

Lab 2 – Product Specification Outline

CS 411W Lab II

Product Specification

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October 17, 2019

Version 1

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1 Introduction

1.1 Purpose

Tutor Dash is an Android application that will act as a centralized, university-specific tutoring resource. This product will allow tutors and tutees to connect to each other, either in person or online, to simplify the process of seeking help in a specific class or offering tutoring services. The end goal of this product is to allow more university students to have better access to tutoring services, and to reduce the stigma associated with seeking a tutor.

1.2 Scope

The prototype will contain most features of the real-world product, but will be limited in scope to Old Dominion University.

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1.3 Definitions, Acronyms, and Abbreviations

Course-specific tutoring: Academic assistance services provided for a particular course at a particular university.

DFWI: An acronym for Drop/Fail/Withdraw/Incomplete. This relates to university course incompleteness status.

DFWI rates: Represents the ratio of university students who do not complete their courses to students who do complete their courses.

Direct Competitor: Another product or company which is solely involved in the same domain space as Tutor Dash.

Entity: A person, object, or external server that serves as a leveraged functional component of the Tutor Dash product.

FERPA: The Family Educational Rights and Privacy Act is a United States federal law that protects the privacy of educational records.

Indirect Competitor: Another product or company which is involved in the same domain space as Tutor Dash, but doesn't not focus solely in that space.

Serverless Architecture: Concerning database interactions over a network server, this type of architecture implies that the server's implementation is invisible (or abstracted) to the team developing the product using the actual server.

Tester: Individuals responsible for testing the quality of the software.

Tutee: A university student seeking academic assistance.

Tutor: A university student offering independent tutoring services that are qualified based off previously taken courses.

Uber: A ride-hailing company that offers the Uber mobile app, which you can use to submit a trip request that is automatically sent to an Uber driver near to you, alerting the driver to your location.

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1.5 Overview

This specification contains a description of the architectural and functional components of the Tutor Dash application, along with the required interfaces, protocols, and requirements.

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2 General Description

2.1 Prototype Architecture Description

Figure 1 shows Tutor Dash's MFCD.

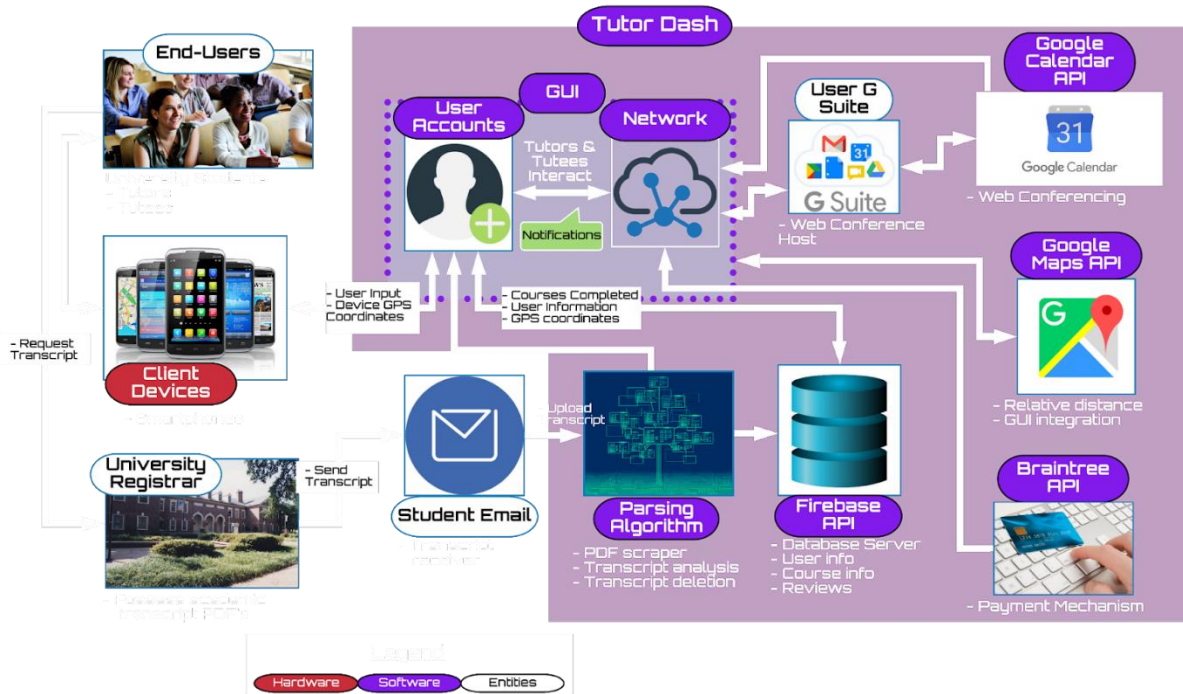


Figure 1: Major Functional Component Diagram

Tutor Dash is composed of the following major components:

- Client Device: Allows the end user to access the application.
- GUI: Allows the end user to access their personal account and communicate with other end users.
- Firebase API: Database server used to store user information, course information, university information, and user reviews.
- Google Calendar API: Used to track end users' scheduled meetings.
- Google Maps API: Calculates and displays relative distance to other end users.
- User G Suite: Google Hangouts is used to create online web conference meetings.

- Braintree API: Used to handle in-app payments.
- Parsing Algorithm: Used to analyze and delete uploaded transcripts to determine tutor eligibility.

2.2 Prototype Functional Description

The major functional components of Tutor Dash include the following:

- Account Creation: This function allows end users to create a personal account in the Tutor Dash database.
- Account Management: This function allows a user with an existing account to make various changes to that account, including switching between tutor mode and tutee mode and changing their password.
- Member Profile View: This function allows users to view and edit public information in their profile, including username and offered courses.
- Transcript Parser: This function analyzes a user’s transcript to determine tutor eligibility, then deletes the transcript. The algorithm flow is shown in Figure 2.

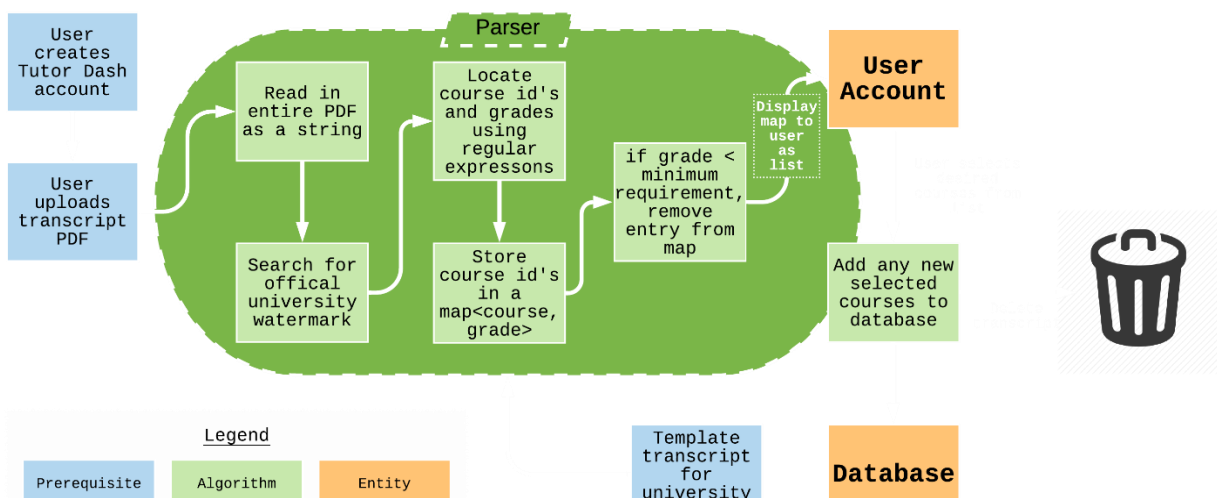


Figure 2: PDF Transcript Parser Algorithm Flow

- **Relative Distance Calculator:** This feature calculates the distance between users, allowing users to only show potential users within a certain distance of them. The algorithm flow is shown in Figure 3.

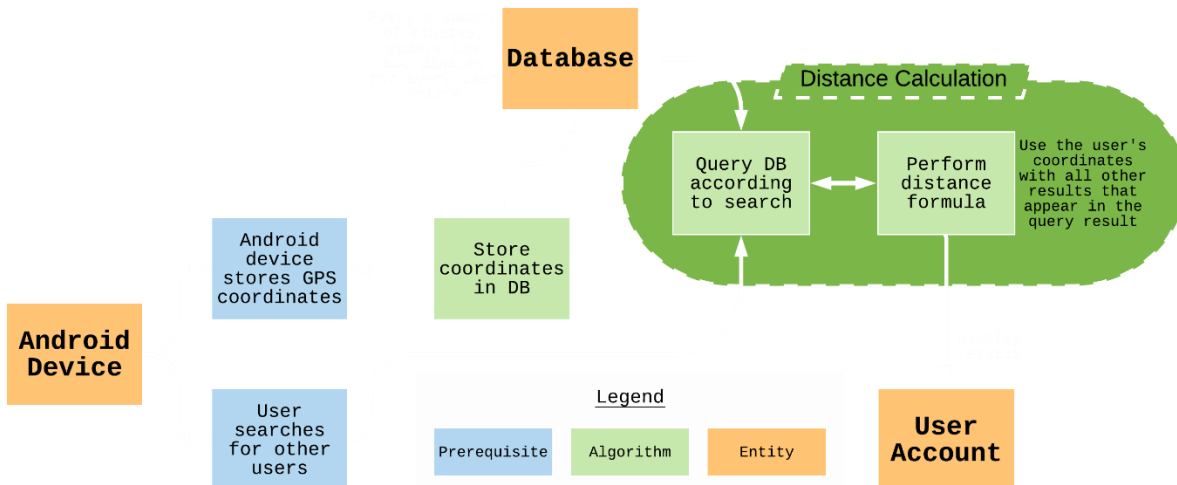


Figure 3: Relative Distance Calculator Algorithm Flow

- **Alert System:** This feature allows tutors and tutees to send and receive notifications requesting help of offering tutoring services.
- **Automatic Pay-Rate Calculation:** This feature automatically calculates a fair price for a tutor's services to keep rates competitive. The algorithm flow is shown in

Figure 4.

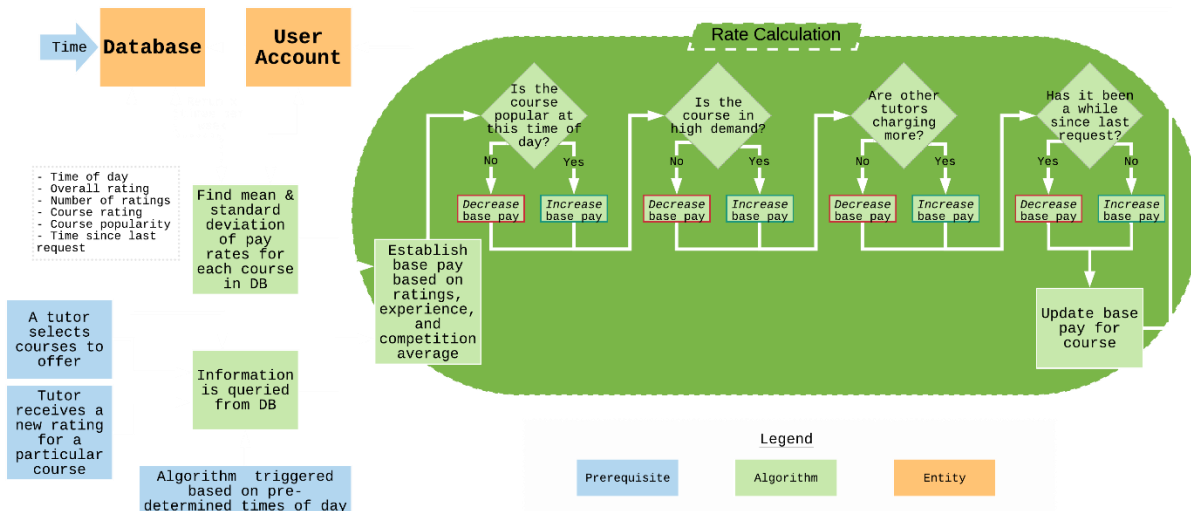


Figure 4: Pay-Rate Calculator Algorithm Flow

- Automatic Payment Handling: This function automatically handles in-app payments in a variety of situations.
- Tutor/Tutee Rating System: This feature allows tutors and tutees to rate each other, and allows users to see the ratings of potential partners.
- Discovery Pages: This feature allows users to search for potential partners via a map, a search query, or a sortable list.
- Chat Messaging: The feature allows users to communicate with each other outside of a tutoring session.
- Session Scheduling: This feature automatically creates a meeting with Google Hangouts if the users choose to meet via web conferencing. The algorithm flow is shown in Figure 5.

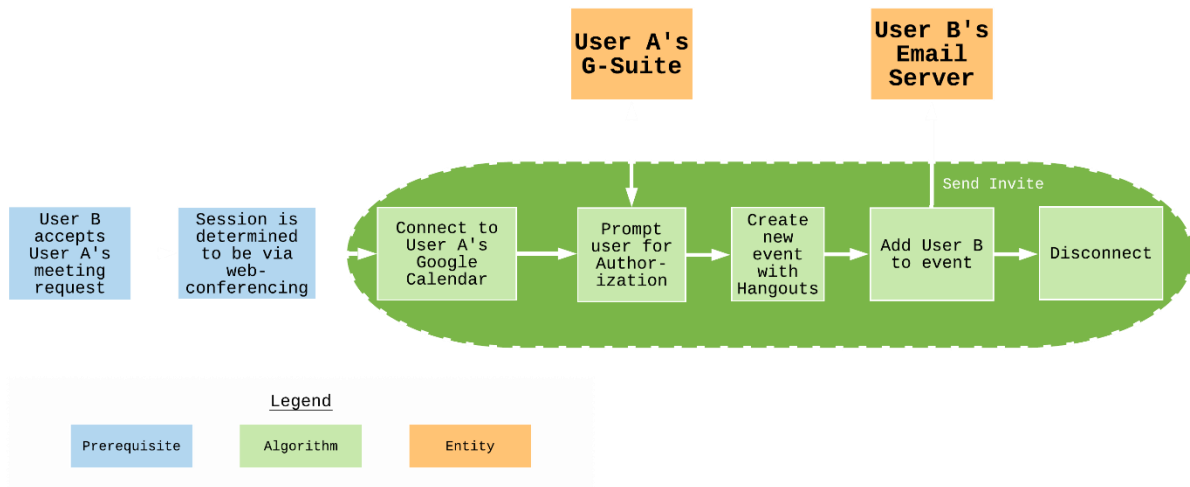


Figure 5: Web Conference Appointment Creator Algorithm Flow

2.3 External Interfaces

2.3.1 Hardware Interfaces

Tutor Dash has no external hardware interfaces.

2.3.2 Software Interfaces

- Cloud Firestore: Cloud Firestore is a NoSQL, document-oriented database that will serve as the database for Tutor Dash. The database schema are shown in Figure 6.

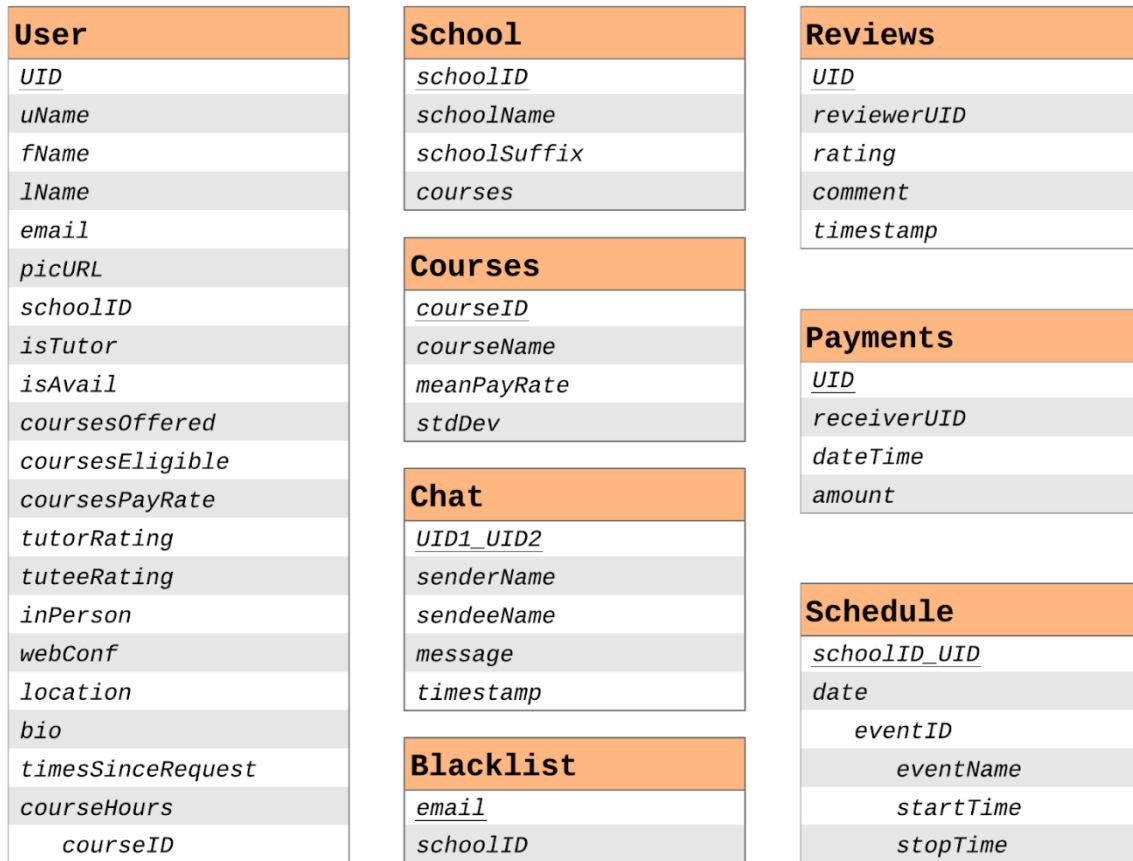


Figure 6: Database Schema

- Braintree: Allows Tutor Dash to handle in-app payments.
- Google Maps API: Provides the capability to use the map discovery view.
- Google Calendar API: Allows users to view a calendar that displays their current schedule.

2.3.3 User Interfaces

Tutor Dash will only be compatible with Android devices. To use the application, users must have Android API 16 or later installed, and their device must have GPS capabilities.

2.3.4 Communications Protocols and Interfaces

Tutor Dash has no external communications interfaces.