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1.0 Section 1

1.1 Introduction to the Web Application

The online campus facility report system is a new web-based application system that designed to support all faculty members as well as students in making report on faulty facilities in the campus. The system goal is to achieve on creating campus environment that is safer and efficient where the facilities is in good condition by providing the report management. To illustrate that, the features of the system included login as different roles, logout, faulty facility report with adding photo and audio description as attachment to the report, work confirmation for confirming the maintenance is started for the submitted report, job status for informing the progress on the confirmed work, acknowledgement on submitted reports, comment on work confirmation, summary report for maintenance completion, and fault severeness for indicating the priority of the maintenance. Moreover, the roles supported in the system included administrator, faculty member and student. Following that, the development methodology chosen for developing the online campus facility report system based on the requirements is Agile development methodology, Scrum as specific. The reason of choosing Scrum methodology is due to its excellent capability in handling complex system. To elaborate that, the complexity of online campus facility report system is raised due to its requirements consists of multiple features and multiple roles. Moreover, another reason of using Scrum methodology for the system development is due to its iterative approach, sprints, which make it possible for adaptation and continuous improvement as the feedback from the stakeholders is considered for the subsequent sprints. In addition, another reason of selecting Scrum methodology is due to its fast development. To elaborate that, it allows this new system to deliver quickly and efficiently for user testing. Finally, Scrum methodology is selected because it is able to divide this large project into smaller sprints. Hence, making the project more manageable. *Table 1.1* shows the summary of the introduction to the online campus facility report system.

System:	Online Campus Facility Report System
System Type:	Web-Based Application
System Goal:	Create safer campus with efficient facility that is in good condition by providing faulty facility report system.
Features	• Login • Logout • Faulty Facility Report • Work Confirmation • Job Status • Acknowledgment • Comment • Summary Report • Fault Severeness
User Roles:	• Administrator • Faculty Member • Student
Software Development Methodology:	Scrum (Agile Software Development)
	Reason: • Excellent in handling complex system. • Iterative approach (sprints) for adaptation and continuous improvement. • Fast deliverables on the product. • Dividing large project into smaller manageable pieces.

Table 1.1 Summary Table of Online Campus Facility Report System

Moreover, due to the fact that some of the roles share the same features, hence the roles will be generalise as shown in *Figure 1.1*.

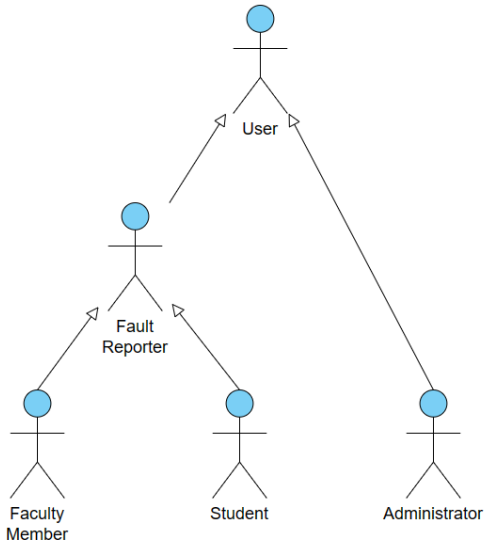


Figure 1.1 Roles Generalisation

Table 1.2 shows the more detailed scopes of the software.

	Features	**Description**
1.	Login	• User should be able to login to their account and access the system with their respective role privileges.
2.	Logout	• User should be able to logout their account.
3.	Faulty Facility Report	• Fault Reporter should be able to submit report on faulty facility with photo and audio description as attachment. • Administrator should be able to view the submitted report for reviewing.
4.	Work Confirmation	• Administrator should be able to send work confirmation to inform about the work details that will be constructed during the maintenance on the report. For example, maintenance start date and time, expected end date and time, and the work listing. • Fault Reporter should be able to receive work confirmation to be informed about the work is confirmed on their submitted report along with the work details will be constructed during the maintenance. For example, maintenance start date and time, expected end date and time, and the work listing.
5.	Job Status	• Administrator should be able to update the job status to inform the work progress on the ongoing maintenance on the report. • Fault Reporter should be able to view job status to be informed about the work progress on the ongoing maintenance.

6.	Acknowledgement	• Administrator should be able to send acknowledgement to inform the faulty facility report is reviewed and the attitude towards the report such as the maintenance is rejected due to false information, or it is accepted and will notify once the work is confirmed. • Fault Reporter should be able to receive acknowledgement to be informed on the submitted report have been reviewed and the attitude towards the report such as the maintenance is rejected due to false information, or it is accepted and will notify once the work is confirmed.
7.	Comment	• Faculty Member should be able to add comment and reply comment on the work confirmation, as having more responsibility to communicate on the maintenance and work arrangement. • Administrator should be able to reply comment on the work confirmation to address concern of the maintenance and work arrangement.
8.	Summary Report	• Administrator should be able to send summary report to inform on completed maintenance. • Fault Reporter should be able to view the summary report and get informed on completed maintenance.
9.	Fault Severeness	• Fault Reporter should be able to submit report as severe fault to indicate the maintenance priority. • Administrator should be able to view on severe fault report to prioritise the maintenance arrangement.

Table 1.2 Online Campus Facility Report System Software Scopes

1.2 Product Backlog and User Stories

For clarification, the first sprint, Sprint 1 has finished on developing Feature 1 and Feature 2, which is Login and Logout. Hence, the updated product backlog after Sprint 1, consisting overall features with short summary of user stories are shown in *Table 1.1*. Due to the reason that this is a new system instead of updating an existing system, and only 1 sprint is done with no improvement required, hence there will not be having the column 'Type' as the value held will be repeated as 'Requirement', resulting in wastage on the table space. Moreover, the priority of the features is indicated as a number is due to the purpose of referring it as the development order number. The reason is that it is nearly impossible for features to be develop exactly the same time even though that have similar priority. In addition, the reason for consolidating the features for Administrator side and for Faculty Member side is that only 3 features will be selected on Sprint 2, hence, to show the functionality for all three roles, those features from both sides are considered as one feature but with different user stories.

	Features	**User Stories**	**ID**	**Priority**	**Status**	**Estimate**
1.	Login	As a User, I want to authenticate myself and login, so that I can access the system with my respective role privileges.	1	1	Done	3
2.	Logout	As a User, I want to logout, so that I can terminate my session securely.	2	2	Done	1
3.	Faulty Facility Report	As a Fault Reporter, I want to report faulty facility with photo and audio description	3	3	Not Started	11

		attachment, so that I can inform the fault clearer.				
		As an Administrator, I want to view all the faulty facility report made, so that I can review the report and decide on action.	4	4	Not Started	9
4.	Work Confirmation	As an Administrator, I want to send work confirmation with the details of works will be constructed, so that I can inform about the maintenance work is arranged for the report.	5	5	Not Started	9
		As a Fault Reporter, I want to view the confirmed work on submitted report with the details of works will be constructed, so that I knows that my report will be started to work on with detailed information.	6	6	Not Started	7
5.	Job Status	As an Administrator, I want to update the job status, so that I can inform the maintenance progress.	7	9	Not Started	5
		As a Fault Reporter, I want to view the job status, so that I can know the maintenance progress.	8	10	Not Started	5
6.	Acknowledge -ment	As an Administrator, I want to send the acknowledgement, so that I can inform the report is reviewed along with the attitude towards the report with reason.	9	11	Not Started	4
		As a Fault Reporter, I want to view the acknowledgement of my submitted report, so that I can know if my maintenance report is approved or rejected with reason.	10	12	Not Started	3
7.	Comment	As a Faculty Member, I want to add comment and reply comment on the work confirmation, so that I can be more responsible on provide feedback and communicate about the maintenance and work arrangement.	11	7	Not Started	10
		As an Administrator, I want to reply comment on the work confirmation, so that I can address concern on the maintenance and work arrangement.	12	8	Not Started	6
8.	Summary Report	As an Administrator, I want to send summary report, so that I can inform on completed maintenance with details given.	13	13	Not Started	9
		As a Fault Reporter, I want to view the summary report on completed maintenance, so that I can know that the maintenance is done with details given.	14	14	Not Started	5
9.	Fault Severeness	As a Fault Reporter, I want to submit report as severe fault, so that my report will get the priority for maintenance.	15	15	Not Started	6
		As an Administrator, I want to view severe fault report, so that I can prioritise the maintenance arrangement on that report.	16	16	Not Started	7

Table 1.3 Product Backlog and User Stories

To explain on the priority set, Feature 3, Feature 4, and Feature 7, which is Faulty Facility Report, Work Confirmation and Comment features is prioritised as they are the main features of the system. To illustrate that, Feature 3: Faulty Facility Report feature support the main goal of the system, which enabling all faculty members and students to report faulty facilities. Next, having the Feature 4: Work Confirmation feature enable the fault reporter, which including faculty member and student to know their report is acknowledged with more information such as the work in confirmed with maintenance start date and work listing, while Feature 6: Acknowledgement just inform them about the attitude towards the report. Hence, in order to test the usability of the system, Feature 4: Work Confirmation provide more values. Moving forward, Feature 7: Comment is prioritised as it differentiates the privileges on Faculty Member and Student role, where Faculty Member have more responsibilities in ensuring the maintenance work on the right track such as the work listing for the maintenance is correct and communicating on shifting the maintenance start date to earlier time as if it is urgent. Hence, prioritising this feature as one of the main features can test the usability of the system in earlier stage in case there is adaptation or improvement needed. The other features are relatively less prioritised as they are just additional features to support and enhance the main features of the online campus facility report system, hence leaving them in the upcoming sprints is adequate and more appropriate.

Therefore, according to the priority, Feature 3, Feature 4 and Feature 7 is selected as the work items for the next sprint, which is Sprint 2. For clarification, the following report will only be focusing on Sprint 2, hence, the features developed in Sprint 1 will not be presented in this report. The workflow is shown in *Figure 1.2* with the annotation for better clarification. The details on user stories for Sprint 2 will be shown in the next section.

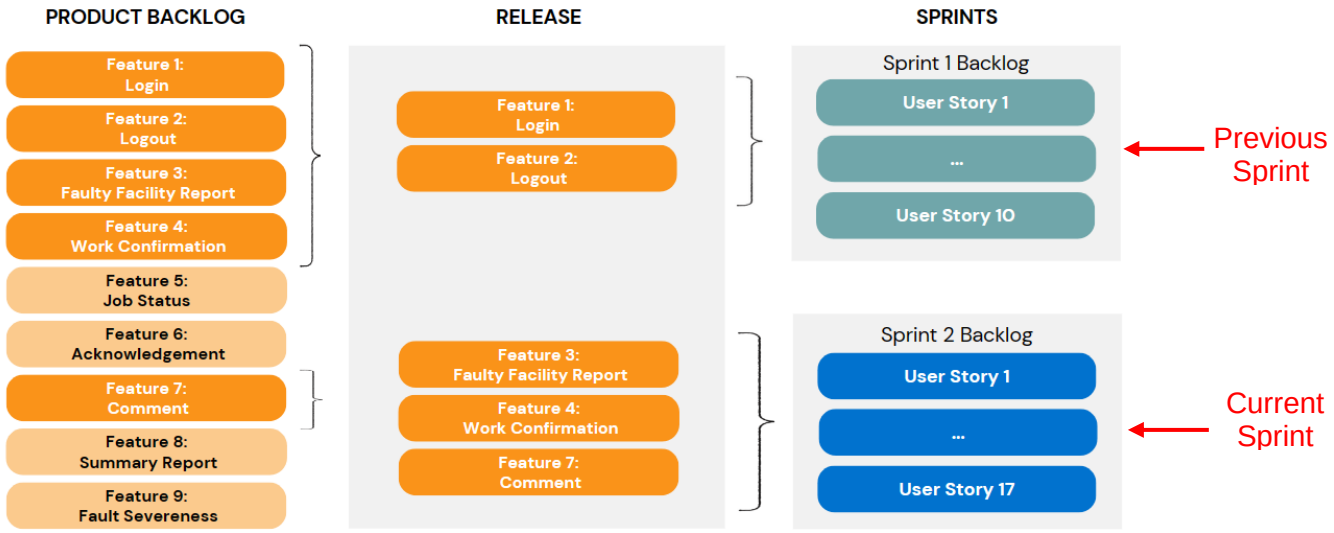


Figure 1.2 Workflow of the System

1.3 Detailed User Stories with Acceptance Criteria

Due to the reason that some of the user stories for the selected features are considered huge, hence they will be split into smaller user stories as making the task more manageable. In addition, as for clarification, the priority and estimate here is referring to the priority and estimate of time in this Sprint 2.

Sprint 2 User Stories:

Feature 3: Faulty Facility Report

Before Split:

ID: 3	As a Fault Reporter, I want to report faulty facility with photo and audio description attachment, so that I can inform the fault clearer.

After Split:

Title:	**Priority:**	**Estimate:**
User Story 1 – Constant Information Fill In by Default	Medium	3

User Story

As a Fault Reporter,

I want to fill in the information that stays the same for every report by default,

so that I can directly fill in the other required details.

Acceptance Criteria

Given that the Fault Reporter enters correct credentials,

when the Fault Reporter selects <*login*> option,

then the system directs the Fault Reporter to the home page, fault report,

and displays the report form with email, id, role, and name of the Fault Reporter filled in by default.

Title:	Priority:	Estimate:
User Story 2 – Submit Fault Report	High	3

User Story

As a Fault Reporter,

I want to submit report about the fault,

so that I can inform about the issue.

Acceptance Criteria

Given that the Fault Reporter login the system with correct credentials,

and been directed to the home page, fault report,

when the Fault Reporter enters valid required details, including mobile number, location, defective item, and description in the fault report form,

and selects <*submit*> option,

then the system sends the report to the Administrator,

and the system prompts the Fault Reporter for successful submission along with system generated report id.

Title:	Priority:	Estimate:
User Story 3 – Invalid and Missing Details for Report	High	1

User Story

As a Fault Reporter,

I want to get remind on invalid and missing details,

so that I can submit all required information to help in the fault report review process.

Acceptance Criteria

Given that the Fault Reporter enters some invalid or missing details in the fault report form,

when the Fault Reporter selects <*submit*> option,

then the system prompts the Fault Reporter on the invalid or missing details,

and the fault report is not submitted,

then the Fault Reporter can make respective adjustment before submission

Title:	**Priority:**	**Estimate:**
User Story 4 – Add Photo Attachment	Medium	2

User Story

As a Fault Reporter,

I want to add photo as attachment to the fault report,

so that I can inform and show the issue in more detailed way.

Acceptance Criteria

Given that the Fault Reporter login the system with correct credentials,

and been directed to the home page, fault report,

when the Fault Reporter selects <*browse photo*> option,

then the system prompts the Fault Reporter to upload image format file,

given that the Fault Reporter browse through the folders,

when the Fault Reporter uploads image format file,

then the system displays the uploaded image with file name in the photo section to indicate the selected photo is added.

Title:	**Priority:**	**Estimate:**
User Story 5 – Add Audio Attachment	Medium	2

User Story

As a Fault Reporter,

I want to add audio description as attachment to the fault report,

so that I can inform the issue clearer.

Acceptance Criteria

Given that the Fault Reporter login the system with correct credentials,

and been directed to the home page, fault report,

when the Fault Reporter selects <*browse audio*> option,

then the system prompts the Fault Reporter to upload audio format file,

given that the Fault Reporter browse through the folders,

when the Fault Reporter uploads audio format file,

then the system displays the uploaded audio with file name and allow playback in the audio section to indicate the selected audio is added.

Before split:

ID: 4	As an Administrator, I want to view all the faulty facility report made, so that I can review the report and decide on action.

After split:

Title:	**Priority:**	**Estimate:**
User Story 6 – Receive Fault Report	High	5

User Story

As an Administrator,

I want to receive all faulty facility reports made,

so that I can access to the report and review.

Acceptance Criteria

Given that the Administrator enters correct credentials,

when the Administrator selects <*login*> option,

then the system directs the Administrator to the home page, fault report,

and displays all the report submission sent to the Administrator.

Title:	**Priority:**	**Estimate:**
User Story 7 – View Fault Report Details	High	4

User Story

As an Administrator,

I want to view all the details of the fault report made,

so that I can review the report and decide on action.

Acceptance Criteria

Given that the Administrator login the system with correct credentials,

and been directed to the home page, fault report,

and the Administrator have received at least one report,

when the Administrator selects one of the submitted report,

then the system displays all the information of that report for the Administrator to review.

Feature 4: <u>Work Confirmation</u>

Before Split:

ID: 5	As an Administrator, I want to send work confirmation with the details of works will be constructed, so that I can inform about the maintenance work is arranged for the report.

After Split:

Title:	**Priority:**	**Estimate:**
User Story 8 – Fill in Confirmed Work Details	High	3

User Story

As an Administrator,

I want to fill in confirmed work details,

so that I can provide more details on the maintenance arrangement.

Acceptance Criteria

Given that the Administrator selects on one report in the home page, fault report,

and reviews the report,

and the maintenance work is arranged,

when the Administrator selects <*confirm work*> option,

then the system navigates the Administrator to the send work confirmation page,

and display the form for Administrator to fill in the details of the maintenance.

Title:	**Priority:**	**Estimate:**
User Story 9 – Send Work Confirmation	High	5

User Story

As an Administrator,

I want to send work confirmation,

so that I can inform that maintenance work is arranged for the report.

Acceptance Criteria

Given that the Administrator selects <*confirm work*> option on a report,

and been navigated to the send work confirmation page,

and fills in valid required maintenance details, including maintenance start date and time, expected end date and time, and work listing,

when the Administrator selects <*submit*> option,

then the system sends the work confirmation to the Fault Reporter of that report,

and the system prompts the Administrator for successful work confirmation sent along with system generated work id.

Title:	**Priority:**	**Estimate:**
User Story 10 – Invalid and Missing Details for Work Confirmation	High	1

User Story

As an Administrator,

I want to get remind on invalid and missing details,

so that I can ensure all details on the maintenance arrangement are informed.

Acceptance Criteria

Given that the Administrator enters some invalid or missing details in the work confirmation form,

when the Administrator selects <*submit*> option,

then the system prompts the Administrator on the invalid or missing details,

and the work confirmation is not sent,

then the Administrator can make respective adjustment before sending the work confirmation.

Before Split:

ID: 6	As a Fault Reporter, I want to view the confirmed work on submitted report with the details of works will be constructed, so that I knows that my report will be started to work on with detailed information.

After Split:

Title:	**Priority:**	**Estimate:**
User Story 11 – Receive Work Confirmation	High	3

User Story

As a Fault Reporter,

I want to receive work confirmation for confirmed maintenance on the report I submitted,

so that I can know that maintenance of my report is being worked on.

Acceptance Criteria

Given that the Fault Reporter login in the system with correct credentials,

when the Fault Reporter selects <*confirmed work*> option on the sidebar menu,

then the system directs the Fault Reporter to the confirmed work page,

and displays all the work confirmation sent to the Fault Reporter.

Title:	**Priority:**	**Estimate:**
User Story 12 – View Work Confirmation Details	High	4

User Story

As a Fault Reporter,

I want to view all the details of a work confirmation,

so that I can know the detailed information on the maintenance arrangement.

Acceptance Criteria

Given that the Fault Reporter selects <*confirmed work*> option on the sidebar menu,

and been directed to the confirmed work page,

and have received at least one work confirmation,

when the Fault Reporter selects one of the work confirmations,

then the system displays all the information of the selected work confirmations.

Feature 7: Comment

Before Split:

ID: 11	As a Faculty Member, I want to add comment and reply comment on the work confirmation, so that I can be more responsible on provide feedback and communicate about the maintenance and work arrangement.

After Split:

Title:	**Priority:**	**Estimate:**
User Story 13 – Add Comment	Medium	4

User Story

As a Faculty Member,

I want to add comment on a work confirmation,

so that I can provide feedback on the maintenance and work arrangement.

Acceptance Criteria

Given that the Faculty Member selects one of the work confirmations,

when the Faculty Member enters comment in the text box in the comment section of the selected work confirmation,

and selects <*add comment*> option,

then the system will submit the comment,

and display the submitted comment under the comment section of the selected work confirmation.

Title:	Priority:	Estimate:
User Story 14 – View Reply	Low	3

User Story

As a Faculty Member,

I want to view reply on my comment,

so that I can know the feedback on my comment.

Acceptance Criteria

Given that the Faculty Member have added comment on a work confirmation,

and there is reply on the comment,

when the Faculty Member navigates to that work confirmation,

then the comment section of that work confirmation displays the Faculty Member comment along with the reply to the comment.

Title:	Priority:	Estimate:
User Story 15 – Faculty Member Add Reply to Comment	Low	3

User Story

As a Faculty Member,

I want to add reply to my comment,

so that I can add information or communicate with received reply.

Acceptance Criteria

Given that the Faculty Member have added comment on a work confirmation,

and the Faculty Member navigates to that work confirmation,

when the Faculty Member enters reply in the text box in the reply section under the selected comment,

and the Faculty Member selects <*add reply*> on the selected comment,

then the system will submit the reply,

and display the submitted reply in the reply section under the selected comment.

Before Split:

ID: 12	As an Administrator, I want to reply comment on the work confirmation, so that I can address concern on the maintenance and work arrangement.

After Split:

Title:	**Priority:**	**Estimate:**
User Story 16 – View Comment	Medium	3

User Story

As an Administrator,

I want to view the comment on work confirmation,

so that I can know the feedback on the work confirmation.

Acceptance Criteria

Given that a comment is added on a work confirmation,

when the Administrator navigates to that work confirmation,

then the comment section of that work confirmation displays all the comment along with the reply to the comment.

Title:	**Priority:**	**Estimate:**
User Story 17 – Administrator Add Reply to Comment	Low	3

User Story

As an Administrator,

I want to add reply to the comment,

so that I can communicate and address the concern on the maintenance and work confirmation.

Acceptance Criteria

Given that comment is added on a work confirmation,

and the Administrator navigates to that work confirmation,

when the Administrator enters reply in the text box in the reply section under the selected comment,

and the Administrator selects <*add reply*> on the selected comment,

then the system will submit the reply,

and display the submitted reply in the reply section under the comment.

2.0 Section 2

2.1 UML Design

2.1.1 Class Diagram

The class diagram will only focus on Sprint 2, the login logout will only appear as a simple login(), logout() operation in user class without any further details.

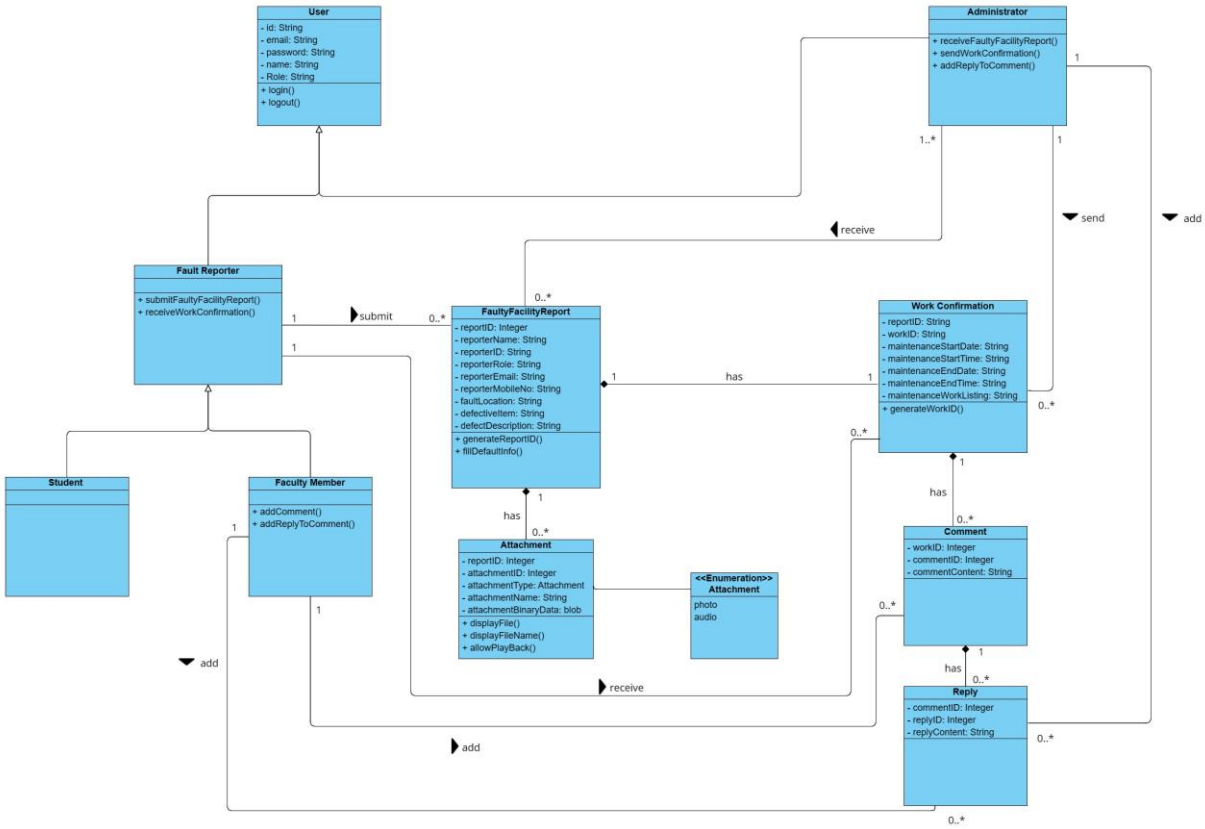


Figure 2.1 Class Diagram

2.1.2 Use Case Diagram

The use case diagram will only focus on Sprint 2, hence login and logout features are not included.

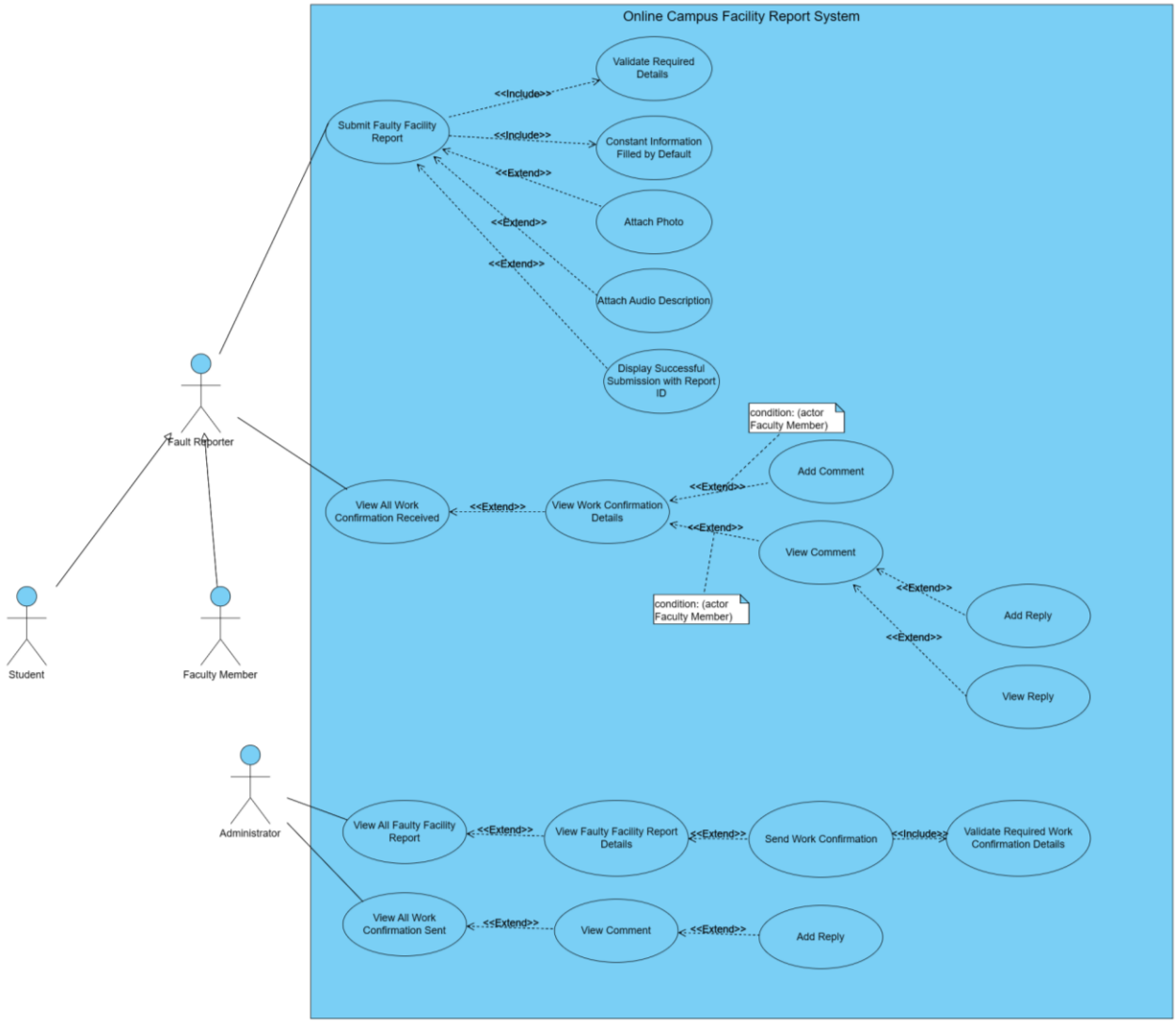


Figure 2.2 Use Case Diagram

2.1.3 Activity Diagram

The activity diagram will only focus on Sprint 2, hence login and logout are not included.

Use Case: Submit Faulty Facility Report

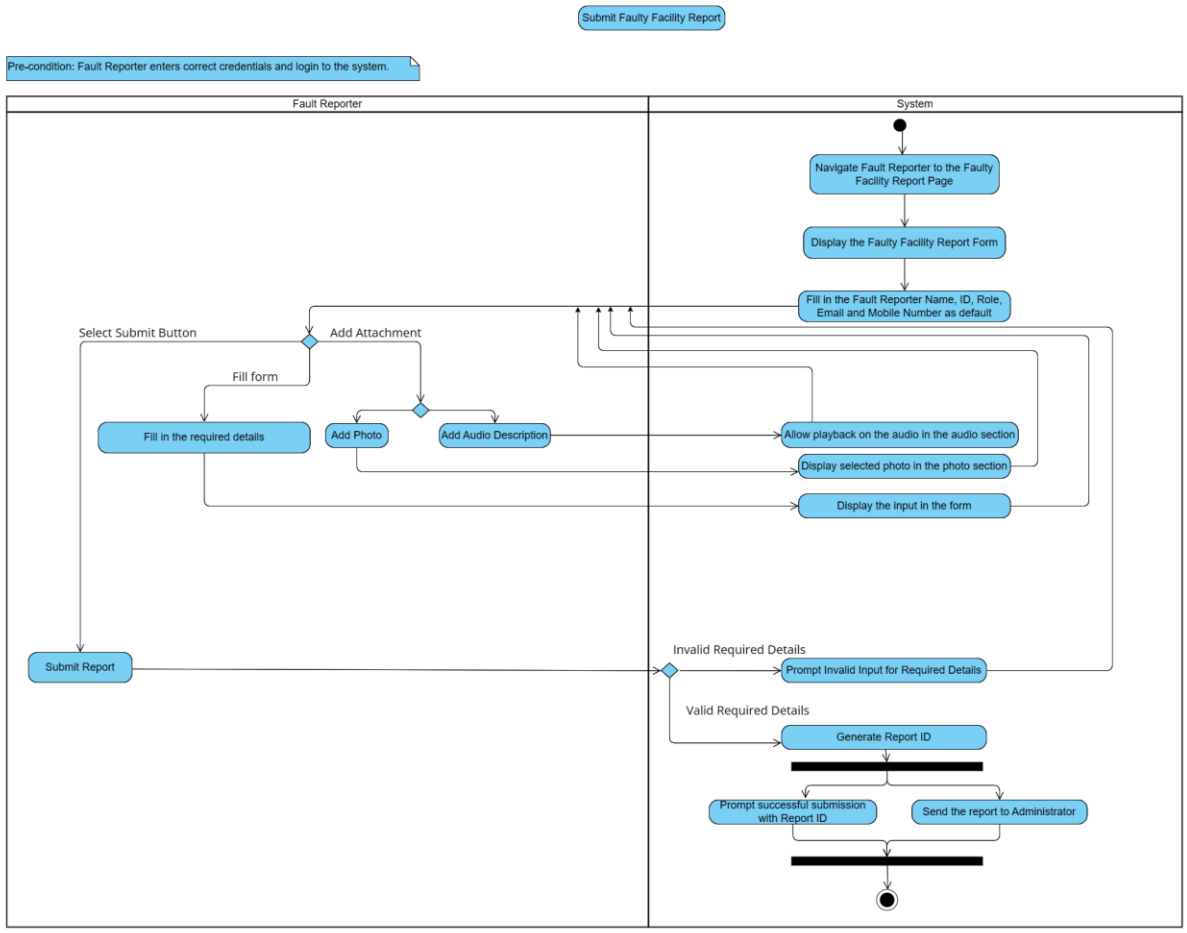


Figure 2.3 Activity Diagram - Use Case: Submit Faulty Facility Report

Use Case: View All Work Confirmation Received

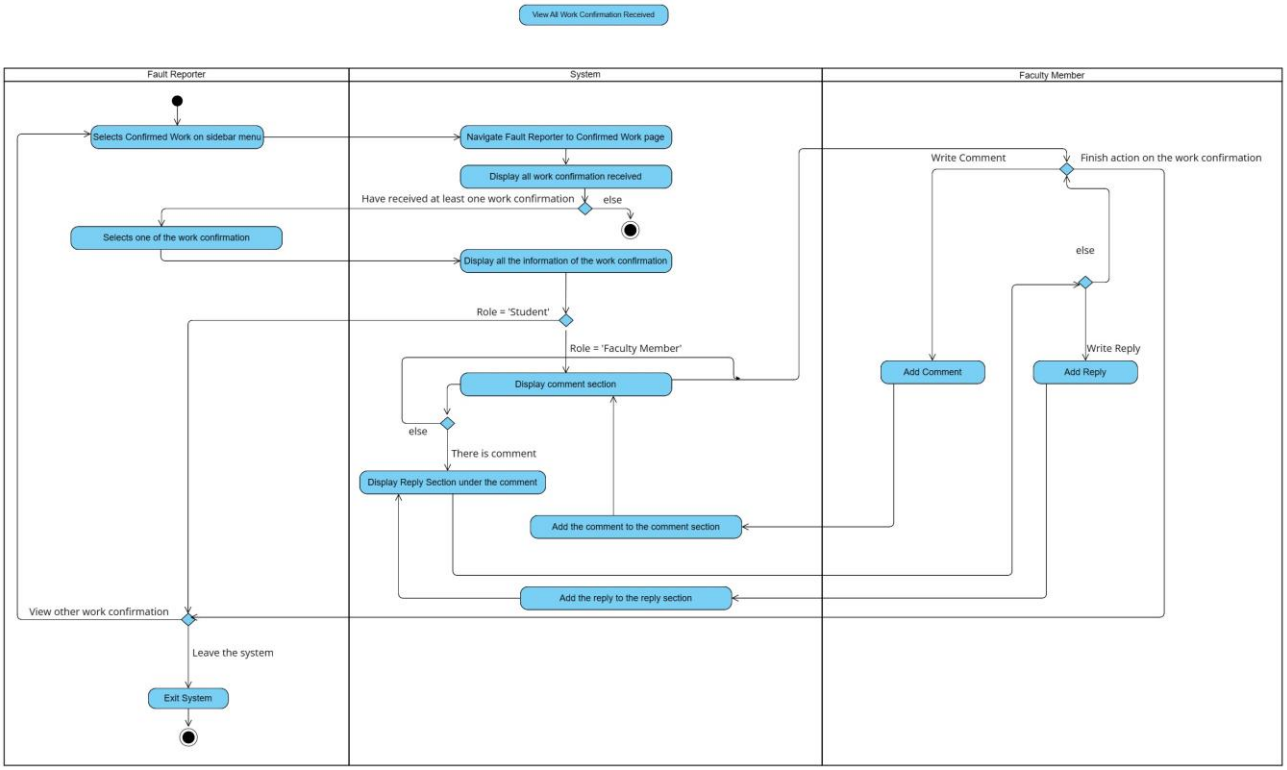


Figure 2.4 Activity Diagram - Use Case: View All Work Confirmation Received

Use Case: View All Faulty Facility Report

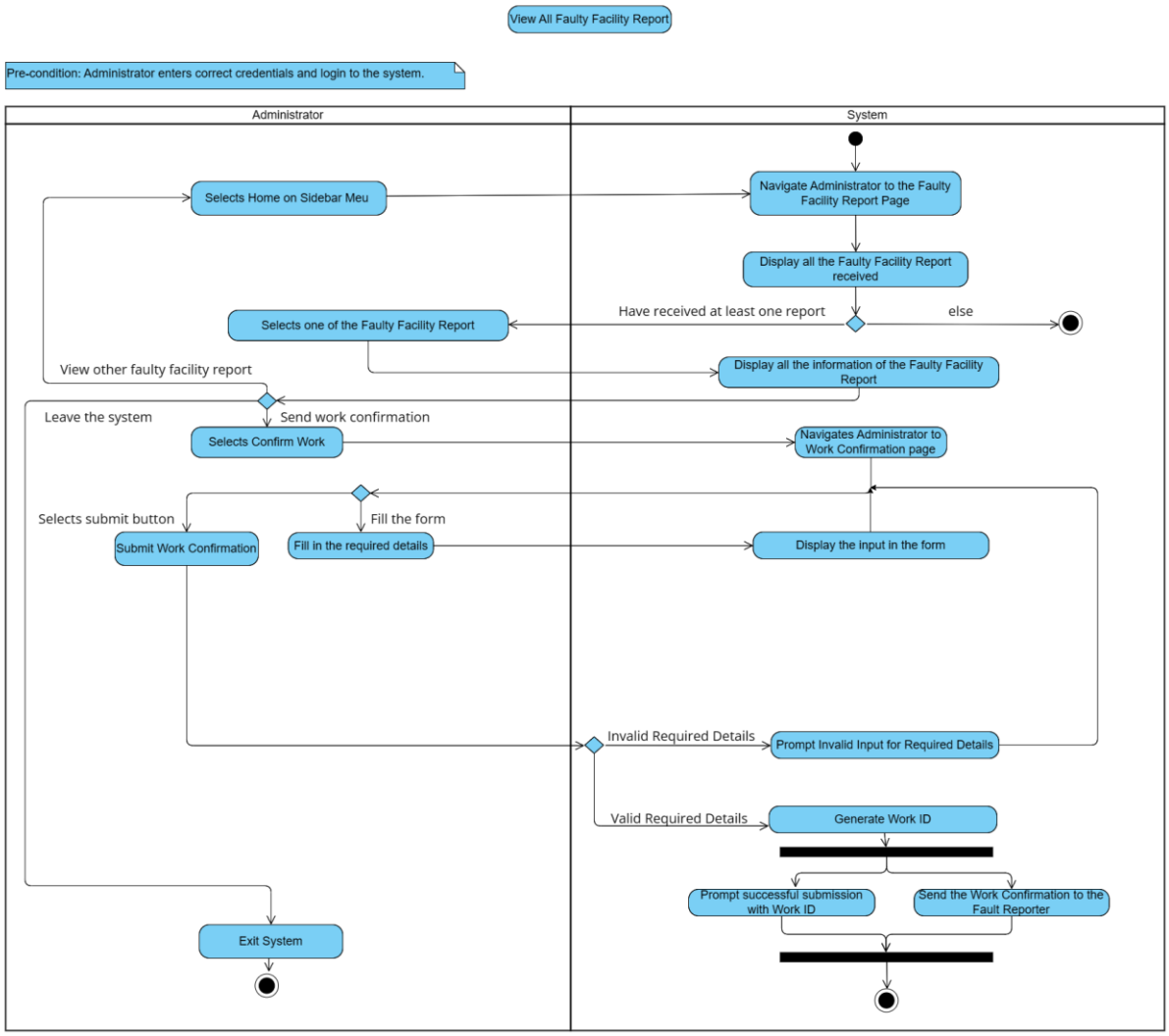


Figure 2.5 Activity Diagram - Use Case: View All Faulty Facility Report

Use Case: View All Work Confirmation Sent

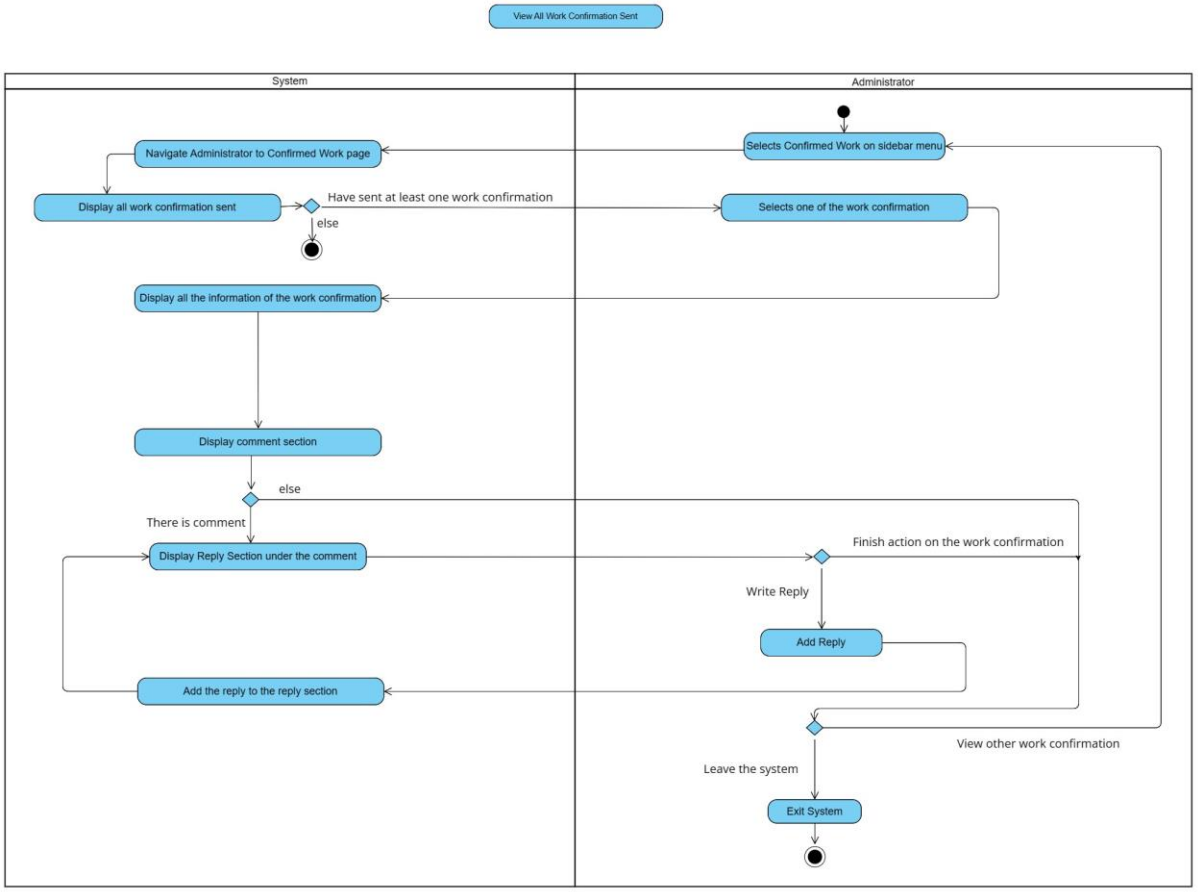


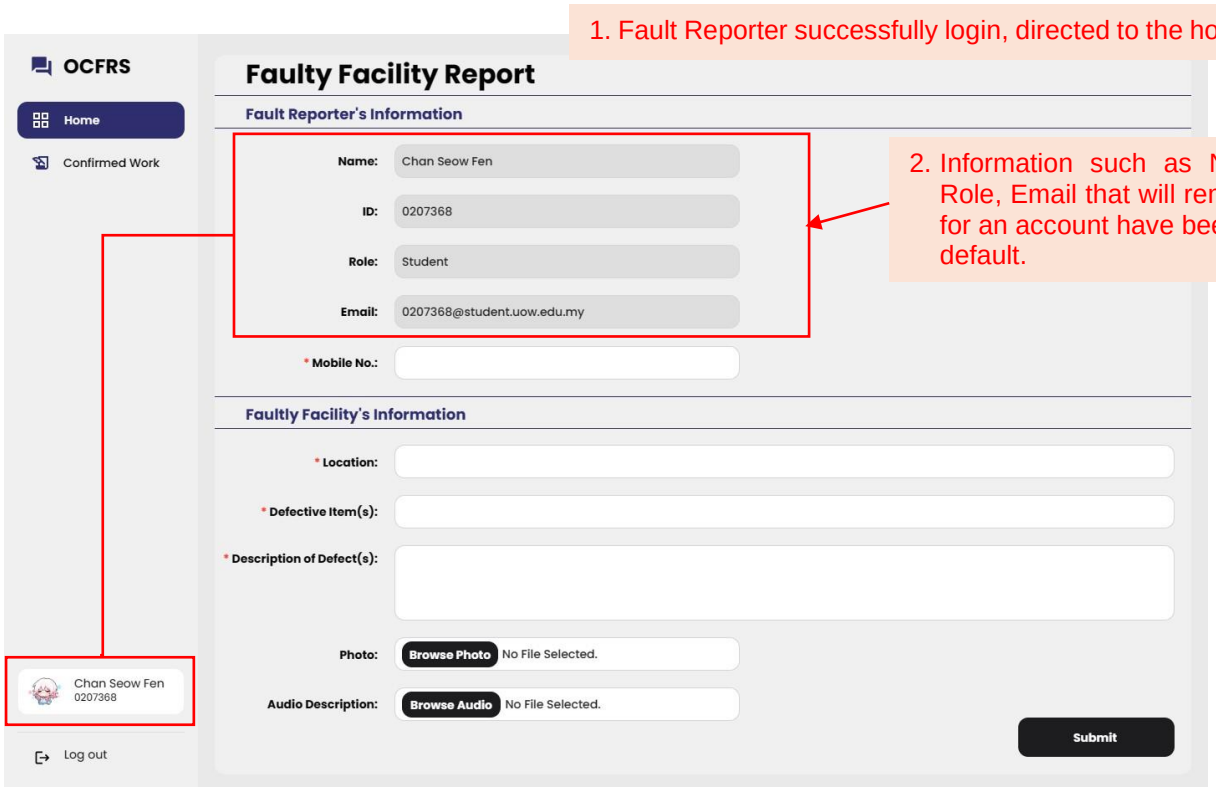
Figure 2.6 Activity Diagram - Use Case: View All Work Confirmation Sent

2.2 Screen Design

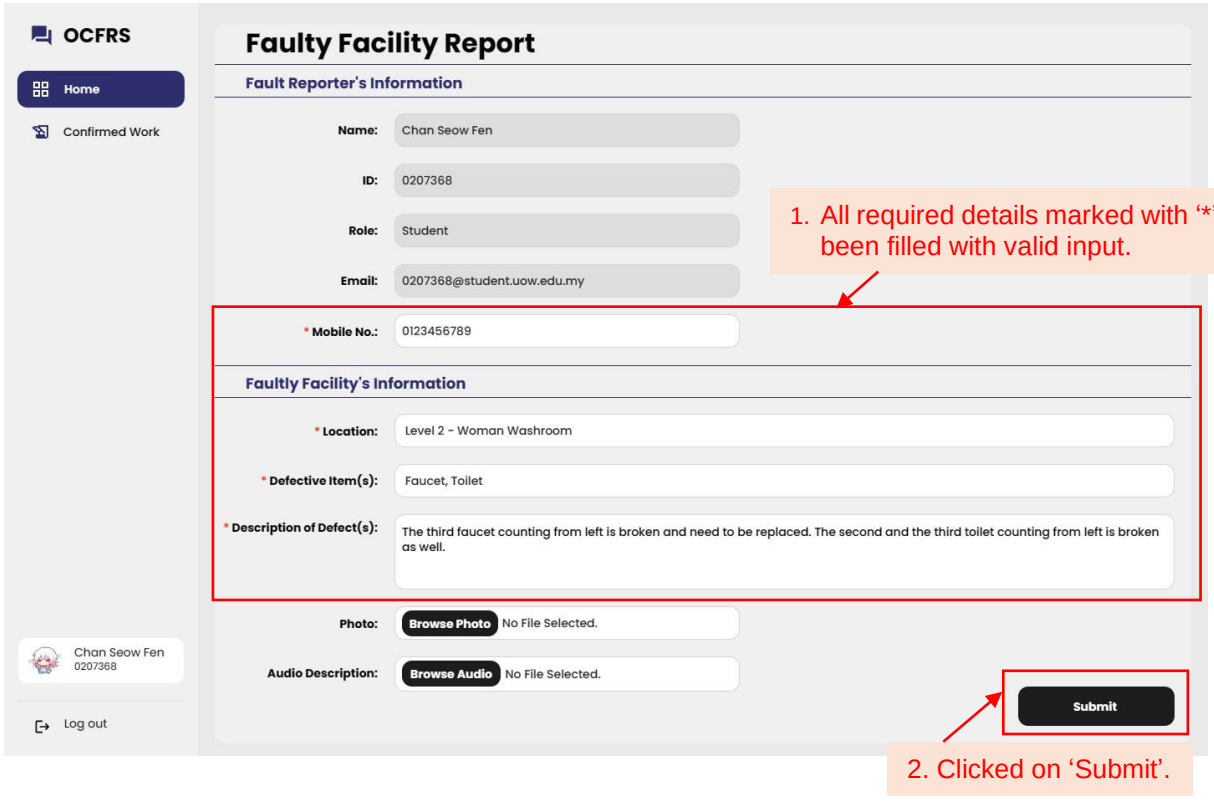
2.2.1 Faulty Facility Report

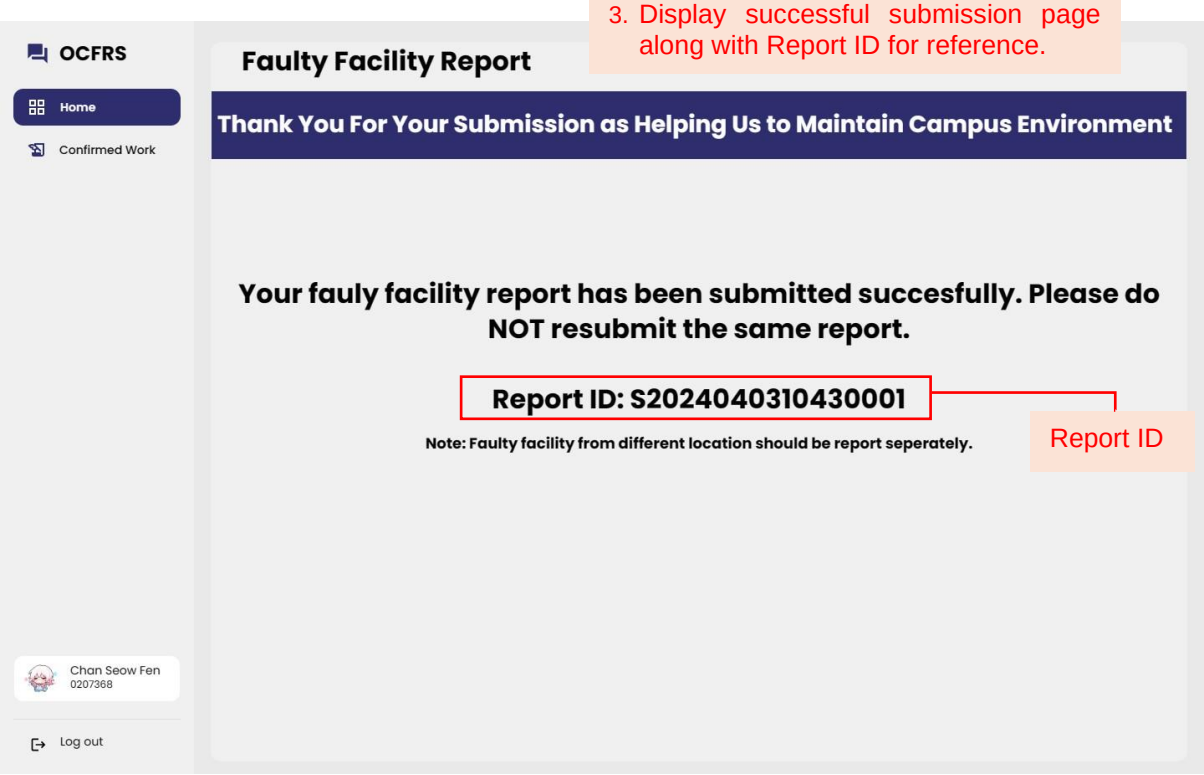
Fault Reporter

User Story 1 – Constant Information Fill In by Default

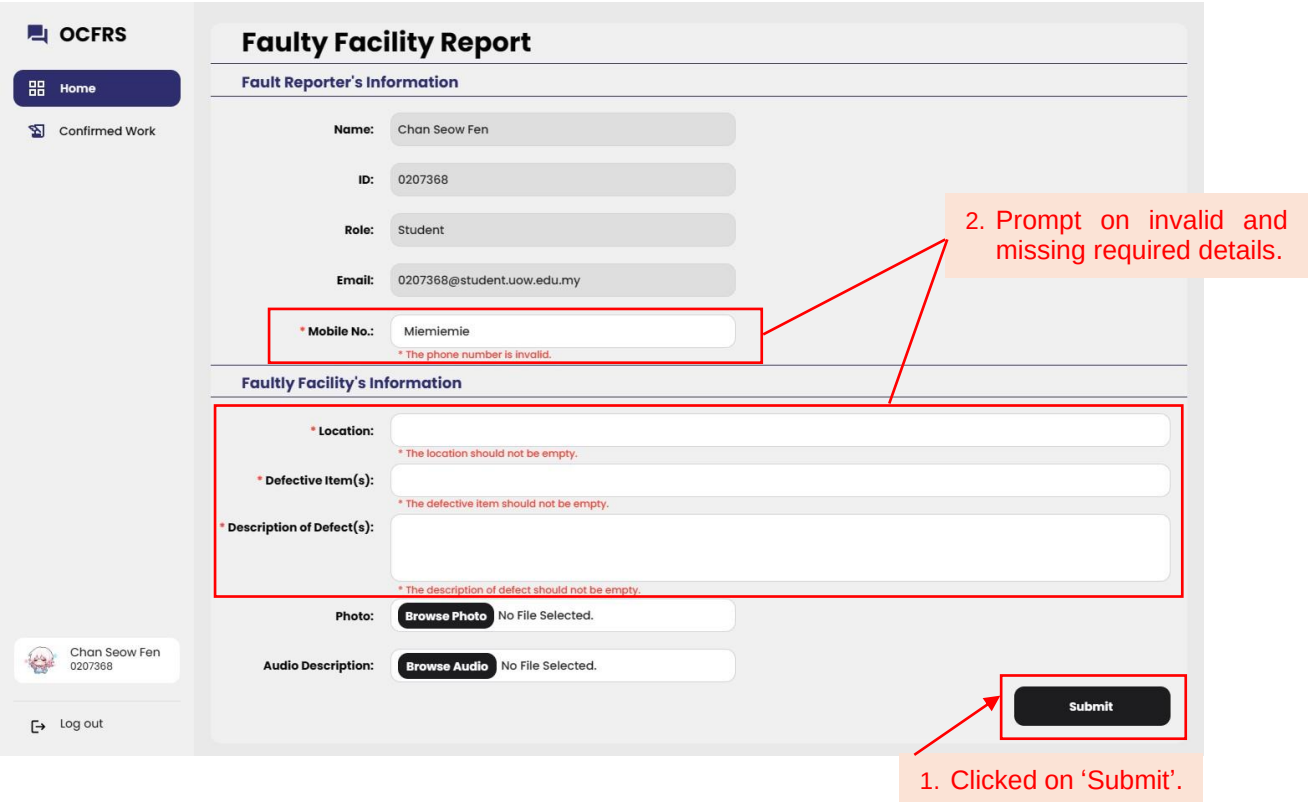


User Story 2 – Submit Fault Report

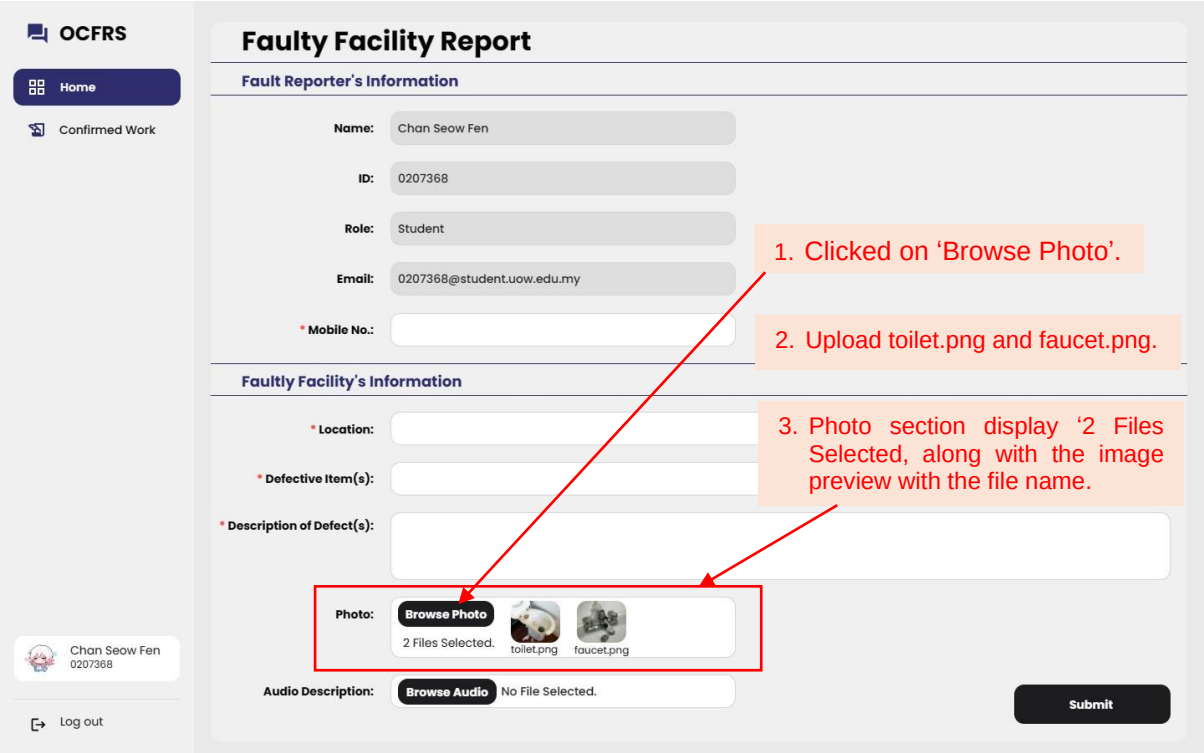




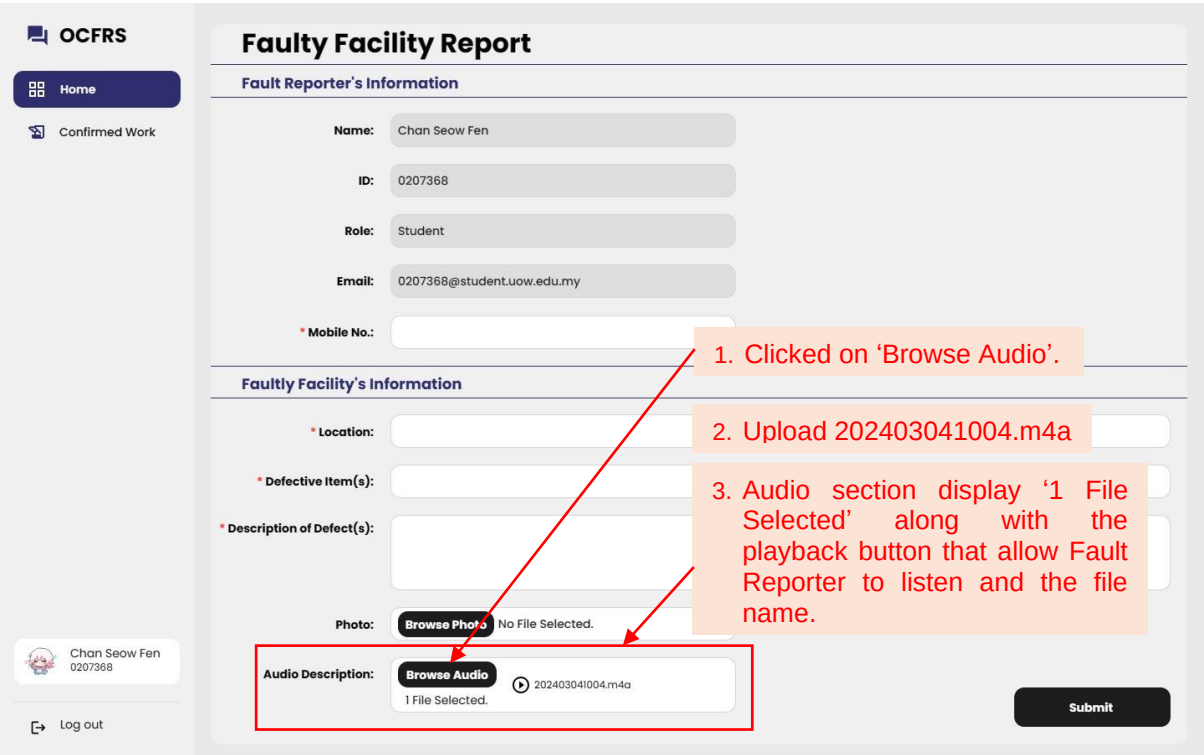
User Story 3 – Invalid and Missing Details for Report



User Story 4 – Add Photo Attachment

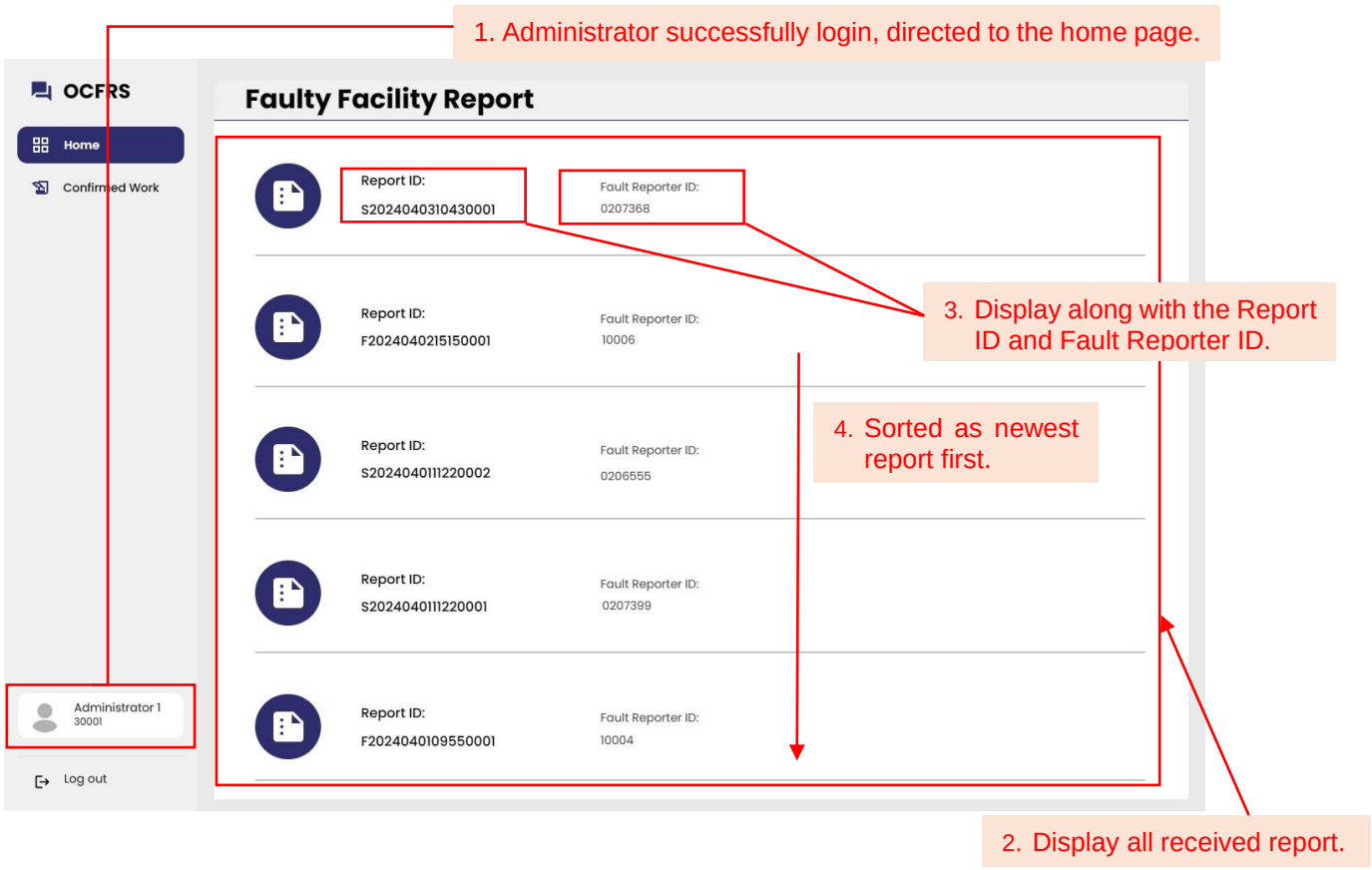


User Story 5 – Add Audio Attachment

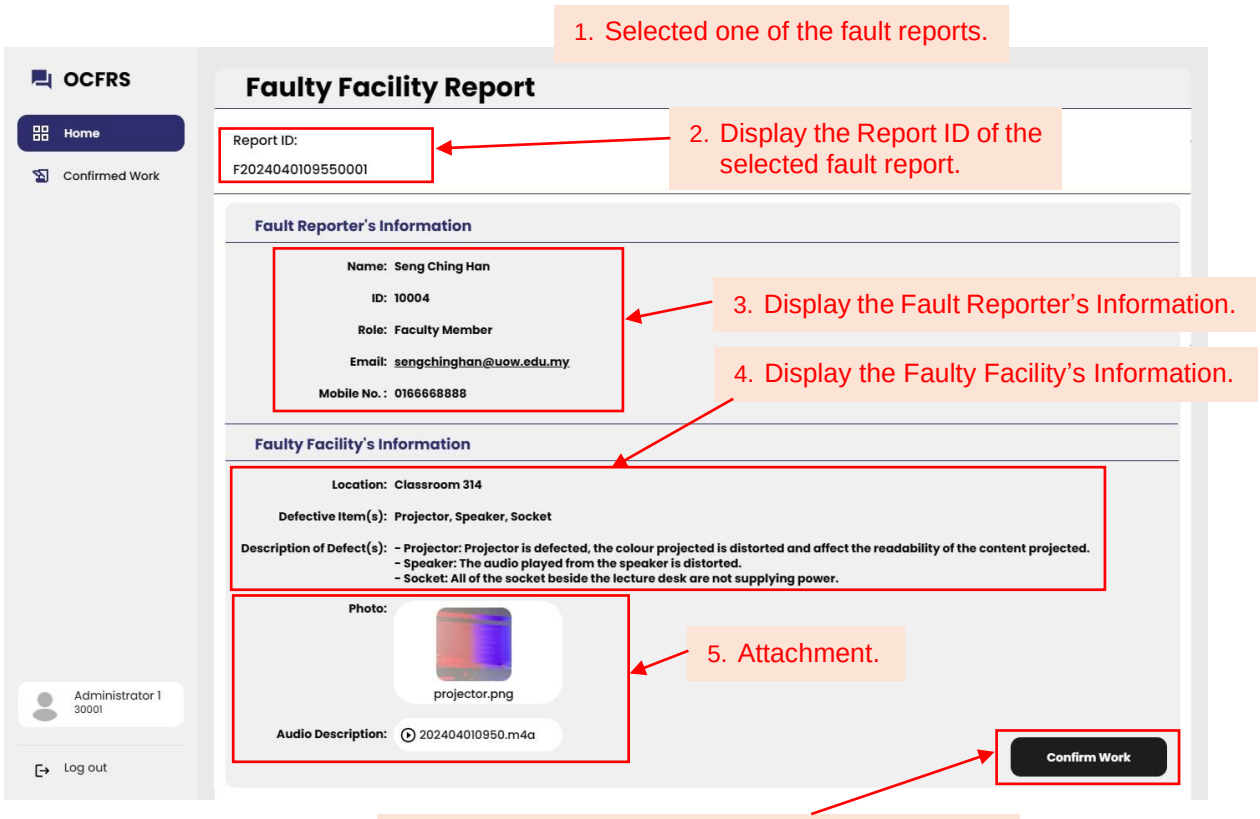


Administrator

User Story 6 – Receive Fault Report



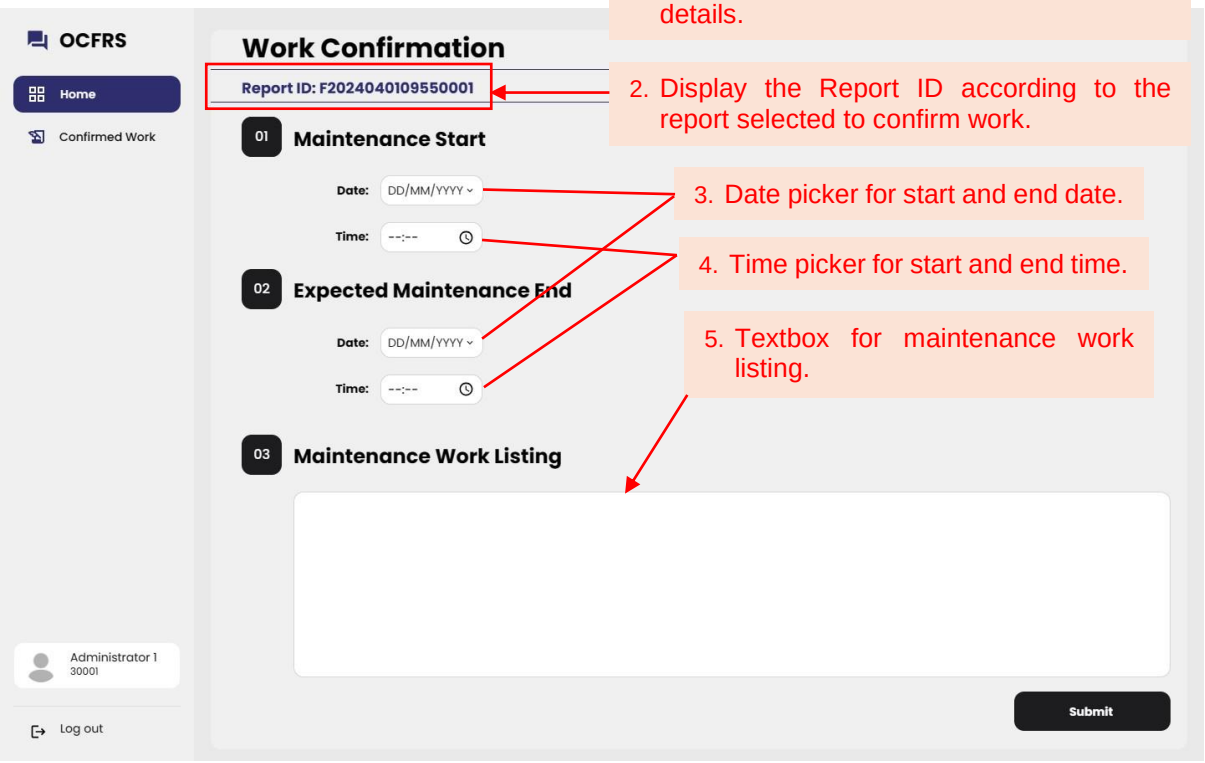
User Story 7 – View Fault Report Details



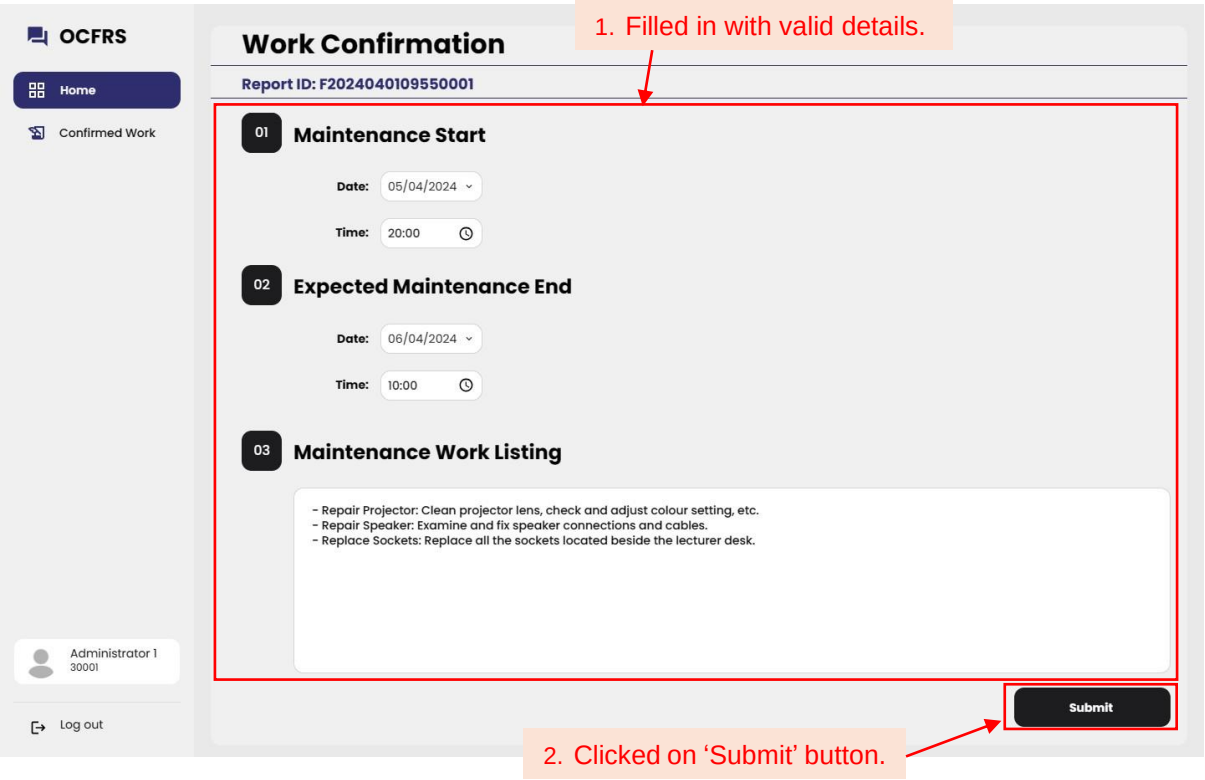
2.2.2 Work Confirmation

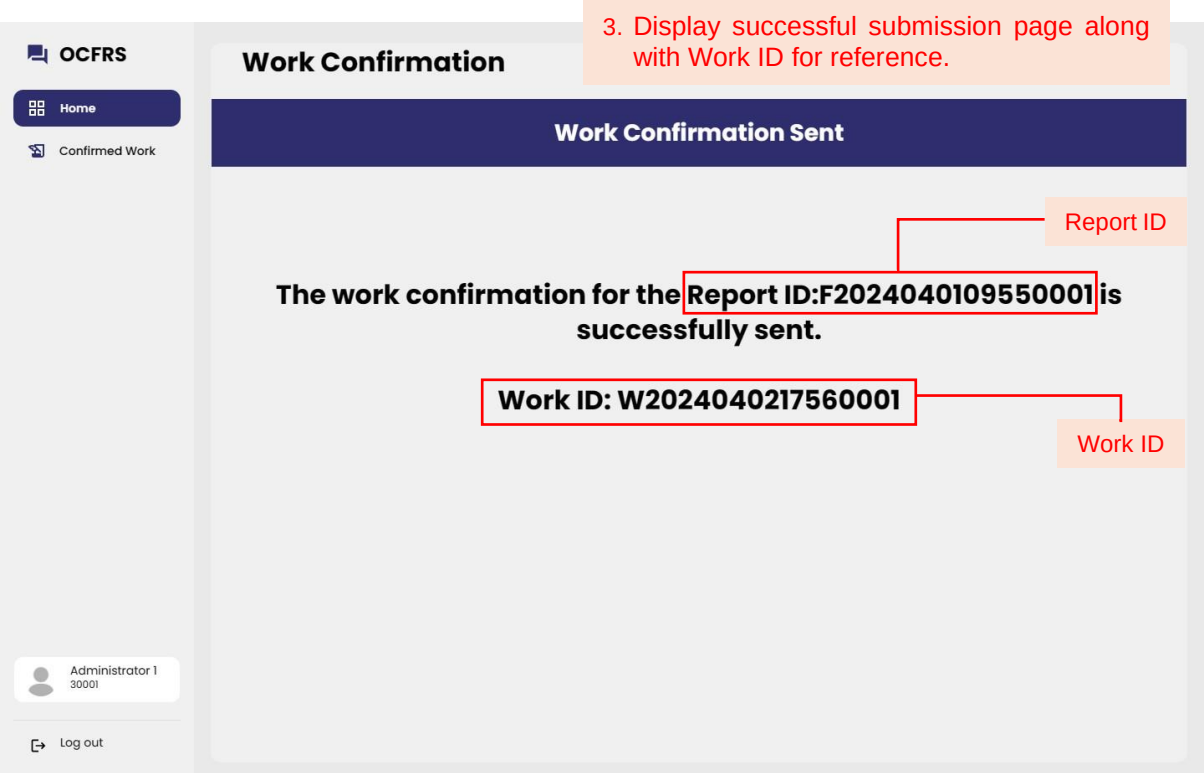
Administrator

User Story 8 – Fill in Confirmed Work Details

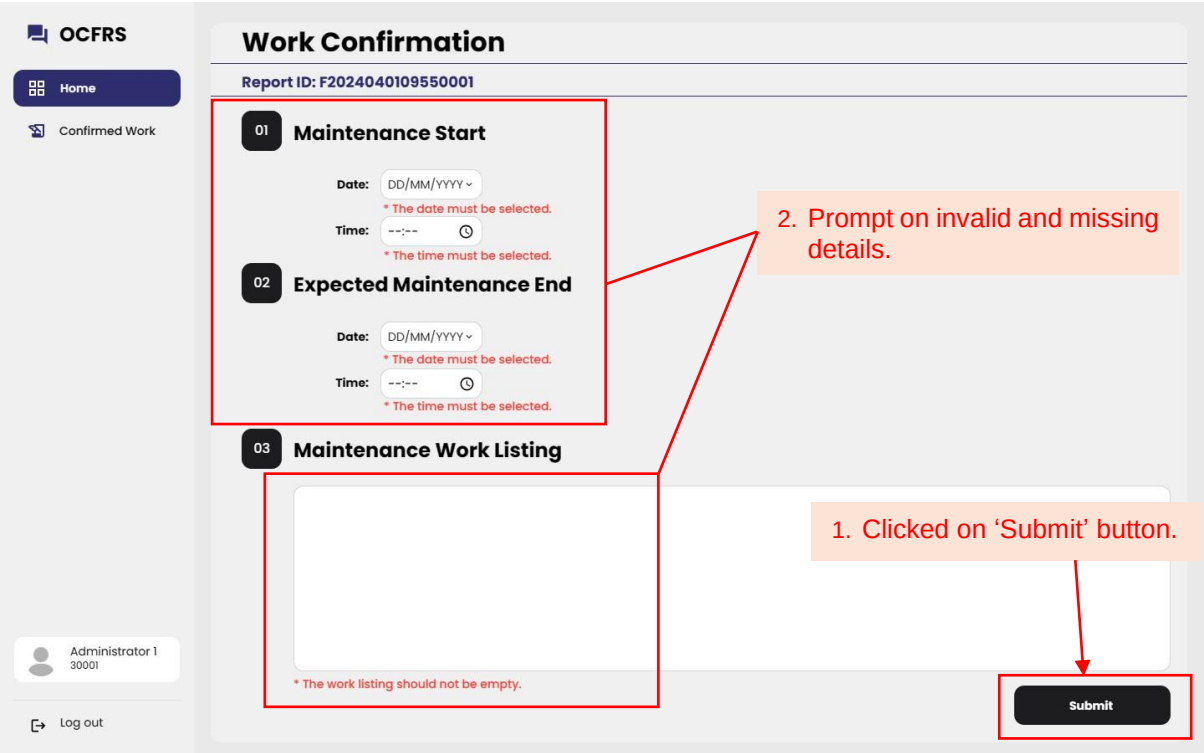


User Story 9 – Send Work Confirmation





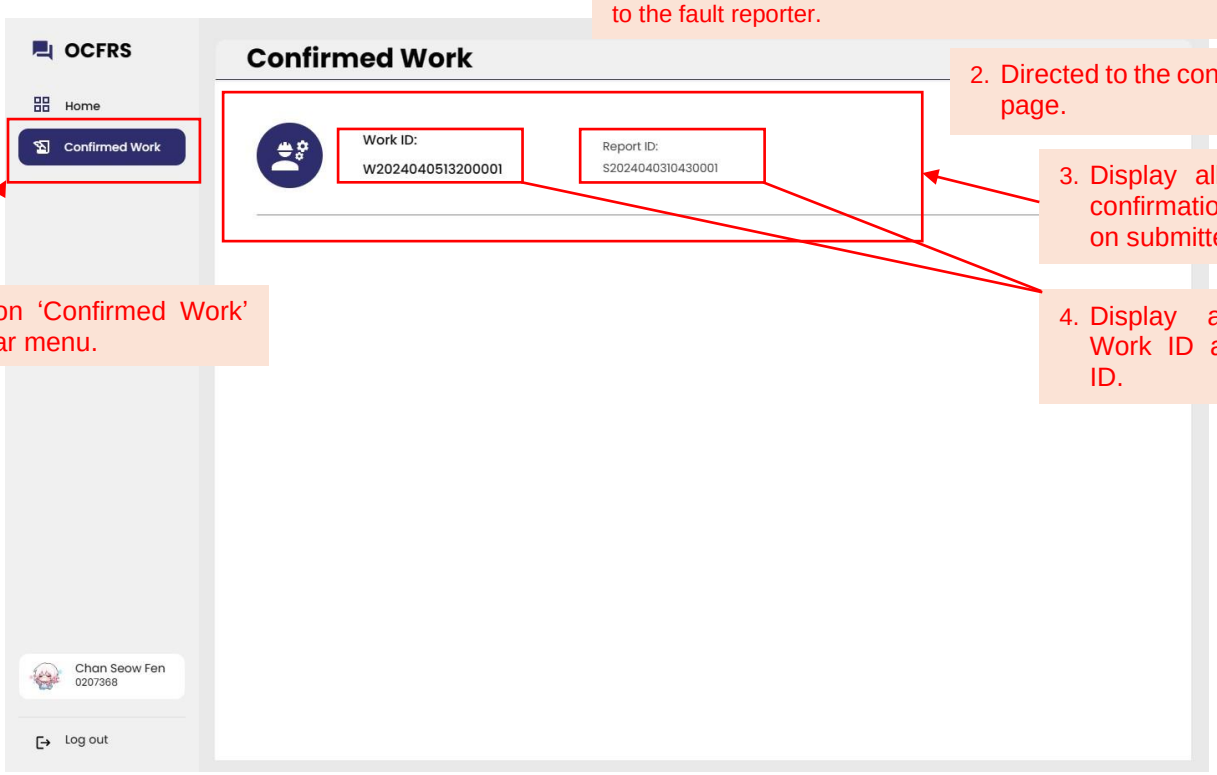
User Story 10 – Invalid and Missing Details for Work Confirmation



Fault Reporter

User Story 11 – Receive Work Confirmation

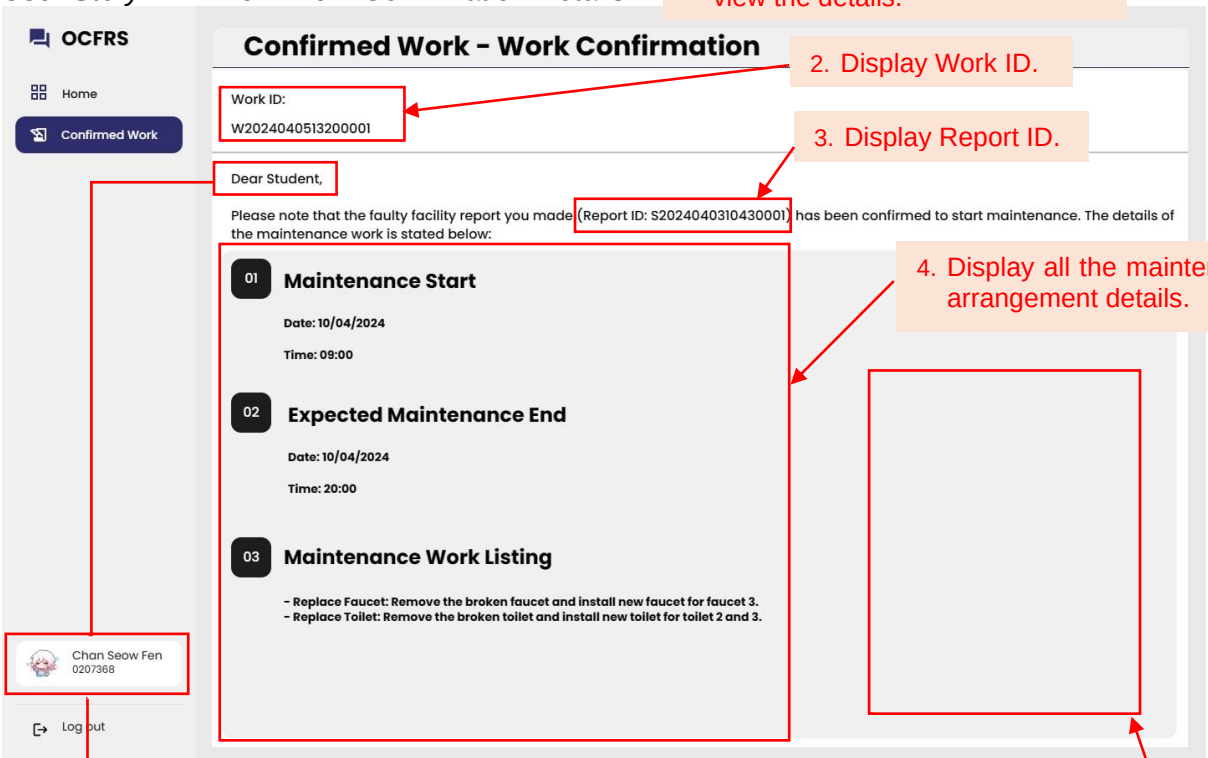
Pre-condition: The administrator have sent the work confirmation to the fault reporter.



1. Clicked on 'Confirmed Work' on sidebar menu.
2. Directed to the confirmed work page.
3. Display all the work confirmation received on submitted report.
4. Display along with Work ID and Report ID.

User Story 12 – View Work Confirmation Details

1. Selected the work confirmation to view the details.

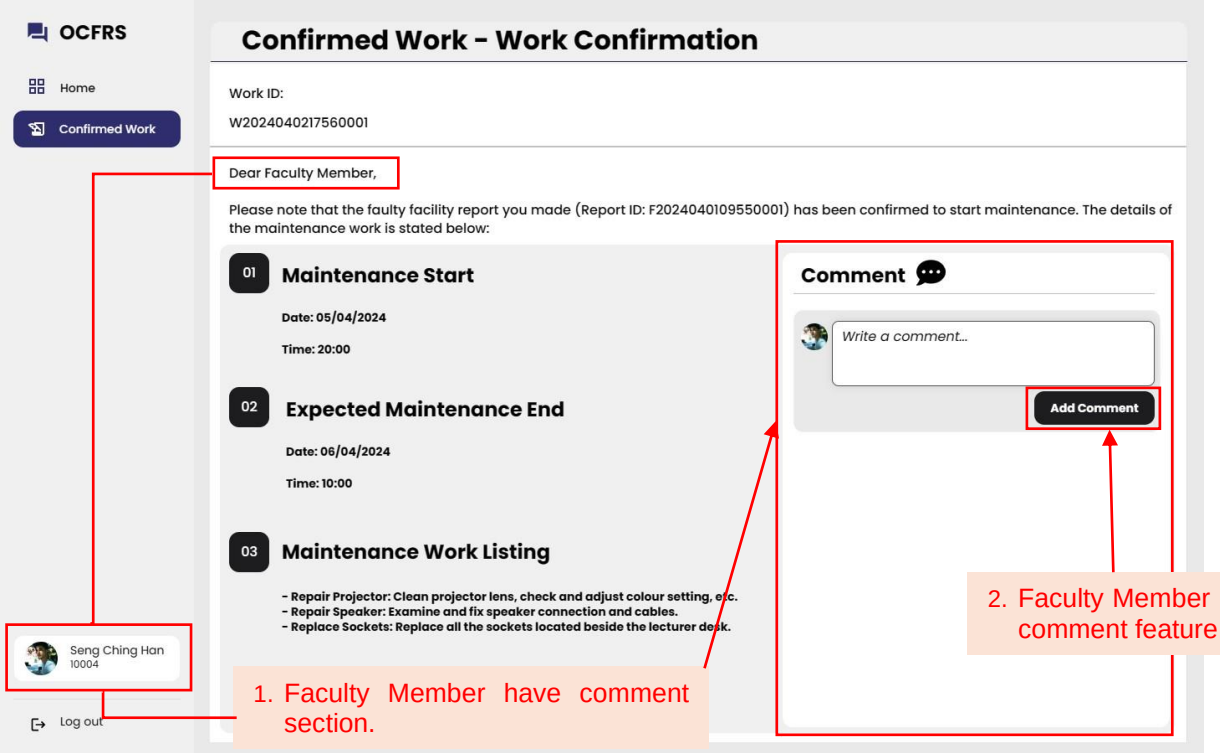


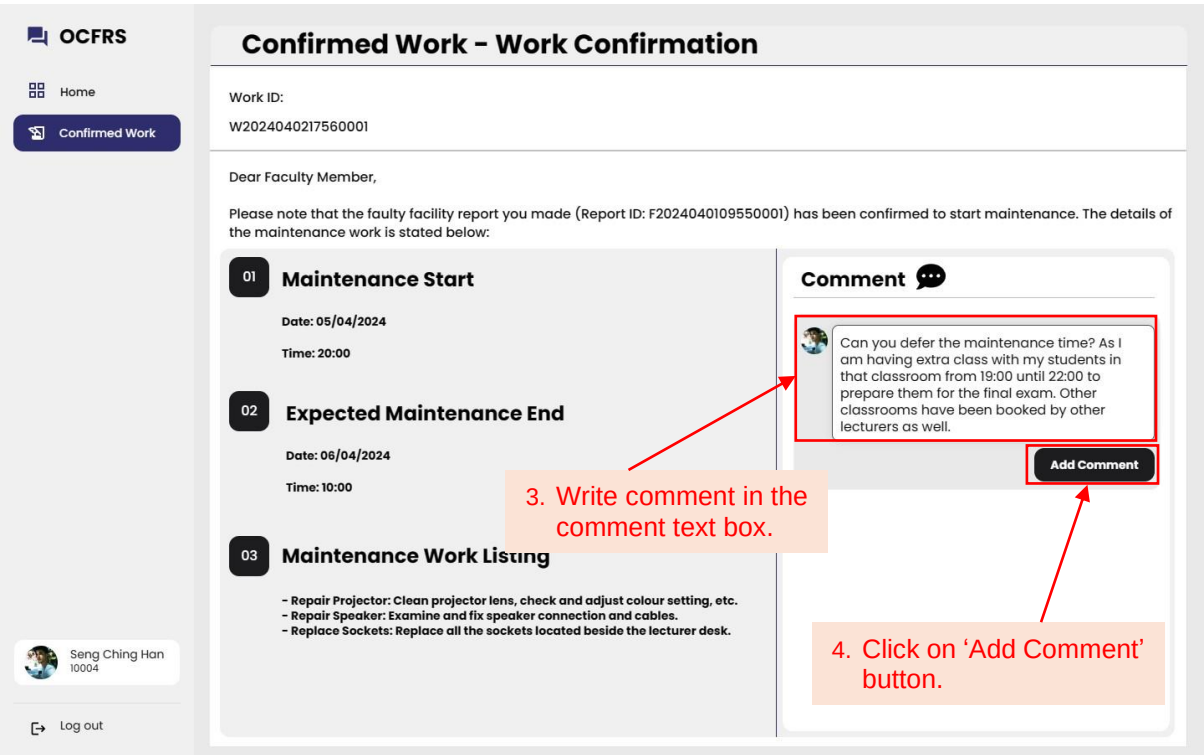
2. Display Work ID.
3. Display Report ID.
4. Display all the maintenance arrangement details.
5. Student do not have comment section or add comment feature.

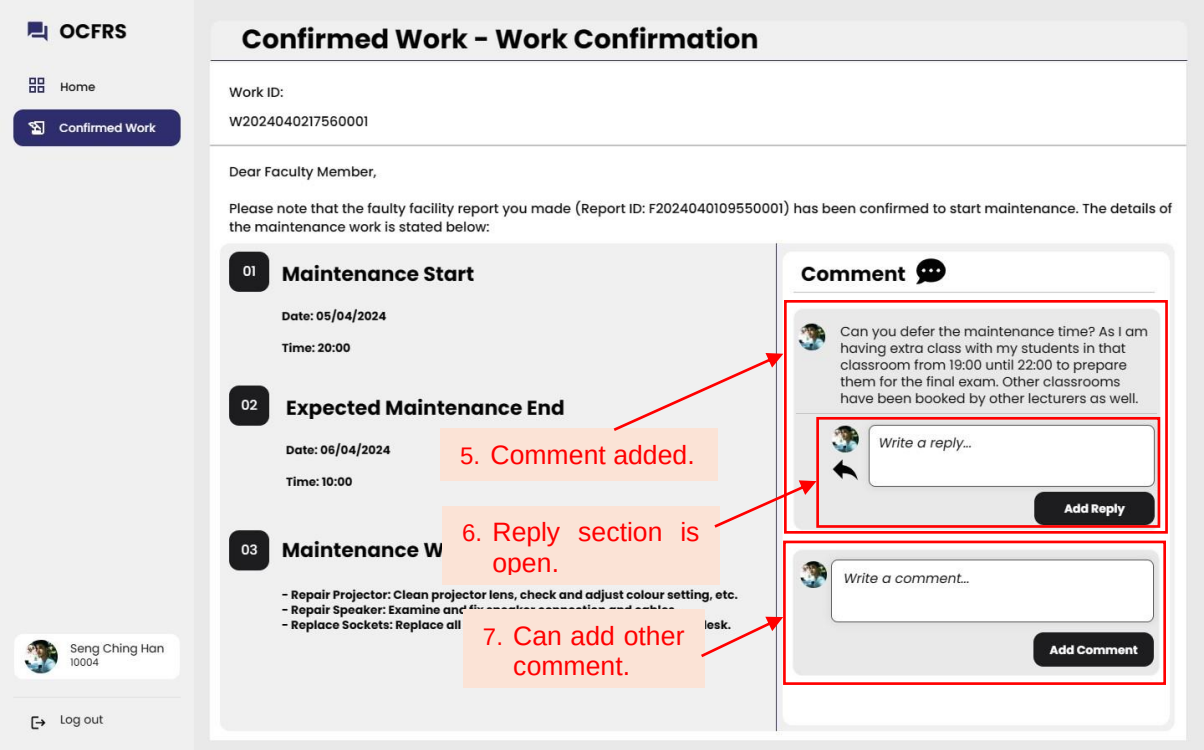
2.2.3 Comment

Faculty Member

User Story 13 – Add Comment

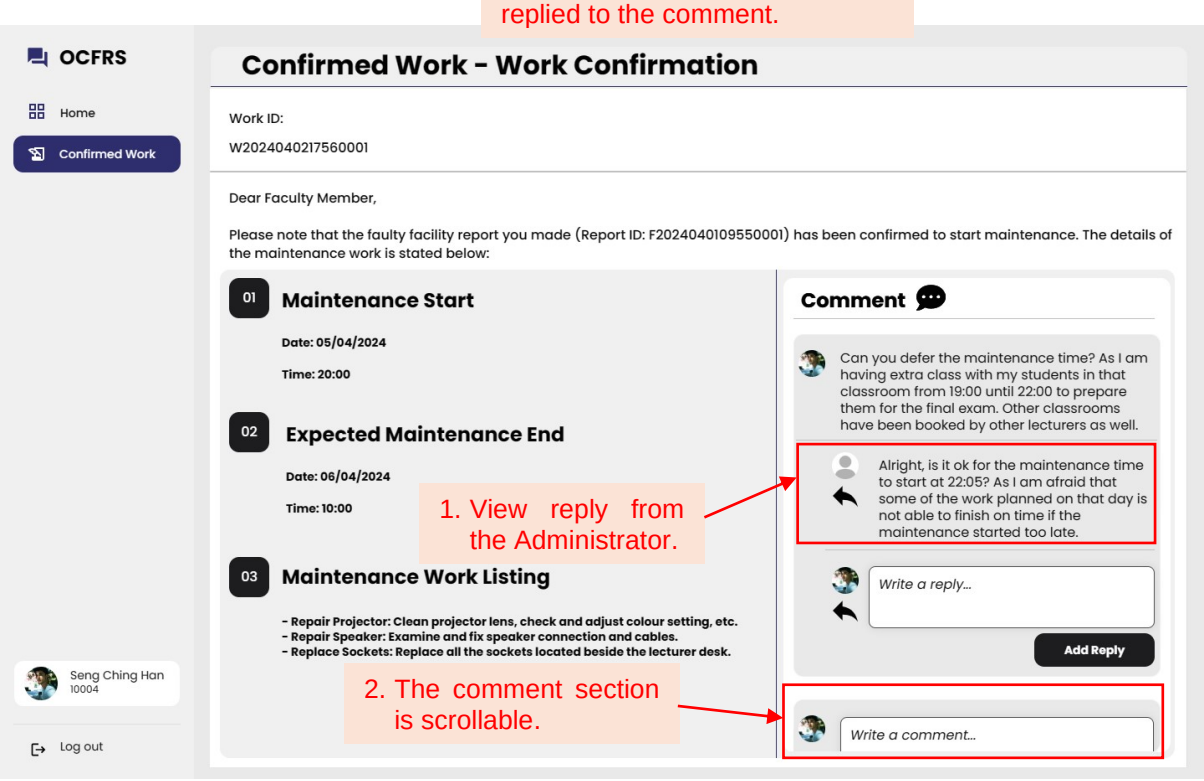




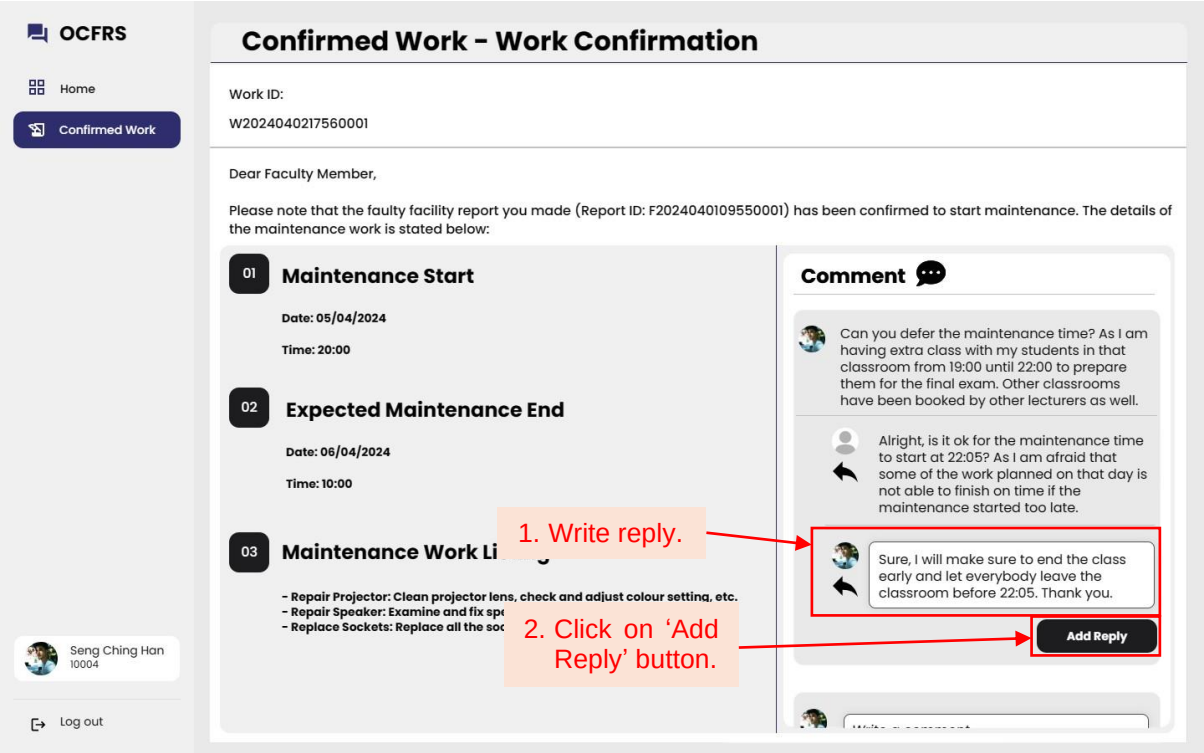


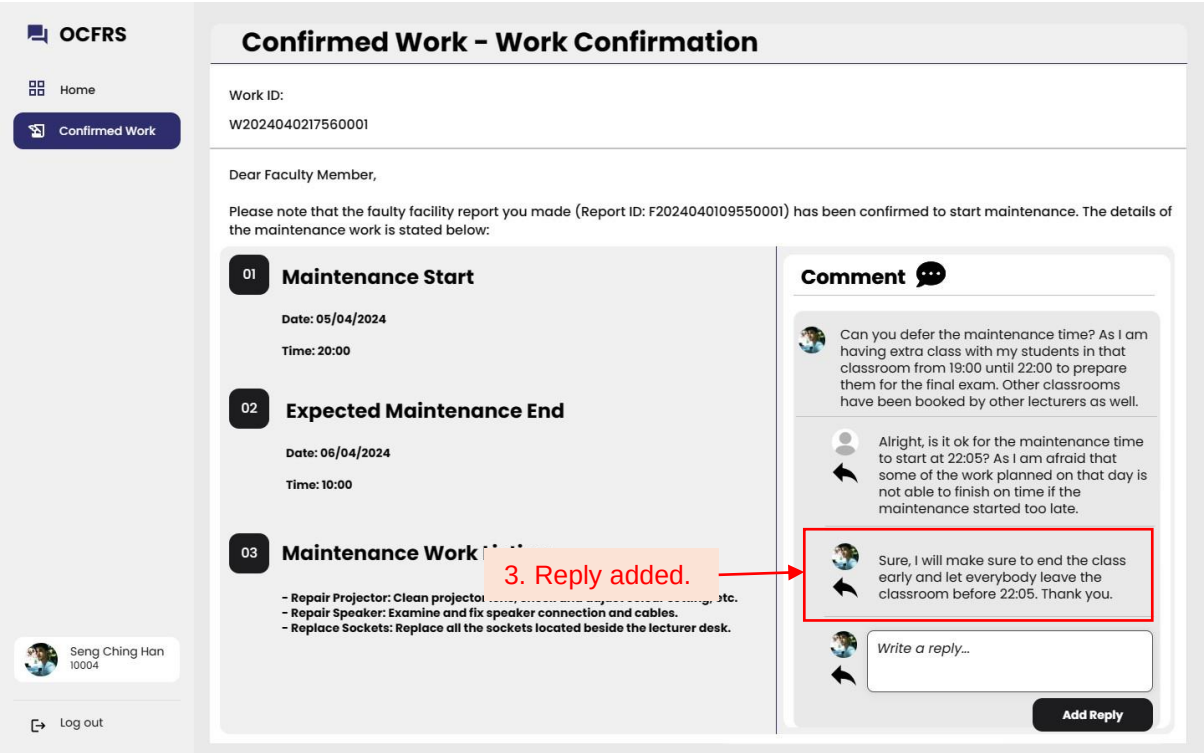
User Story 14 – View Reply

Pre-condition: Administrator have replied to the comment.



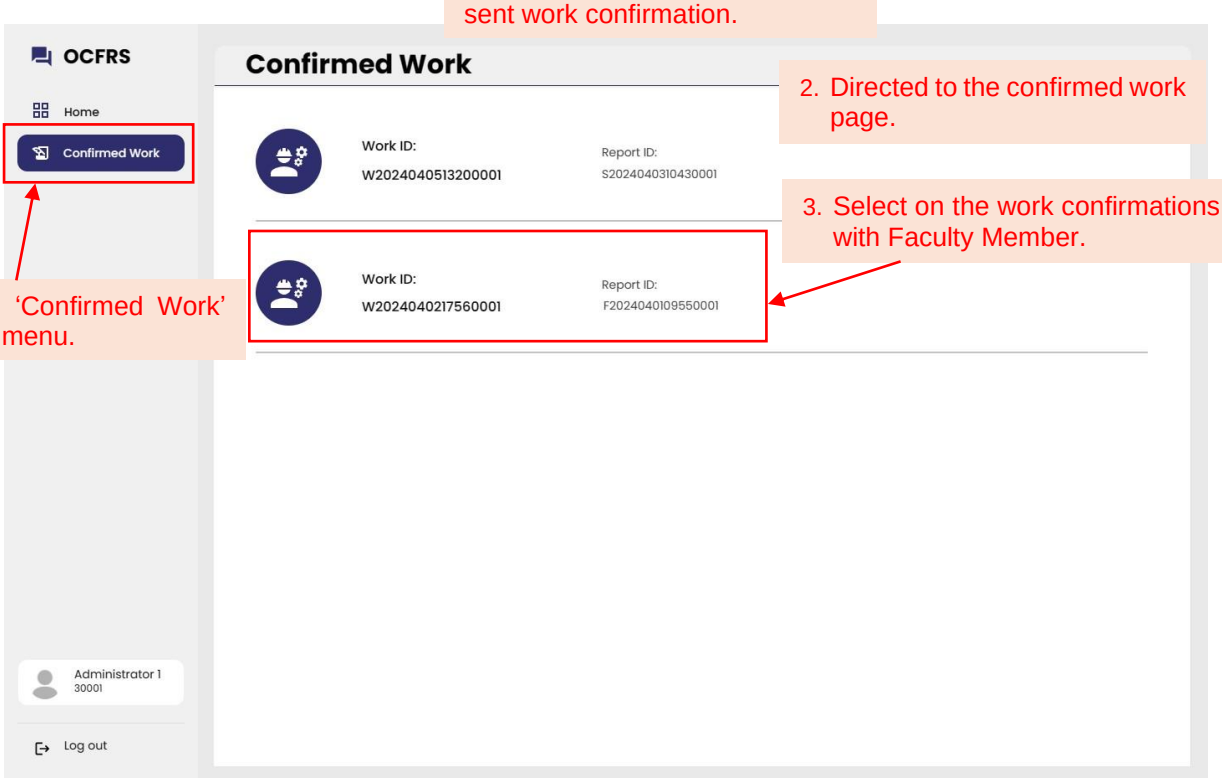
User Story 15 – Faculty Member Add Reply to Comment

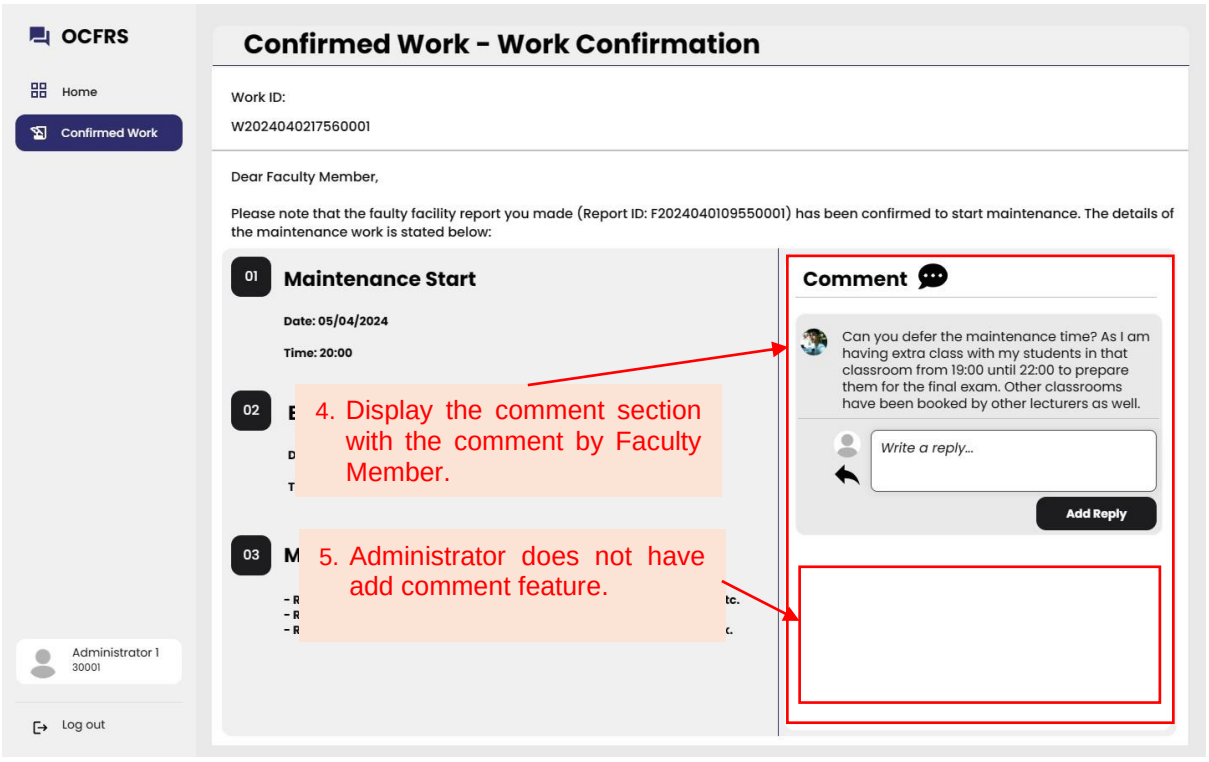




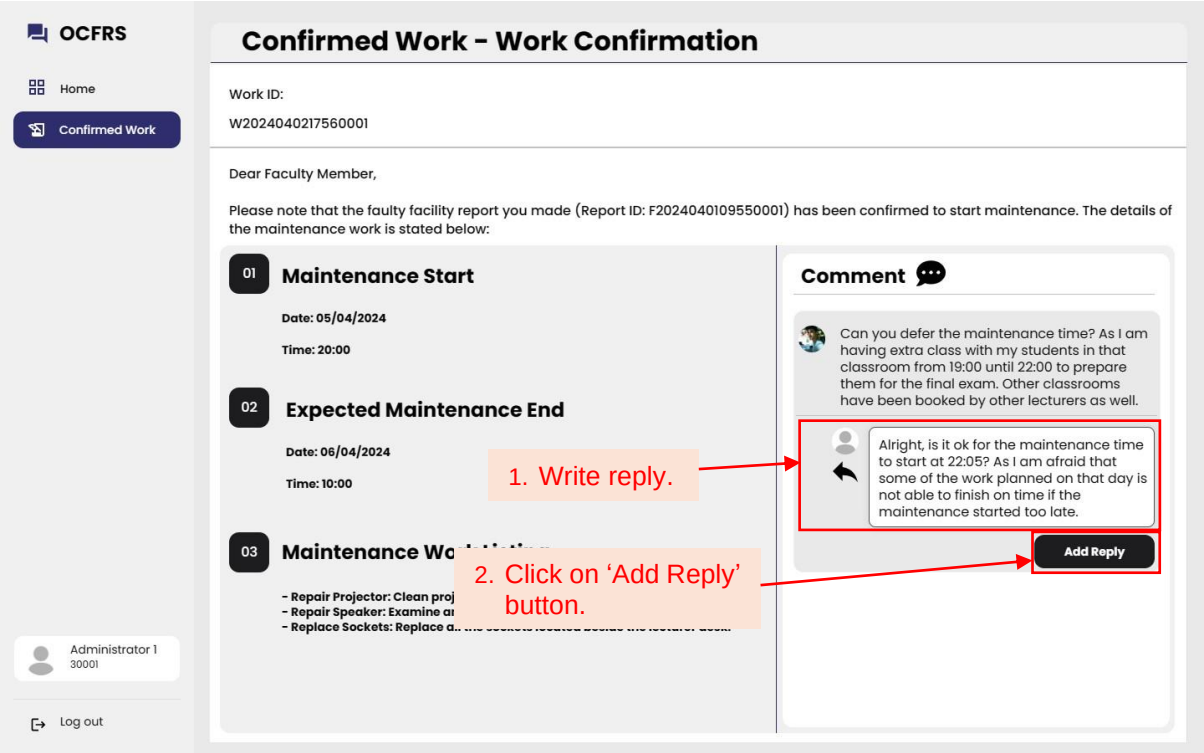
Administrator
User Story 16 – View Comment

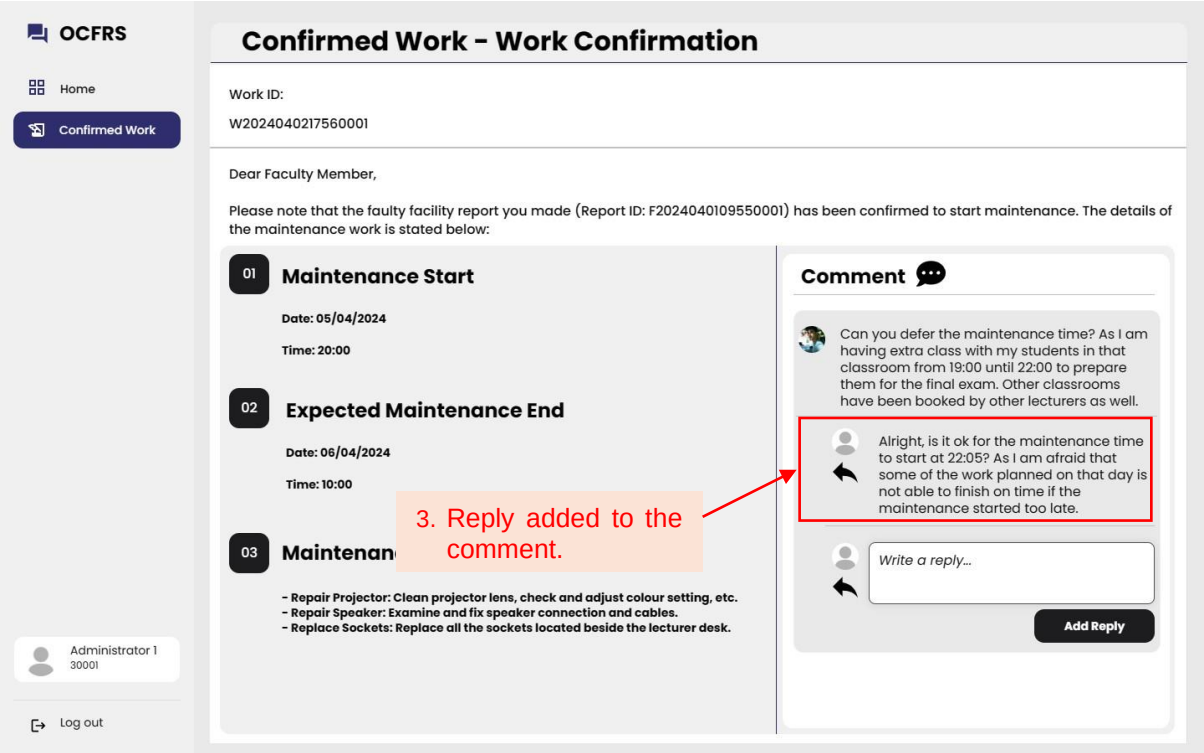
Pre-condition: Administrator have sent work confirmation.





User Story 17 – Administrator Add Reply to Comment





3.0 Section 3

3.1 Test Scenario, Test Plan and Test Data

Since only submit faulty facility report and submit work confirmation will consist of user input with validation that need to be evaluated, hence Blackbox testing will only include these two use cases. Others which mainly on output will just briefly describe the scenario with expected outcome.

3.1.1 Blackbox Testing

***Use Case: Submit Faulty Facility Report* (*Feature 3: Faulty Facility Report*)**

Pre-condition: Fault Reporter logins to the system with correct credentials.

Test Case 1: Mobile No. Validation

Test Scenario: Verify the Fault Reporter is not able to submit the report when the Mobile No. filled in is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
012345678	Valid Upper Boundary Values	-
0123456789	Valid Lower Boundary Values	-
01234567890	Invalid – Above Upper Boundary Values	Prompt 'The phone number is invalid.' under the input text box.
01234567	Invalid – Below Lower Boundary Values	Prompt 'The phone number is invalid.' under the input text box.
NULL	Invalid – Blank Mobile No.	Prompt 'The phone number should not be empty' under the input text box.
012345@@@	Invalid – Special Characters in Mobile No.	Prompt 'The phone number is invalid.' under the input text box.
Abc12345	Invalid – Contain Alphabet	Prompt 'The phone number is invalid.' under the input text box.

Table 3.1 Mobile No. Test Data

Test Case 2: Location Validation

Test Scenario: Verify the Fault Reporter is not able to submit the report when the Location filled in is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
Lecture Hall 2	Valid Input	-
Block B, Level 2, Pink Female Toilet	Valid Upper Boundary Values (30 characters without space)	-
Classroom A	Valid Lower Boundary Values (10 Characters without space)	-
The female toilet beside male toilet	Invalid – Above Upper Boundary Values	Prompt 'The location is too long, please be short and

		precise.' under the input text box.
Man Toilet	Invalid – Below Lower Boundary Values (Explanation: Too short, could not give information, e.g. which toilet)	Prompt 'The location should be longer to be specific.' under the input text box.
NULL	Invalid – Blank Location	Prompt 'The location should not be empty.' under the input text box.

Table 3.2 Location Test Data

Test Case 3: Defective Item(s) Validation

Test Scenario: Verify the Fault Reporter is not able to submit the report when the Defective Item(s) filled in is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
Projector, Speaker	Valid Input	-
Projector, Speaker, Mouse, Computer, Monitor	Valid Upper Boundary Values (40 characters without space)	-
Fan	Valid Lower Boundary Values (3 Characters without space)	-
The violet monitor ASUS with MG28UQ as model name	Invalid – Above Upper Boundary Values	Prompt 'The defective item is too long, please be short and precise.' under the input text box.
LG	Invalid – Below Lower Boundary Values (Explanation: Too short, could not give information, e.g. what exactly is that thing branded as LG)	Prompt 'The defective item should be longer to be specific.' under the input text box.
NULL	Invalid – Blank Defective Item(s)	Prompt 'The defective item should not be empty.' under the input text box.

Table 3.3 Defective Item(s) Test Data

Test Case 4: Description of Defect(s) Validation

Test Scenario: Verify the Fault Reporter is not able to submit the report when the Defective Item(s) filled in is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
The third faucet counting from the left is broken and needs to be replaced. The second and the third toilet counting from left is broken as well.	Valid Input	-

[Description with 200 characters without space]	Valid Upper Boundary Values (200 characters without space)	-
The fan cannot on.	Valid Lower Boundary Values (15 characters without space)	-
[Description with 201 characters without space]	Invalid – Above Upper Boundary Values	Prompt 'The description of defect is too long, please be short and precise.' under the input text box.
Fan not working.	Invalid – Below Lower Boundary Values (Explanation: Too short, could not give information, e.g. which toilet)	Prompt 'The description of defect should be longer to provide more information.' under the input text box.
NULL	Invalid – Blank Defect(s)	Prompt 'The description of defect should not be empty.' under the input text box.

Table 3.4 Description of Defect(s) Test Data

Test Case 5: Successful Submission

Test Scenario: Verify the Fault Reporter is able to submit the faulty facility report when all required details are filled in with valid input.

Test Plan: Unit Testing

Field	Input	Expected Output
Mobile No.	0123456789	Prompts for successful submission along with the system generated Report ID for reference.
Location	Level 2 – Woman Washroom	
Defective Item(s)	Faucet, Toilet	
Description of Defect(s)	The third faucet counting from the left is broken and needs to be replaced. The second and the third toilet counting from left is broken as well.	

Table 3.5 Test Data for Successful Submission

***Use Case: Submit Work Confirmation* (*Feature 4: Work Confirmation*)**

Pre-condition: Administrator selects <*confirm work*> option on one of the received faulty facility report.

Test Case 1: Maintenance Start Date Validation

Test Scenario: Verify the Administrator is not able to submit the work confirmation when the Maintenance Start Date picked from date picker is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
[Any date later than system date]	Valid Input	-
[Any date earlier than system date]	Invalid – Past Start Date	Prompt 'The date selected must be a future date.' under the Start Date field.

--:--	Invalid – Start Date is not Picked	Prompt 'The date must be selected.' under the Start Date field.

Table 3.6 Maintenance Start Date Test Data

Test Case 2: Maintenance Start Time Validation

Test Scenario: Verify the Administrator is not able to submit the work confirmation when the Maintenance Start Time picked from time picker is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
[Any time]	Valid Input	-
--:--	Invalid – Start Time is not Picked	Prompt 'The time must be selected.' under the Start Time field.

Table 3.7 Maintenance Start Time Test Data

Test Case 3: Maintenance End Date Validation

Test Scenario: Verify the Administrator is not able to submit the work confirmation when the Maintenance End Date picked from date picker is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
[Any date later or equal to selected Start Date]	Valid Input	-
[Any date earlier than selected Start Date]	Invalid – End Date before Start Date	Prompt 'The date selected should not before the selected start date.' under the End Date field.
--:--	Invalid – End Date is not Picked	Prompt 'The date must be selected.' under the End Date field.

Table 3.8 Maintenance End Date Test Data

Test Case 4: Maintenance End Time Validation

Test Scenario: Verify the Administrator is not able to submit the work confirmation when the Maintenance End Time picked from time picker is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
Case 1: Maintenance Start Date Selected is same as Maintenance End Date		
[Any time later than the selected Start Time]	Valid Input	-

[Any time earlier than selected Start Time]	Invalid – End Time before Start Time for Same Start and End Date	Prompt 'The time selected should after the selected start time as the start date is same as the end date.' under the End Time field.
Case 2: Maintenance Start Date Selected is Before Maintenance End Date		
[Any time]	Valid Input	-
Apply to All Case		
--:--	Invalid – End Date is not Picked	Prompt 'The time must be selected.' under the End Time field.

Table 3.9 Maintenance End Time Test Data

Test Case 5: Maintenance Work Listing Validation

Test Scenario: Verify the Administrator is not able to submit the work confirmation when Maintenance Work Listing filled in is invalid.

Test Plan: Unit Testing

Input	Comments	Expected Output
- Repair Projector: Clean projector lens, check and adjust colour setting, etc. - Repair Speaker: Examine and fix speaker connection and cables. - Replace Sockets: Replace all the sockets located beside the lecturer desk.	Valid Input	-
[Description with 400 characters without space]	Valid Upper Boundary Values (400 characters without space)	-
Replace Sockets Replace all sockets beside lecturer desk.	Valid Lower Boundary Values (50 characters without space)	-
[Description with 401 characters without space]	Invalid – Above Upper Boundary Values	Prompt 'The work listing is too long, please be short and precise.' under the input text box.
Repair Projector Repair Speakers Replace Sockets Fix Fan	Invalid – Below Lower Boundary Values (Explanation: Too short, could not give information, e.g. which socket will be replaced)	Prompt 'The work listing should be longer to provide more information.' under the input text box.
NULL	Invalid – Blank Work Listing	Prompt 'The work listing should not be empty.' under the input text box.

Table 3.10 Maintenance Work Listing Test Data

Test Case 6: Successful Submission

Test Scenario: Verify the Administrator is able to submit the work confirmation when all required details are filled in with valid input.

Test Plan: Unit Testing

Field	Input	Expected Output
Maintenance Start Date	05/04/2024	Prompts for successful submission along with the system generated Work ID for reference.
Maintenance Start Time	20:00	
Maintenance End Date	06/04/2024	
Maintenance End Time	10:00	
Maintenance Work Listing	- Repair Projector: Clean projector lens, check and adjust colour setting, etc. - Repair Speaker: Examine and fix speaker connection and cables. - Replace Sockets: Replace all the sockets located beside the lecturer desk.	

Table 3.11 Test Data for Successful Submission

3.1.2 Brief Description

For clarification, the use cases that have been covered in Blackbox Testing will not be included in this section.

Feature 3: Faulty Facility Report

	Test Scenario	Test Plan	Test Data	Expected Output
1.	Verify when Fault Reporter directed to Faulty Facility Report page, the Name, ID, Role, Email is filled in by default with correct information.	Pre-condition: Fault Reporter login with correct credentials and directed to Faulty Facility Report page. 1. Verify default information displayed in the Faulty Facility Report form.	A Student account	Display correct student's name, ID, email and role as 'Student'.
			A Faculty Member account	Display correct faculty member's name, ID, email and role as 'Faculty Member'.
2.	Verify successful addition of photo by Fault Reporter.	Pre-condition: Fault Reporter login with correct credentials and directed to Faulty Facility Report page. 1. Selects <browse photo> option and upload photo. 2. Verify if correct photo is displayed in the photo section.	1 Photo	Display '1 File selected.' with the correct selected photo in the photo section with the correct file name.
			3 Photos	Display '3 Files selected.' with the correct selected photos in the photo section with the correct files name.

3.	Verify successful addition of audio description by Fault Reporter.	Pre-condition: Fault Reporter login with correct credentials and directed to Faulty Facility Report page. 1. Selects <browse audio> option and upload audio. 2. Verify if correct audio is displayed in the photo section with the ability of playback.	1 Audio	Display '1 File selected.' with the correct selected audio in the audio section with the correct file name and allow playback with the correct content.
			3 Audio	Display '3 Files selected.' with the correct selected audio in the audio section with the correct files name and allow playback with the correct contents.
4.	Verify Administrator can receive the correct Faulty Facility Report submitted by Fault Reporter.	Pre-condition: Administrator login with correct credentials and directed to Faulty Facility Report page. 1. Verify all report submitted by Fault Reporter is exist in the Administrator side.	1 Submission	Display 1 Faulty Facility Report in the home page with the correct Report ID and Fault Reporter ID.
			3 Submission	Display 3 Faulty Facility Report in the home page with the correct Report ID and Fault Reporter ID sort according to newest first.
5.	Verify Administrator can view the correct Faulty Facility Report submitted by Fault Reporter.	Pre-condition: Administrator login with correct credentials and directed to Faulty Facility Report page. 1. Selects one of the reports. 2. Verify the report content is exactly the same as what the Fault Reporter have submitted.	Student Submission	Display correct student's name, ID, email and role as 'Student' as fault reporter's information and the correct faulty facility's information submitted by the student.
			Faculty Member Submission	Display correct student's name, ID, email and role as 'Faculty Member' as fault reporter's information and the correct faulty facility's information submitted by the student.

Table 3.12 Brief Description for Feature 3

Feature 4: Work Confirmation

	Test Scenario	Test Plan	Test Data	Expected Output
1.	Verify when User directed to Confirmed	Pre-condition: User login with correct credentials.	A Fault Reporter Account	Display all work confirmation received on

	Work page, will display all work confirmation received (Fault Reporter) / sent (Administrator)	1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Verify all work confirmation received (Fault Reporter) / send (Administrator) is displayed.		submitted report with correct Work ID and Report ID.
			An Administr-ator account	Display all work confirmation sent on received report with correct Work ID and Report ID.
2.	Verify when User selects one of the work confirmation, correct details of the work confirmation will be displayed.	Pre-condition: - User login with correct credentials. - Fault Reporter received at least one work confirmation. - Administrator sent at least one work confirmation. 1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Select one of the work confirmations. 4. Verify the work confirmation details is correct.	A Fault Reporter Account	Display the correct maintenance details sent by Administrator.
			An Administr-ator account	Display the correct maintenance details sent to the Fault Reporter.

Table 3.13 Brief Description for Feature 4

Feature 7: Comment

	Test Scenario	Test Plan	Test Data	Expected Output
1.	Verify the comment section only display on the work confirmation between Faculty Member and Administrator on both Faculty Member and Administrator side.	Pre-condition: - User login with correct credentials. - Fault Reporter received at least one work confirmation. - Administrator sent at least one work confirmation. 1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Select one of the work confirmations. 4. Verify the availability of comment section to Student, Faculty Member and Administrator.	A Student Account	Only display work confirmation details.
			A Faculty Member Account	Display work confirmation details along with comment section.
			An Administr-ator account	Display work confirmation details. Only display comment section on the work confirmation with Faculty Member.

2.	Verify only Faculty Member is able to add comment.	Pre-condition: - User login with correct credentials. - Faculty Member received at least one work confirmation. - Administrator sent at least one work confirmation. 1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Select one of the work confirmations. 4. Verify the availability of the <*add comment*> option.	A Faculty Member Account	Display work confirmation details along with comment section and a comment input box with add comment option.
			An Administr-ator account	Display work confirmation details. Only display comment section on the work confirmation with Faculty Member and do not have add comment option.
3.	Verify both Administrator and Faculty Member can add reply to existed comment.	Pre-condition: - User login with correct credentials. - Fault Reporter received at least one work confirmation. - Administrator sent at least one work confirmation. 1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Select one of the work confirmations. 4. Verify the availability of <*add reply*> option.	A Faculty Member Account	Display work confirmation details along with comment section and a comment input box with add comment option. Only display reply input box with <*add reply*> option when there is at least one comment.
			An Administr-ator account	Display work confirmation details. Only display comment section on the work confirmation with Faculty Member and do not have add comment option. Only display reply input box with <*add reply*> option when

				there is at least one comment.
4.	Verify both Administrator and Faculty Member can see the correct comment and reply added.	Pre-condition: - User login with correct credentials. - Fault Reporter received at least one work confirmation. - Administrator sent at least one work confirmation. 1. Selects <*confirmed work*> option on the sidebar menu. 2. Directs by system to Confirmed Work page. 3. Select one of the work confirmations. 4. Verify the comment and reply displayed.	A Faculty Member Account	Display the work confirmation details along with the comment section with correct comment added by the Faculty Member himself/herself and the correct reply added by the Faculty Member and Administrator.
			An Administr-ator account	Display the work confirmation details. When it is the work confirmation with Faculty Member, display comment section with correct comment added by the Faculty Member and the correct reply added by the Faculty Member and Administrator himself/herself.

Table 3.14 Brief Description for Feature 7