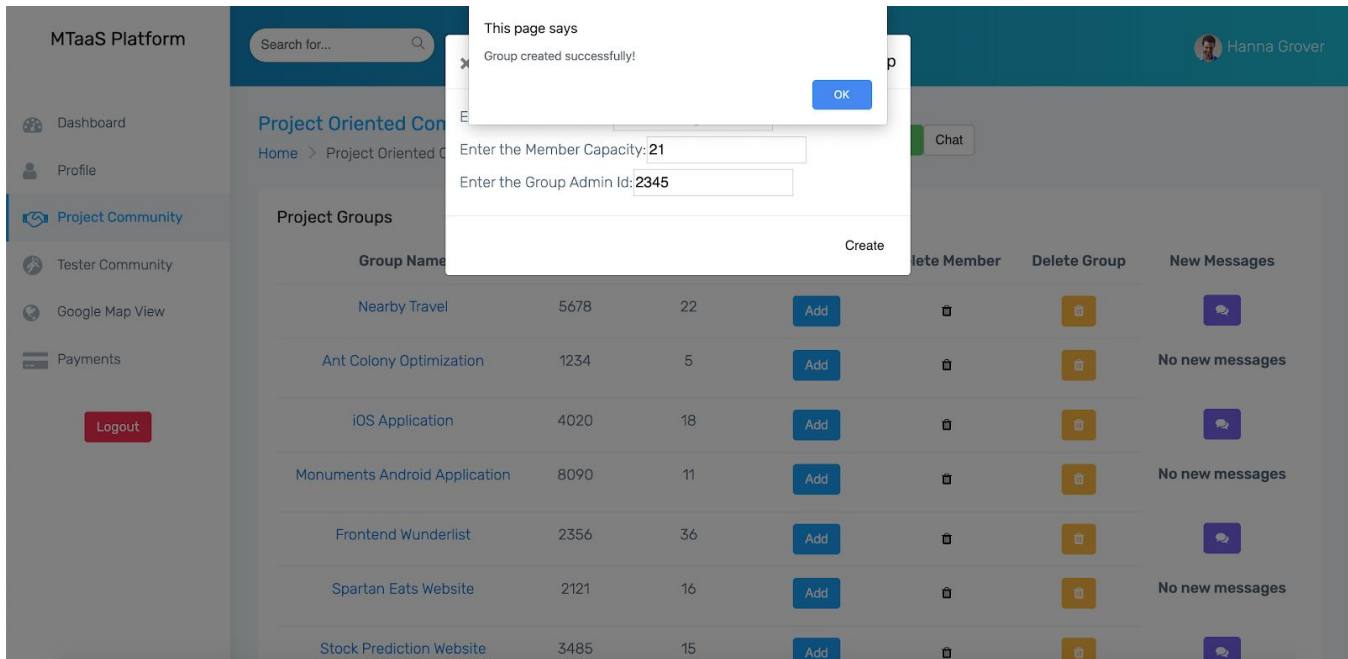
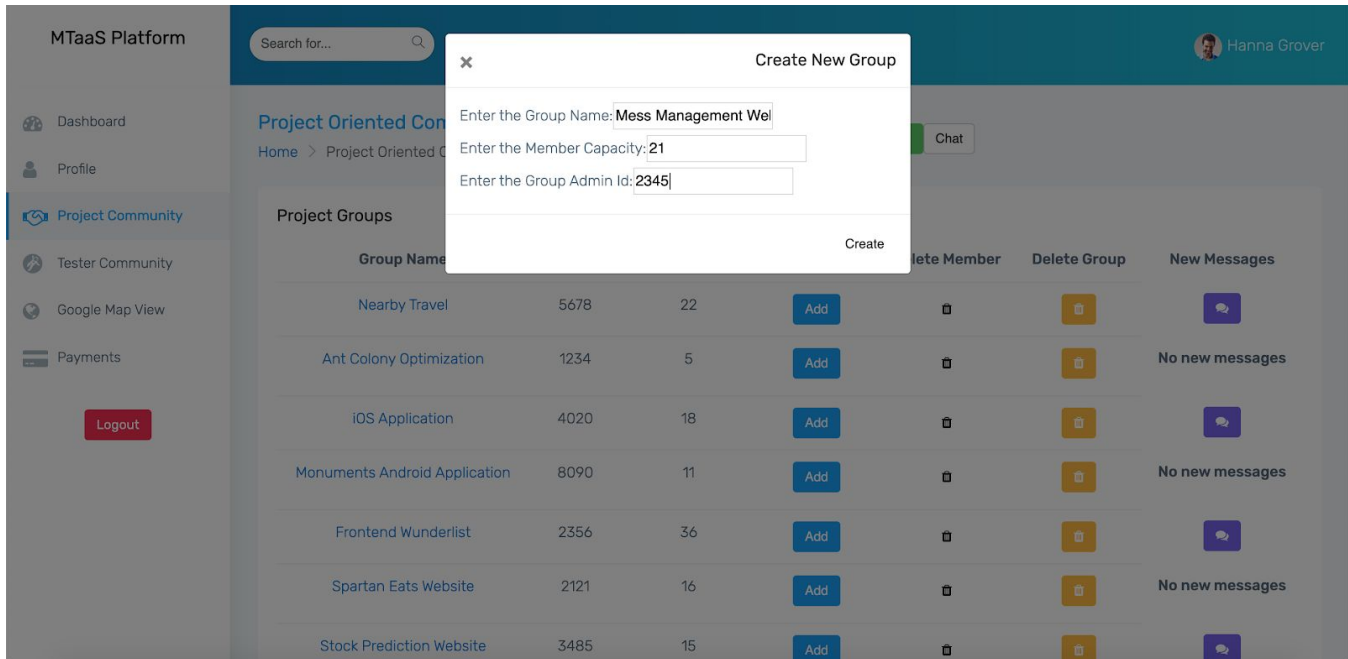


Figure 5: This is a screenshot of the Project Community Screen, which allows project managers to create a new group for a project discussion by clicking on the green button for

creating a new group and entering the required details. (example: Mess Management Group created)

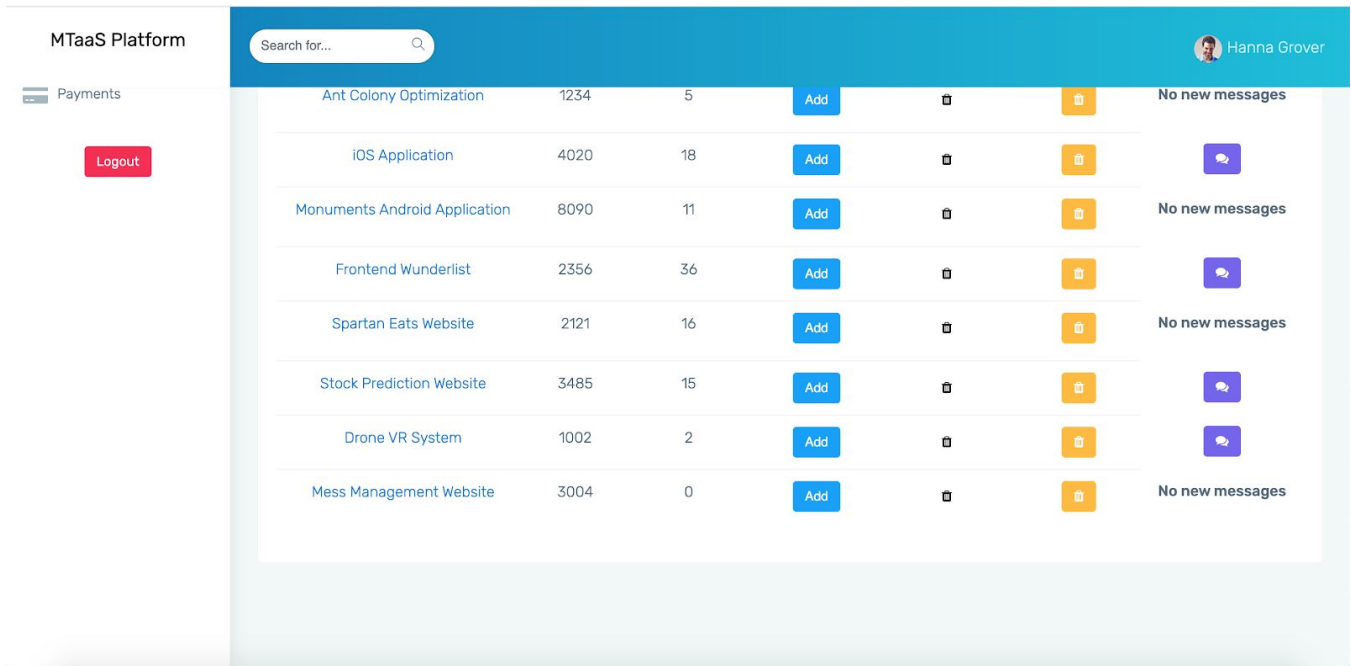


Figure 6: This is a screenshot of the Project Community Screen, where the new group(Mess Management Website) has been successfully added to the list of Project Groups

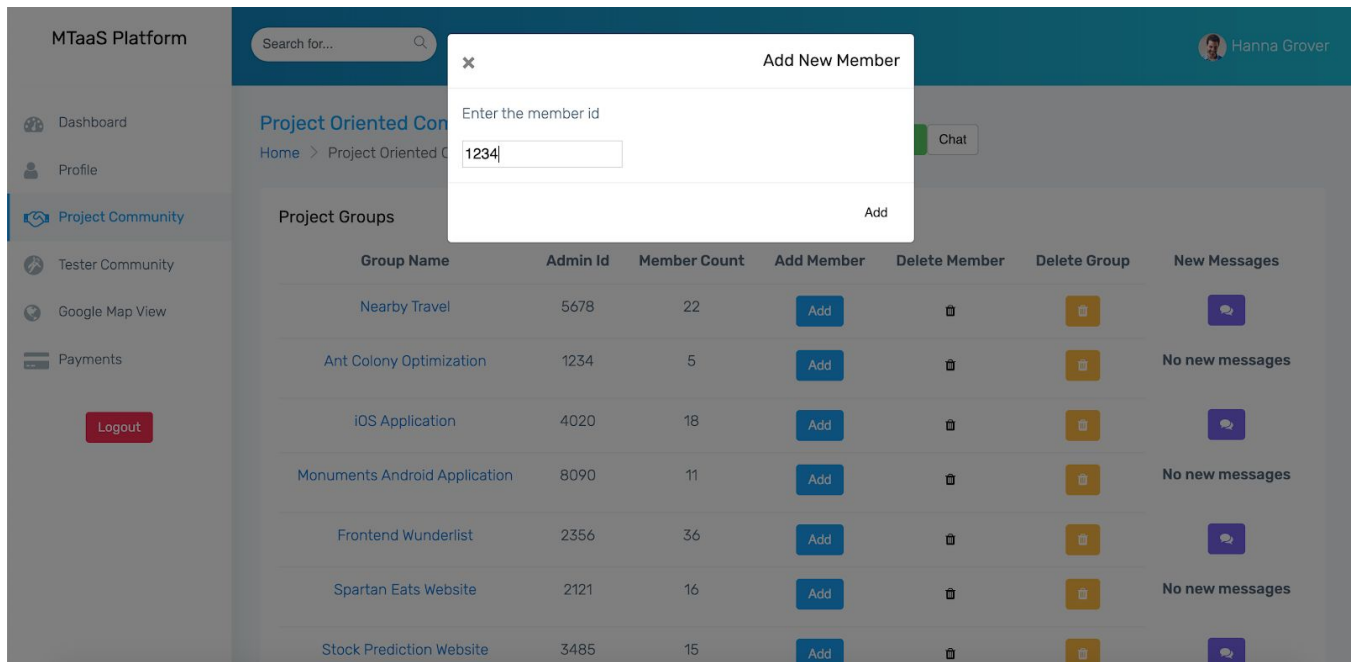


Figure 7: This is a screenshot of the Project Community Screen, where the project manager is able to add a new member to the group by entering his/her tester id.

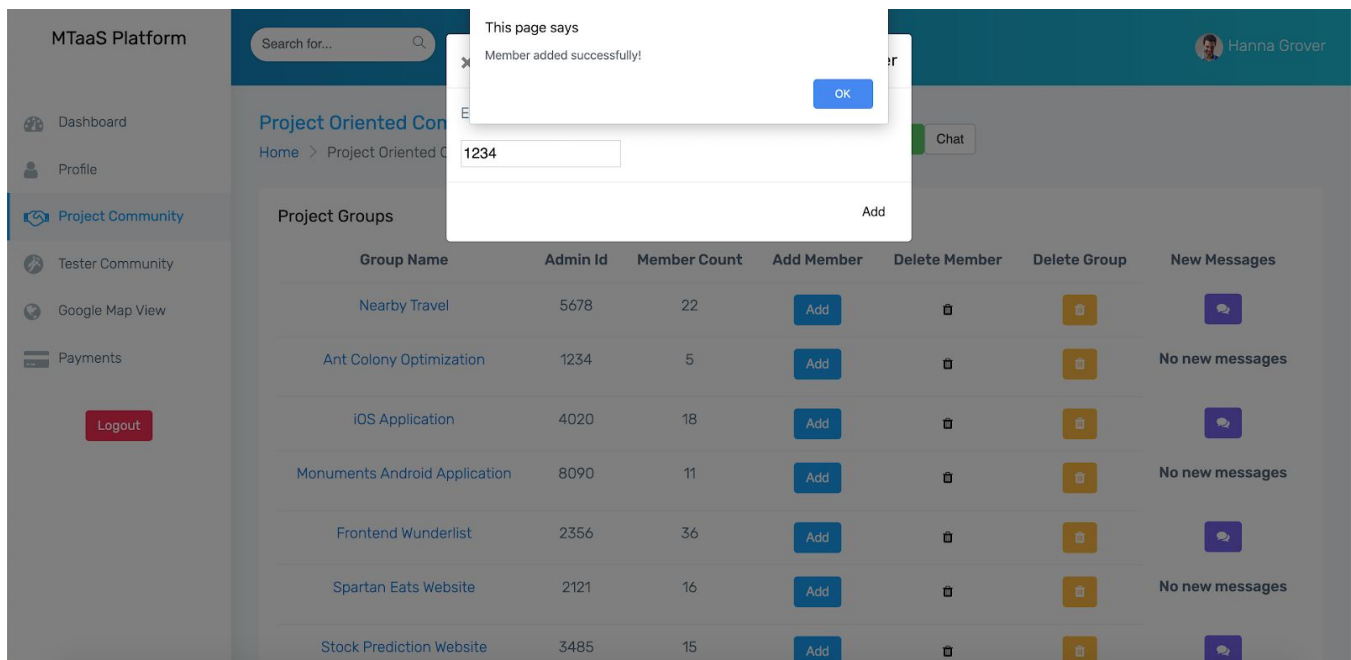


Figure 8: This is a screenshot of the Project Community Screen, where the member is successfully added to the group

MTaaS Platform

Search for...

Dashboard

Profile

Project Community

Tester Community

Google Map View

Payments

Logout

Project Oriented Community

Create New GroupChat

Home > Project Oriented Community

Project Groups

Group Name	Admin Id	Member Count	Add Member	Delete Member	Delete Group	New Messages
Nearby Travel	5678	22	Add	<div></div>	<div></div>	<div></div>
Ant Colony Optimization	1234	5	Add	<div></div>	<div></div>	No new messages
iOS Application	4020	18	Add	<div></div>	<div></div>	<div></div>
Monuments Android Application	8090	11	Add	<div></div>	<div></div>	No new messages
Frontend Wunderlist	2356	36	Add	<div></div>	<div></div>	<div></div>
Spartan Eats Website	2121	16	Add	<div></div>	<div></div>	No new messages
Stock Prediction Website	3485	15	Add	<div></div>	<div></div>	<div></div>

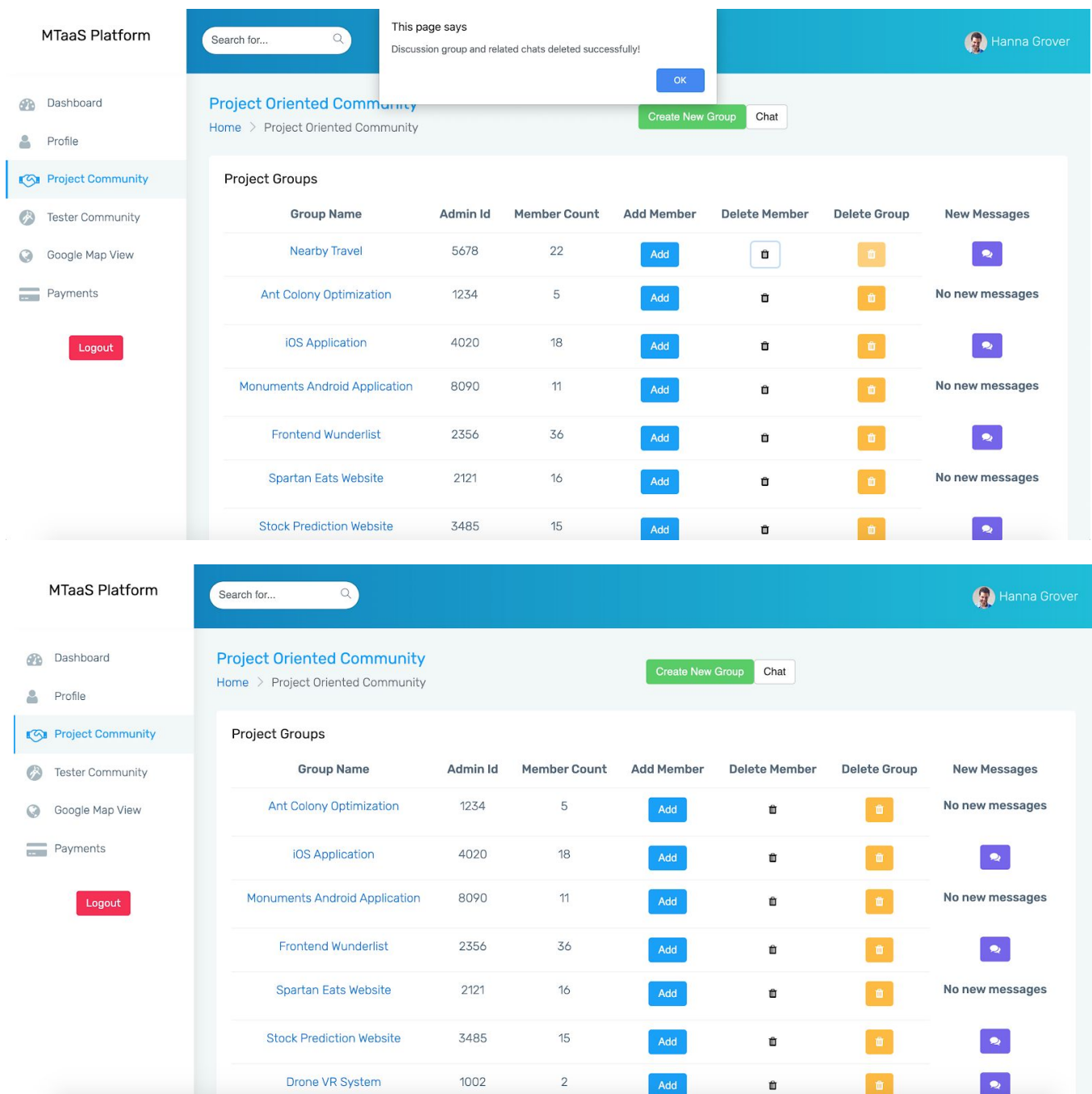


Figure 9 : This is a screenshot of the Project Community Screen, where the project manager is able to delete the group named 'Nearby Travels'. The above screenshots are for before and after the deletion.

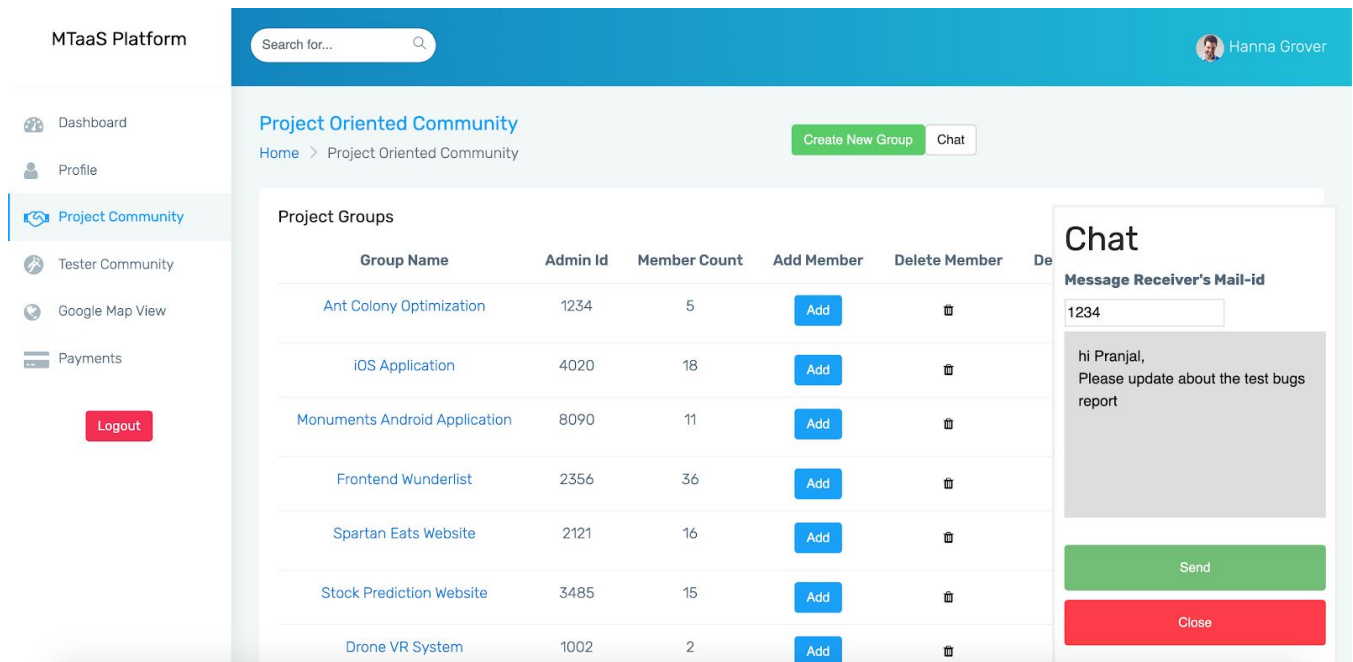


Figure 10 : This is a screenshot of the Project Community Screen, where the project manager is able to individually send message to a member using the private chat feature.

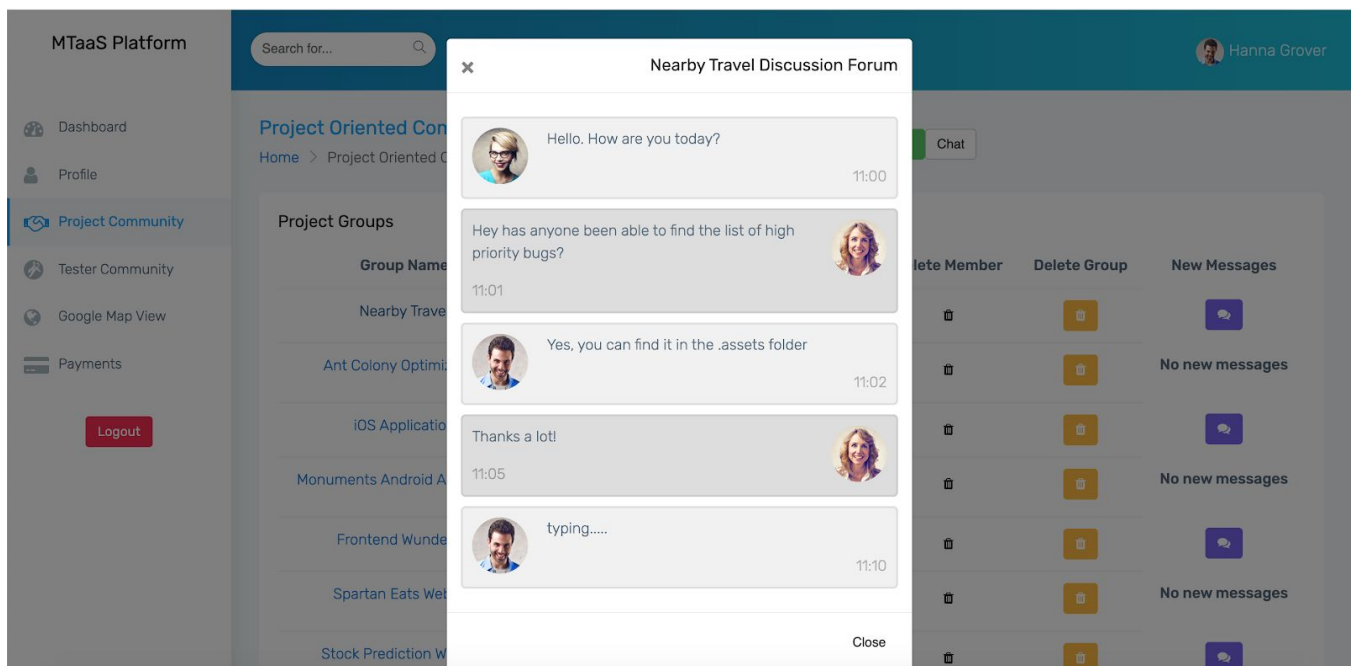


Figure 11 : This is a screenshot of the Project Community Screen, where the members in a particular project group can chat with each other.

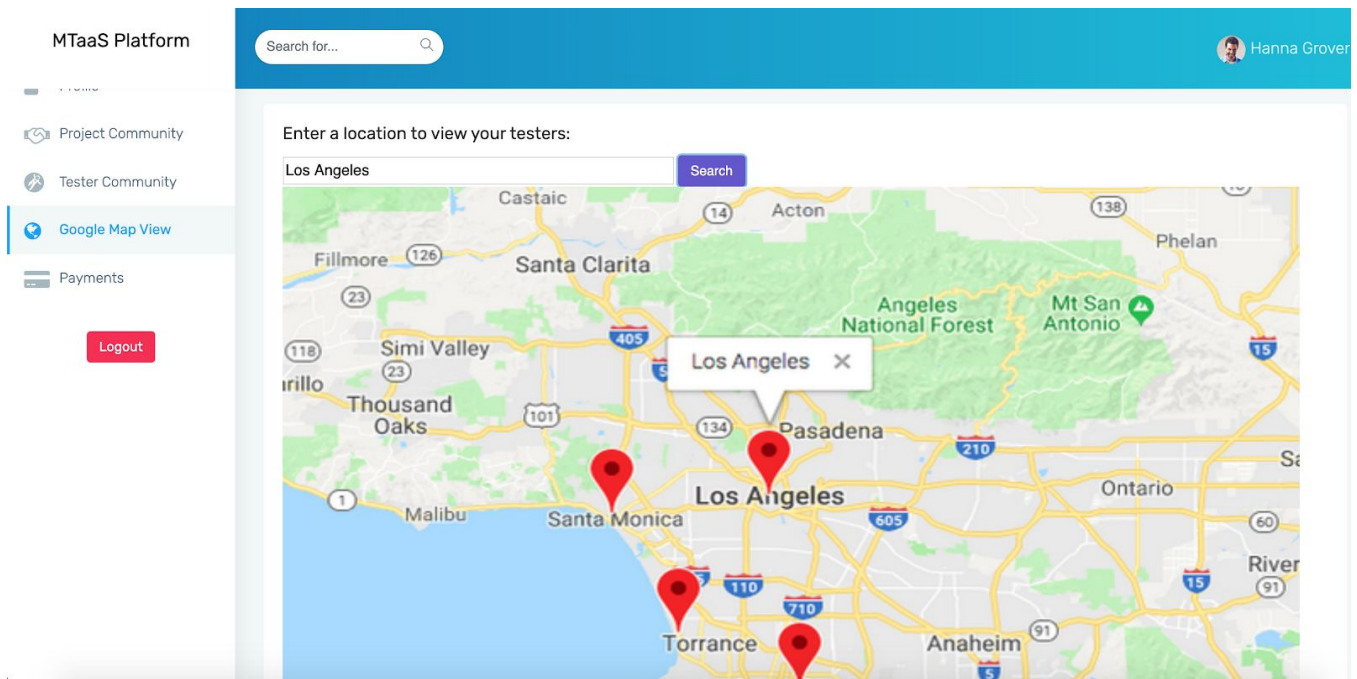


Figure 12: This is a screenshot of the Project Community Screen, where the project manager is able to search testers based on location(for example entering Los Angeles displays testers in the nearby location)

Tester ID	Name	Project Name	View Resources	Payment Amount	Payment Status
1234	Mark Otto	Drone Application	View Resources High Priority Bugs Reported: 12 Instances:2	\$12	Pending
2345	Jacob Thronton	Nearby Travel Search	View Resources	\$34	Completed
3456	Larry Bird	Mini Twitter	View Resources	\$9	Pending

Figure 13 : This is a screenshot of the Project Community Screen, where the project manager is able to view the payment status of each tester, the resources consumed and the amount of payment.The manager can also make payment transaction using PayPal.

The screenshots for the Tester Community are shown below (Note: Only the pages with differences are shown. The similar pages like profile update and google maps view have not been shown below but they do exist in the application and are exactly similar to the Project Community screenshots)

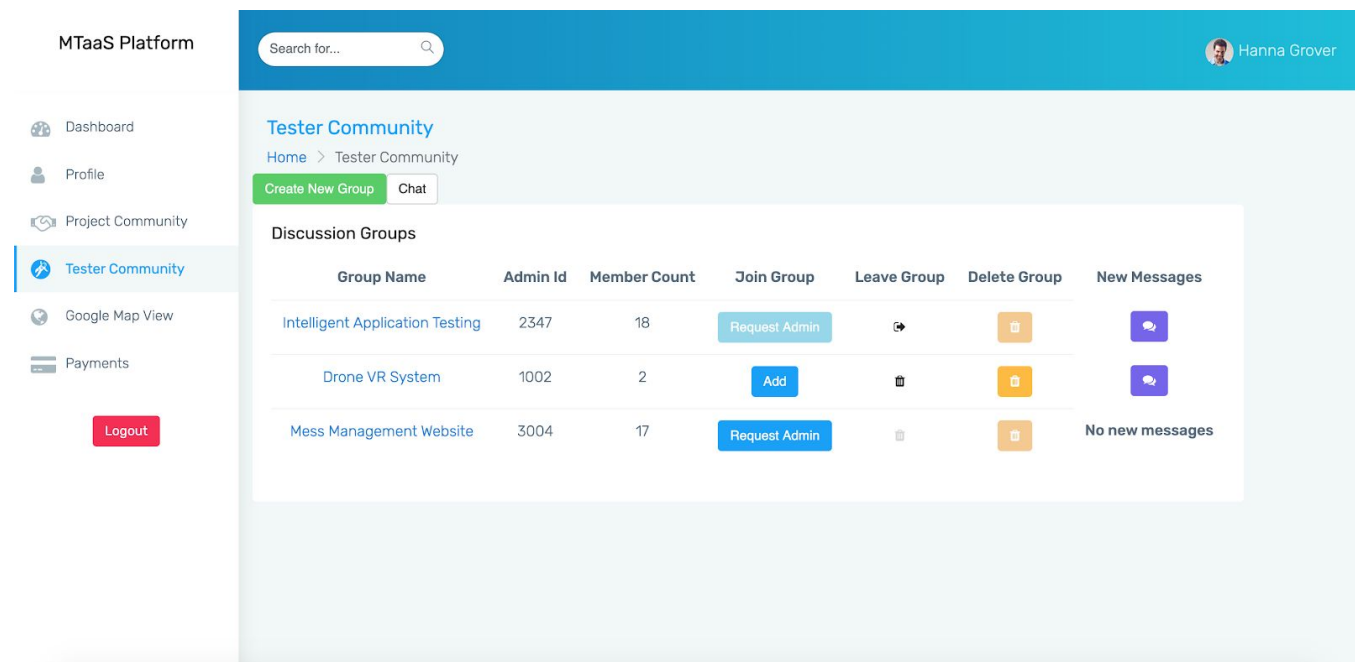


Figure 14: This is a screenshot of the Tester Community Page. The 'Create New Group' and 'Chat' functions are exactly similar to those present in the Project Community Page. In the 'Discussion Groups panel', we can see three projects. For the first project 'Intelligent Application Testing', only 'Leave Group' button is enabled because the tester is already a member of the group. Hence, the 'Request Admin' button is disabled and the 'Delete Group' button is disabled because the tester is not the group admin and hence does not have the privilege to delete the group.

For the second project group titled 'Drone VR System', the tester is the group admin, hence the 'Add' button which allows him to add new members to the group and the 'Delete Group' button is also hence enabled.

The tester is not a member of the last project titled 'Mess Management Website'. Hence, only the 'Request Admin' button is enabled which allows him to submit request to the admin for joining. Also, the other buttons are disabled because he is not a member of the group and hence cannot have access rights to the group chats and leave group facilities.

7. Demonstration of the Module

For the demonstration of the module, a video has been recorded. Since the other dependent login modules have not yet been integrated, therefore, the current video does not demonstrate the functionalities for the Project and Tester based communities separately logged in through different roles (Tester and Project Manager). However, once the login module is integrated, the community Module features will have different views for the Tester and Project Community Roles.

In the current demo, the user account i.e. Hanna Grover view is used to demonstrate the functionalities of both the Tester and the Project Oriented Community.

Note: I have recorded the video using ScreenFlow software. Since it is a trial version, therefore, while exporting the video, there is a watermark 'Demo Mode' on the screen. The watermark is not a part of the application.