

UTD

RE-MATCH



Final Report

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Systems Proposal

Executive Summary

The purpose of this system plan is to ease the process of making reservations and connect students with similar interests in three highly active UTD buildings: Student Union, Rec Center West, and the Activity Center. Many students utilize time in between classes or after their day comes to an end to let loose and engage in physical activity at these locations. The problem is that students either have to talk to the front desk at these centers face-to-face or call to reserve courts, which can be inconvenient. Another problem is that students sometimes don't have a partner when attending these facilities and there is no current way for these people to find partners. *Re-Match* is an application that aims to provide a solution to an on-going issue that students face when having trouble reserving the courts or tables at these centers on campus.

This application will allow students to reserve hourly time slots for racquetball, badminton, basketball courts, ping pong, and pool tables within a 24-hour time period. This app will be able to show updates of availability for these activities in real-time. The objective is to make the process of using on-campus athletic facility services more efficient and enhance student experiences, while saving time and offering the convenience of making reservations for both students and front desk representatives. Another functionality of this application is finding partners (via "matching") for students to play activities with if they don't currently have partners or want to socialize with new folk. This can also help students create connections and build their social networks.

Re-Match is currently an application that does not exist but because of its relevance to students who often use the Activity Center, Student Union, and Rec Center West, we believe it would play an essential part in the lives of these students and hope that it will come in to existence in the future.

Background and Justification

- Project Background:
 - These conditions make the process of making reservations very inconvenient and not user-friendly:
 - In order to reserve ping pong and pool tables at the Student Union, badminton tables and basketball courts at the Recreation Center West, and racquetball and squash courts at the Activity Center on the UT Dallas campus, students have to talk to the representatives at the front desk either face-to-face or call to make reservations at these center.
 - Students have little to no idea about the availability of these courts and tables.
 - Students sometimes may not have a partner to play these activities with, leading to missed opportunities for improvement in sociability for students.
- Project Justification:
 - Higher rates of efficiency for both students and front desk representatives, and more user-friendly experiences for students can be achieved if students are able to reserve courts by their control.

- Allowing students to view/book time-slots through a more user-accessible means like an web/mobile app can help attain higher rates of efficiency and reduce the risk of human error.
- Provide more opportunities for students to socialize.

Functionality (objectives)

- Reduce inconvenience of students having to consult with front desks to know whether the campus facilities are available.
- Make data viewable for students about the availability of the courts/tables.
- Students would be able to reserve 30-minute time slots at these centers within a 24 hour time frame from the app.
- Provide a chat interface for students to interact with each other if students are looking to invite other students or if students don't have a partner to play with.
- Facilitate use of campus recreational facilities.
- Reduce the risk of human error.

Project Scope

- In scope:
 - The project will target students and front-desk representatives as its primary users.
 - The project will be a software implementation which will be available via mobile and the web.

- The project will aim to limit the amount of time needed to make reservations.
 - The project will aim to provide opportunities for students to socialize.
 - The project will attempt to limit the risk of human error.
- Out of scope:
 - The project will not be designed for business use.
 - The project will not be designed for students who don't attend UT Dallas.
- The project is targeted to students and front-desk representatives at the centers with students being its primary users and front-desk representatives. This project is within the scope of being available to students who attend UT Dallas as the likelihood of similar situations happening on other campuses is unknown. The primary scope of this project is to provide a tool for students and staff, which eases the process of making reservations and opens possibilities for student interaction.

Functional and Non-functional requirements

- **Functional Requirements:**

Requirement Name:	Description:
Register User Account	The system must be able to verify a user registering is an active student. The system must also create, register and store user accounts.
Remove Users Automatically	The system must compare accounts to active student database to unregister students who leave or graduate from the university.

Reservation of court	The system must keep a database of all court reservations and cross-reference this against new requests. If no reservation is in place for selected time, the system must create a new one.
Student Matching	The system must keep a record of all students who wish to play with someone else and provide suggestions based on time and availability.
Storage of Reservation	The system must store user data (user reservation and invitation history) for at least 4 years until the user exits the university. The system will indefinitely store reservation data in the database for use in analytics and future expansion.

- **Non-Functional Requirements:**

Requirement Name:	Description:
Efficiency	The application must be able to easily access the data used for the reservation and matching system while providing timely results.
Availability	The application must be online at all times and available for use. There will be times when the user cannot reserve a slot due to facilities being closed but the system must still be operational and able to receive requests.
Reliability	The application must be reliable and able to accept requests anytime. We are aiming to provide a reliability percentage of 50%. This would

	include app crashes, inconsistent loading, incorrect matching and errors in reservations.
Performance	The application must be responsive in a quick and timely manner. The application must perform key features within 15 seconds such as opening, closing, submitting a booking, fetching available times and fetching available players among others,
Security	The application will keep a log of all paired matches and scheduled meeting times to ensure the safety of the user. All persons registering and using the app MUST be active students to use the system.
Usability	The application must be easy to navigate and allow students to view available time slots. We wouldn't like distracting ads within the app and would like an interface that is easy to understand.
Login	The application will use DUO dual authentication to validate login credentials against the schools active student database
Legal	<p>The application will set strict guidelines against any form of online harassment, misconduct, or misbehavior. Any breach of this legal policy will result in temporary suspension or deactivation of user accounts based on the degree of misconduct.</p> <p>The application will abide by the Data Protection Act.</p>

Culture	The application will be available in English, Spanish, Japanese, Arabic and Hindi using Google's services.
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Expected Value

- Once the system is implemented fully and ridden of any possible erroneous features – we can expect the main outcome to be vastly improved customer (student) experience and satisfaction. This stems from removing the necessity of walking to the centers for an inquiry on availability, or calling the help desk and hoping for accurate information. Another outcome would be increased usability of the fields because of QOL changes the system would bring: efficiency, convenience, ease of use, and a way to find a partner for games intended to play. Another outcome would be the increased interactivity between students that would not be able to participate in these activities if the activity requires several participating bodies; this system provides an easy, built-in solution for students without partners to play with.

Constraints

- Current difficulty in collecting data regarding student identification, courts, tables and equipment availability
- Short time frame to deploy prototypes and receive substantial feedback for improvement
- Project scope is limited due to time and human resource constraints

- Limited human resources with extra, prioritized responsibilities
- Funding is restricted for deployment and implementation
- Human capital is limited in programming expertise
- Time limitation of under 4 months to finish the whole project

Project Schedule

WBS

Task Name	Dependencies	Effort (in days)	Estimated Start Date	Estimated End Date	Allocation of Activities
<i>Planning</i>					
Meeting Minutes		1	09/26/2019	09/26/2019	Krishnasai
1) Executive Summary		6	09/26/2019	10/02/2019	Rasaan
2) Systems Proposal					
2a) Background and Justification	2.1	6	09/26/2019	10/02/2019	Krishnasai
2b) Functionality (objectives)	2.2	6	09/26/2019	10/02/2019	Fabliha
2c) Project Scope	2.3	6	09/26/2019	10/02/2019	Krishnasai
2d) Functional & Non-functional requirements	2.4	6	09/26/2019	10/02/2019	Andrew
2e) Expected Value	2.5	6	09/26/2019	10/02/2019	Dan
2f) Constraints	2.6	6	09/26/2019	10/02/2019	Minh
Meeting Minutes		1	10/02/2019	10/02/2019	Rasaan
Meeting Minutes		1	10/09/2019	10/09/2019	Krishnasai
Meeting Minutes		1	10/17/2019	10/17/2019	Rasaan
<i>Analysis</i>					
3. Process Model: Use-Case Diagrams	2.7	1	10/17/2019	10/17/2019	Krishnasai, Fabliha,

and Descriptions					Rassaan, Andrew, Dan, Minh
4. Class Diagram	3	21	10/24/2019	11/14/2019	Krishnasai, Fabliha, Rassaan, Andrew, Dan, Minh
5. Object Behavior Model: A Sequence Diagram for the major Use Cases	4	21	10/24/2019	11/14/2019	Krishnasai, Fabliha, Rassaan, Andrew, Dan, Minh
<i>Design</i>					
6. Interface Design	5	21	10/24/2019	11/14/2019	Krishnasai, Fabliha, Rassaan, Andrew, Dan, Minh
7. Test Cases	6	7	11/14/2019	11/21/2019	Dan
8. Software Design	7	7	11/14/2019	11/21/2019	Andrew
9. Control	8	7	11/14/2019	11/21/2019	Krishnasai
<i>Implementation</i>					
10. System Construction (Back-end)	12	7	11/21/2019	11/28/2019	Andrew, Fabliha, Dan
11. UI Creation (Front-end)	13	5	11/28/2019	12/05/2019	Rassaan, Krishnasai, Minh
12. System Installation	14	5	11/28/2019	12/05/2019	Fabliha, Krishnasai, Andrew, Dan, Minh, Rassaan
16. App Implementation	15	5	12/05/2019	12/10/2019	Andrew, Krishnasai, Fabliha, Andrew, Dan, Minh

Meeting Minutes

Meeting (09/26/2019)

- Distributing parts of system proposal to each member
- Starting the designing of the WBS

Meeting (10/02/2019)

- Reviewing and refining everyone's part on system proposal

Meeting (10/09/2019)

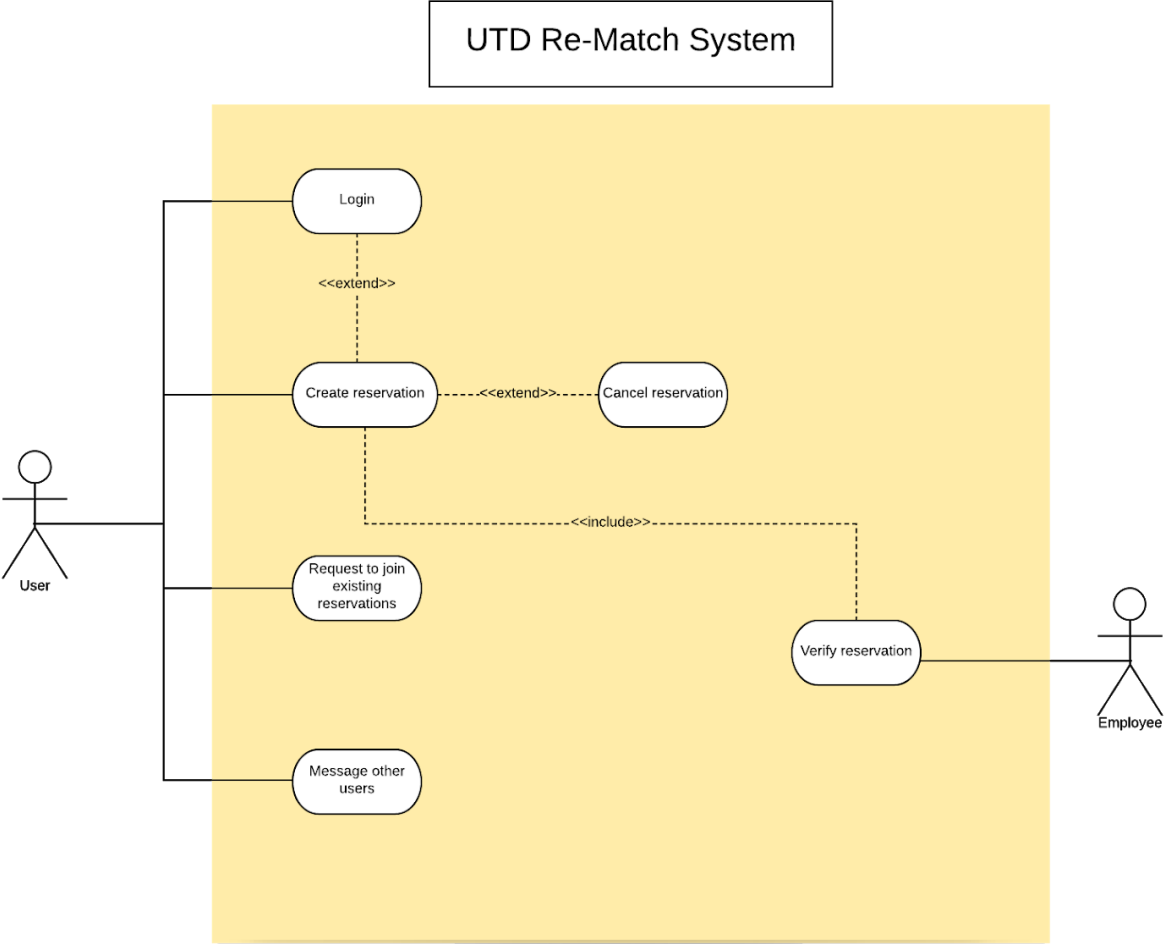
- Reviewing comments on and refining system proposal

Meeting (10/17/2019)

- Finishing use case diagram & descriptions
- Finishing the designing of the WBS

Use-Case Diagram & Descriptions

Use-Case Diagram



Use-Case Descriptions

Use Case Name: Login	ID:1	Importance Level: High
Primary Actor: User	Use Case Type: Essential, Internal	
Stakeholders and Interests: User/Customer - Login to access application.		
Brief Description: This case explains how the user will be able to access the application and go through the initial setup.		
Trigger: User - interest in using the application		
Subflows: None		
Normal Flow of Events: <ol style="list-style-type: none">1) User clicks "Log In" button2) User enters Net ID3) User enters password4) User hits submit5) System confirms login		
Alternate/Exceptional Flows: 5a) If failed login <ol style="list-style-type: none">1. Please re-enter password.2. Account is locked after 5 unsuccessful attempts.3. Wait 10 minutes till next login attempt 5b) If login successful on 1st screen <ol style="list-style-type: none">1. User authenticates login one more time using DUO Mobile Authentication (choose phone)		

Use Case Name: Create Reservation	ID:2	Importance Level: Medium
Primary Actor: User		Use Case Type: Essential, Internal
Stakeholders and Interests: User/Customer - Create a reservation for any available field/court.		
Brief Description: This case explains how the user will be able to reserve a specific field/court for the sport he/she wants to play.		
Trigger: User - wants guaranteed access to a field/court		
Subflows: None		
Normal Flow of Events:		
<ol style="list-style-type: none"> 1) User picks the sport (tennis, ping-pong, racquetball, badminton, basketball) desired to play 2) User views fields/courts for that sport 3) User selects a field/court 4) User views times that are open 5) User picks a time and date he/she wants to reserve the field for 6) User confirms how long he/she will occupy the field 7) User sets the invitation settings of his/her games as “open” or “closed” option by default 		
Alternate/Exceptional Flows:		
3a) If user clicks on an already occupied field <ol style="list-style-type: none"> 1. Prevent user from reserving field 2. Deliver message “Field is occupied - please choose an open one” 		

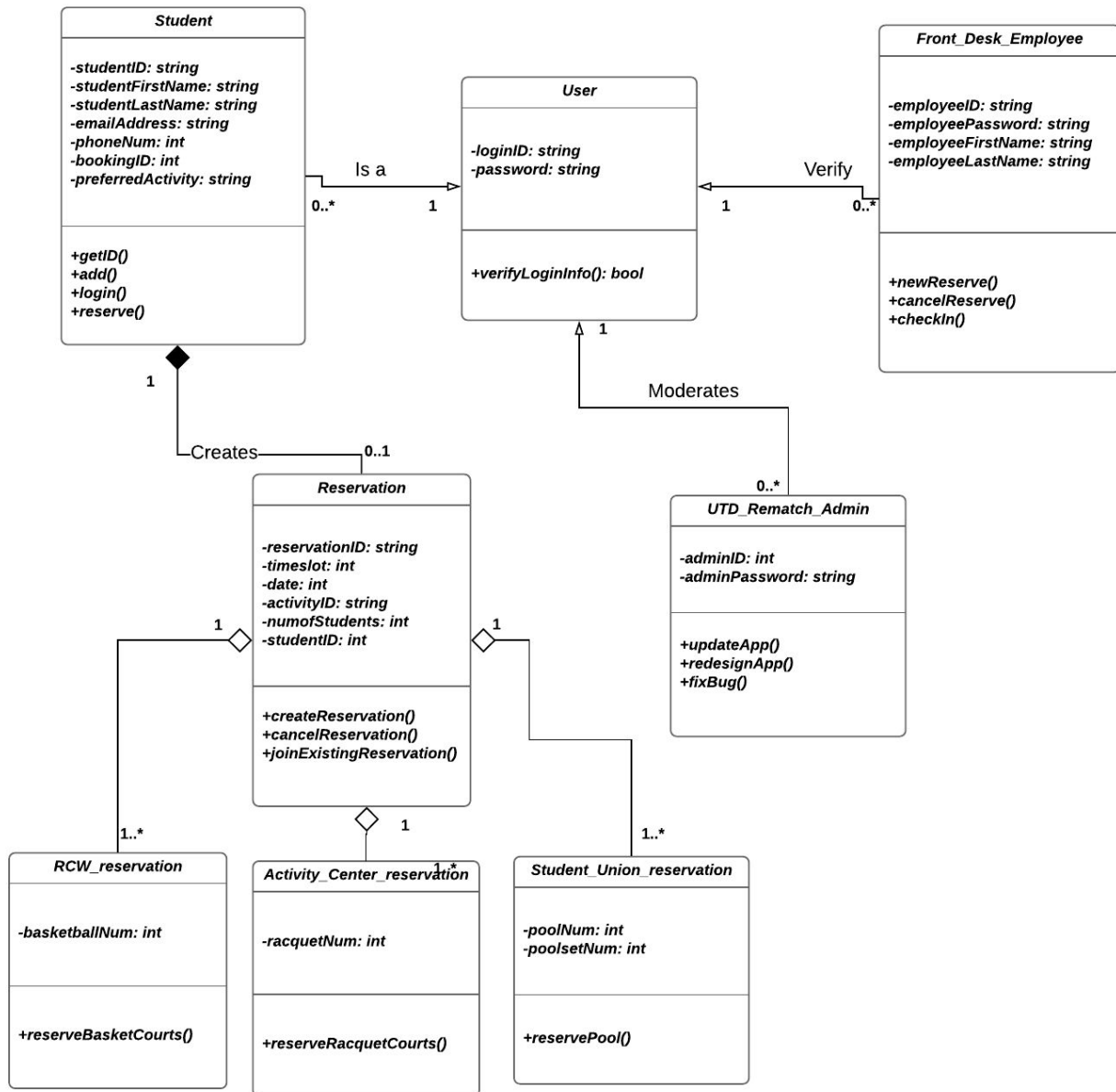
Use Case Name: Cancel Reservation	ID: 3	Importance Level: Medium
Primary Actor: User		Use Case Type: Essential, Internal
Stakeholders and Interests: User/Customer - Cancel a reservation		
Brief Description: This case explains how the user will be able to cancel their reservation made on the app.		
Trigger: User - wants to cancel an existing reservation		
Subflows: None		
Normal Flow of Events:		
<ol style="list-style-type: none"> 1) User clicks his/her reservation 2) User clicks "Cancel reservation" 3) User and other users associated with the reservation get confirmation notification immediately 4) Cancellation complete 		
Alternate/Exceptional Flows: <i>None</i>		

Use Case Name: Request to Join	ID:4	Importance Level: Medium
Primary Actor: User		Use Case Type: Essential, Internal
Stakeholders and Interests: User/Customer - User wants to participate/join in existing reservations.		
Brief Description: This case explains how the user has the option of joining any open fields as an easy way of finding a game partner.		
Trigger: User - wants to enjoy active games with other players		
Subflows: User - may message owners of other open groups.		
Normal Flow of Events:		
<ol style="list-style-type: none"> 1) User selects active reservations 2) User sets game as open 3) User accepts or declines incoming requests 4) User looks for active, open fields 5) User applies to join other student's game 		
Alternate/Exceptional Flows:		
<ol style="list-style-type: none"> 5a) If maximum number of players reached <ol style="list-style-type: none"> 1. Prevent user from joining 2. Show message "Please apply to a different game" 		

Use Case Name: Verify Reservation	ID:5	Importance Level: High
Primary Actor(s): Desk Worker, System		Use Case Type: Essential, Internal
Stakeholders and Interests: Desk Worker - View reservations and mark as fulfilled System Administrator - View success rate of fulfilled reservations		
Brief Description: This case explains the process of a user's check-in at the front desk.		
Trigger: Player Arrives to Check In		
Subflows: None, Optional		
Normal Flow of Events: <ol style="list-style-type: none"> 1. User arrives to check in 2. Users provides proof of reservation (Comet Card, Net ID, confirmation email) 3. Desk worker verifies reservation 4. Desk worker marks reservation as fulfilled 		
Alternate/Exceptional Flows: <ol style="list-style-type: none"> 1a) User does not arrive within 15 minutes of reservation time <ol style="list-style-type: none"> 1. Reservation automatically cancelled by system 3a) Reservation invalid or proof not provided <ol style="list-style-type: none"> 1. Deny user reservation 		

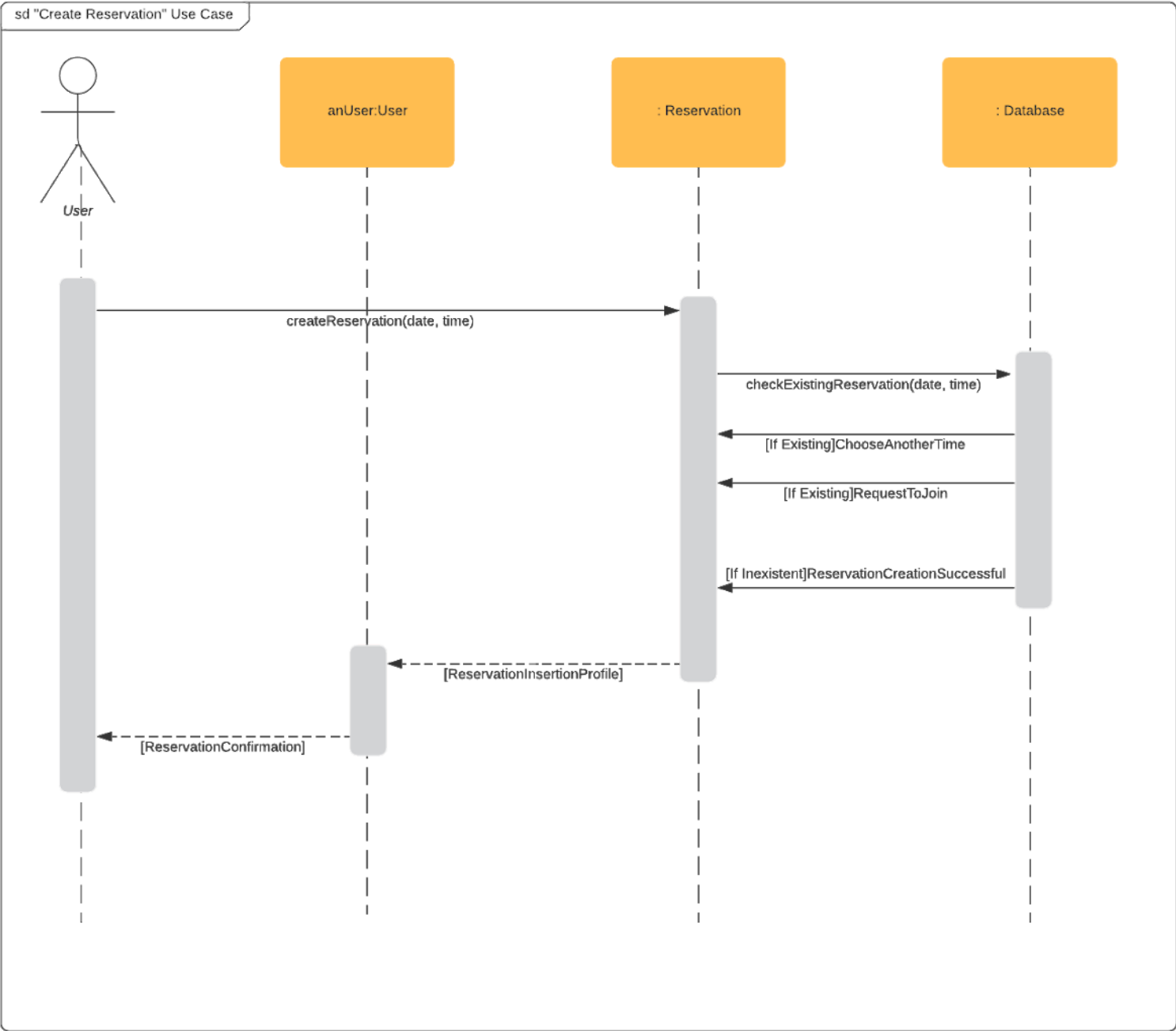
Use Case Name: Message Other Users	ID:6	Importance Level: Medium
Primary Actor: User		Use Case Type: Non-Essential, Internal
Stakeholders and Interests: User/Customer - Students who need to message other users to find playing partners		
Brief Description: This case lays out the processes of students who want to direct message other students or create group messages.		
Trigger: User - need to form a group for the activity.		
Subflows:		
<ol style="list-style-type: none"> 1. User can start a conversation with the owner of an existing reservation. 2. User can start a conversation with another user without needing an existing reservation. 		
Normal Flow of Events:		
<ol style="list-style-type: none"> 1. User selects another user or a group of users to start a conversation 2. Chat is created 3. Users are able to message each other 		
Alternate/Exceptional Flows: None		

Class Diagram

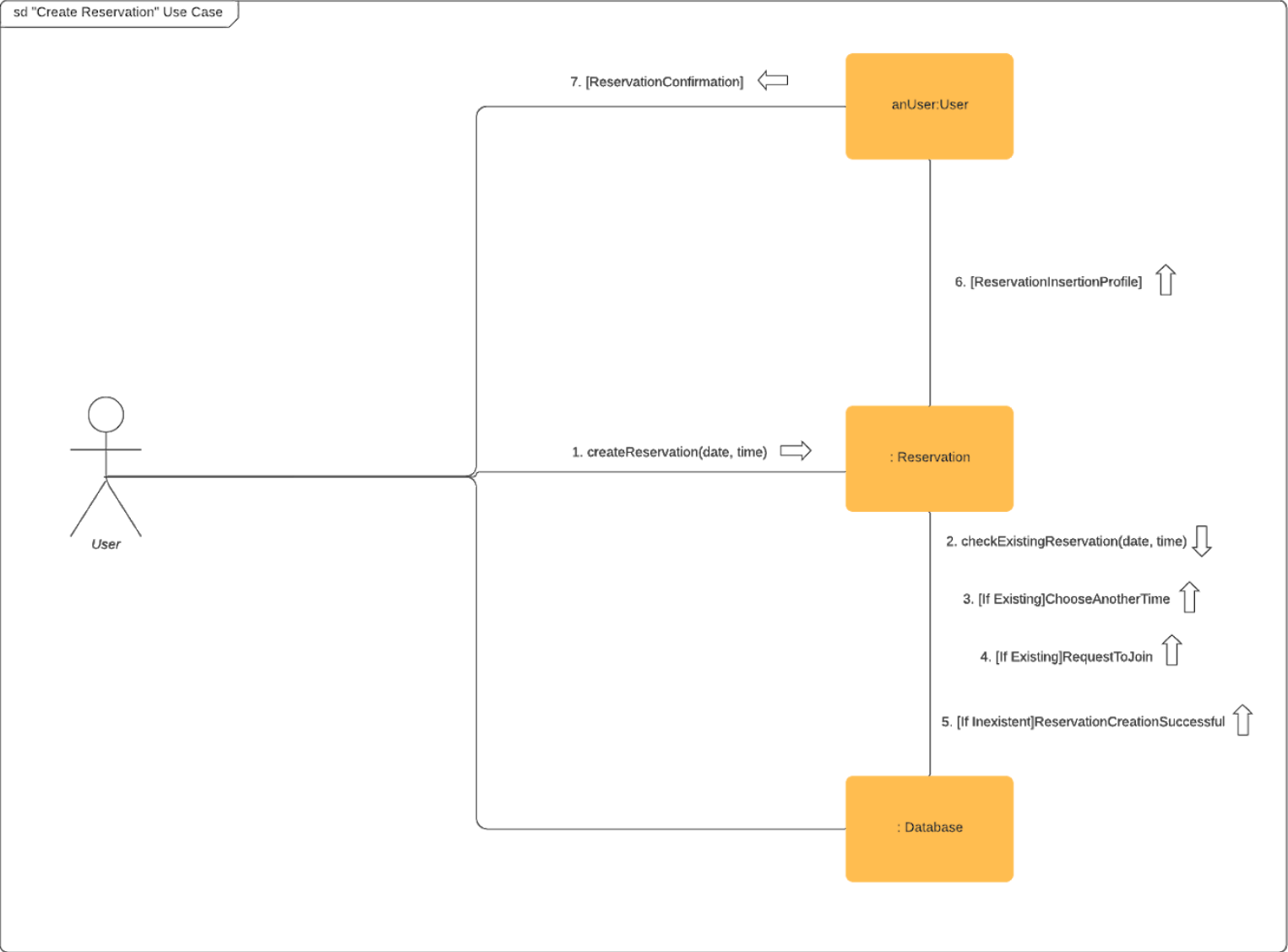


Communication & Sequence Diagrams

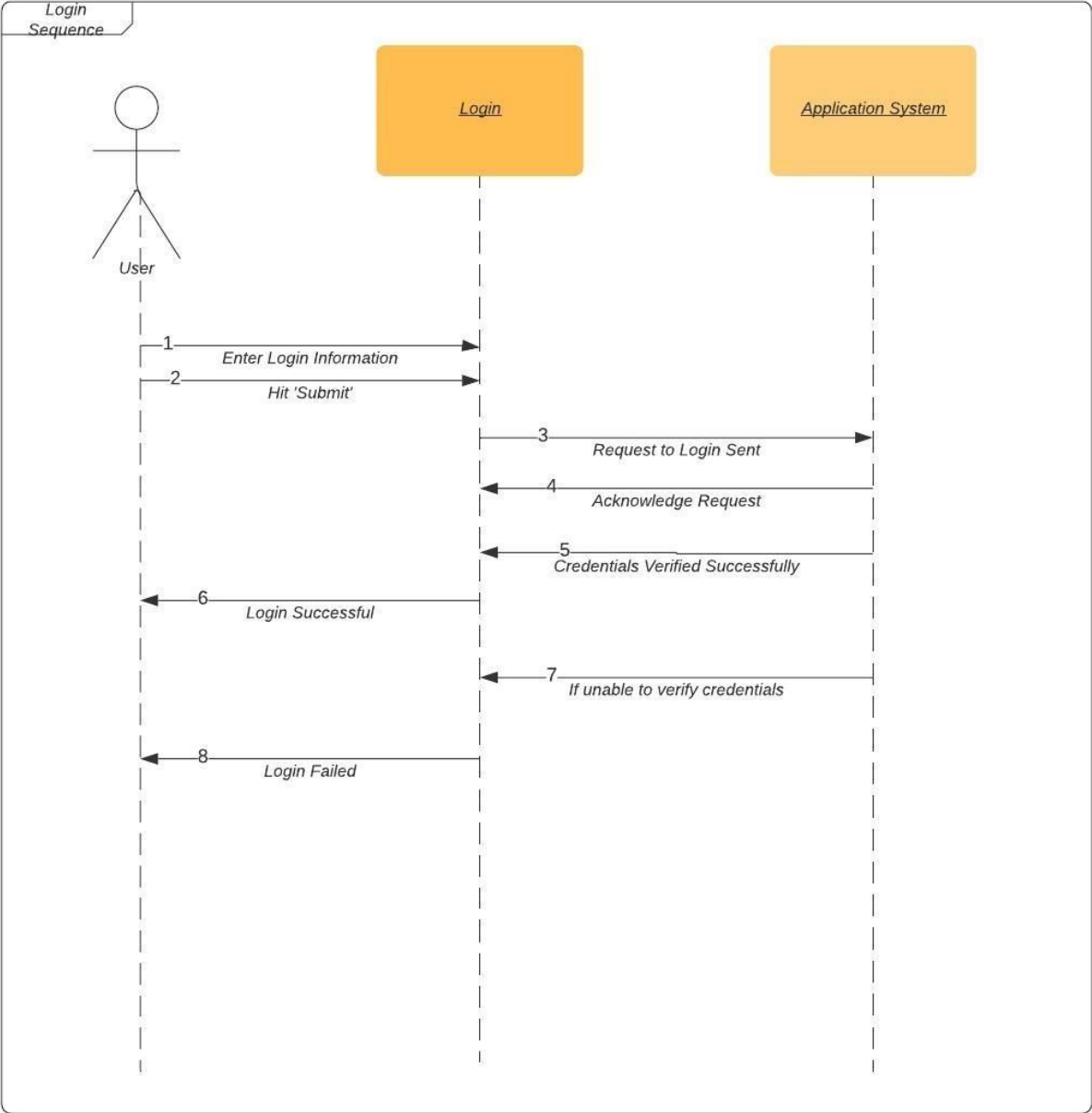
Sequence Diagram #1



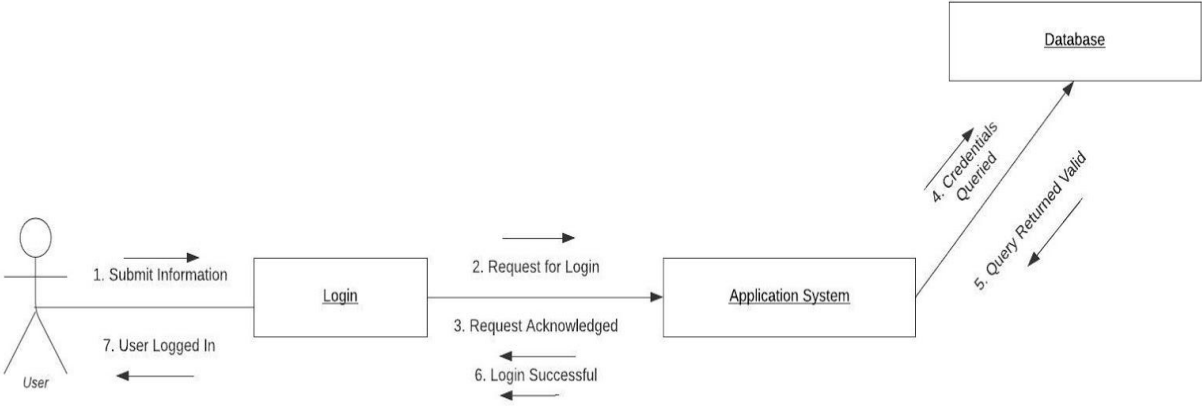
Communication Diagram #1



Sequence Diagram #2

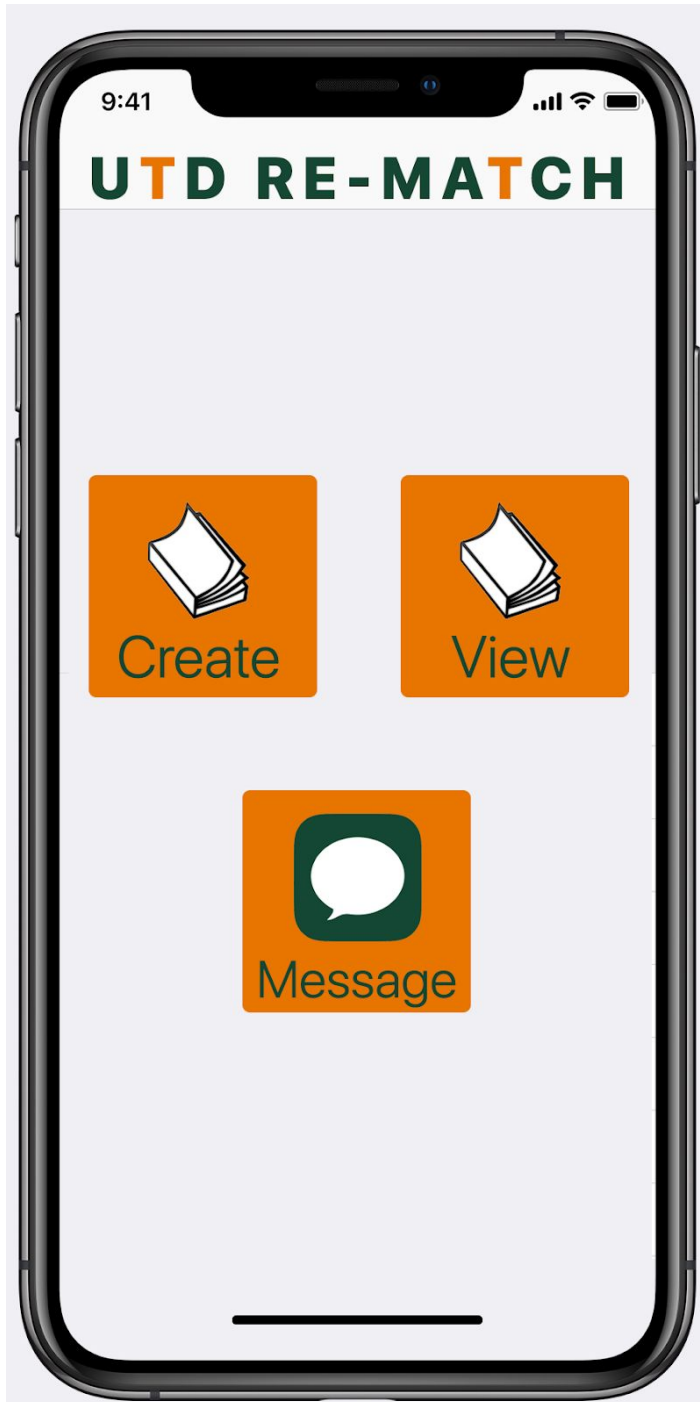


Communication Diagram #2

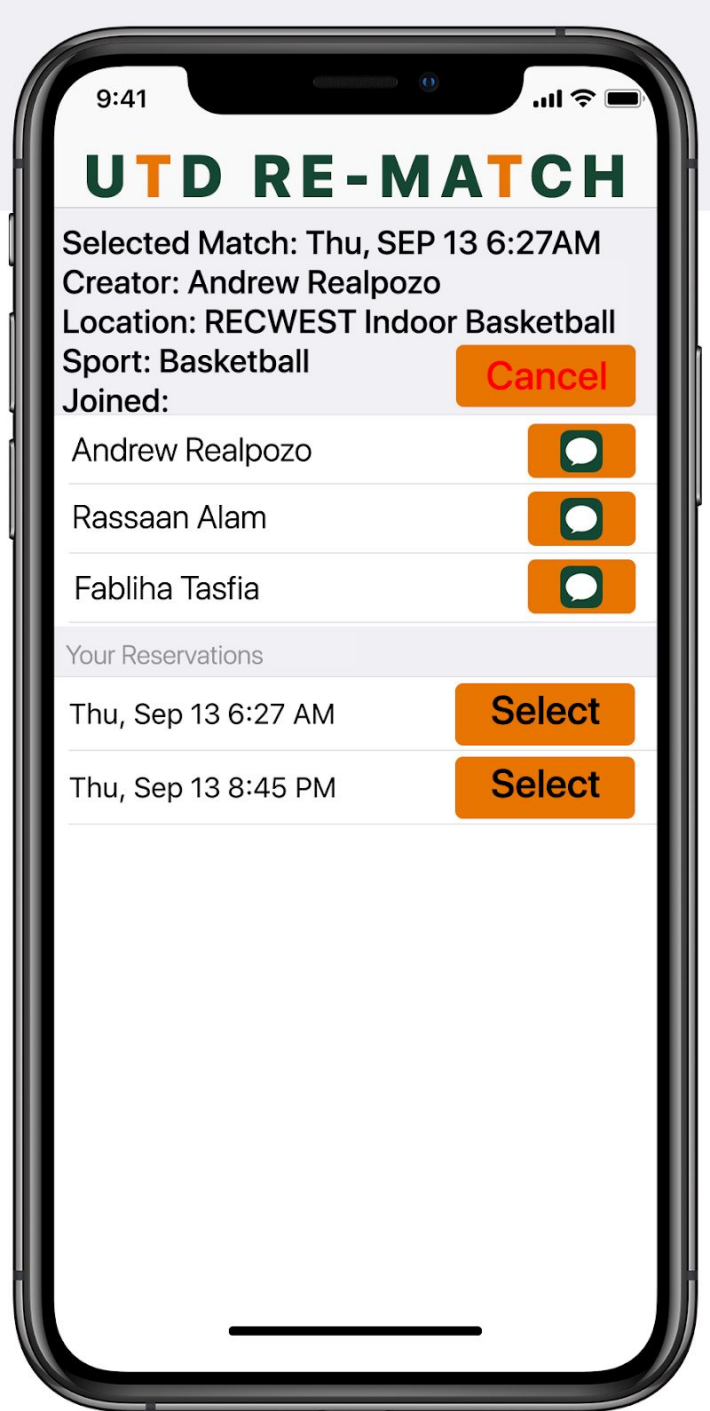


User Interface

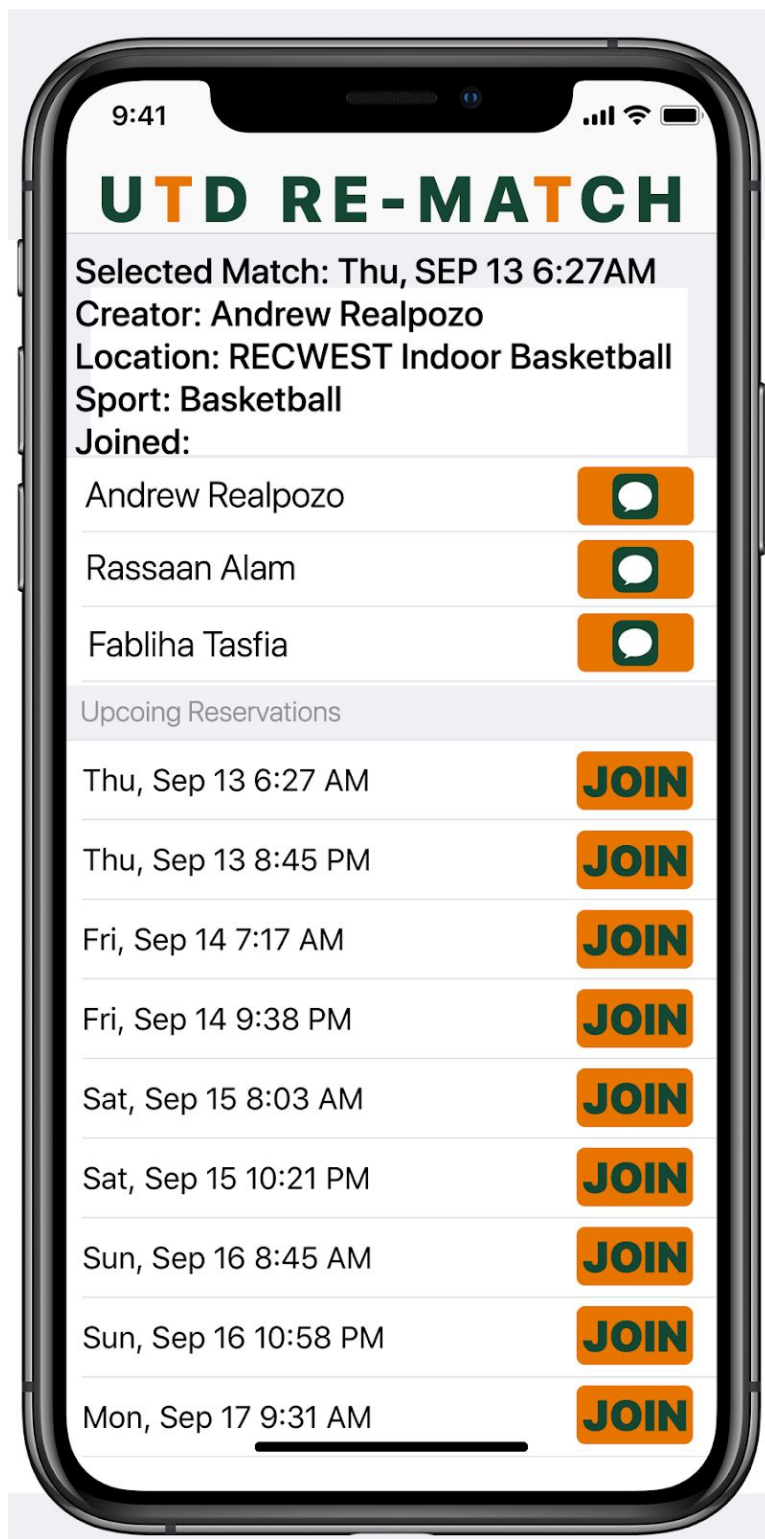
Home Screen UI



Your Reservations UI



View Reservation UI



Messaging UI

