



Introduction to Software Engineering

Phase Two

Term Project: Research Resource Management System (RRMS)

Team members:

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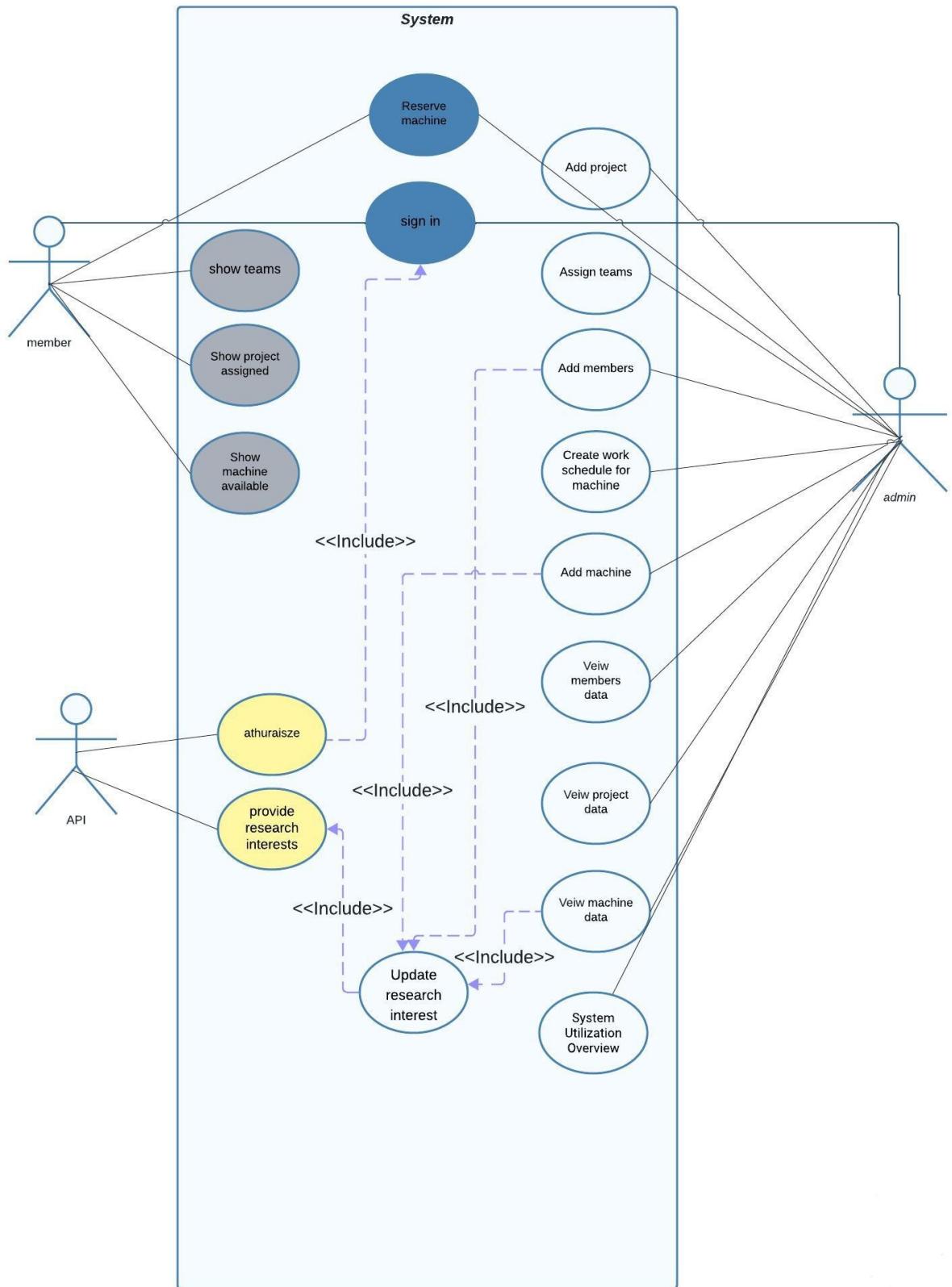
Phase One

Non-functional requirements list

- 1- Response Time:** The response time is an essential aspect of system performance. It refers to the time it takes for the system to respond to a user's action or request. Performance testing and monitoring tools can be utilized to measure and analyze response times for different system functionalities.
- 2- Security:** The system should ensure the security and confidentiality of user data, including personal information and research-related data. It should have appropriate authentication and access control mechanisms to prevent unauthorized access.
- 3- Usability:** The user interface should be intuitive, user-friendly, and easy to navigate, promoting efficient interaction with the system. It should require minimal training for both admins and regular team members to use the system effectively.
- 4- Availability:** The system should be available to users with minimal interruptions. It should have a high uptime percentage, which represents the ratio of the system's uptime to the total time in a designated timeframe. The research center should define target uptime percentages based on their specific requirements and industry best practices. Also, it should provide notifications or alternative arrangements in case of scheduled maintenance or unexpected downtime. System logs and monitoring can be used to track and analyze any instances of unexpected downtime, allowing for prompt resolution of issues to maintain high availability.
- 5- Reliability:** The system should be highly reliable, minimizing downtime and ensuring data integrity. It should have backup and recovery mechanisms in place to protect against data loss and allow for easy restoration in the event of failures.
- 6- Maintenance:** The system should be designed with maintainability in mind, allowing for easy updates, bug fixes, and enhancements. Regular maintenance tasks, such as database optimization, software updates, and performance tuning, should be performed to ensure the system's smooth operation. Maintenance activities should be scheduled during off-peak hours to minimize disruptions to users.

Use case diagram

Aisha Algharib | November 24, 2023



Use case ID: 1.1			
Use Case Name:	Assign machine time		
Created by:	Rimas Alghamdi	Last Updated by:	Jood Faqera
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	admin		
Description:	The ability for an admin to schedule specific hours and days for teams to use machines for research.		
Trigger:	Click on the "Assign machine time" option.		
Preconditions:	<ul style="list-style-type: none"> The user must be signed in as an admin with the necessary permissions. The machine being assigned must be available during the requested time slot. 		
Postconditions:	<ul style="list-style-type: none"> The requested machine is successfully assigned to the team's project for the specified time slot. 		
Normal Flow:	<ol style="list-style-type: none"> The admin selects the "Assign Machine Time" option from the system's interface. The system displays a list of machines. The admin selects the desired machine for assignment. The admin selects the desired date and time slot for machine usage. The system checks if the selected machine and time slot are available. If the machine and time slot are available, the system assigns the machine to the team's project and confirms the assignment. The system updates the machine's availability schedule to reflect the assigned time slot. 		
Alternative Flows:	<p>In the normal flow step 6, If the selected machine is unavailable during the requested time slot :</p> <ol style="list-style-type: none"> The system checks if there is an available time slot close to the chosen time The system offers available time slot The admin accepted the offered time. 		

	4. Go back to normal flow step 7
Exceptions:	<p>In the normal flow step 6, If the selected machine is unavailable during the requested time slot :</p> <ol style="list-style-type: none"> 1. The system checks if there is an available time slot close to the chosen time 2. The system offers available time slot 3. admin does not accept the offered time 4. the system will display an error message and abort the operation.
Assumptions:	<ul style="list-style-type: none"> • The system has accurate and up-to-date information about machine availability. • The admin has the knowledge to determine the appropriate machine and time slot for each project's requirements.
Notes and Issues:	<ul style="list-style-type: none"> • The system should provide notifications or reminders to admins and team members about assigned machine time to facilitate effective coordination and utilization of resources.

Use Case ID:	1.2		
Use Case Name:	Add project		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	31/10/2023	Last Revision Date:	05/11/2023
Actors:	Admin		
Description:	The ability for an admin to add a new project to the system.		
Trigger:	Click on "Add Project" option		
Preconditions:	<ul style="list-style-type: none"> ● The user is logged in as an admin. ● The admin has the necessary permissions to add projects. 		
Postconditions:	<ul style="list-style-type: none"> ● The new project is successfully added to the system. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin selects the "Add Project" option. 2. The system displays a form to enter project details. 3. The admin fills in the required project information, such as project name, description, start date, and end date and the usernames of the project members is optional. 4. The admin clicks the "Add" button. 5. The system validates the entered project information. 6. If the project information is valid: <ol style="list-style-type: none"> a. The system creates a new project with the provided details. b. The system assigns the selected members to the project. c. The system notifies the admin that the project addition was successful. d. The system notifies each member that they have been added to a new project. 		
Alternative Flows:	<p>In the normal flow, at step 6, If the project information is invalid:</p> <ol style="list-style-type: none"> 1. The system displays error messages indicating the validation errors. 2. The admin corrects the errors and resubmits the form. 3. Go to normal flow 5. 		

	<p>In the normal flow of step 6, if project name is duplicate:</p> <ol style="list-style-type: none"> 1. The system detects that the entered project name already exists in the system. 2. The system notifies the admin that a project with the same name already exists. 3. The admin reviews the project name and identifies any discrepancies or confirms that it is indeed a duplicate. 4. If there is a discrepancy or the admin determines it is not a duplicate: <ol style="list-style-type: none"> a. The admin corrects the project name to resolve the discrepancy. b. Then go to normal flow 5. e. If the corrected project information is still a duplicate or invalid, the system displays appropriate error messages, and the admin repeats the correction process. 5. If the project name is confirmed to be a duplicate: <ol style="list-style-type: none"> a. The admin cancels the project addition process. b. The system informs the admin that the project addition was not completed due to a duplicate project name.
Exceptions:	
Assumptions:	<ul style="list-style-type: none"> ● The system allows multiple members to be assigned to a project. ● The admin has access to the necessary project information required for adding a new project.
Notes and Issues:	<ul style="list-style-type: none"> ● This exception handles scenarios where the admin unintentionally tries to add a project with a name that already exists in the system. ● This alternative flow handles scenarios where the admin selects project members that are invalid or do not exist in the system.

Use case ID: 1.3			
Use Case Name:	Assign teams		
Created by:	Rimas Alghamdi	Last Updated by:	Aishah Algharib
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	admin		
Description:	The ability for an admin to assign teams to specific projects within the Research Management System.		
Trigger:	Click on the "Assign teams" option		
Preconditions:	<ul style="list-style-type: none"> The admin must be signed in to the system with the necessary administrative privileges. The project and team members must already exist within the system. 		
Postconditions:	<ul style="list-style-type: none"> The selected team is successfully assigned to the specified project. 		
Normal Flow:	<ol style="list-style-type: none"> The admin selects the desired project from the list of available projects. The system displays a list of available teams. The admin selects the desired team to be assigned to the project. The system verifies that the selected team is eligible for the project based on their expertise and research interests. If the team is eligible based in members interests, the system assigns the team to the project. The system updates the project's information to reflect the assigned team. 		
Alternative Flows:	<p>in the normal flow step 2, If the admin wants to choose a specific team that is not on the list:</p> <ol style="list-style-type: none"> The admin selects an option to "add team" that is not in the list. The admin inputs the members of a new team and submits it. The system adds the team to the list and sends a notification to the team members. 		

	4. Go back to normal flow step 4.
Exceptions:	<p>In the normal flow step 5, if the selected team is not eligible based in members interests for the project:</p> <ol style="list-style-type: none"> 1. The system will display an error message.
Assumptions:	<ul style="list-style-type: none"> • The system has accurate and up-to-date information about available projects and teams. • The admin has the knowledge to determine the appropriate team for each project based on their expertise and research interests.
Notes and Issues:	<ul style="list-style-type: none"> • It is important to consider any dependencies or constraints between teams and projects to ensure that the assignment aligns with project requirements and team availability.

Use Case ID:	1.4		
Use Case Name:	Add members		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	31/10/2023	Last Revision Date:	01/11/2023
Actors:	Admin		
Description:	The ability for an admin to add new members to the system.		
Trigger:	Click on "Add Members" option		
Preconditions:	<ul style="list-style-type: none"> ● The user is logged in as an admin. ● The admin has the necessary permissions to add members. 		
Postconditions:	<ul style="list-style-type: none"> ● The new members are successfully added to the system. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin selects the "Add Members" option. 2. The system displays a form to enter member details. 3. The admin fills in the required member information such as name, email, and research interest. 4. The admin selects the member role(s) from a predefined list 5. The admin clicks the "Add" or "Submit" button. 6. The system validates the entered member information. 7. If the member information is valid: <ol style="list-style-type: none"> a. The system creates a new member account with the provided details. b. The system assigns the selected role(s) to the member. c. The system notifies the admin that the member addition was successful. 		
Alternative Flows:	<p>In the normal flow step 6, If the member information is invalid:</p> <ol style="list-style-type: none"> 1. The system displays error messages indicating the validation errors. 2. To allow the admin to correct the errors and resubmits the form. 3. Go back to normal flow step 4 		
	<p>In the normal flow, at step 6, the system detects that the entered member information matches an existing member in the system.</p>		

Exceptions:	<ol style="list-style-type: none"> 1. The system notifies the admin that a member with the same information already exists. 2. The admin reviews the member information and identifies any discrepancies or confirms that it is indeed a duplicate. 3. If there is a discrepancy or the admin determines it is not a duplicate: <ol style="list-style-type: none"> a. The admin corrects the member information to resolve the discrepancy. b. Then the admin resubmit and go back to normal flow step 5. c. If the corrected member information is still a duplicate or invalid, the system displays appropriate error messages, and the admin repeats the correction process. 4. If the member information is confirmed to be a duplicate: <ol style="list-style-type: none"> a. The admin cancels the member addition process. b. The system informs the admin that the member addition was not
Assumptions:	<ul style="list-style-type: none"> ● The system allows multiple roles to be assigned to a member. ● The admin has access to the necessary member information required for adding new members.
Notes and Issues:	<ul style="list-style-type: none"> ● This exception handles scenarios where the admin unintentionally tries to add a member with information that matches an existing member in the system.

Use case ID: 1.5			
Use Case Name:	Create a work schedule for the machine		
Created by:	Rimas Alghamdi	Last Updated by:	Joud Alsayid
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	admin		
Description:	The ability for an admin to create a timetable or work schedule for machines within the Research Management System.		
Trigger:	Click on the " Create timetable/work schedule" option		
Preconditions:	<ul style="list-style-type: none"> The admin must be signed in to the system with the necessary administrative privileges. The machines and their respective projects must already exist within the system. 		
Postconditions:	<ul style="list-style-type: none"> A timetable or work schedule is successfully created and implemented for the teams. 		
Normal Flow:	<ol style="list-style-type: none"> The admin selects the "Create Timetable/Work Schedule" option from the system's interface. The system presents a calendar or scheduling tool for the admin to define the time slots and machines. The admin selects the desired date and time range for the schedule. The admin assigns specific machines to the time slots. The admin assigns machines to the respective time slots based on their availability and project requirements. The system validates the selected time slots for availability The admin confirms the selected time slots for the machine's availability. The system saves the machine timetable or work schedule in the database. 		
Alternative Flows:	<p>In normal flow 6, if the time slot is not available:</p> <ol style="list-style-type: none"> The system informs the admin about the unavailability of the work time. Go to normal flow 2 and let the admin select alternative available time slots. 		
	<p>In normal flow 3, if the selected time slots for the machine's availability overlap with a scheduled maintenance window:</p>		

Exceptions:	<ol style="list-style-type: none"> 1. The system detects the overlap between the selected time slots and the scheduled maintenance window. 2. The system alerts the admin about the conflict and informs them that the selected time slots coincide with a scheduled maintenance window. 3. The admin is prompted to modify the selected time slots to ensure they do not overlap with the maintenance window. 4. The admin can either select alternative available time slots that do not conflict with the maintenance window or consult with the maintenance team to reschedule the maintenance. 5. Once the conflict is resolved, the admin confirms the updated time slots for the machine's availability
Assumptions:	<ul style="list-style-type: none"> • The system has accurate and up-to-date information about machine availability and any predefined constraints for scheduling. • The admin has the necessary knowledge to define appropriate machines, allocate time slots
Notes and Issues:	<p>-</p>

Use case ID: 1.6			
Use Case Name:	Add Machine		
Created by:	Rimas Alghamdi	Last Updated by:	Joud Alsayid
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	admin		
Description:	The ability for an admin to add a new machine to the Research Management System.		
Trigger:	Click on the "Add Machine" option		
Preconditions:	<ul style="list-style-type: none"> The admin must be signed in to the system with the necessary administrative privileges. The necessary information about the new machine, such as its specifications, availability, and unique identifier, must be available. 		
Postconditions:	The new machine is successfully added to the system's inventory.		
Normal Flow:	<ol style="list-style-type: none"> The admin selects the "Add Machine" option from the system's interface. The system presents a form or interface to enter the details of the new machine, such as its name and usage. The admin fills in the required information for the new machine, ensuring accuracy and completeness. The admin submits the form and confirms the addition of the new machine. The system validates the entered information and checks for any conflicts with existing machines. If there are no conflicts, the system adds the new machine to the inventory and confirms the addition. 		
Alternative Flows:	<p>In the normal flow step 2, If the machine already exists:</p> <ol style="list-style-type: none"> The System shows a message that the machine already exists. After showing the message the system opens the existing machine profile. The admin should modify the number of machines. Go back to normal flow step 3. 		

Exceptions:	In the normal flow step 5, If the machines of the same type conflict in name or specification: <ul style="list-style-type: none"> • the system will display an error message and abort the operation
Assumptions:	<ul style="list-style-type: none"> • The system can store and manage information about machines, including their specifications, availability, and unique identifiers. • The admin has the necessary knowledge and authorization to add machines to the system.
Notes and Issues:	<ul style="list-style-type: none"> • It is important to ensure that the system properly tracks and updates the inventory of available machines to avoid overbooking or conflicts in machine assignments. • The admin should review the accuracy and completeness of the entered machine information before confirming the addition to avoid any inconsistencies or errors in the system. • The system may provide notifications or updates to users regarding the addition of new machines to keep them informed about the available resources for their research activities.

Use case ID:	1.7		
Use Case Name:	View members' data		
Created by:	Aishah Algharib	Last Updated by:	Joud Alsayid
Date Created:	31/10/2023	Last Revision Date:	4/11/2023
Actors:	Admin		
Description:	The ability to view members' data including their name, their email, and their research interests.		
Trigger:	Click track members' data		
Preconditions:	<ul style="list-style-type: none"> ● sign in as admin ● User Access and Permissions ● Data Availability 		
Postconditions:	<ul style="list-style-type: none"> ● The admin can view and edit members' data 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin clicks "View Members' Data" from the track menu 2. The system ensures the availability of the members' data 3. the system organize the members' data in form 4. The admin gains access to track members' data and viewing information including: <ol style="list-style-type: none"> a. Members' names b. Members' emails c. Members' research interests 		
Alternative Flows:	<p>In the normal flow step 4, the system provide an option to the admin edit members' data:</p> <ol style="list-style-type: none"> a. The Admin click edit b. the system provide to the admin the ability to change the information c. After the admin changed anything, he/ she clicks save d. The system update the changes 		
Exceptions:	In the normal flow, if during step 2 the system determines that the data structures are not available:		

	<ol style="list-style-type: none">1. The system displays an error message indicating the unavailability of data structures.2. The system aborts the operation of tracking project data.3. The admin is informed about the unavailability of data structures.
Assumptions:	Member can be part of multiple teams.
Notes and Issues:	-

Use case ID:	1.8		
Use Case Name:	View project data		
Created by:	Aishah Algharib	Last Updated by:	Joud Alsayid
Date Created:	31/10/2023	Last Revision Date:	04/11/2023
Actors:	Admin		
Description:	The ability to view the project's name and the team supposed to work on that project.		
Trigger:	Clicks view project data		
Preconditions:	<ol style="list-style-type: none"> 1. Sign in as admin 2. The system provide access and permissions to admin 3. Data availability 4. Team information availability 5. Project data structure creation 		
Postconditions:	<ol style="list-style-type: none"> 1. Successful project data viewing 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin clicks "View Project Data" from the track menu 2. The system ensures the availability of data to track project data. 3. The system organize the project' data in a form 4. The admin gains access to all the projects names 5. The admin chooses the project name that he/she want to track 6. The admin gains access to track that project data, allowing for viewing team assigned to the respective project 		
Alternative Flows:	<p>In the normal flow step 6, the admin choose project name that has not yet been assigned to a team:</p> <ol style="list-style-type: none"> 1. The system will display a message to the admin that the selected project has not yet been assigned to a team 2. The system allow the admin to choose another project and assign a team 3. Go back to normal flow step 5 		
Exceptions:	<p>In the normal flow, if during step 2 the system determines that the data structures are not available:</p>		

	<ol style="list-style-type: none">1. The system displays an error message indicating the unavailability of data structures.2. The system aborts the operation of tracking project data.
Assumptions:	
Notes and Issues:	

Use case ID:	1.9		
Use Case Name:	View machine data		
Created by:	Aishah Algharib	Last Updated by:	Joud Alsayid
Date Created:	31/10/2023	Last Revision Date:	5/11/2023
Actors:	Admin		
Description:	The ability to keep view of the machine's name, and to record the suggested usage from the research interests.		
Trigger:	Click view machines' data		
Preconditions:	<ul style="list-style-type: none"> ● sign in as admin ● User Access and Permissions ● Data Availability ● The use case “update research interest” is successfully done 		
Postconditions:	<ul style="list-style-type: none"> ● Data Storage and Accessibility of the machines' data ● Data Integrity of the machine's name and the suggested usage from the research interests 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin clicks "View machines' data" from the track menu 2. The system retrieves the updated list of research interests from the Research Center's site via the API. 3. For each machine, the system compares its specifications with the research interests to identify suitable matches. 4. The system then tags each machine with the matching research interests, identifying the areas of research for which each machine is suitable. 5. The system shows the stored data 6. The admin gains access to track machines' data and viewing information including: <ol style="list-style-type: none"> a. machine's names b. suggested usage 		
Alternative Flows:	<p>In the normal flow step 6, the system provide an option to the admin edit machines' data:</p> <ol style="list-style-type: none"> a. The Admin click edit b. the system provide to the admin the ability to change the information 		

	c. After the admin changed anything, he/ she clicks save
Exceptions:	<p>In the normal flow step 3, An error occurred during the retrieval of the list of research interests from the Research Center's site via the API</p> <ol style="list-style-type: none"> 1. The system notifies the admin about the issue. 2. The system presents the admin with two options: "Retry" or "Cancel" the operation. 3. if the admin chooses to retry: <ul style="list-style-type: none"> a. The system retrieves the list of research interests. b. If the system succeed, proceed to step 4. c. If the computation fails again: <ul style="list-style-type: none"> i. The system notifies the admin of the continued error. ii. The admin is prompted again to choose between "Retry" or "Cancel" the operation. 4. If the admin chooses to cancel: <ul style="list-style-type: none"> a. The system acknowledges the cancellation b. The system informs the admin that the operation is cancelled. c. The system show the admin the machine's names only without the suggested usage.
Assumptions:	-
Notes and Issues:	-

Use case ID:	1.10		
Use Case Name:	System Utilization Overview		
Created by:	Aishah Algharib	Last Updated by:	Joud Alsayid
Date Created:	31/10/2023	Last Revision Date:	5/11/2023
Actors:	Admin		
Description:	The ability to visualizes the most utilized machine, the project that uses the most machines, the most active members		
Trigger:	Click visualizes system statistics		
Preconditions:	<ul style="list-style-type: none"> ● Sign in as admin ● User Access and Permissions ● Data Availability 		
Postconditions:	<ul style="list-style-type: none"> ● Visualization of Most Utilized Machine ● Identification of Projects Using the Most Machines ● Highlighting Most Active Members 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin clicks the "System Utilization Overview" option 2. The system grants access to the statistics screen. 3. The systems found that the data is valid to be computed 4. The system proceeds to compute the following data: <ol style="list-style-type: none"> a. Identify most utilized machine b. Determine the project that uses the most machines c. Recognize most active members 5. The admin views the Utilization Statistics. 		
Alternative Flows:	<p>In the normal flow step 3, the system fails to compute due to incomplete or unavailable data:</p> <ol style="list-style-type: none"> 1. The system notifies the admin about the issue. 2. The system presents the admin to "Cancel" the operation. <ol style="list-style-type: none"> a. The system acknowledges the cancellation b. The system informs the admin that the visualization is cancelled. 		

Exceptions:	In normal flow 3, if the system encounters an error while computing the system statistics: <ol style="list-style-type: none"> 1. The system detects an error or exception during the computation process. 2. The system displays an error message indicating the failure to <u>compute the system statistics</u>.
Assumptions:	-
Notes and Issues:	-

Use case ID:	1.11		
Use Case Name:	Update research interest		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	4/11/2023	Last Revision Date:	5/11/2023
Actors:	Admin		
Description:	This use case enables the admin to update the research interests within the research center.		
Trigger:	Clicks update research interest		
Preconditions:	<ul style="list-style-type: none"> ● Sign in as admin ● Admin Access and Permissions ● The system is connected to the API for retrieving the updated list of research interests. ● The use case "provide research interest" is successfully done 		
Postconditions:	<ul style="list-style-type: none"> ● Successful update of research interests. ● Updated research interest data is stored and accessible in the application. ● The updated research interests are reflected in relevant system functionalities. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The admin clicks "Update Research Interest". 2. The system establishes a connection with the research center's website and retrieves the updated list of research interests. 3. The system presents the admin with the updated research interest list for review and modification. 4. The admin can add, remove, or modify research interests based on the current updates and update it. 5. The admin confirms the changes made to the research interest list. 6. The system validates the updated research interest data for any errors or inconsistencies. 7. If validation is successful, the system updates the research interest data with the modified list. 8. The system stores the updated research interest data securely. 9. The system confirms the successful update of research interests to the admin. 		

<p>Alternative Flows:</p>	<p>In the normal flow step 6, If validation is unsuccessful:</p> <ol style="list-style-type: none"> 1- The system will show an error message 2- The system will ask admin to retry or cancel 3- if admin chooses to retry, go back to step 2 <p>In the normal flow step 3, if the admin encounters difficulties in modifying the research interest list:</p> <ol style="list-style-type: none"> 1. The admin realizes that there are complexities or uncertainties in updating the research interest list. 2. The admin chooses the option to seek assistance or guidance. 3. The system provides an option to access help documentation or contact support for assistance. 4. The admin follows the provided instructions or contacts support to resolve the difficulties. 5. If the admin receives the necessary guidance or assistance: <ol style="list-style-type: none"> a. The admin proceeds with modifying the research interest list based on the received guidance. b. The admin continues from step 5 of the normal flow to confirm the changes. <p>Else:</p> <p>If the difficulties persist or cannot be resolved:</p> <ol style="list-style-type: none"> a. The admin chooses to revert the changes made and cancel the update process. b. The system acknowledges the cancellation and informs the admin about the cancellation of the update of research interests
<p>Exceptions:</p>	<p>During step 2 of the normal flow, if the system fails to establish a connection with the research center's website to retrieve the updated list of research interests:</p> <ol style="list-style-type: none"> 1. The system displays an error message indicating the inability to connect to the research center's website. 2. The system prompts the admin to retry the connection or cancel the update process. 3. If the admin chooses to retry: <ol style="list-style-type: none"> a. The system attempts to establish a connection with the research center's website again. b. If the connection is successful, the system proceeds to step 3. c. If the connection still fails, the system repeats the error message.

	<p>4. If the admin chooses to cancel:</p> <ol style="list-style-type: none"> The system acknowledges the cancellation of the update process. The system informs the admin that the update of research
Assumptions:	<ul style="list-style-type: none"> The research center's website provides a mechanism to export the updated research interest list in a compatible format. The admin has the necessary knowledge and authority to update research interests. The research interest update process is performed periodically or as needed to keep the information up to date.
Notes and Issues:	<ul style="list-style-type: none"> The updated research interest data should be synchronized across relevant system functionalities to ensure consistency. The research interests can vary and change over time, and the system allows for easy updating of this information.

Use Case ID:	2.1		
Use Case Name:	Reserve machine		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	31/10/2023	Last Revision Date:	04/11/2021
Actors:	Member		
Description:	The ability to reserve a machine for a specific time slot in advance.		
Trigger:	Click on "Reserve Machine" option		
Preconditions:	<ul style="list-style-type: none"> ● The user is logged in as a member or a team leader. ● The user has the necessary permissions to reserve machines. ● The machine is available for reservation. 		
Postconditions:	<ul style="list-style-type: none"> ● The machine is reserved for the specified time slot. ● The reserved time slot is recorded in the machine's work schedule. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The user selects the "Reserve Machine" option. 2. The system displays a list of available machines. 3. The user selects a machine from the list. 4. The system shows the machine's work schedule. 5. The user selects a date and time slot for reservation. 6. The system checks if the selected time slot is available. 7. If the time slot is available: <ol style="list-style-type: none"> a. The user confirms the reservation. b. The system updates the machine's work schedule to reflect the reservation. c. The system notifies the user that the reservation is successful. 		
Alternative Flows:	<p>In the normal flow step 7, the system determines that the selected time slot is not available:</p> <ol style="list-style-type: none"> 1. The system notifies the user that the selected time slot is already reserved 2. The user selects a different time slot or cancel the reservation 3. The reservation process is aborted if the user clicks cancel, otherwise go back to step 4. 		

	In the normal flow of step 7.a, The user do not confirm the reservation and clicks cancel:
Exceptions:	In the normal flow, at step 6, the system encounters an error while checking the availability of the selected time slot: <ol style="list-style-type: none"> 1. The system notifies the user that there was an error in checking the availability 2. The reservation process is aborted. 3. The system informs the user that the reservation could not be completed.
Assumptions:	<ul style="list-style-type: none"> • Users have access to the list of available machines and their work schedules. • The system can handle multiple concurrent reservations for different machines.
Notes and Issues:	<ul style="list-style-type: none"> • This alternative flow allows the user to select an alternative time slot if the initially chosen time slot is not available, ensuring that they can still reserve the machine for a different time. • This exception handles scenarios where there are technical issues or errors in checking the availability of the selected time slot for the machine.

Use case ID:	2.2		
Use Case Name:	Show teams		
Created by:	Jood Faqera	Last Updated by:	Aishah Algharib
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	Member		
Description:	The ability to show the teams for a member		
Trigger:	Click on " Show teams" option		
Preconditions:	<ul style="list-style-type: none"> ● The member has a valid account and has successfully logged into the system. ● The member has been assigned to one or more teams. ● The system has recorded the member's team assignments accurately. ● The system has up-to-date information on projects, including team assignments and machine availability. 		
Postconditions:	<ul style="list-style-type: none"> ● The member has successfully viewed their teams ● The member can access the details of each team they are assigned to. ● The system ensures that the member's access to teams and information is secure and protected. ● The system provides appropriate error messages or notifications if there are any issues with accessing team information or if any errors occur during the process. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The member navigates to the "Teams" section or clicks on a "View Teams" button. 2. The system checks the following conditions: <ol style="list-style-type: none"> a. The member does belong to teams 3. The system displays the list of the teams of the member, showing relevant information such as team names, project assignments, and machine availability. 		
Alternative Flows:	<p>In normal flow step 2.a, the system found that the member does not belong to any team:</p> <ol style="list-style-type: none"> 1. The member navigates to the "Teams" section or clicks on a "View Teams" button. 2. The system checks the following conditions: 		

	<ul style="list-style-type: none"> - If the member does not belong to any teams: <ul style="list-style-type: none"> - The system displays a message indicating that the member is not currently part of any teams. - The system may provide suggestions or options for the member to join or create a team. - The alternative flow ends. - If the member belongs to teams: <ul style="list-style-type: none"> - Proceed to the next step.
	<ol style="list-style-type: none"> 3. The system encounters an error while retrieving the list of teams for the member. 4. The system displays an error message indicating that there was an issue retrieving the team information. 5. The alternative flow ends.
Exceptions:	<p>Exceptions for the "View Teams" use case may include:</p> <ol style="list-style-type: none"> 1. Invalid User: Display an error message for unauthorized or unauthenticated users. 2. Network Connection Failure: Show an error message for connection issues and suggest retrying later. 3. Data Retrieval Failure: Display an error message for problems retrieving team information and advise retrying or contacting support. 4. Incomplete Team Information: Warn about missing or inaccurate data and suggest refreshing or contacting support. 5. Team Membership Change: Update the team list if a user is removed and provide a notification. 6. System Maintenance: Display a message during maintenance periods and advise trying again later. 7. Unexpected Errors: Handle unexpected errors gracefully with error messages and options for resolution or support.
Assumptions:	<ol style="list-style-type: none"> 1. The system maintains accurate and up-to-date records of team assignments, project details, and machine availability. 2. The member's account is properly linked to their assigned teams, projects, and machines. 3. The system provides a user-friendly interface that allows members to easily navigate and view their team information.

Notes and Issues:

1. It is important to ensure that the system's data is regularly synchronized and updated to reflect any changes in team assignments, project details, or machine availability.
2. The system should provide clear and concise information about each team, project, and machine, allowing members to quickly understand the relevant details.
3. To enhance usability, the system could implement search or filter functionality to help members find specific teams or projects more easily.

Use case ID:	2.3		
Use Case Name:	Show Assigned Project		
Created by:	Jood Faqera	Last Updated by:	Jood Alsayid
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	Member		
Description:	The ability to show the assigned projects for a member		
Trigger:	Click on "Show Assigned Project" option		
Preconditions:	<ul style="list-style-type: none"> ● The member has a valid account and has successfully logged into the system. ● The member is connected to the internet and can access the system. ● The member is part of one or more teams. ● The system has recorded the member's team assignments accurately. ● The system has up-to-date information on projects, including team assignments. 		
Postconditions:	<ul style="list-style-type: none"> ● The member has successfully viewed the projects assigned to their team(s). ● The member can access the details of each project, including the project name, team leader, other team members, and any additional project information. ● The system maintains the accuracy of the member's team assignments and project details. ● The system displays any changes or updates in the assigned projects to the member in real-time. ● The system ensures that the member's access to project information is secure and protected. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The member clicks on the "View Projects" option. 2. The system checks if the member is assigned to any projects 3. The system retrieves the list of projects associated with the member's teams. 4. The system displays the list of projects to the member 5. The member can scroll or navigate through the list to see all the projects assigned to their teams. 		

	<p>6. The member can click on a specific project for more detailed information if needed.</p> <p>7. The system displays the project details, including the project name, team leader, other team members, and any additional information related to the project.</p> <p>8. If the project has any specific requirements or deadlines, the system shows them to the member.</p>
Alternative Flows:	<p>1. The member navigates to the "Projects" section or clicks on a "View Projects" button.</p> <p>2. The system checks the following conditions:</p> <ul style="list-style-type: none"> - If the member does not belong to any projects: <ul style="list-style-type: none"> - The system displays a message indicating that the member is not currently part of any projects. - The system may provide suggestions or options for the member to join or create a project. - The alternative flow ends. - If the member belongs to projects: <ul style="list-style-type: none"> - Proceed to the next step. <p>3. The system encounters an error while retrieving the list of projects for the member.</p> <p>4. The system displays an error message indicating that there was an issue retrieving the team information.</p> <p>5. The alternative flow ends.</p>
Exceptions:	<p>In normal flow step 3, if the system encounters an error while retrieving the list of projects associated with the member's teams:</p> <ol style="list-style-type: none"> 1. The system detects the error in retrieving the project list. 2. The system displays an error message indicating the failure to retrieve the projects. 3. The member is notified about the issue and instructed to try again later or contact the system administrator for assistance.
Assumptions:	<ol style="list-style-type: none"> 1. The system has a reliable authentication mechanism in place to ensure that only authorized members can log in and access project

	<p>information.</p> <ol style="list-style-type: none">2. The member's account is properly linked to their assigned teams and projects, ensuring accurate project assignment information.3. The system maintains up-to-date records of project assignments and details, including team leaders, team members, and project-specific information.
Notes and Issues:	<ol style="list-style-type: none">1. It is important to ensure that the system's data is regularly synchronized and updated to reflect any changes in project assignments and details.2. The system should provide a user-friendly interface that allows members to easily navigate and view their assigned projects.

Use case ID:	2.4		
Use Case Name:	Show available machines		
Created by:	Jood Faqera	Last Updated by:	Joud Alsayid
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	Member		
Description:	This use case describes how a team member can access and view the list of available machines.		
Trigger:	click view available machines		
Preconditions:	<ul style="list-style-type: none"> ● The user is signed in to the system with appropriate privileges. ● The system is operational. ● The system has information about available machines and their schedules. 		
Postconditions:	<ul style="list-style-type: none"> ● The user has access to the list of available machines and can review their details. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The member initiates the process by clicking on "View Available Machines." 2. The system retrieves the list of available machines and displays relevant details. 3. The member has the option to apply filters to the list, allowing them to narrow down the results based on criteria such as most used or least used machines. 4. The member reviews the list of available machines and their details. 5. The member can select a specific machine for further information or proceed with scheduling their research activities. 		
Alternative Flows:	<p>In the normal flow step 2, if the system fails to retrieve any available machines:</p> <ol style="list-style-type: none"> 1. The system notifies the member that there are currently no available machines. 2. The member acknowledges the notification. 3. The process returns to step 2, allowing the member to check for available machines later. 		
Exceptions:	In the normal flow step 1, if the system is unavailable:		

	<ol style="list-style-type: none"> 1. The system is down or experiencing technical difficulties, rendering it unavailable. 2. The member is informed about the unavailability of the system.
Assumptions:	<ul style="list-style-type: none"> ● The list of available machines is regularly updated and accurately reflects the current availability. ● The system provides an intuitive user interface to facilitate easy access and navigation through the list of available machines.
Notes and Issues:	<ul style="list-style-type: none"> ● The availability of machines helps members plan and schedule their research activities effectively.

Use case ID:	2.5		
Use Case Name:	Assign machine time to projects		
Created by:	Jood Faqera	Last Updated by:	Aishah Algharib
Date Created:	02/11/2023	Last Revision Date:	05/11/2023
Actors:	Member		
Description:	This use case outlines the process by which a member uses the system to allocate machine time to specific research projects.		
Trigger:	Click on " Assign machine time to project" option		
Preconditions:	<ul style="list-style-type: none"> ● The member is logged in to the system with appropriate privileges. ● The system is operational. ● There are available machines. ● There are active research projects. 		
Postconditions:	<ul style="list-style-type: none"> ● The member has successfully allocated machine time to the selected research project. ● The project's schedule is updated to reflect the machine allocation. ● Team members are notified of the allocation. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The member accesses the machine allocation section. 2. The system displays a list of active research projects. 3. The member selects a specific research project to allocate machine time to. 4. The member specifies the date, time, and duration for machine allocation. 5. The system validates the requested machine's availability during the specified time. 6. The member confirms the allocation. 7. The system updates the project's schedule to reflect the machine allocation. 8. The member receives a message confirmation of the allocation. 		
Alternative Flows:	<p>In the normal flow step 5, the system finds that the date, time, and duration for machine allocation are not valid:</p> <ol style="list-style-type: none"> 1. The system informs the user that the machine at that specified time is unavailable 2. The member selects an alternative time and/or machine 3. The system validates the requested machine's availability during the specified time. 		

	<p>4. Go back to normal flow step 6.</p> <p>In normal flow step 6, the member cancels the allocation:</p> <ol style="list-style-type: none"> 1. The reservation process is aborted. 2. The system informs the user that the reservation has been canceled.
Exceptions:	When the system is under manufacturers:
Assumptions:	-
Notes and Issues:	-

Use Case ID:	3.1		
Use Case Name:	Provide research interests		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	2/11/2023	Last Revision Date:	05/11/2023
Actors:	API		
Description:	The system retrieves the latest list of research interests from the Research Center's site and makes it available in the application.		
Trigger:	API request for research interests		
Preconditions:	<ul style="list-style-type: none"> ● The system has a connection to the Research Center's website. ● The Research Center has provided an updated list of research interests. 		
Postconditions:	<ul style="list-style-type: none"> ● The system displays the list of research interests to the user. 		
Normal Flow:	<ol style="list-style-type: none"> 1. The API sends a request to the Research Center's website to retrieve the latest list of research interests. 2. The system receives the response from the Research Center. 3. The system processes the response and extracts the list of research interests. 4. The system displays the list of research interests to the user. 		
Alternative Flows:	<p>In the normal flow step 3, If the received list of research interests is invalid or incomplete:</p> <ol style="list-style-type: none"> 1. The system generates an error or warning message indicating the issue with the received list. 2. The system notifies the admin about the error or warning. 3. The admin takes appropriate action to rectify the issue and resubmit the list. 4. The use case continues from step 3 of the normal flow. 		
Exceptions:	<p>In normal flow step 2, If the connection to the Research Center's website is lost:</p> <ol style="list-style-type: none"> 1. The system displays an error message. 2. The system notifies the user that the research interests are currently unavailable. 3. The use case ends. 		

Assumptions:	<ul style="list-style-type: none">• The Research Center regularly updates the list of research interests on its site.• The API request is authenticated and authorized to access the Research Center's data.
Notes and Issues:	<ul style="list-style-type: none">• It is important to ensure that the system fetches the most up-to-date list of research interests to provide accurate information to the users. Regular synchronization with the Research Center's website is necessary to keep the data updated.

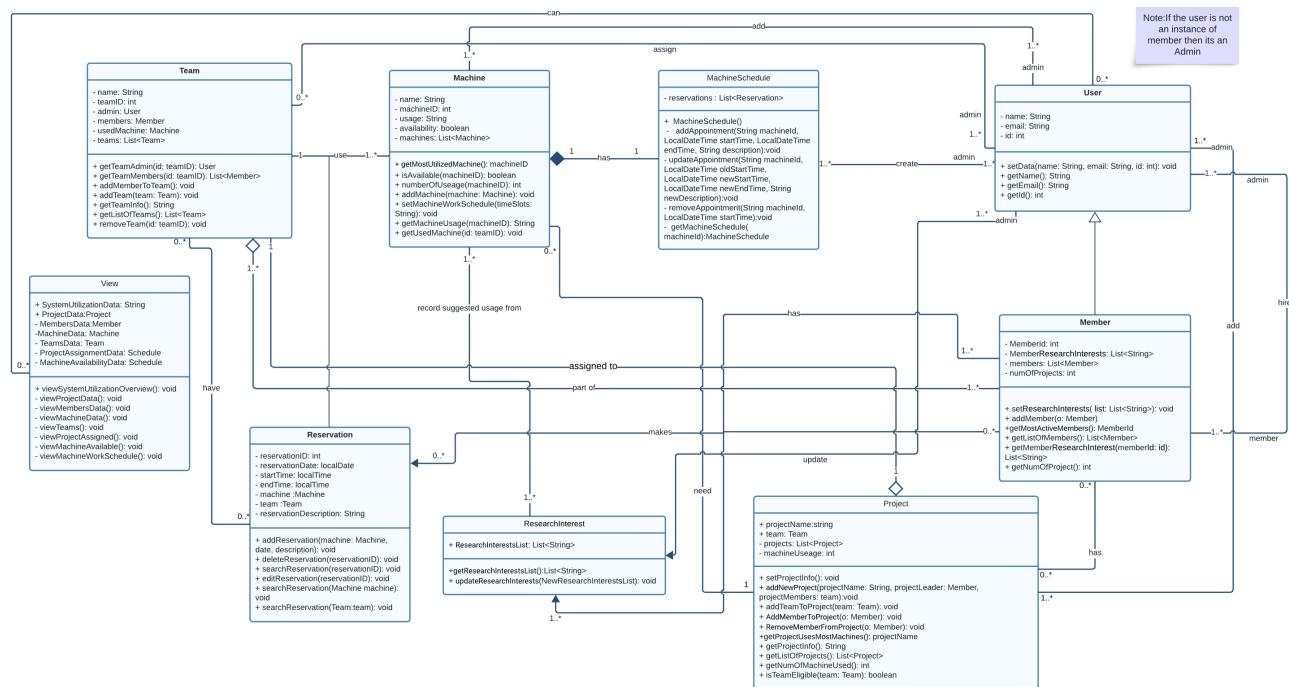
Use Case ID:	3.2		
Use Case Name:	Sign in		
Created by:	Joud Alsayid	Last Updated by:	Aishah Algharib
Date Created:	31/10/2023	Last Revision Date:	05/11/2021
Actors:	API, admin, leader, member.		
Description:	The ability for leaders and members to sign in to the system using an API external authentication system, with administrative control over authentication settings.		
Trigger:	Click 'sign-in'		
Preconditions:	<ul style="list-style-type: none"> The system is accessible and operational. The user has an active account in the system. 		
Postconditions:	<ul style="list-style-type: none"> The user is successfully authenticated and granted access to the system. 		
Normal Flow:	<ol style="list-style-type: none"> The user navigates to the Sign page by clicking on 'sign-in'. The system redirects the user to the API for sign-in. The user interacts with the API sign-in and provides their credentials. The External Authentication System verifies the user's credentials. If the authentication is successful, the API sends a response to the system indicating authentication success. The system validates the user's authentication status. If the user is authenticated: <ul style="list-style-type: none"> The system grants access to the appropriate user role (Leader or Member or admin) and redirects the user to the corresponding dashboard. If the user is not authenticated: <ul style="list-style-type: none"> The system displays an error message indicating invalid credentials and authentication failure. The user is prompted to re-enter their credentials and repeat the authentication process. 		
	In the normal flow, at step 8, if the user is not authenticated, the user realizes they		

	<p>have forgotten their password:</p> <ol style="list-style-type: none"> 1. The system provides a link or option to initiate the password reset process. 2. The user clicks on the "Forgot Password" option. 3. The system redirects the user to the API's for password reset. 4. The user interacts with the API's password reset interface and provides their registered email address. 5. The API verifies the provided email address and sends a password reset link to the user's registered email address. 6. The user receives the password reset link in their email. 7. The user clicks on the password reset link to navigate to the password reset page. 8. The user follows the instructions on the password reset page to reset their password. 9. The API updates the user's password and notifies the user that the password has been successfully reset. 10. The user can then proceed with the sign-in process as per the normal flow
<p>Exceptions:</p>	<p>In the normal flow, at step 6, if the account is locked:</p> <ol style="list-style-type: none"> 1. The system detects that the user's account is locked and disabled in the API. 2. The system displays an error message to the user indicating that the account is locked and disabled, instructing them to try again in a few minutes. 3. Once the user's account is unlocked or enabled, the user can proceed with the sign-in process as per the normal flow 3.
<p>Assumptions:</p>	<ul style="list-style-type: none"> • The system relies solely on the integration with an API (external authentication system) for user authentication. • The admin has the necessary permissions to configure authentication settings and manage user accounts in the API (External Authentication System).
<p>Notes and Issues:</p>	<ul style="list-style-type: none"> • The user's interaction with the API for sign-in, password reset, and account unlocking or enabling is handled externally and not within the system itself. • When the user enters the password incorrectly three times at most, the account status changes to 'locked.' The system notifies the user to wait a few minutes and then try again. After this time period, the account state returns to its normal unlocked state.

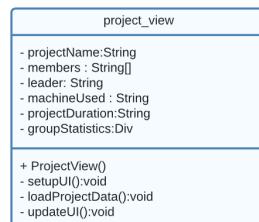
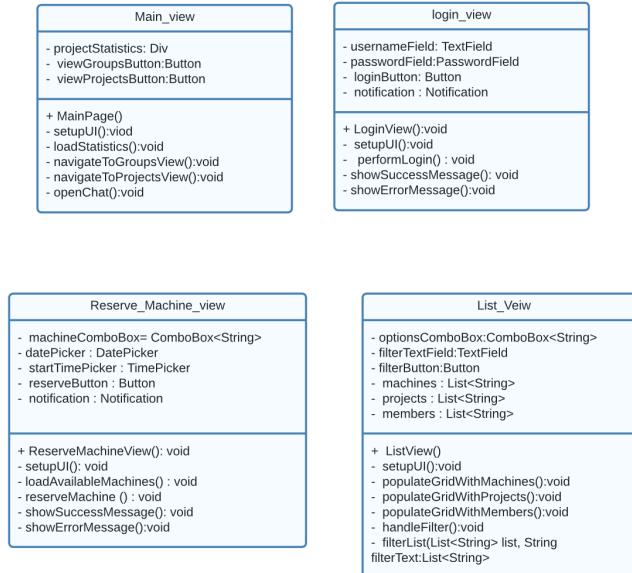
Work distribution

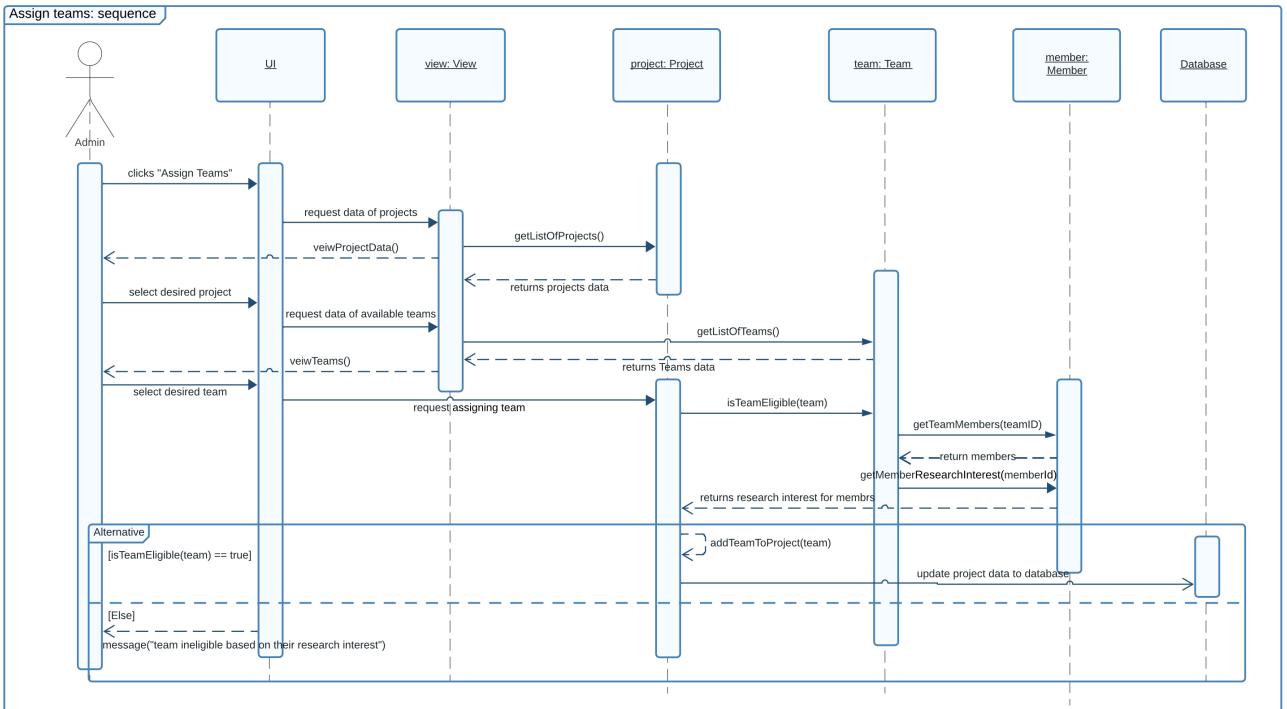
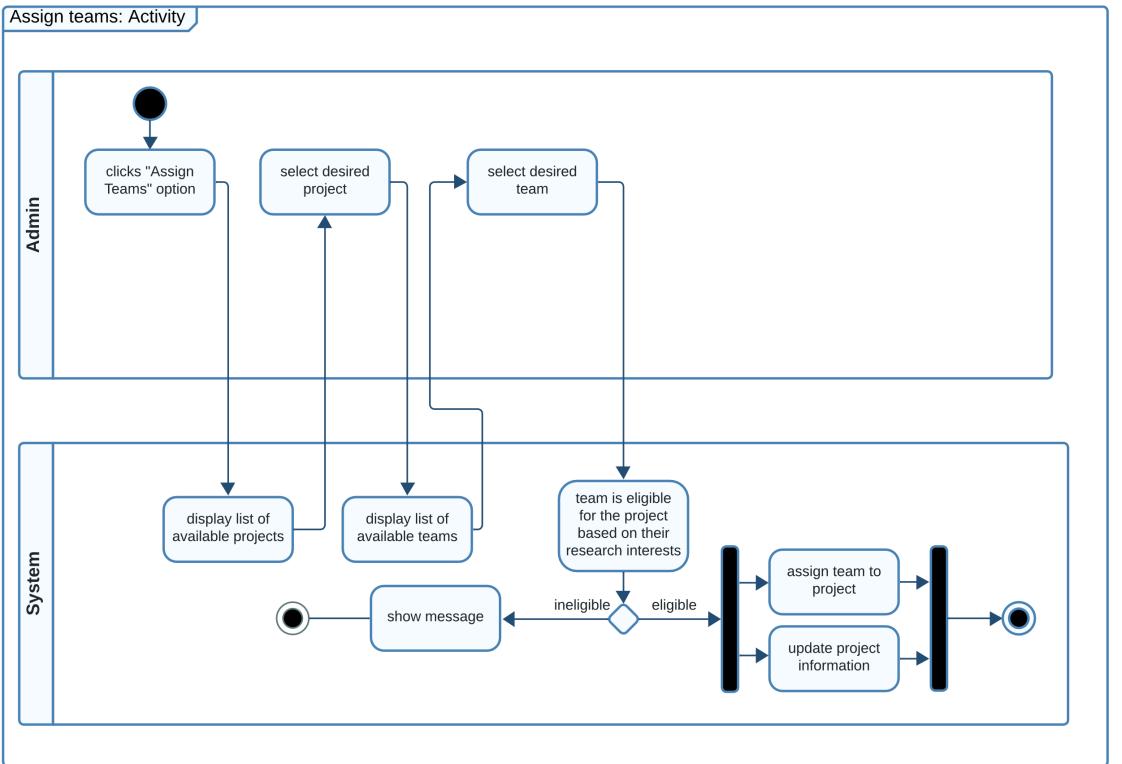
Joud Alsayid	<ul style="list-style-type: none">• Creation of the use cases of the actors admin and API• Creation of the use case description is with the IDs: 1.4 - 1.2 - 3.1 - 3.2 - 2.1 - 1.11
Jood Faqera	<ul style="list-style-type: none">• Creation of the use cases of the actors member and leader• Creation of the use case description is with the IDs: 2.2 - 2.3 - 2.4 - 2.5
Rimas Alghamdi	<ul style="list-style-type: none">• Creation of the use cases of the actors member and leader• Creation of the use case description is with the IDs: 1.1 - 1.3 - 1.5 - 1.6
Aishah Algharib	<ul style="list-style-type: none">• Creation of the use cases of the actors admin and API• Creation of the use case description is with the IDs: 1.7 - 1.8 - 1.9 - 1.10 - 1.11
All team members	Creation of the non-functional requirement list

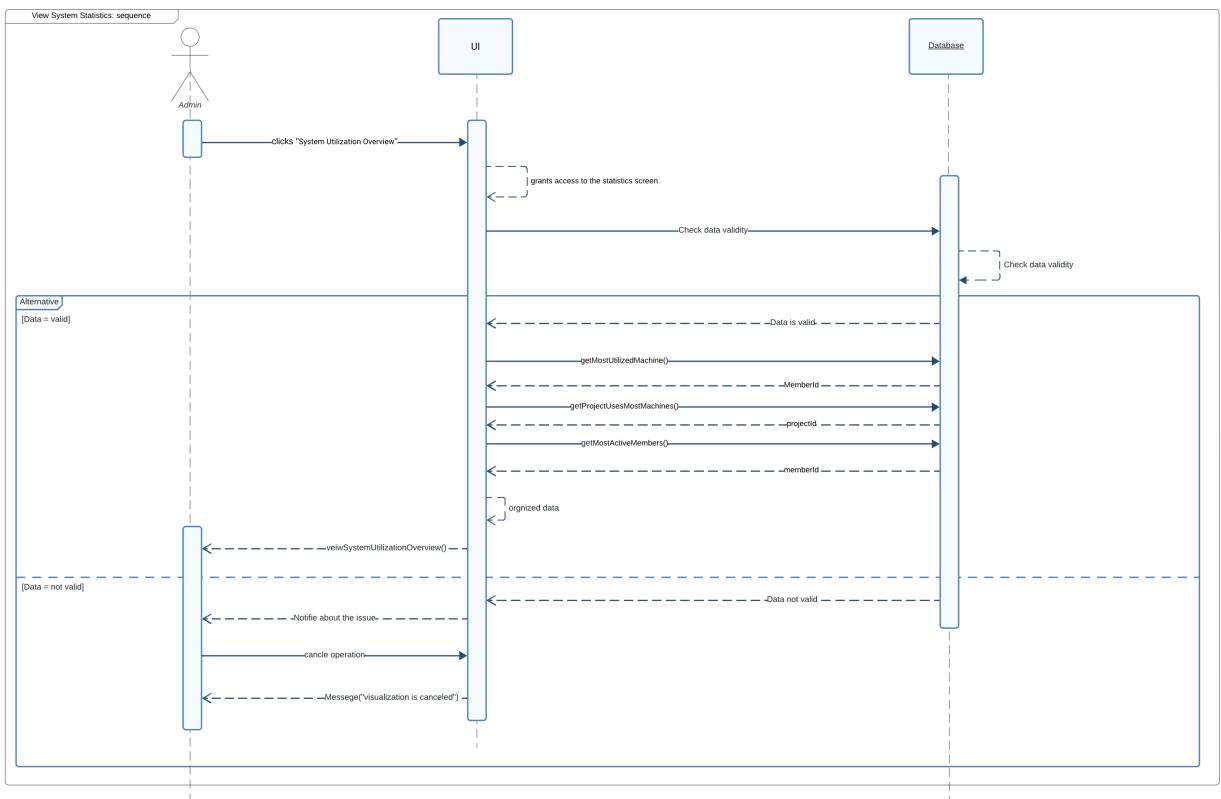
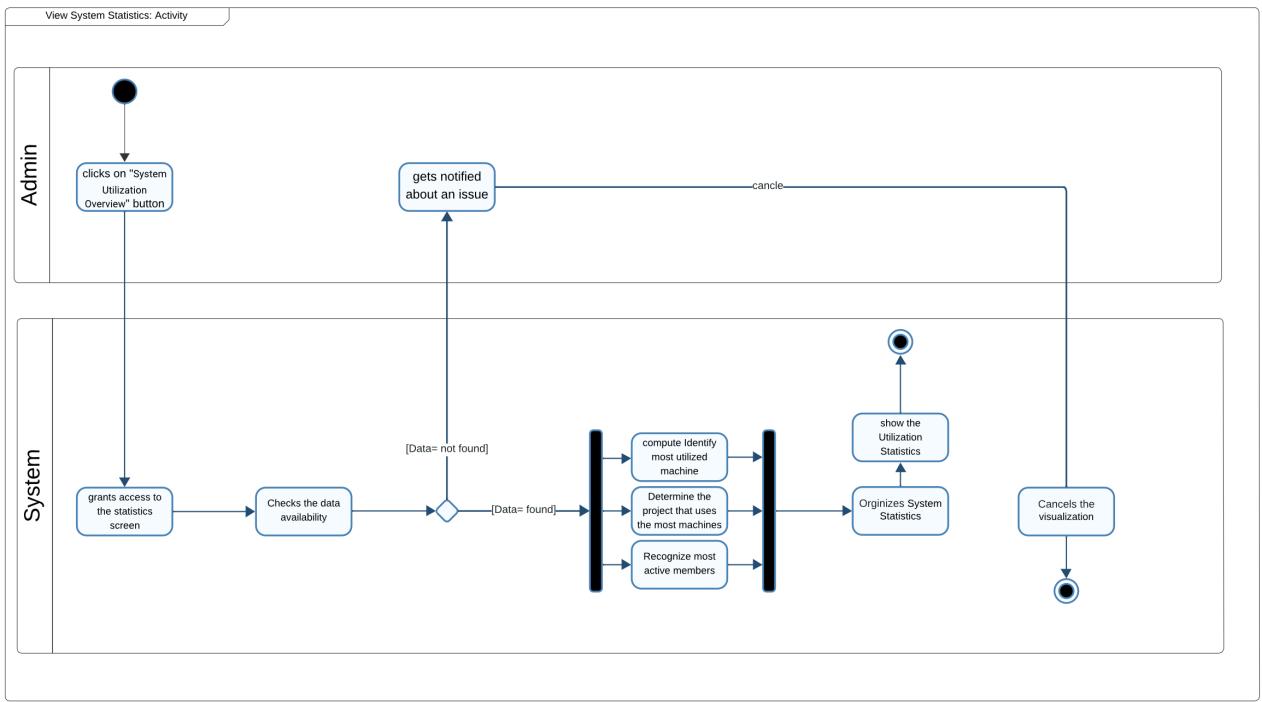
Phase Two

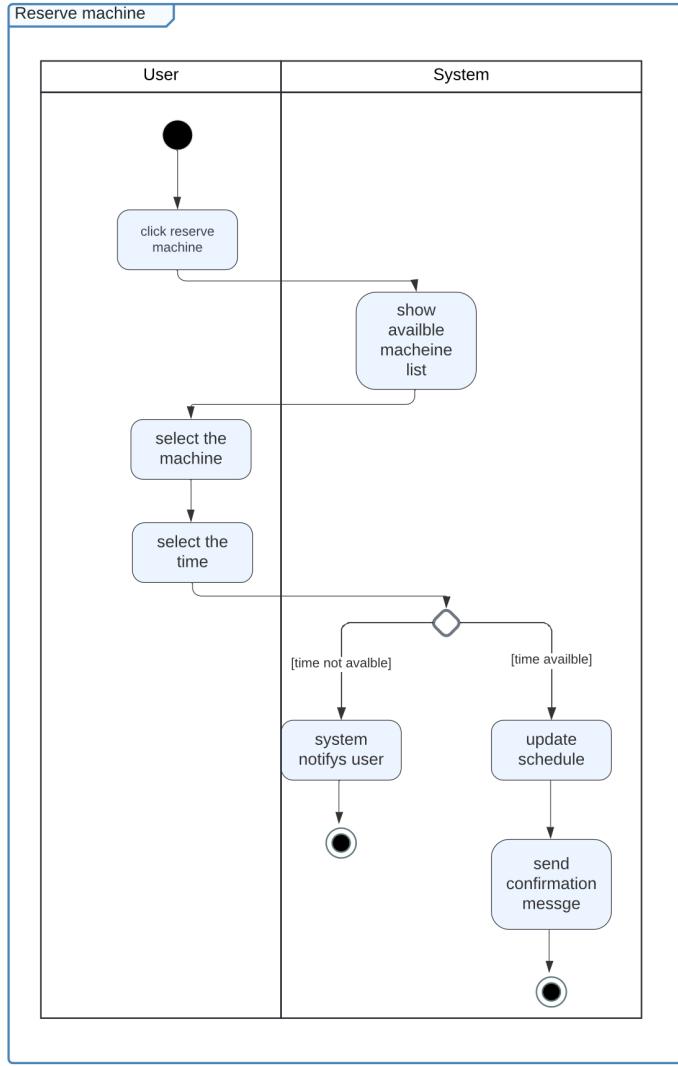


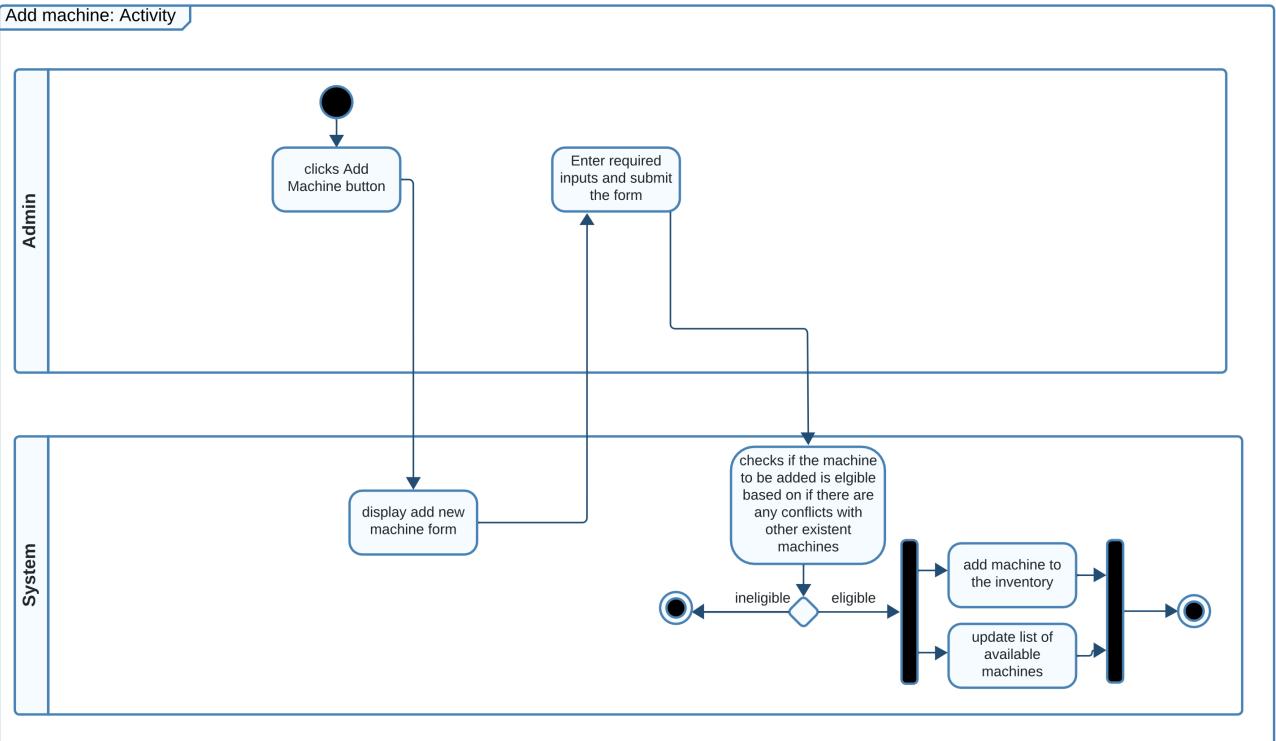
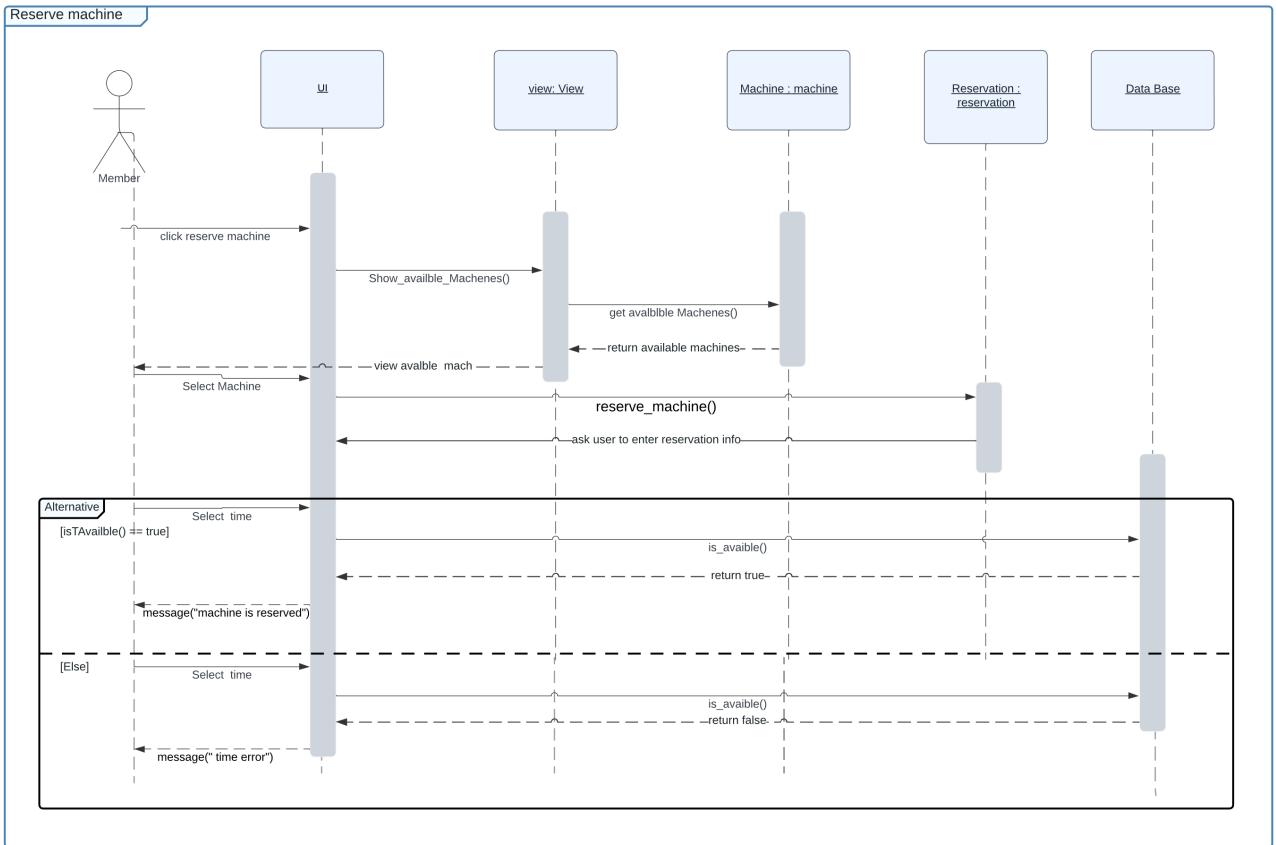
Controller Classes (for UI)

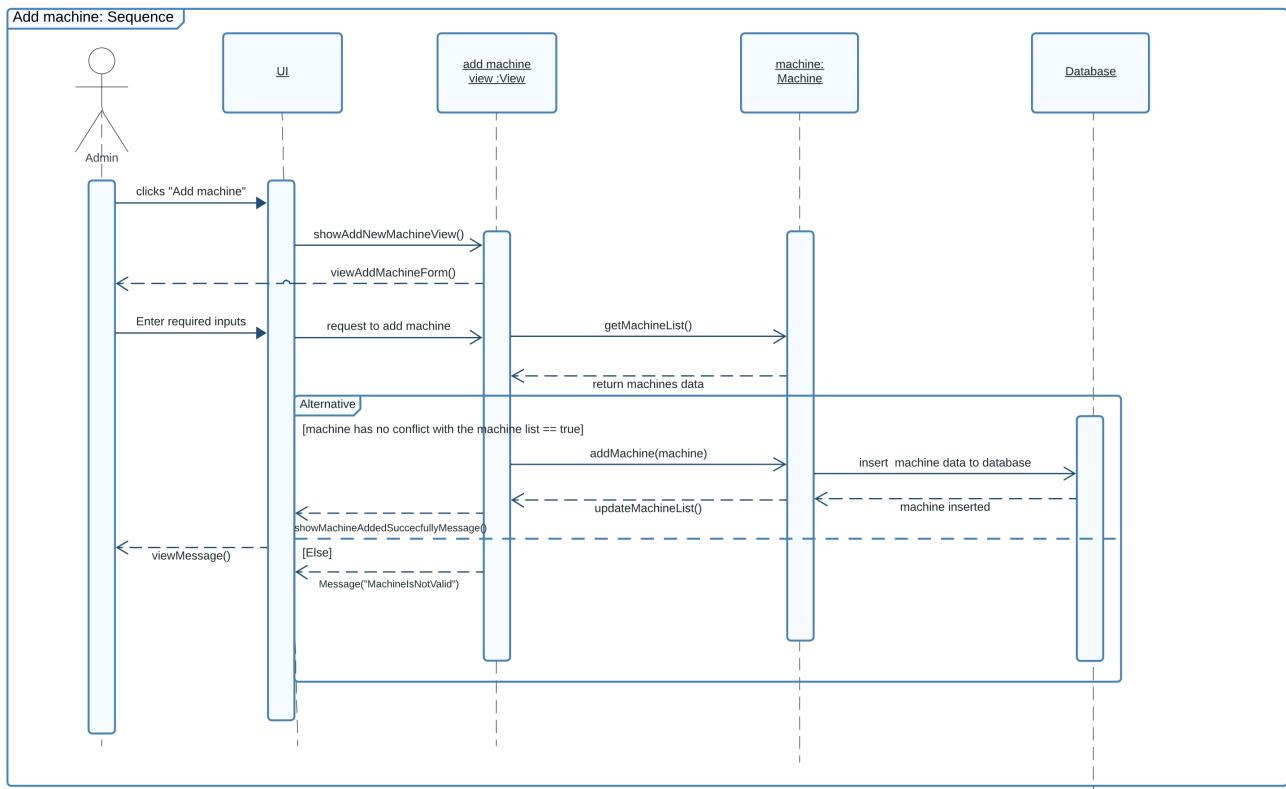












Work distribution

Joud Alsayid	Create sequence and activity diagram for assign teams and create User and Member classes and editing pdf for phase 2
Jood Faqera	Create sequence and activity diagram for add machine and create Reservation, Team, Machine classes
Rimas Alghamdi	Create sequence and activity diagram for reserve machine and create MachineSchedule class and Controller Classes (for UI)
Aishah Algharib	Create sequence and activity diagram for view system statistics and create View, ResearchInterest, and Project classes
All team members	Add associations in class diagram and review all diagrams

Thank You!

