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TUNKU ABDUL RAHMAN UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

BACS3403 PROJECT 1
FORM 2 : PROPOSAL

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PROJECT TITLE

EazeTuition : Streamlining Enrollment, Services, and Transactions

ABSTRACT

EaseTuition aims to solve two major problems faced by tuition centers: **manual scheduling** and **inefficient payment processes**. Manual scheduling leads to uneven class schedules and poor communication, while outdated payment systems lead to delays and errors. The solution provided by EaseTuition includes an intelligent scheduling and communication system and an integrated online payment system. Key features include AI-powered automatic scheduling, centralized chat, flexible subject and class management, and automatic fee calculation. Other service modules support other services such as transportation and childcare, and provide flexible billing methods so that parents and tuition centers can have more services. EaseTuition was developed using Python, DolphinDB, and Stripe, with the main goal of simplifying operations, reducing human errors, and improving communication. The expected outcome is a more efficient, transparent, and user-friendly experience for staff and parents.

(133 words)

PROBLEM

<u>Problem 1: Manual Scheduling and Communication Barriers in Tuition Centers</u>

In many tutoring centers, scheduling is still managed manually by administrators or staff, which creates many challenges for both students and tutors. One of the main issues is the **creation of uncomfortable and unbalanced schedules**. This often leads to insufficient breaks, such as insufficient time for lunch or dinner, or long wait times between classes, resulting in wasted time and inefficient daily work.

The process of creating timetables manually is also **time-consuming and error-prone**. Staff must constantly **refer to previous schedules** and **manually cross-check** multiple calendars, making it **difficult** to create optimal schedules that **balance the time** available to students and counselors. This lack of automation increases the likelihood of scheduling conflicts, such as overlapping class times or misaligned breaks. It also increases the difficulty of meeting special scheduling requirements without disrupting the entire schedule. There is a study that has proven that manual scheduling is a time-consuming process as manually creating a schedule often takes 12 to 15 days to complete. In contrast, an automated scheduling system can significantly reduce this time, completing the same task in just 3 to 5 days (Nsulangi et al.).

Manual systems also make it **difficult** to **support** students in **different subjects or class structures**. For example, students who wish to take multiple courses or who require intensive instruction

rather than regular group instruction often cannot be accommodated. Most tutoring centers are only equipped to handle basic multi-student courses, which limits the potential for personalized education and flexible learning paths.

Additionally, **miscommunication with parents** is a common problem. Scheduling information is often shared through **lengthy and cluttered WhatsApp threads**, where key details can easily be missed or misunderstood. This leads to confusion, frustration, and a lack of trust between parents and centers.

Problem 2: Time-consuming and inefficient payment process (payment, other service)

Currently, the payment process in many tuition centers is still largely manual and face-to-face, leading to **inefficiencies that affect** both staff and parents. One of the most common problems is long waiting times. Parents often have to **wait in line** while tutors manually verify records and calculate fees, which leads to **unnecessary delays and frustration**. In addition, manual tracking **increases** the likelihood of **human error**, such as miscalculations, overlooked payments, or input errors. Studies have shown that manual payment systems can have error rates as high as 15-20%, which can undermine trust and create an administrative burden (Lee & Park, 2020)

Another major challenge is the **lack of payment flexibility**. Without an online system, parents have to **physically visit tuition centers** during working hours, which is inconvenient, especially for working parents. This inconvenience makes the payment process more stressful and time-consuming for families. According to the U.S. Bureau of Labor Statistics (2020), more than **40%** of working parents say they have difficulty taking care of basic tasks, including paying bills, due to conflicts with standard work schedules.

Manually dealing with **complex fee structures** adds another layer of difficulty. Many tutorial centers offer **not only academic courses**, but also services such as transportation and childcare. These services often involve **different fee models**, for example, direct payment at the time of enrollment, or a deposit model with monthly fees based on attendance. Managing these different models manually is time-consuming and error-prone, often resulting in inconsistency, confusion and disputes.

SOLUTION

Solution 1: Intelligent Scheduling & Communication System for Tuition Centers

- **Key Feature and Improvement:**
  - **Subjects Module**
    - **Flexible Subject Management:** Allows administrators to create, update and categorize subjects to support students who wish to take more than one subject at a time.
    - **Class Type Differentiation:** Allows classes to be categorized into different types, such as regular classes and focus classes, to support different learning needs. Focused classes have fewer students, allowing teachers to provide more individualized attention and targeted support to each student.
    - **Batch Import Function:** Allows staff to batch upload subject information to avoid errors and save time, thus reducing data entry workload.
  - **Class Schedule Module**

- **Artificial Intelligence Auto Scheduling:** Automatically schedules classes based on student preferences, counselor availability, and operational constraints, reducing wait times and scheduling conflicts.
- **Class Registration Rules:** Prevents duplicate or invalid class registrations by enforcing business logic (e.g., no overlap, class limits).
- **Custom Class Packs:** Allows subjects to be grouped into student-specific course packs, which is especially useful for personalizing learning paths.
- **Batch Scheduling:** Allows staff to update or upload multiple schedules at once, greatly improving the efficiency of manual entry.

- **Chat Module**
  - **Centralized One-to-One Messaging**
    - Replaces fragmented WhatsApp threads with a structured messaging platform linked to each student's profile.

- Proposed Technologies:
  - Programming Language: Python
  - Database: DolphinDB (for handling large-scale scheduling data)
  - Version Control: Git + GitHub
  - AI tool: Scikit-Learn

Solution 2: Integrated Online Payment System

- **Key Features and Enhancements:**
  - **Payment Module:**
    - **Flexible Online & Offline Payment System:**
      - Online Payments - Parents will be able to pay directly through the app using a variety of payment methods such as **payment gateway** which support credit or debit cards, e-wallets and online banking.
      - Offline Payments - Parents can still pay by cash at **physical counters** without waiting for tutors to manually calculate fees.
      - This saves time and effort by eliminating the need to visit the tuition center in person.
    - **Automatic Fee Calculation**:
      - The system will automatically calculate the tuition fee based on the following factors:
        - Number of subjects registered
        - Number of days and times per day of transport
        - Additional services such as childcare which include meal and bath based on the days attended
      - Parents can view the fee details in real time to minimize misunderstandings and disputes.
    - **Flexible Payment Plans:**
      - Direct Payment
        - Parents register for subjects or services, then the system directly calculates fees and parents make the payment immediately.
      - Deposit
        - For the other services such as childcare, parents pay the first month's deposit after registering, and the system generates a full invoice for the following month based on the month the children attend to the childcare services.

- **Instant digital receipt and payment record**
  - After successful payment, the system will automatically generate an e-receipt for parents. Parents can view their payment history at any time, making it easier to track past transactions.
- **Other Service Module:**
  - **Service Enrollment Management:**
    - Allows staff to schedule and manage additional services that often arise from additional student or parent needs.
  - **Support for Flexible Billing Structures:**
    - Supports complex billing models, such as per-attendance childcare or half-day services.
  - **Integration with Payment Module:**
    - Ensures accurate fee calculations by passing service data directly to the payment system, reducing miscalculations and confusion.

- Proposed Technologies:
  - Programming Language: Python
  - Database DolphinDB
  - Payment gateway: Stripe
  - Version Control: Git + GitHub

TARGET MARKET

Target Market 1: Tuition Center Administrators & Staff

Tuition Center administrators and staff are the primary users of the app, and they rely on it to efficiently **manage their day-to-day operations**. The platform allows them to update and organize course schedules digitally, eliminating the need for manual Excel sheets and greatly reducing the risk of scheduling conflicts. The app also automates fee calculations and payment processing, helping to minimize human error and reduce administrative workload. In addition, it allows staff to seamlessly track and manage payment records, ensuring accuracy and consistency without the need for tedious manual paperwork. Most importantly, built-in communication features enable staff to maintain clear, timely and organized interactions with parents, which strengthens relationships, reduces misunderstandings and builds higher levels of trust and satisfaction.

Target Market 2: Parents

Parents are the primary users of the app when it comes to **managing their children's tuition activities**. They can **easily enroll their children** in subjects and courses directly through the app, eliminating the need for time-consuming on-site enrollment. The payment module allows parents to conveniently pay tuition fees online or at the counter of the tuition center, with instant access to payment history and digital receipts for easy record keeping. The app also sends timely push notifications to remind parents of upcoming classes, assessment tests or pending payments. In addition, an in-app chat feature allows parents to communicate directly with tuition center staff, eliminating the need to look up contact information through WhatsApp or other platforms.

COMPETITION / CONTRIBUTION

Module	Cs Tuition Application	Tuition Management	EazeTuition
Subject	Yes, offering the main subject for different levels, but no additional subject.	Yes, offering the main subject for different levels, but no additional subject.	Yes, offering the main subject for different levels or some additional subjects.
Class	Yes, involving letting the parent to register a class for children, but no package to select, need to select one-by-one.	Yes, users select which online class to enroll in, but no package to select, need to select one-by-one.	Yes, provide multiple packages or self-select classes to enroll. Also include AI auto scheduling class.
Other Service	No, do not consider other services.	No, do not consider other services.	Yes, provide optional service such as transport and childcare service.
Payment	Yes, allow for various payment ways.	No, it does not include payment features, only for fees management.	Yes, provide various payment methods for paying fees.
Chat	Yes, one to one chat.	Yes, students tutor one to one chat.	Yes, parents, tutor one to one chatting.

MILESTONES

Proposed Development Model / Research Method : Incremental Development

- Reason:
  - **Limited Development Team**
    - Our team is a small one, with only two developers, so an incremental approach allows for step-by-step development rather than tackling the whole system at once.
  - **Short Development Time**
    - The project needs to be completed within 3-4 months, so it is more practical to develop in small manageable increments.
  - **Version-based deployment**
    - The project will be released in multiple versions, each building on the previous version.
  - **Core-first approach**
    - The first release will focus on the basic modules to address the most critical issues, such as course scheduling and registration.
  - **Flexibility to improve**
    - Urgent changes and enhancements can be implemented in subsequent releases.

Project Schedule:

ACTIVITIES	EXPECTED OUTCOME	COMPLETION DATE

Proposal Phase	Project research, problem identification, scope definition, and proposal submission.	18/4/2025
Project I Portfolio	Come out with a portfolio which ensures all methods, needs analyses, and system plans are completed, accurate, approved and suitable.	9/8/2025
Initial System Preview	Ensure that the application runs as expected and successfully performs all core module operations as designed.	26/9/2025
System Preview	Execute test procedures and test cases efficiently to minimize errors and ensure that overall system functionality remains stable and unaffected.	21/11/2025
Final System Testing	Verify system performance through rigorous testing to confirm that the application meets all functional and operational requirements.	28/11/2025
Submission of Draft FYP Report	Submit preliminary project reports documenting test results and verifying the accuracy of expected results.	12/12/2025
Submission of Final FYP Report	Submit final project documents with all deliverables to formally close out the project and ensure full implementation of the system.	19/12/2025

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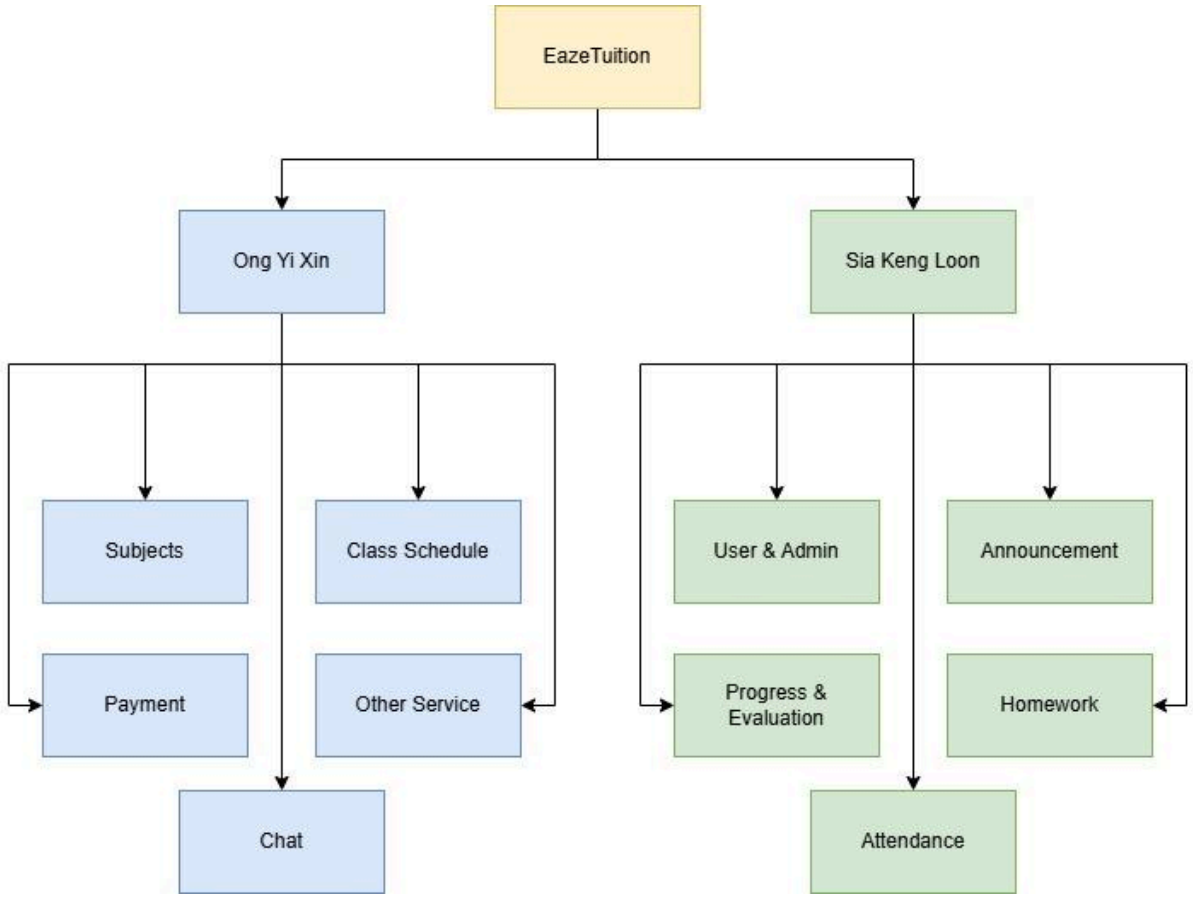
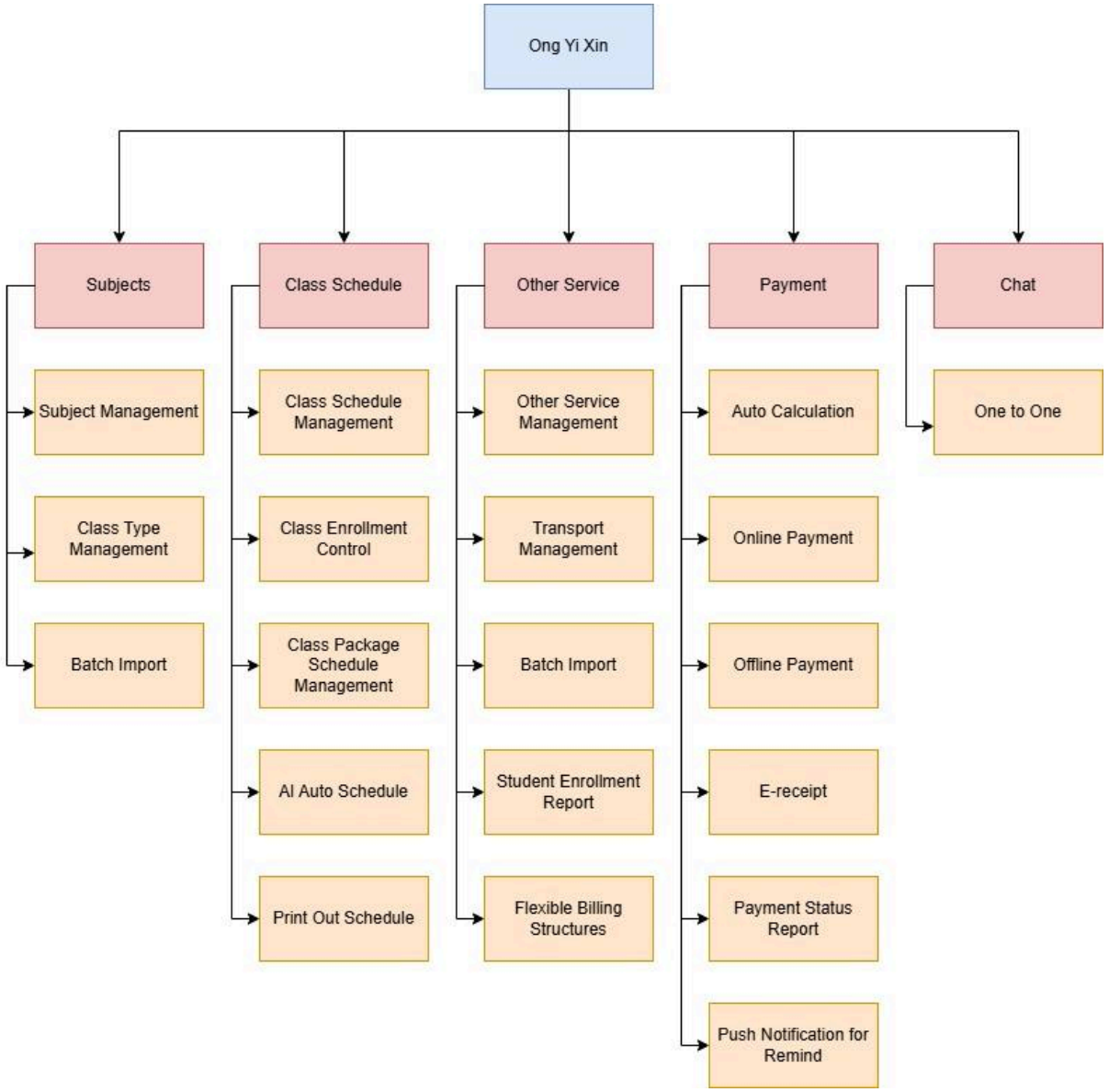
Appendix


EazeTuition
Ong Yi Xin
Sia Keng Loon
Subjects
Class Schedule
Payment
Other Service
Chat
User & Admin
Announcement
Progress & Evaluation
Homework
Attendance


Ong Yi Xin
Subjects
Subject Management
Class Type Management
Batch Import
Class Schedule
Class Schedule Management
Class Enrollment Control
Class Package Schedule Management
AI Auto Schedule
Print Out Schedule
Other Service
Other Service Management
Transport Management
Batch Import
Student Enrollment Report
Flexible Billing Structures
Payment
Auto Calculation
Online Payment
Offline Payment
E-receipt
Payment Status Report
Push Notification for Remind
Chat
One to One