

## Project Plan (Semester 2)

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### TutorFIT

Project Title:

A Mobile Application Connecting Students and Tutors at the Florida Institute of Technology

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Client:

- Dr. Khaled Salhoub
- Students of the Florida Institute of Technology

Client Meeting:

- 01/19/2024



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## **1. Goal and Motivation**

Our primary objective is to streamline the process of connecting students with accessible tutoring resources at the Florida Institute of Technology (FIT). We will make the process of finding a tutor easier for students while also giving them flexibility with regards to more tutoring options being available. Additionally, we aim to bridge the noticeable deficit of available tutors, particularly for challenging junior and senior level classes. The current tutoring system at FIT falls short in covering these advanced courses, leaving students with limited options for seeking extra assistance on complex topics. Our app will empower successful students to offer tutoring to their peers, expanding the pool of available tutors and improving the overall learning experience for the FIT student community. By creating a dynamic platform that connects students and tutors, we aim to provide a comprehensive solution that meets the diverse and demanding educational needs of our university.

## **2. Approach**

Our approach to developing this app is centered around addressing the critical need for accessible tutoring resources for students at FIT, and our intended features are designed to achieve this goal effectively:

### **2.1 User Registration**

Students and tutors will have the option to "sign up" and input their personal information to create their profiles within the app. This registration process will be user-friendly and intuitive, guiding them through the steps to provide essential details. Additionally, we will include a comprehensive database of courses to simplify the registration process, making it easier for users to identify and add their relevant courses. To allow student and tutor registration, we will also utilize a live search feature, allowing users to quickly find the courses and professors they need during the registration process. Students and Tutors will also be able to set their preferred teaching or learning languages.

### **2.2 Scheduling (Student and Tutor)**

Students will have the ability to view a list of the classes they are enrolled in and access information about available tutors for those classes. They can then schedule tutoring sessions at their convenience. Tutors, on the other hand, will be able to view the list of classes they have earlier selected to tutor for (during registration) and manage incoming tutoring requests, accepting or declining them as needed. Students will also be able to search for tutors using filters such as course name, course code, preferred learning language and department.

### **2.3 Communication (Between Student and Tutor)**

Effective communication is essential for successful tutoring. We will implement an in-app messaging feature, leveraging real-time messaging SDKs, to facilitate seamless communication between students and tutors. Users can choose to communicate via in-app chat or through email if they prefer.

## **2.4 Push Notifications/Alerts**

To keep users informed and engaged, our app will support push notifications and alerts. Students will receive alerts about accepted or declined appointments, reminders for scheduled tutoring sessions, and messages from their tutors. Tutors, on the other hand, will be notified of pending appointment requests from students, cancellations, and incoming messages from their students. These real-time notifications ensure that both students and tutors stay well-connected and can manage their tutoring commitments effectively.

## **2.5 Event Tracking**

We will integrate a third-party SDK to monitor user engagement and interactions with the app. This will include tracking the amount of sign-ups, appointments booked and canceled as well as other relevant activities. The data collected will be valuable for stakeholders to gain insights into app usage and make informed decisions for improvements.

## **2.6 User Engagement and Retention**

In our app, we value and reward user loyalty. Loyal and frequent users will have the unique advantage of accessing free tutoring sessions, funded by revenue generated from strategically integrated advertisements via a third-party ad provider. Simultaneously, our dedicated tutors will benefit from ad revenue redistribution, allowing them to earn extra income. This dual approach not only encourages users to stay engaged with the app but also creates a mutually beneficial ecosystem where students receive valuable tutoring while tutors are rewarded for their commitment, enhancing the overall learning experience within our community.

## **2.7 Student Reviews and Ratings**

To promote transparency and accountability, we will implement a feature that allows students to rate and leave reviews about their tutoring sessions and experiences with individual tutors. After each tutoring session, students can provide feedback on factors such as tutor knowledge, communication skills, and overall effectiveness. These reviews and ratings will be visible to other students considering the same tutor, helping them make informed decisions when choosing a tutor. Additionally, tutors will have the opportunity to view and respond to student feedback, fostering a constructive feedback loop that benefits both students and tutors. This feature encourages high-quality tutoring and creates a sense of trust within our tutoring community.

# **3. Algorithms and Tools**

## **3.1 Algorithms**

- 1. Searching Algorithm:** To enable quick traversal and retrieval of courses during user registration.
  - a.** Integrate a binary search algorithm for efficient searching through the sorted list of courses.
  - b.** Develop a live search feature that dynamically displays search results as the user types, enhancing the user experience.

2. **Sorting Algorithm:** To organize the list of courses in a user-friendly manner, facilitating easy selection.
  - a. Employ a quick sort or merge sort algorithm to sort courses based on various criteria such as course code or name.
  - b. Ensure that the sorted list updates in real-time as new courses are added or existing courses are modified.
3. **Stacks and Queues:** To manage and add the courses selected by users during the registration process.
  - a. Implement a queue data structure to process course registrations in the order they were added.

### 3.2 Technical Tools

1. **User Registration:** Native form creation
2. **Scheduling (Student and Tutor):** Calendly
3. **Communication (Between Student and Tutor):** Twilio
4. **Push Notifications/Alerts:** Microsoft AppCenter
5. **Student Rating and Reviews:** Native Review System
6. **Event Tracking:** Microsoft AppCenter
7. **User Engagement and Retention:** Microsoft AppCenter

## 4. Novel Features/Functionalities

### 4.1 Real-Time Communication

The feature of facilitating real-time communication between students and tutors is novel, primarily because it addresses a significant gap in the market. Many educational apps lack a centralized and efficient way for students and tutors to communicate seamlessly. By integrating real-time messaging capabilities, our app offers a practical solution for enhancing the learning experience by allowing for immediate clarification of doubts and queries.

### 4.2 Event Tracking

While event tracking itself is a common practice, the emphasis on using third-party SDKs to monitor and gather data about user engagement, user retention, and the ease of system use is a novel approach. This data-driven approach not only helps in improving the app's overall user experience but also provides valuable insights for stakeholders, enabling informed decisions and enhancing the app's long-term sustainability and success.

### 4.3 Incentive/Reward Systems

While reward systems are not uncommon in apps, the specific implementation of an incentive system that offers free tutoring sessions to loyal and frequent users, while also allowing tutors to benefit from ad revenue redistribution, is a unique and compelling approach. It encourages both students and tutors to actively participate and engage with the platform.

#### **4.4 Student Reviews and Ratings**

The novel feature is the integration of real-time student reviews and ratings for tutors on the platform, enhancing transparency and accountability. This feature allows students to provide immediate feedback after each session, making it unique. Furthermore, the visibility of these reviews to other students aids in informed tutor selection. The ability for tutors to respond to feedback fosters improvement, ultimately promoting high-quality tutoring and trust within the community.

### **5. Technical Challenges**

#### **5.1 Cross-Platform Application Development**

Developing a cross-platform application that works seamlessly on various devices and operating systems will be a challenge, especially since the team has only a cursory knowledge of cross-platform development frameworks. Ensuring a consistent user experience across platforms while optimizing performance and handling platform-specific nuances can require a deep understanding of these technologies. It's important that we invest time in learning and mastering these frameworks to ensure the project's success.

#### **5.2 Limited Availability of Florida Tech's existing API and Web Hooks**

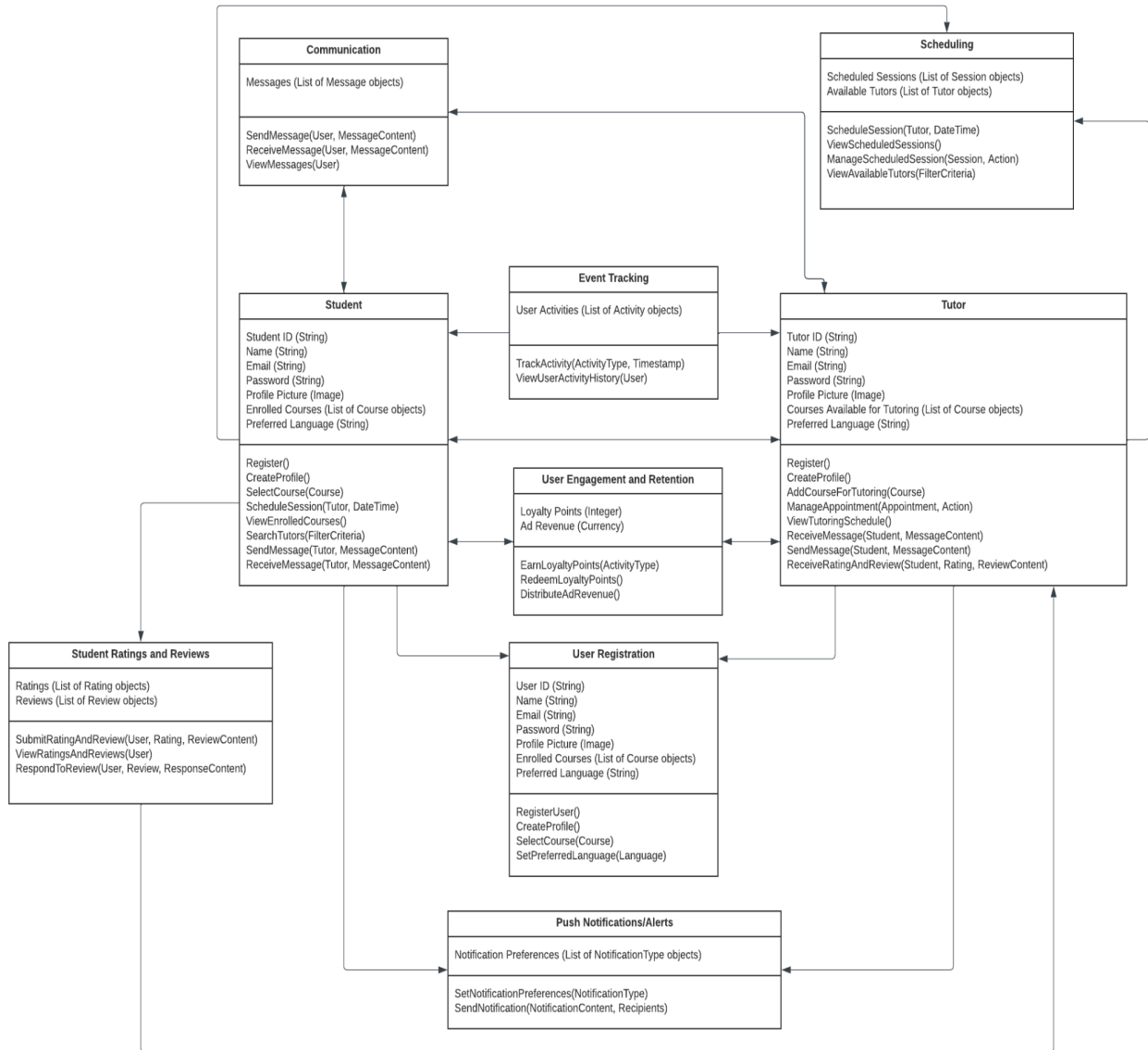
The absence of API access will limit our ability to retrieve real-time data from the Florida Tech registrar or hub, making it difficult to provide up-to-date information to users. Without access, we will rely on the structure and availability of the Florida Tech registrar or hub's web pages. Any updates to these pages can potentially disrupt our manual data retrieval methods and will require constant monitoring and adjustments to keep the app functional.

#### **5.3 Using JavaScript for Server-Side Automations**

While JavaScript is a versatile language widely used for web development, using it for server-side automations can pose challenges, especially as the team lacks experience in server-side JavaScript development. Ensuring the security and scalability of server-side components, such as handling user communication, sending push notifications, and managing email delivery, demands a strong understanding of JavaScript's backend frameworks like Node.js. Overcoming this challenge may involve extensive research, training, or collaboration with experienced backend developers to implement robust and secure server-side functionalities.

## 6. Design

### 6.1 System Architecture Diagram



## 7. Evaluation

We are using Microsoft app centers tracking ability to evaluate our mobile app development and lifecycle. Some of the metrics we are measuring are student course registration interest and popularity, app openings for initial user engagement, and sign-up page visits for onboarding effectiveness and initial interest. We will also be evaluating the login frequency, app load time, and response time for requests. By monitoring these metrics we are focusing on speed, accuracy, reliability, and user survey.

## 8. Progress Summary

<b>Task</b>	<b>Completion</b>	<b>To do</b>
<b>User Registration</b>	100%	
<b>Scheduling</b>	75%	Calendly API Integration
<b>Ratings and Reviews</b>	50%	Feature needs to be implemented
<b>Event Tracking</b>	100%	
<b>Communication</b>	50%	Feature needs to be implemented
<b>User Engagement and Retention</b>	70%	Implementation
<b>Push Notifications</b>	20%	Implementation

## 9. Milestone 4 (Feb 19)

1. Implement, test and demo: Student vs. Tutor Log In
2. Implement, test and demo: Tutoring Appointment Scheduling
3. Implement, test and demo: Push Notifications
4. Implement, test and demo: Student Resources Page
5. Update Design and Style Elements

## 10. Milestone 5 (Mar 18)

1. Implement, test and demo: Communication Feature
2. Implement, test and demo: Review Feature
3. Conduct evaluation and analyze results
4. Create poster and ebook page for Senior Design Showcase

## 11. Milestone 6 (Apr 15)

1. Test/demo of the entire system
2. Conduct evaluation and analyze results
3. Create user/developer manual
4. Create demo video



## 12. Task matrix for Milestone 4

Task	Sidney	Samaher	Eleanor
<b>1. Scheduling</b>	Implementation	Design	Course List
<b>2. Custom Log in</b>	Implementation	Design	Testing
<b>3. Push Notifications</b>	Implementation	Implementation	Testing
<b>4. Design Elements</b>			1. Find stock images 2. Color scheme 3. Font styles
<b>5. Student Resources</b>	Implementation	Design	Find pages and links to student resources

## 13. Task Description for Milestone 4

- 1. Allow student/tutor login (custom pages depending on the role of the user):** After registration, both Students and Tutors must sign in to access their respective dashboards and functionalities. This task involves creating and implementing sign-in processes that lead to role-specific dashboards.
- 2. Fully Functional Scheduling System:** Students should be able to schedule tutoring sessions with available Tutors. The task is to ensure that the scheduling system is fully functional, allowing students to easily book sessions with tutors based on availability and subject matter expertise.
- 3. Push Notifications:** Both Students and Tutors should be able to receive notifications about various activities such as session confirmations, reminders, or new messages. This task involves setting up a reliable notification system that informs users promptly about important updates and communications.
- 4. Updating Design and Style Elements:** The user interface must be intuitive, guiding users through registration, scheduling, and communication. This task implies updating the design and style elements of the application to ensure a user-friendly experience that can easily guide users through different functionalities without confusion.
- 5. Student Resources Page:** This task involves creating a dedicated page or section within the application that provides students with the resources they need. This may include study materials, FAQs, contact information for support, and other relevant content to aid their learning and use of the application.

#### **14. Approval from Faculty Advisor**

- "I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."
- Signature: \_\_\_\_\_ Dr Khaled Slhoub \_\_\_\_\_ Date: \_01/22/2024\_