



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

SESSION 2023/2024 SEMESTER II

SECD2613: SYSTEM ANALYSIS AND DESIGN

SECTION 08

Project

Phase 2: Information System Gathering and Requirement (12%)

[DolphinLearn Hub]

GROUP 7

NO.	GROUP MEMBERS	MATRIC NUMBER
1.	KOK WEI YEE	A23CS0094
2.	TAY WEI CHENG	A23CS0190
3.	TAN QING QING	A23CS5034
4.	MUHAMMAD AMMAR BIN MOHAMAD IDHAM	A23CS0247

LECTURER'S NAME: DR. CIK SUHAIMI BIN YUSOF

Table of Contents

1.0 Overview of the Project	1
2.0 Problem Statement	2
3.0 Proposed Solutions	4
4.0 Information gathering process	6
4.1 Method used	6
4.2 Summary from method used	17
5.0 Requirement Analysis (based on AS-IS analysis)	18
5.1 Current business process (scenarios, workflow)	18
5.2 Functional Requirement (input, process and output)	32
5.3 Non-functional Requirement (performance and control)	37
5.4 Logical DFD AS-IS system (Context Diagram, Diagram 0, Child)	40
6.0 Summary of Requirement Analysis process	46

1.0 Overview of the Project

The Dolphin Tuition Centre, established by Mr. Lim, is a renowned educational institution dedicated to providing high-quality tutoring services to students. Over the years, the centre has earned a reputation for its commitment to academic excellence and personalized student support. However, the centre faces several operational challenges that hinder its ability to maximize its reach and efficiency. These challenges include a heavy reliance on manual processes, limited online presence, and difficulties in monitoring and engaging students outside of class hours.

To address these issues, the Dolphin Tuition Centre proposes the development of the DolphinLearn Hub, a comprehensive digital platform designed to modernize the centre's operations and enhance the overall learning experience for students. The DolphinLearn Hub aims to transform the centre's traditional methods by integrating advanced technology solutions to streamline administrative tasks, facilitate better communication, and provide robust tools for student engagement and progress tracking.

The primary objectives of the DolphinLearn Hub project are to:

- **Expand Reach and Enrollment:** Establish a strong online presence to attract and enroll more students from a broader geographic area.
- **Improve Operational Efficiency:** Automate administrative processes to reduce manual workload and minimize errors.
- **Enhance Student Engagement:** Implement interactive tools to engage students beyond the classroom, providing support and resources that foster continuous learning.
- **Optimize Student Monitoring:** Develop a comprehensive tracking system to monitor student progress and provide personalized support.

The DolphinLearn Hub will be a user-friendly, integrated platform accessible via a website and mobile application. Key features will include online payment options, real-time messaging, video conferencing capabilities, and a detailed student monitoring system. By leveraging these technologies, the Dolphin Tuition Centre aims to create a more effective, inclusive, and future-

ready educational environment that aligns with the evolving needs of students and parents in the digital age.

In summary, the DolphinLearn Hub project is a strategic initiative to modernize Dolphin Tuition Centre's operations, enhance its educational offerings, and ensure sustainable growth. Through this project, the centre aims to overcome current challenges and position itself as a leader in the digital education space.

2.0 Problem Statement

The Dolphin Tuition Centre, despite its success and reputation, faces significant challenges that hinder its operational efficiency and ability to provide an optimal learning experience for students. The key issues identified are as follows:

1. Limited Reach and Enrollment:

- The centre's current marketing and enrollment strategies are heavily reliant on word-of-mouth and traditional advertising methods, limiting its ability to attract a broader audience. The absence of a strong online presence means the centre cannot effectively reach potential students outside its immediate geographic area.

2. Inefficient Administrative Processes:

- The centre's administrative tasks, including student enrollment, scheduling, attendance tracking, and payment processing, are predominantly managed through manual processes. This reliance on manual operations leads to inefficiencies, higher error rates, and increased workload for staff, impacting overall productivity.

3. Challenges in Student Engagement:

- Engaging students outside of classroom hours remains a significant challenge. The centre lacks effective tools and platforms to facilitate continuous learning and

interaction between tutors and students. This gap results in missed opportunities for reinforcing learning and providing timely support to students.

4. Inadequate Student Monitoring and Support:

- Monitoring student progress and providing personalized support is difficult with the current system. The absence of a robust tracking mechanism means that tutors and administrators cannot efficiently track academic performance, identify areas needing improvement, and tailor support to individual student needs.

5. Limited Communication Channels:

- Communication between the centre, students, and parents is primarily through traditional means such as phone calls and emails. This approach is not only time-consuming but also fails to provide the real-time interaction and collaboration necessary for addressing concerns promptly and effectively.

These challenges highlight the need for a comprehensive digital solution that can streamline administrative operations, expand the centre's reach, enhance student engagement, and improve communication and support mechanisms. Addressing these issues is critical for Dolphin Tuition Centre to sustain its growth, improve educational outcomes, and remain competitive in the evolving educational landscape.

The proposed DolphinLearn Hub aims to tackle these challenges by integrating advanced technological solutions to modernize the centre's operations and enhance the overall learning experience for its students.

3.0 Proposed Solutions

To address the challenges identified in the problem statement, Dolphin Tuition Centre proposes the development of the DolphinLearn Hub, an innovative digital platform designed to streamline operations, expand the centre's reach, enhance student engagement, and improve monitoring and support mechanisms. The key features and benefits of the DolphinLearn Hub are as follows:

1. Expansion of Online Presence:

- **Website and Mobile Application:** Develop a user-friendly website and mobile application to showcase the centre's services, facilitate online enrollment, and provide accessible information to prospective students and parents.
- **Online Marketing:** Implement digital marketing strategies, including search engine optimization (SEO), social media marketing, and online advertising campaigns to attract a broader audience and increase enrollment.

2. Automation of Administrative Processes:

- **Enrollment and Scheduling:** Automate student enrollment and class scheduling processes to reduce manual workload, minimize errors, and improve efficiency.
- **Attendance Tracking and Reporting:** Implement an automated attendance tracking system that allows tutors to record attendance digitally and generate reports easily.
- **Payment Processing:** Integrate secure online payment options to streamline fee collection and provide convenient payment methods for parents.

3. Enhanced Student Engagement:

- **Real-Time Messaging and Notifications:** Introduce a messaging system that enables real-time communication between students, tutors, and administrators. This feature will facilitate timely feedback, reminders, and announcements.
- **Interactive Learning Tools:** Provide access to interactive learning resources such as quizzes, videos, and educational games that students can use outside of class hours to reinforce their learning.

- **Virtual Classrooms:** Implement video conferencing capabilities to conduct virtual classes, allowing for remote tutoring sessions and increased flexibility for students.

4. **Comprehensive Student Monitoring and Support:**

- **Student Progress Tracking:** Develop a robust tracking system that monitors student performance, attendance, and participation. This system will enable tutors to identify areas where students need additional support and tailor their teaching strategies accordingly.
- **Personalized Learning Plans:** Create individualized learning plans based on student progress data, helping tutors provide targeted support and resources to improve academic outcomes.

5. **Improved Communication Channels:**

- **Parent and Student Portals:** Develop dedicated portals for parents and students to access important information, track progress, communicate with tutors, and stay informed about upcoming events and announcements.
- **Feedback and Support System:** Implement a feedback mechanism that allows students and parents to provide input on the learning experience, facilitating continuous improvement and addressing concerns promptly.

The DolphinLearn Hub aims to transform the operational and educational landscape of Dolphin Tuition Centre by leveraging modern technology to address current inefficiencies and challenges. By implementing these solutions, the centre will be able to provide a more effective, engaging, and supportive learning environment, ultimately leading to better educational outcomes and sustained growth.

4.0 Information gathering process

The information gathering process is a critical phase in the development of the DolphinLearn Hub. This phase involves collecting comprehensive data about the current system (AS-IS), understanding the needs and expectations of stakeholders, and identifying the requirements for the new system (TO-BE).

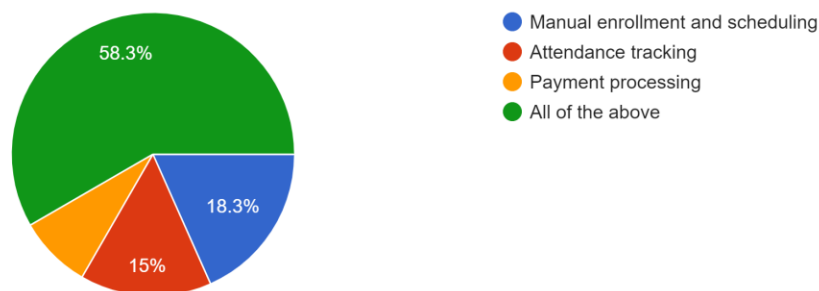
4.1 Method used

To learn more about the Dolphin Tuition Centre's structure, culture, and the problems faced by using the current manual system, we have conducted an interview and questionnaire containing both closed and open-ended questions. Google Forms was used to conduct the questionnaire for organizational analysis. The questionnaire responses from 60 parents and students of Dolphin Tuition Centre, along with the interview process with the stakeholder, Mr. Lim, conducted through WhatsApp, are all presented here.

4.1.1 Questionnaires

Question 1: What is the biggest challenge you face with the current administrative processes at Dolphin Tuition Centre?

What is the biggest challenge you face with the current administrative processes at Dolphin Tuition Centre?
60 responses

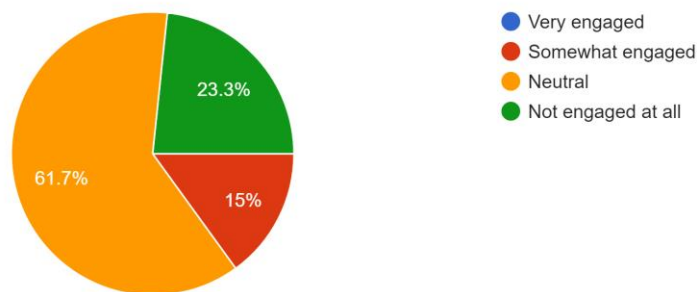


Based on the pie chart, 8.3% of the respondents face challenges while doing payment. 15% of the respondents chose student attendance issue as their biggest challenge, while 18.3% of the

respondents chose manual enrollment and scheduling. Meanwhile, 58.3%, which is over half of the respondents thought that these 3 issues confront them. This indicates that Dolphin Tuition Centre needs to improve their administration processes at all levels.

Question 2: How would you rate the current level of student engagement outside classroom hours?

How would you rate the current level of student engagement outside classroom hours?
60 responses

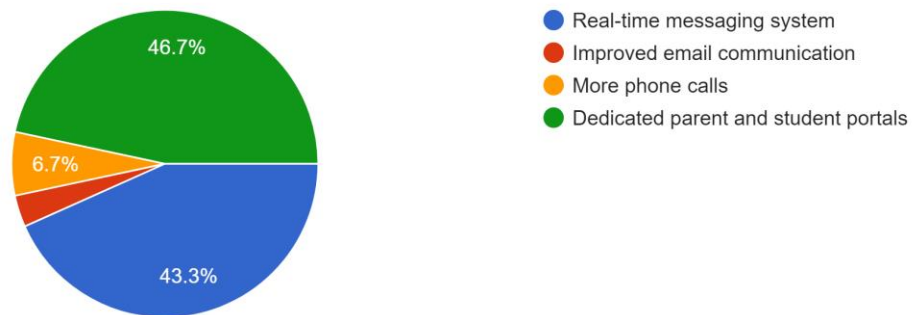


Based on 60 responses, the majority of respondents (61.7%) rated the current level of student engagement outside classroom hours as "Neutral." Additionally, 23.3% indicated that students are "Not engaged at all," while only 15% rated the engagement as "Somewhat engaged." No respondents felt that students are "Very engaged." This indicates a significant need for improvement in student engagement outside of classroom hours.

Question 3: Which of the following would most improve your communication with the centre?

Which of the following would most improve your communication with the centre?

60 responses

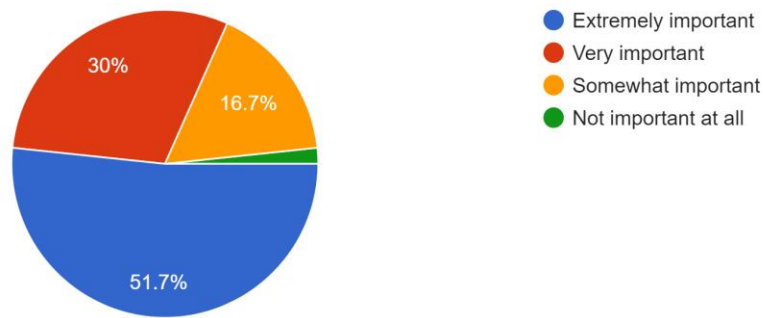


The majority of respondents (46.7%) selected "Dedicated parent and student portals" as the most desired improvement. This is followed by 43.3% who chose "Real-time messaging system." A smaller percentage of respondents indicated a preference for "Improved email communication" (6.7%) and "More phone calls" (3.3%). This suggests a strong preference for digital communication tools that offer real-time interaction and dedicated access for parents and students.

Question 4: How important is it for you to have access to virtual classrooms and online learning tools?

How important is it for you to have access to virtual classrooms and online learning tools?

60 responses



From the pie chart, most respondents (51.7%) consider it "Extremely important." A significant portion (30%) finds it "Very important." Meanwhile, 16.7% view it as "Somewhat important," and a minimal 1.7% believe it is "Not important at all." This indicates a strong preference for virtual classrooms and online learning tools among the respondents.

Open-ended questions:

Question 5: What specific features or tools do you think would enhance your or your child's learning experience at Dolphin Tuition Centre?

What specific features or tools do you think would enhance your or your child's learning experience at Dolphin Tuition Centre?

40 responses

The ability to attend live online classes and participate in interactive sessions remotely.

Virtual study group creation tools where students can collaborate, share resources, and study together.

A dashboard that shows real-time updates on academic performance, attendance, and participation.

Customized study plans based on individual student progress and learning needs.

Access to a digital library of study materials, reference books, and past exam papers.

A platform for students to submit homework and receive feedback digitally.

Access to interactive quizzes, educational games, and simulation tools that make learning more engaging.

A platform for students to submit homework and receive feedback digitally

A portal where parents can monitor their child's progress, view grades, and communicate with tutors.

Secure online payment options for tuition fees and other related expenses.

Interactive Learning Resources:

Access to quizzes, videos, and educational games that make learning engaging and fun.

A messaging system that allows instant communication with tutors for quick questions and feedback.

Ability to attend live online classes and participate in interactive sessions remotely.

Access to quizzes, videos, and educational games that make learning engaging and fun.

Secure online payment options for tuition fees and other related expenses.

A mobile app version of the platform for easier access.

A feature showing tutors' available times for make up sessions.

A secure messaging system integrated with class schedules and assignments for quick tutor-student communication.
A portal for parents to track their child's academic progress, attendance, schedule, and communicate with tutors.
A dashboard featuring detailed analytics on academic performance, attendance, participation, and areas for improvement.
Setting and tracking academic milestones and goals to help students stay motivated and focused.
Downloadable content and resources for offline use to ensure learning continuity without internet access.
A mobile app providing all functionalities of the web platform, including notifications for upcoming classes and assignments.
Notifications system that sends automated alerts and reminders that cover class schedules, upcoming tests, fee payment due dates, and important announcements
A portal where parents can monitor their child's progress, view grades, and communicate with tutors.
Notifications system that sends automated alerts and reminders that cover class schedules, upcoming tests, fee payment due dates, and important announcements.
Live online classes with breakout rooms for group work and interactive whiteboard functionalities.
Setting and tracking academic milestones and goals to help students stay motivated and focused
A Web platform includes notifications for upcoming classes and exercises
Customized study plans based on individual performance data and learning preferences.

Out of 60 respondents, 40 provided their input on features that would enhance the learning experience at Dolphin Tuition Centre. Key suggestions included live online classes, virtual study groups, real-time academic dashboards, customized study plans, access to a digital library, platforms for digital homework submission, interactive learning tools, and a parent monitoring portal. Additionally, respondents emphasized the need for secure online payment options, a mobile app for easier access, notifications and alerts for important updates, offline access to resources, detailed analytics on academic performance, and tools for tracking academic milestones. These features reflect a strong preference for digital enhancements that improve engagement, communication, and personalized support.

Question 6: Can you describe any difficulties you have encountered with the current system of monitoring and supporting student progress? How do you think these could be improved?

Can you describe any difficulties you have encountered with the current system of monitoring and supporting student progress? How do you think these could be improved?

40 responses

Parental Involvement:

Difficulty: Limited involvement of parents in the learning process.

Improvement: Create a parent portal for better engagement and communication.

No Personalized Support:

Difficulty: One-size-fits-all approach to tutoring.

Improvement: Develop personalized learning plans based on individual student needs.

Manual Progress Tracking:

Difficulty: Reliance on paper records for tracking progress.

Improvement: Implement a digital system for tracking and reporting progress.

Inconsistent Communication:

Difficulty: Communication with tutors is often inconsistent and slow.

Improvement: Introduce a real-time messaging system for instant communication.

Difficult Scheduling:

Difficulty: Challenges in coordinating schedules for extra help or makeup classes.

Improvement: Offer flexible scheduling options through an online booking system.

Limited Feedback on Learning Progress:

Difficulty: Insufficient feedback on learning progress and areas for improvement.

Improvement: Regular progress reports and detailed feedback from tutors to guide student improvement.

Unclear Academic Goals:

Difficulty: Students unclear about academic expectations and goals.

Improvement: Clearly defined academic milestones and personalized goal-setting with regular check-ins.

Resource Availability:

Difficulty: Limited access to supplementary learning materials.

Improvement: Provide a comprehensive digital compilation of resources

Lack of Motivation:

Difficulty: Students struggle with motivation outside classroom hours.

Improvement: Use interactive learning tools to keep students engaged.

Attendance Tracking:

Difficulty: Inaccurate or missing attendance records.

Improvement: Implement an automated attendance tracking system.

Online Class Attendance:

Difficulty: Students unable to attend classes virtually due to technical issues or lack of resources.
Improvement: Provide recorded sessions and ensure access to necessary technology.

No Online Class

Difficulty: Students unable to attend classes online due to technical issues or lack of resources.
Improvement: Provide access to necessary technology, such as lending devices or offering technical support.

Limited Access to Performance Data:

Difficulty: Limited access to detailed performance analytics.
Improvement: Provide a detailed dashboard with performance metrics and analytics.

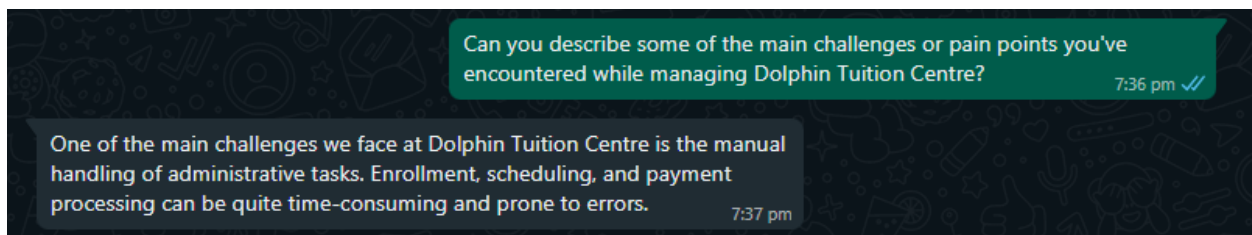
Difficulty: Inaccurate or missing attendance records.
Improvement: Implement an automated attendance tracking system

The responses highlight several difficulties with the current system of monitoring and supporting student progress at Dolphin Tuition Centre. Key issues include limited parental involvement, lack of personalized support, reliance on manual progress tracking, and inconsistent communication. Additionally, respondents noted challenges with scheduling, insufficient feedback on learning progress, unclear academic goals, limited access to resources, and student motivation outside classroom hours. Technical issues affecting online class attendance and limited access to detailed performance data were also mentioned. Suggested improvements include creating a parent portal, developing personalized learning plans, implementing digital tracking systems, introducing real-time messaging, offering flexible scheduling, providing regular feedback, defining academic milestones, compiling digital resources, and ensuring access to necessary technology and detailed performance analytics.

4.1.2 Interviews

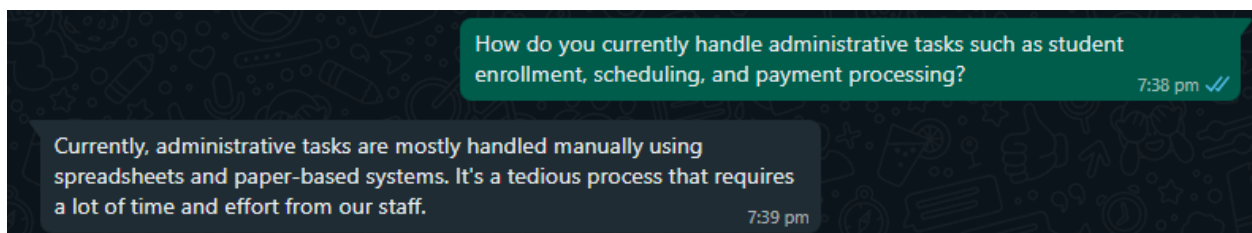
We conducted interviews with key stakeholders, including Mr. Lim, the founder of Dolphin Tuition Centre, and administrative staff, to gain in-depth insights into the challenges and operational inefficiencies faced by the Centre. Below are the interview questions and detailed descriptions of Mr. Lim's answers:

Question 1: Can you describe some of the main challenges or pain points you've encountered while managing Dolphin Tuition Centre?



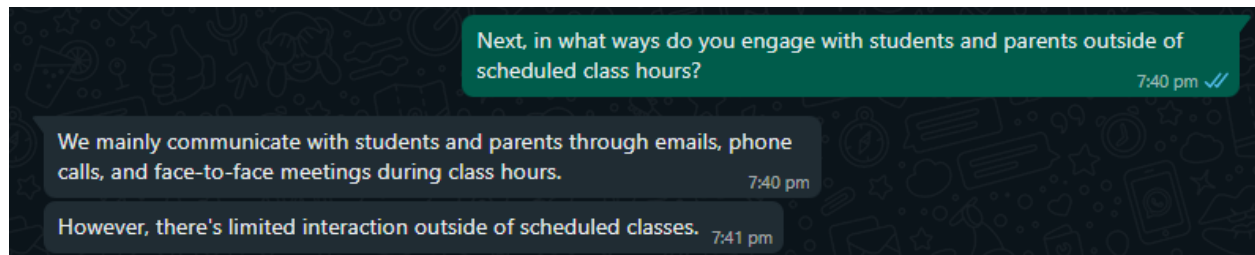
Mr. Lim stated that one of the main challenges is the manual handling of administrative tasks. This includes student enrollment, scheduling, and payment processing, all of which are currently managed using spreadsheets and paper-based systems. These manual processes are time-consuming, prone to errors, and require significant effort from staff.

Question 2: How do you currently handle administrative tasks such as student enrollment, scheduling, and payment processing?



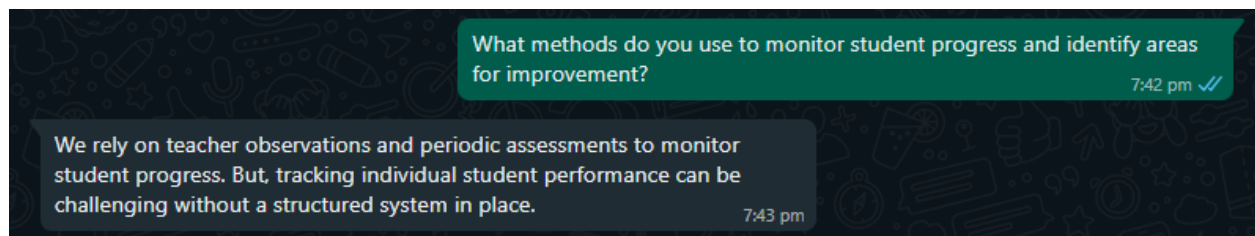
Mr. Lim explained that administrative tasks are mostly handled manually. For enrollment, staff use paper forms and spreadsheets to record student information. Scheduling is done manually, which often leads to conflicts and inefficiencies. Payment processing is also manual, involving cash transactions and paper receipts, which increases the risk of errors and delays.

Question 3: In what ways do you engage with students and parents outside of scheduled class hours?



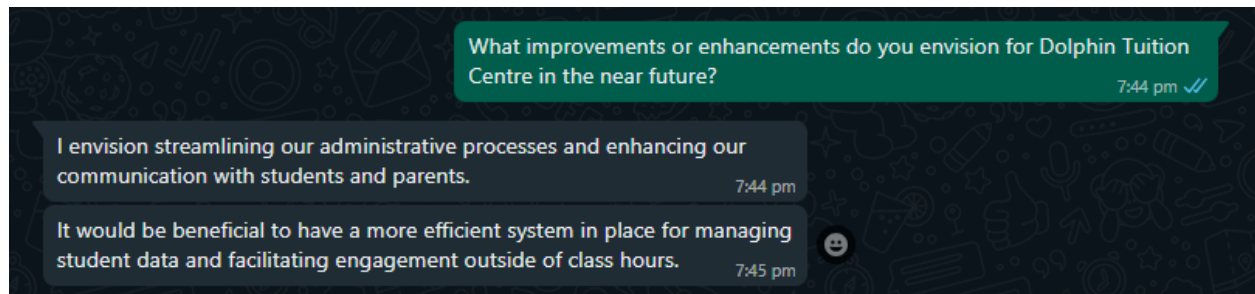
Communication with students and parents is primarily conducted through emails, phone calls, and face-to-face meetings during class hours. Mr. Lim mentioned that there is limited interaction outside of scheduled classes, which affects the Centre's ability to provide continuous support and engagement.

Question 4: What methods do you use to monitor student progress and identify areas for improvement?



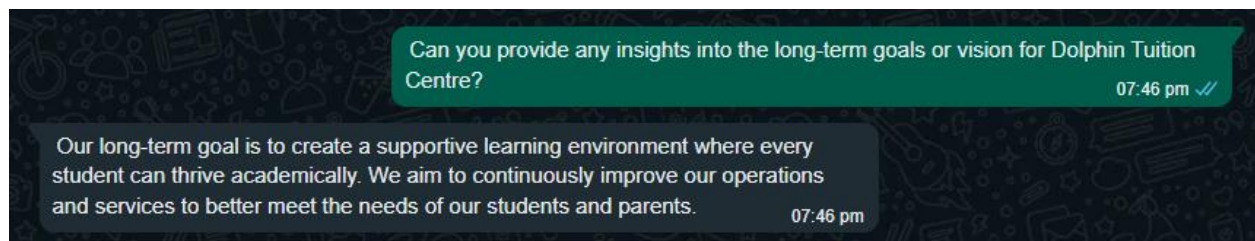
The Centre relies on teacher observations and periodic assessments to monitor student progress. However, without a structured system, tracking individual performance is challenging. This makes it difficult to provide personalized guidance and tailor teaching methods to address students' unique learning needs.

Question 5: What improvements or enhancements do you envision for Dolphin Tuition Centre in the near future?



Mr. Lim envisions streamlining administrative processes and enhancing communication with students and parents. He believes that automating administrative tasks and implementing a more efficient system for managing student data will significantly reduce manual effort and errors. Additionally, he sees value in improving engagement outside of class hours through better communication tools and resources.

Question 6: Can you provide any insights into the long-term goals or vision for Dolphin Tuition Centre?



The long-term goal for Dolphin Tuition Centre is to create a supportive learning environment where every student can thrive academically. Mr. Lim aims to continuously improve the Centre's operations and services to better meet the needs of students and parents. By leveraging digital technologies, he hopes to enhance the overall learning experience and ensure sustainable growth for the Centre.

4.2 Summary from Methods Used

To learn more about the administrative processes and challenges faced by Dolphin Tuition Centre, an interview and a questionnaire were conducted. The interview involved Mr. Lim, the Centre's founder, and was conducted via WhatsApp. The questionnaire, designed using Google Forms, was distributed to 60 customers of the Centre. The survey included both closed and open-ended questions to gather comprehensive feedback on the Centre's current operations and areas needing improvement. The responses provided valuable insights into the administrative inefficiencies and engagement challenges the Centre faces.

After we have collected 60 responses from the Google Form, the questionnaire's results highlighted significant issues. For example, 58.3% of respondents identified all major administrative tasks — enrollment, scheduling, and payment processing—as problematic. Furthermore, 61.7% of respondents rated student engagement outside of classroom hours as "Neutral," indicating a lack of effective interaction. The data also revealed a strong preference for digital solutions, with 46.7% of respondents desiring dedicated parent and student portals, and 43.3% wanting a real-time messaging system. This feedback underscores the necessity for the Centre to modernize its administrative processes and enhance communication and engagement tools.

During the interview, Mr. Lim discussed the challenges of manual administrative processes, including the use of spreadsheets and paper-based systems for enrollment, scheduling, and payment processing. He also noted the limited communication methods currently in use and the difficulties in monitoring student progress without a structured system. Mr. Lim envisions automating administrative tasks to reduce errors and improve efficiency, as well as implementing digital tools to enhance communication and engagement with students and parents. His long-term goal is to create a supportive learning environment that leverages technology to meet the evolving needs of the Centre's community.

To address these challenges, Dolphin Tuition Centre plans to develop and implement the DolphinLearn Hub, a comprehensive digital platform designed to modernize its operations. This platform will automate administrative tasks such as student enrollment, scheduling, and payment processing to reduce manual workload and errors. It will also feature dedicated parent and student portals for better communication, real-time messaging systems, and tools for enhanced student

engagement outside classroom hours. Additionally, the DolphinLearn Hub will include robust student progress tracking capabilities, allowing for personalized support and tailored learning plans. By leveraging these digital technologies, the Centre aims to improve operational efficiency, expand its reach, and provide a more engaging and supportive learning experience for students and parents.

5.0 Requirement Analysis

5.1 Current business process (scenarios, workflow)

AS-IS System (Current manual tuition system)

The current business processes at Dolphin Tuition Centre involve several manual workflows and traditional methods to manage administrative tasks, student engagement, and progress tracking. Below is a detailed description of the current scenarios and workflow:

Scenarios and Workflow for Customers (Students and Parents):

1. Inquiry and Enrollment:
 - 1.1. Customers contact the admin of Dolphin Tuition Centre through phone or email.
 - 1.2. Customers receive details about courses, fees, schedules, and enrollment procedures.
 - 1.3. Customers fill in a paper-based application form, providing personal details, course selection, and contact information.
 - 1.4. Customers submit the completed form to the Centre.
 - 1.5. After processing, customers receive a confirmation call or email from the admin, along with the course enrollment record.
2. Class Scheduling:
 - 2.1. Customers receive a printed or emailed timetable created manually by the staff.
 - 2.2. Any changes to the schedule are communicated through phone calls or emails, requiring manual updates.
3. Attendance Tracking:

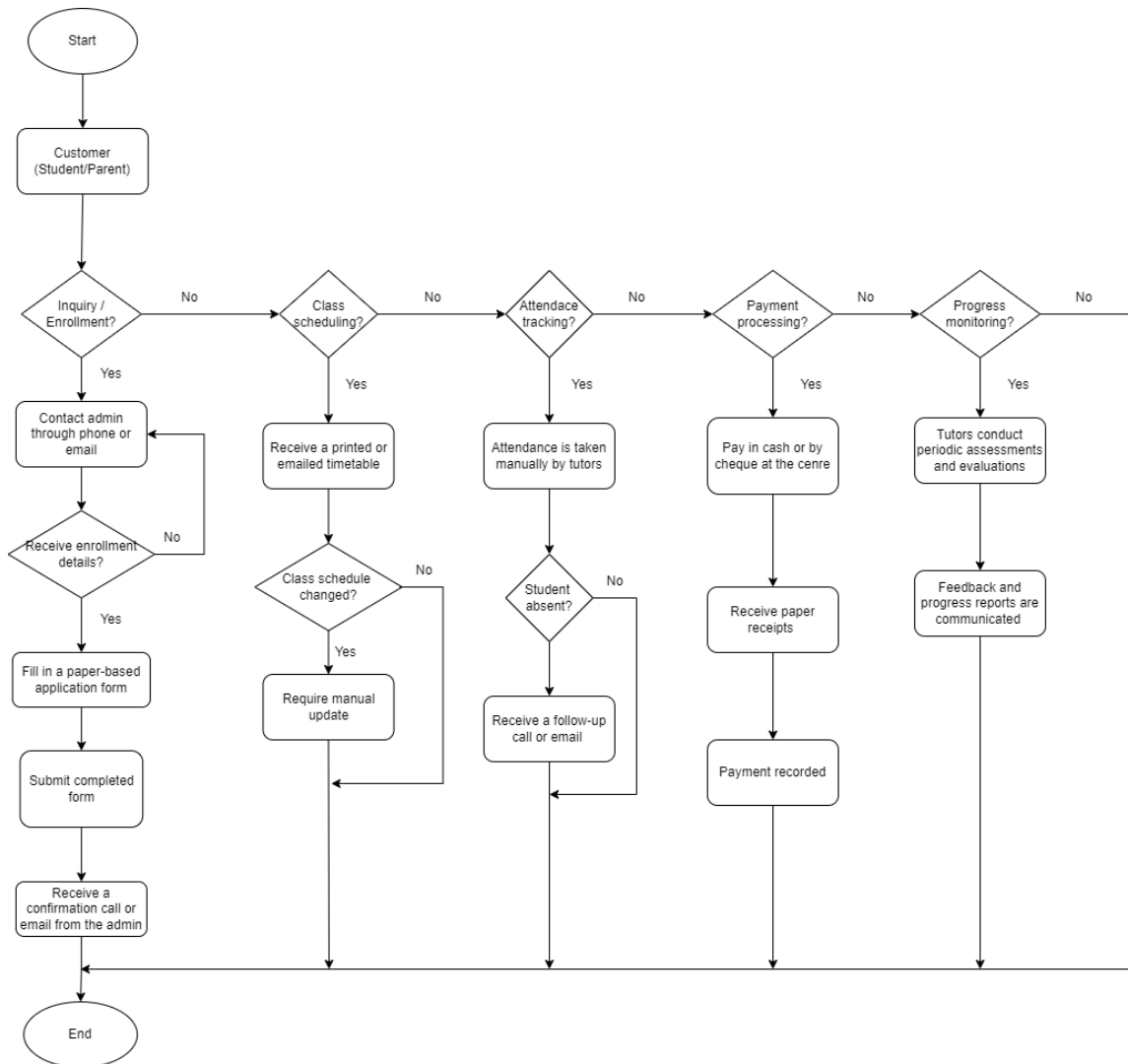
- 3.1.Attendance is taken manually by tutors using paper-based attendance sheets.
- 3.2.In case of absences, customers receive a follow-up call or email from the admin.

4. Payment Processing:

- 4.1.Customers can pay in cash or by cheque at the Centre.
- 4.2.Customers receive paper receipts for their payments.
- 4.3.Payment details are manually recorded by the admin.

5. Progress Monitoring and Support:

- 5.1.Tutors conduct periodic assessments and evaluations.
- 5.2.Feedback and progress reports are communicated during parent-teacher meetings or via emails.



Scenarios and Workflow for Centre Staff (Administrators):

1. Inquiry and Enrollment:

- 1.1. Staff receive inquiries from potential students or parents via phone or email.
- 1.2. Staff provide information about courses, fees, schedules, and enrollment procedures.
- 1.3. Staff collect paper-based application forms filled in by customers.
- 1.4. Staff manually enter application details into spreadsheets.
- 1.5. Staff contact customers to confirm enrollment through phone or email.

2. Class Scheduling:

- 2.1. Staff create class timetables manually using spreadsheets, considering tutor and classroom availability.

2.2. Timetables are distributed to students and tutors via printed copies or email.

2.3. Staff manually update timetables and communicate changes through phone calls or emails.

3. Attendance Tracking:

3.1. Staff receive attendance sheets from tutors.

3.2. Staff manually transfer attendance data from sheets to spreadsheets.

3.3. Staff contact absent students or their parents via phone or email.

4. Payment Processing:

4.1. Staff accept payments in cash or by cheque.

4.2. Staff issue paper receipts for payments.

4.3. Staff manually record payment details in spreadsheets.

4.4. Staff manually track and follow up on late payments through phone calls or emails.

5. Progress Monitoring and Support:

5.1. Tutors conduct periodic assessments and evaluations.

5.2. Staff receive record assessment results from tutors.

5.3. Staff manually update student progress records in spreadsheets.

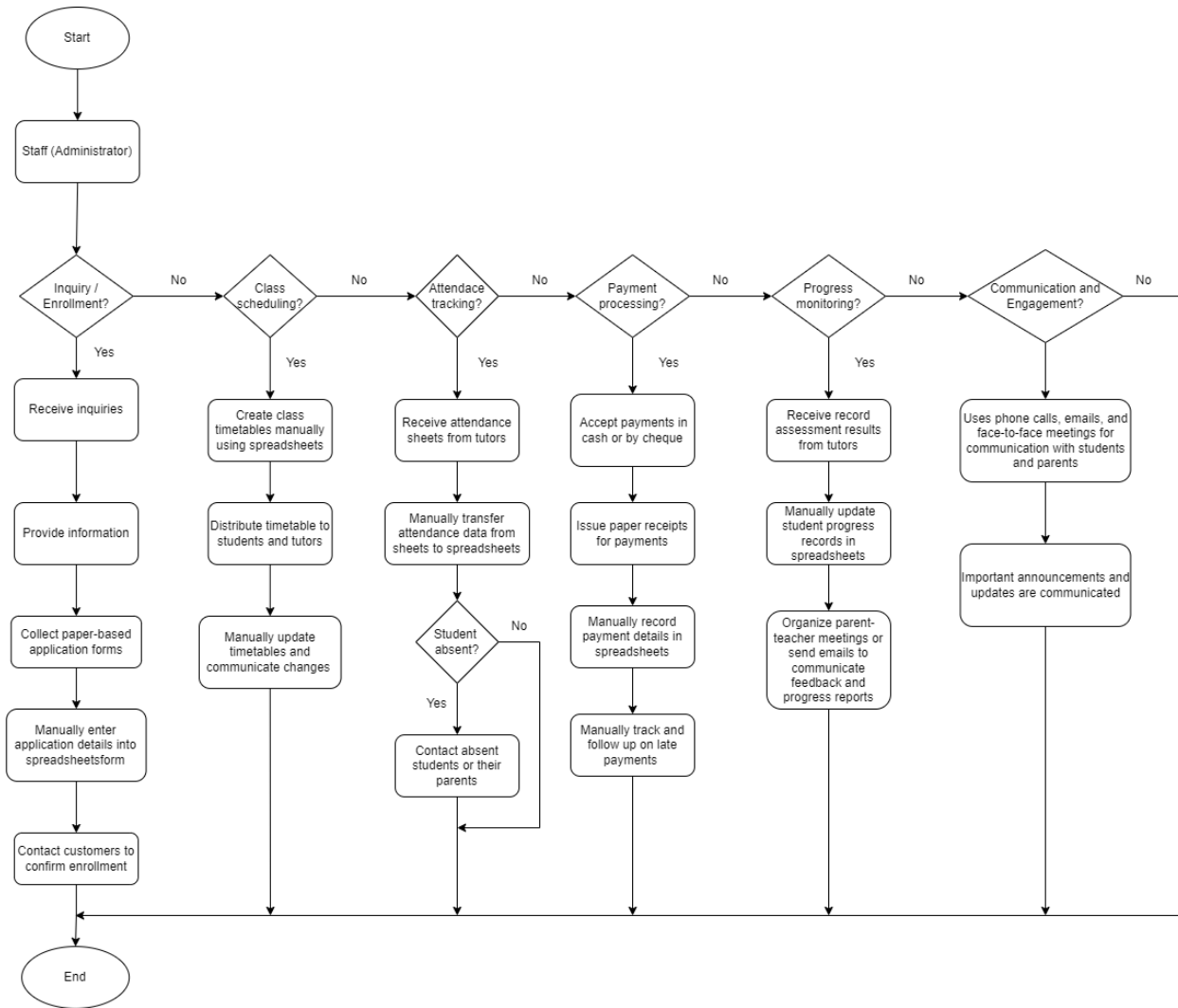
5.4. Staff organize parent-teacher meetings or send emails to communicate feedback and progress reports.

6. Communication and Engagement:

6.1. The Centre uses phone calls, emails, and face-to-face meetings for communication with students and parents.

6.2. Important announcements and updates are communicated via emails and printed notices.

6.3. There is limited interaction between tutors and students outside of scheduled class hours due to the lack of a robust communication platform.



Scenarios and Workflow for Tutors:

1. Inquiry and Enrollment:

- 1.1.Tutors receive their schedules from the admin staff either via email or a printed timetable distributed at the Centre.
- 1.2.Tutors prepare lesson plans based on the schedule, which includes courses, class timings, and student groups.

2. Class Scheduling:

- 2.1.Tutors receive a printed or emailed timetable from the staff.
- 2.2.Tutors conduct classes according to the prepared lesson plans, using physical textbooks and handouts.

3. Attendance Tracking:

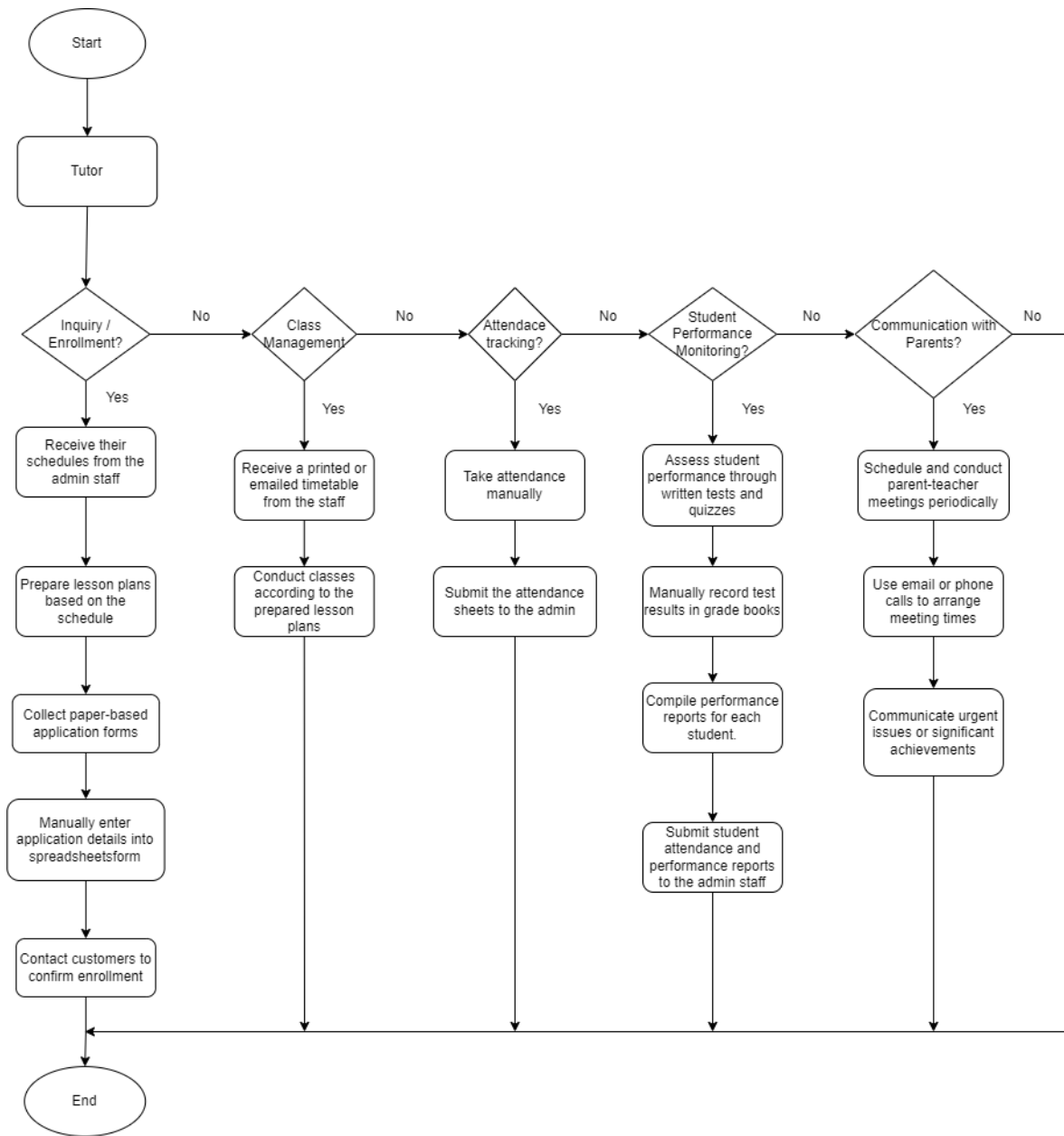
- 3.1.Tutors manually record attendance using paper-based attendance sheets at the beginning of each class.
- 3.2.Tutors submit the attendance sheets to the admin for manual entry into spreadsheets.

4. Student Performance Monitoring:

- 4.1.Tutors assess student performance through written tests and quizzes conducted during class hours.
- 4.2.Tutors manually record test results in grade books.
- 4.3.Tutors compile performance reports for each student.
- 4.4.At the end of each month, tutors submit student attendance and performance reports to the admin staff.

5. Communication with Parents:

- 5.1.Tutors schedule and conduct parent-teacher meetings periodically to discuss student progress.
- 5.2.Tutors use email or phone calls to arrange meeting times and to communicate urgent issues or significant achievements.



TO-BE System (DolphinLearn Hub System)

The proposed DolphinLearn Hub System aims to automate and enhance the existing manual processes at Dolphin Tuition Centre, improving efficiency, engagement, and support for students, parents, staff, and tutors. Below is a detailed description of the proposed scenarios and workflow, including the implementation of virtual classrooms for remote tutoring.

Scenarios and Workflow for Customers (Students and Parents):

1. Inquiry and Enrollment:

- 1.1.**Contact and Inquiry:** Customers access the DolphinLearn Hub online portal or mobile app to inquire about courses.
- 1.2.**Information Provision:** The system provides details about courses, fees, schedules, and enrollment procedures online.
- 1.3.**Application Form:** Customers fill in a digital application form, providing personal details, course selection, and contact information.
- 1.4.**Submission and Confirmation:** Customers submit the form online. They receive an automatic confirmation email with enrollment details and a digital course enrollment record.

2. Class Scheduling:

- 2.1.**Automated Timetable Creation:** The system automatically generates a class timetable based on course and tutor availability.
- 2.2.**Timetable Distribution:** The timetable is available on the DolphinLearn Hub portal and mobile app. Notifications are sent to students and parents for any schedule changes.

3. Attendance Tracking:

- 3.1.**Digital Attendance:** Tutors take attendance using a digital attendance sheet on the DolphinLearn Hub.
- 3.2.**Automated Notifications:** The system automatically notifies parents and students of absences via email or app notifications.

4. Payment Processing:

- 4.1.**Online Payment Options:** Customers can pay through various online methods (credit/debit card, e-wallets) via the DolphinLearn Hub.
- 4.2.**Digital Receipts:** The system generates and emails digital receipts to customers. Payment details are automatically recorded in the system.

5. Progress Monitoring and Support:

5.1.**Automated Assessments:** Tutors conduct assessments using digital tools available on the DolphinLearn Hub.

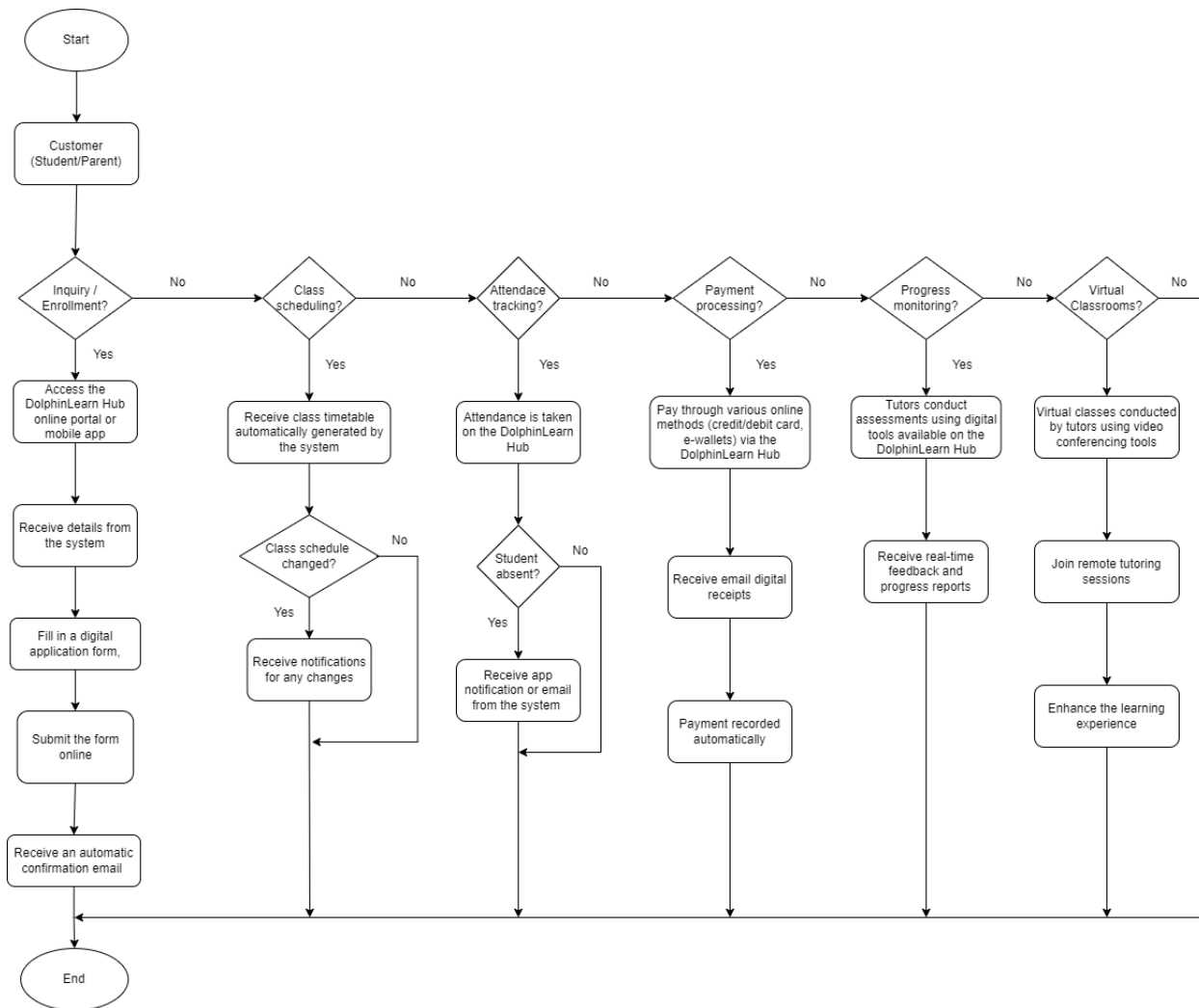
5.2.**Real-time Feedback:** The system provides real-time feedback and progress reports to students and parents through the portal and app.

6. Virtual Classrooms:

6.1.**Video Conferencing:** Tutors conduct virtual classes using video conferencing tools integrated into the DolphinLearn Hub.

6.2.**Remote Tutoring Sessions:** Students join remote tutoring sessions, providing increased flexibility and access to learning resources.

6.3.**Interactive Tools:** The virtual classroom includes interactive tools such as whiteboards, chat features, and screen sharing to enhance the learning experience.



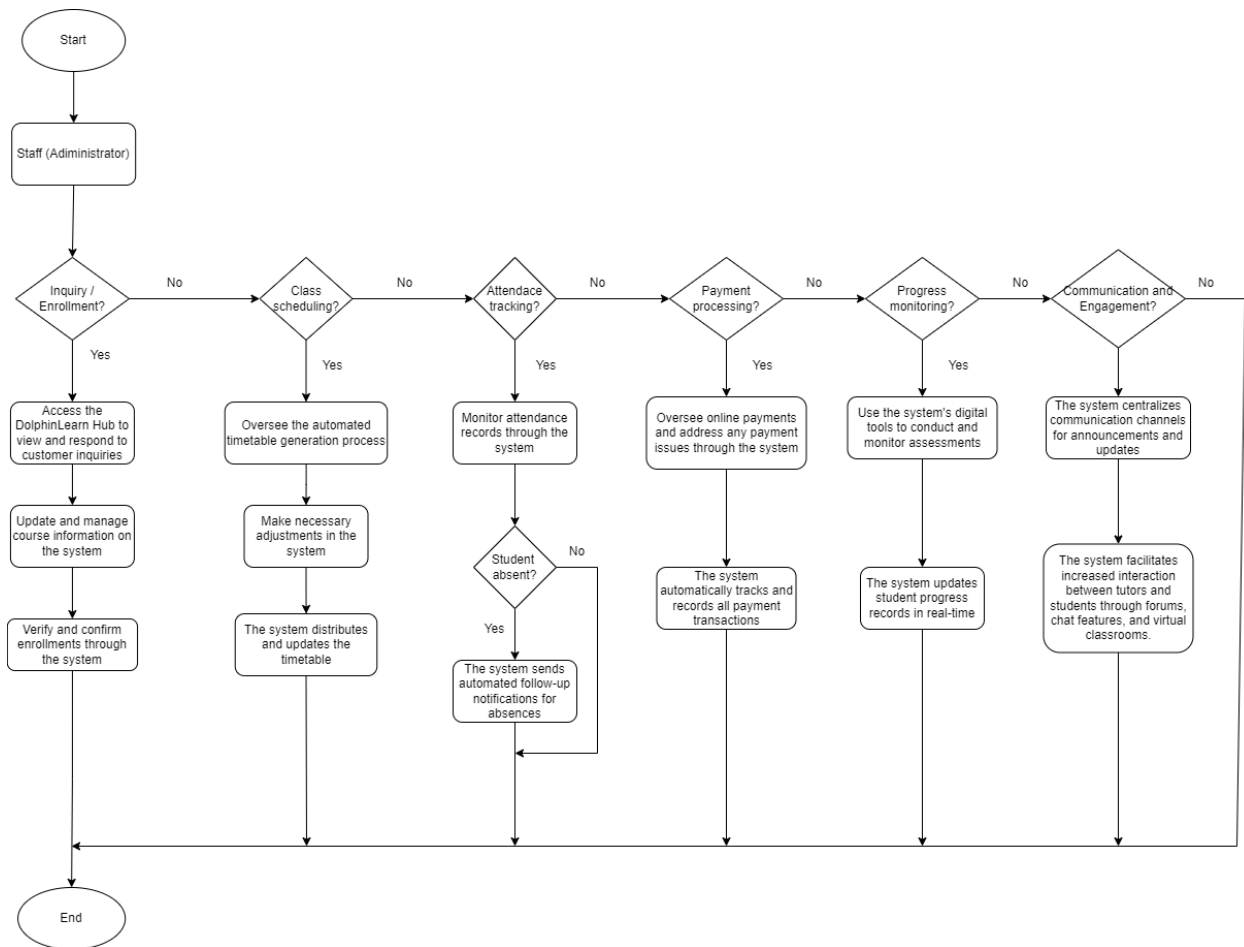
Scenarios and Workflow for Centre Staff (Administrators):

1. Inquiry and Enrollment:

- 1.1. **Manage Inquiries:** Staff access the DolphinLearn Hub to view and respond to customer inquiries.
- 1.2. **Provide Information:** Staff can update and manage course information on the system.
- 1.3. **Process Applications:** The system automatically processes digital application forms. Staff verify and confirm enrollments through the system.

2. Class Scheduling:

- 2.1.**Automate Timetable:** Staff oversee the automated timetable generation process and make necessary adjustments in the system.
 - 2.2.**Manage Timetable:** The system distributes and updates the timetable, reducing manual intervention.
- 3. Attendance Tracking:
 - 3.1.**Monitor Attendance:** Staff monitor attendance records through the system.
 - 3.2.**Follow-up on Absences:** The system sends automated follow-up notifications for absences, with staff able to intervene when necessary.
- 4. Payment Processing:
 - 4.1.**Manage Payments:** Staff oversee online payments and address any payment issues through the system.
 - 4.2.**Track Payments:** The system automatically tracks and records all payment transactions, reducing manual workload.
- 5. Progress Monitoring and Support:
 - 5.1.**Conduct Assessments:** Staff and tutors use the system's digital tools to conduct and monitor assessments.
 - 5.2.**Update Progress Records:** The system updates student progress records in real-time, making them accessible to staff for review.
- 6. Communication and Engagement:
 - 6.1.**Centralized Communication:** The system centralizes communication channels (email, notifications) for announcements and updates.
 - 6.2.**Enhanced Engagement:** The system facilitates increased interaction between tutors and students through forums, chat features, and virtual classrooms.



Scenarios and Workflow for Tutors:

1. Inquiry and Enrollment:

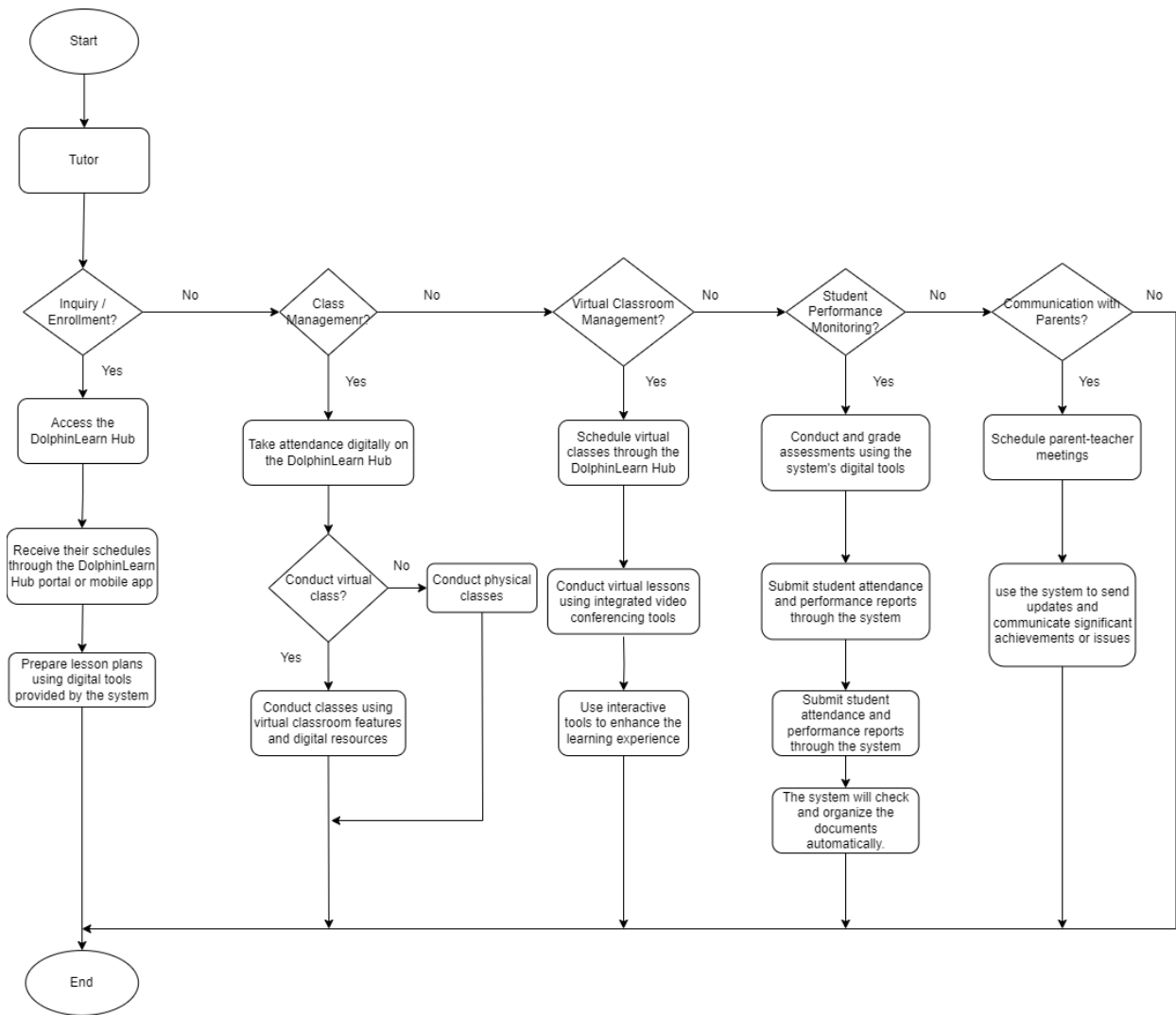
1.1.**Access system:** Tutors access the DolphinLearn Hub.

1.2.**Receive Schedules:** Tutors receive their schedules through the DolphinLearn Hub portal or mobile app.

1.3.**Prepare Lesson Plans:** Tutors prepare lesson plans using digital tools provided by the system.

2. Class Management:

- 2.1.**Digital Attendance:** Tutors take attendance digitally on the DolphinLearn Hub.
- 2.2.**Conduct Classes:** Tutors choose to conduct physical or virtual classes
 - 2.2.1. If virtual classes, tutors conduct classes using /virtual classroom features and digital resources.
 - 2.2.2. If not, the physical classes are conducted.
- 3. Virtual Classroom Management:
 - 3.1.**Schedule Virtual Classes:** Tutors schedule virtual classes through the DolphinLearn Hub.
 - 3.2.**Conduct Virtual Lessons:** Tutors conduct virtual lessons using integrated video conferencing tools.
 - 3.3.**Utilize Interactive Tools:** Tutors use interactive tools such as digital whiteboards, chat features, and screen sharing to enhance the learning experience.
- 4. Student Performance Monitoring:
 - 4.1.**Automated Assessments:** Tutors conduct and grade assessments using the system's digital tools.
 - 4.2.**Real-time Reporting:** Tutors update and monitor student performance in real-time on the DolphinLearn Hub.
 - 4.3.**Submit Reports:** Tutors submit student attendance and performance reports through the system.
 - 4.4.**Automated Filing:** The system will check and organize the documents automatically.
- 5. Communication with Parents:
 - 5.1.**Schedule Meetings:** Tutors schedule parent-teacher meetings through the system.
 - 5.2.**Communicate Updates:** Tutors use the system to send updates and communicate significant achievements or issues.



5.2 Functional Requirement (Input, process, output)

AS-IS System (Current manual tuition system)

Context Diagram

Process	Input	Output
Dolphin Tuition Centre System	Enrollment inquiry, Student details, Course selection Class details Attendance data Test scores, Exercises Announcement	Course enrollment record Class schedule Attendance record Progress reports Receipt Delivered Messages Payment Details

Level 0 Diagram

Process ID	Process	Input	Output
1.0	Manage Enrollment	Enrollment inquiry, Student details, Course selection	Course enrollment record, Class details
2.0	Schedule Classes	Class details	Class schedule
3.0	Track Attendance	Class schedule Attendance data	Attendance record
4.0	Monitor Progress	Attendance record, Test scores, Exercises	Progress reports
5.0	Communicate	Progress report, Announcement, Payment notification	Delivered messages, Payment details
6.0	Process Payments	Payment details	Receipt, Payment record

Level 1 Diagram

Process 1: Manage Enrollment

Process ID	Process	Input	Output
------------	---------	-------	--------

1.1	Receive Inquiry	Enrollment inquiry, Student details, Course selection	Course information
1.2	Provide Information	Course information	Enrollment form
1.3	Process Enrollment Form	Enrollment form	Course enrollment record, Class details

Process 2: Schedule Classes

Process ID	Process	Input	Output
2.1	Create Timetable	Class details	Draft timetable
2.2	Distribute Timetable	Draft timetable	Class schedule
2.3	Update Timetable	Class schedule	Updated class schedule

Process 3: Track Attendance

Process ID	Process	Input	Output
3.1	Take Attendance	Class schedule Attendance data	Attendance sheet
3.2	Transfer Attendance Records	Attendance sheet	Attendance record

Process 4: Monitor Progress

Process ID	Process	Input	Output
4.1	Conduct Assessments	Attendance record Test scores, Exercises	Assessment results
4.2	Record Results	Assessment results	Performance data
4.3	Provide Feedback	Performance data	Progress reports

Process 5: Communicate

Process ID	Process	Input	Output
5.1	Send student's progress	Progress reports	Announcement
5.2	Send Announcement	Announcement	Payment notification
5.3	Send Payment Notification	Payment notification	Delivered messages, Payment details

Process 6: Process Payments

Process ID	Process	Input	Output
6.1	Receive Payment	Payment details	Payment confirmation
6.2	Issue Receipt	Payment confirmation	Receipt
6.3	Record Payment	Receipt	Payment record

TO-BE System (DolphinLearn Hub System)

Context Diagram

Process	Input	Output
DolphinLearn Hub System	Enrollment inquiry, Student details, Course selection Class details Class schedule, Course materials Attendance data Test scores, Exercises Announcements Payment details	Course enrollment record, Confirmation email Automated class schedule, Notifications Virtual class sessions, Recorded lessons Attendance record Real-time performance data, Progress reports Digital receipt

Level 0 Diagram

Process ID	Process	Input	Output
1.0	Manage Enrollment	Enrollment inquiry, Student details, Course selection	Course enrollment record, Confirmation email, Class details
2.0	Schedule Classes automatically	Class details	Automated class schedule, Notifications
3.0	Conduct Virtual Classes	Automated class schedule, Online Course materials	Virtual class sessions, Recorded lessons, Attendance data
4.0	Track Attendance	Attendance data	Attendance record
5.0	Monitor Progress	Attendance record, Test scores, Exercises	Real-time performance data, Progress report

6.0	Communicate	Progress report	Delivered Messages, Payment details
7.0	Process Payments	Payment details	Digital receipt, Payment confirmation

Level 1 Diagram

Process 1: Manage Enrollment

Process ID	Process	Input	Output
1.1	Receive Online Inquiry	Enrollment inquiry, Student details, Course selection	Course information
1.2	Provide Course Information	Course information	Enrollment form
1.3	Process Digital Enrollment Form	Enrollment form	Course enrollment record, Confirmation email, Class details

Process 2: Schedule Classes

Process ID	Process	Input	Output
2.1	Generate Timetable	Class details	Automated timetable
2.2	Distribute Timetable	Automated timetable	Class schedule
2.3	Update Timetable	Class schedule	Updated timetable, Notifications, Automated class schedule

Process 3: Conduct Virtual Classes

Process ID	Process	Input	Output
3.1	Schedule Virtual Classes	Automated class schedule	Online course materials
3.2	Conduct Virtual Lessons	Online course materials	Interactive tools usage, Virtual class sessions
3.3	Record Virtual Sessions	Virtual class sessions	Recorded lessons, Attendance data

Process 4: Track Attendance

Process ID	Process	Input	Output
4.1	Record Attendance	Attendance data	Attendance record
4.2	Notify Absences	Attendance record	Absence notifications
4.3	Sync Attendance Records	Absence notifications	Synced attendance record

Process 5: Monitor Progress

Process ID	Process	Input	Output
5.1	Conduct Digital Assessments	Synced attendance record Test scores, Exercises	Assessment results
5.2	Record Results	Assessment results	Real-time performance data
5.3	Provide Real-time Feedback	Real-time performance data	Progress reports

Process 6: Communicate

Process ID	Process	Input	Output
6.1	Send Progress reports	Progress reports	Announcement
6.2	Provide Updates	Announcement	Communication requests
6.3	Facilitate Communication	Communication requests	Communication records, Payment notification
6.4	Send payment notification	Payment notification	Payment details

Process 7: Process Payments

Process ID	Process	Input	Output
7.1	Receive Online Payment	Payment details	Payment confirmation
7.2	Issue Digital Receipt	Payment confirmation	Digital receipt
7.3	Record Payment	Digital receipt	Payment record

5.3 Non-Functional Requirements (Performance and Control)

The DolphinLearn Hub system must meet certain non-functional requirements to ensure optimal performance, security, and usability. These requirements focus on performance metrics and control mechanisms to maintain system reliability, integrity, and user satisfaction.

Performance Requirements

1. System Availability:

- The system must have an uptime of 99.9% to ensure it is always available for users, including peak usage periods.

2. Response Time:

- The system should respond to user requests within 2 seconds for 95% of transactions to ensure a seamless user experience.

3. Scalability:

- The system must be able to handle an increase in user load by supporting up to 10,000 concurrent users without performance degradation.

4. Data Processing:

- The system should be capable of processing and updating attendance records, enrollment data, and payment transactions within 1 second of submission.

5. Throughput:

- The system should support a minimum of 500 transactions per second to handle peak operational loads effectively.

6. Backup and Recovery:

- The system must perform daily backups of all data and ensure recovery within 4 hours in the event of a failure.

7. Compatibility:

- The system must be compatible with major web browsers (Chrome, Firefox, Safari, Edge) and mobile operating systems (iOS, Android).

8. Resource Utilization:

- The system should optimize server resource usage, ensuring CPU and memory usage do not exceed 75% under normal operating conditions.

Control Requirements

1. Security:

- **Data Encryption:** All sensitive data, including personal information and payment details, must be encrypted using AES-256 encryption both at rest and in transit.
- **Authentication:** The system must support multi-factor authentication (MFA) for all users to prevent unauthorized access.
- **Access Control:** Role-based access control (RBAC) must be implemented to ensure users can only access data and functions relevant to their role.

2. Data Integrity:

- **Validation:** All user inputs must be validated at both the client and server sides to prevent data corruption and ensure data integrity.
- **Audit Trails:** The system must maintain comprehensive audit trails for all user activities, including logins, data changes, and transactions.

3. Compliance:

- **Regulatory Compliance:** The system must comply with relevant data protection regulations, such as GDPR and CCPA, to ensure the privacy and security of user data.
- **Standards Adherence:** The system must adhere to industry standards for web application security, such as OWASP Top Ten.

4. Reliability:

- **Error Handling:** The system must have robust error handling mechanisms to log errors and provide meaningful feedback to users without exposing sensitive information.

- **Redundancy:** The system must incorporate redundancy for critical components, including databases and servers, to ensure high availability and fault tolerance.

5. Usability:

- **User Interface:** The system must have an intuitive and user-friendly interface, ensuring ease of navigation and accessibility for all users, including those with disabilities.
- **Training and Documentation:** Comprehensive training materials and user documentation must be provided to assist users in navigating and utilizing the system effectively.

6. Maintainability:

- **Modular Design:** The system must be designed using a modular architecture to facilitate easy updates, maintenance, and scalability.
- **Monitoring:** Continuous monitoring tools must be implemented to track system performance, detect issues, and trigger alerts for anomalies.

7. Privacy:

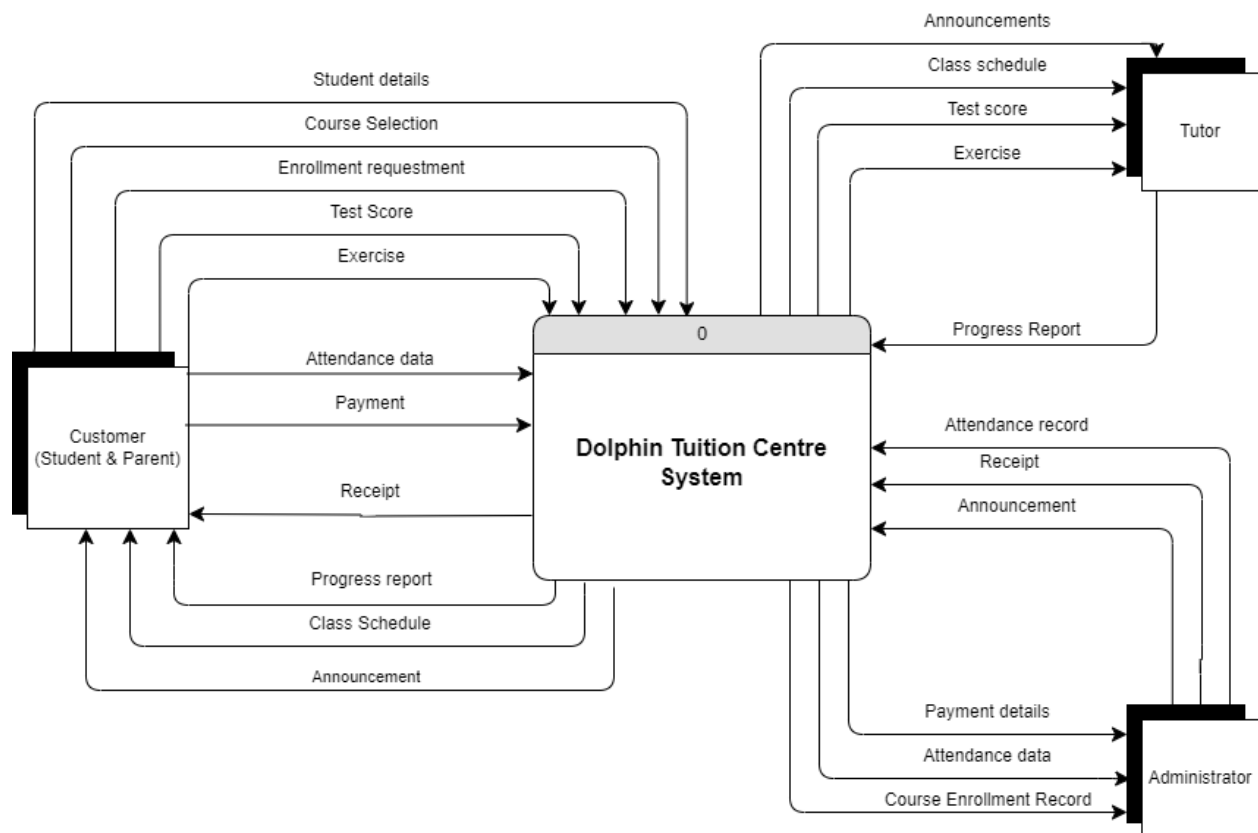
- **Data Minimization:** The system should collect and retain only the data necessary for its operation to minimize privacy risks.
- **User Consent:** The system must obtain explicit consent from users for data collection and processing activities, with options to withdraw consent.

These non-functional requirements will ensure that the DolphinLearn Hub system is robust, secure, and capable of providing a high-quality user experience while maintaining performance and control standards.

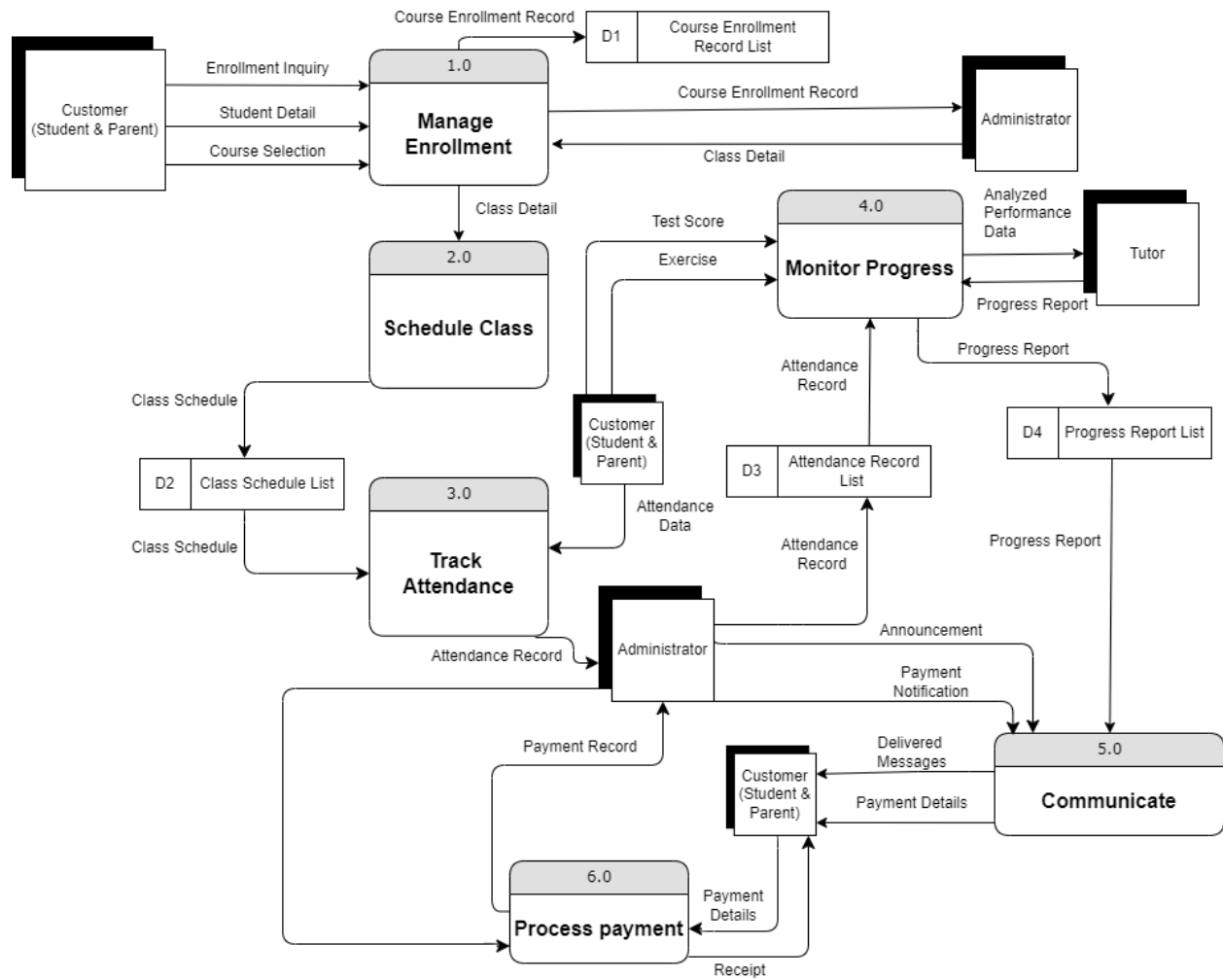
5.4 Logical DFD AS-IS system (Context Diagram, Diagram 0, Child)

DFD for AS-IS System (Current manual tuition system)

Context Diagram

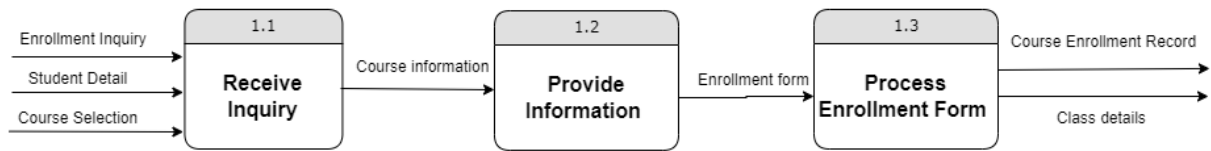


Level 0 Diagram

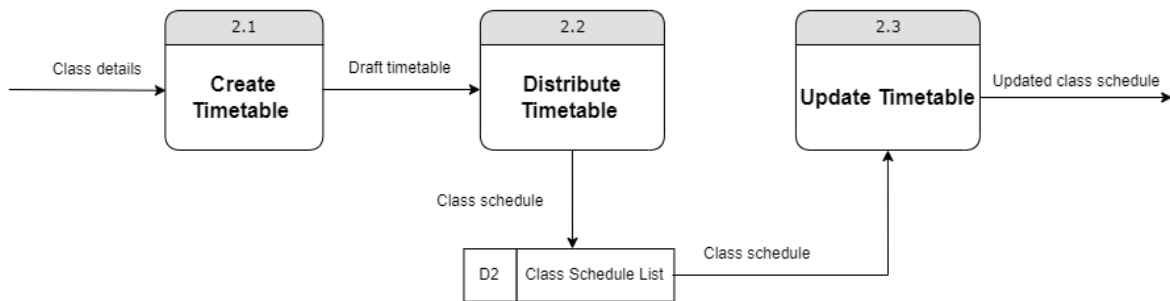


Level 1 Diagram

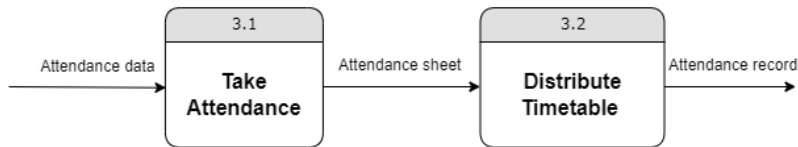
Process 1: Manage Enrollment



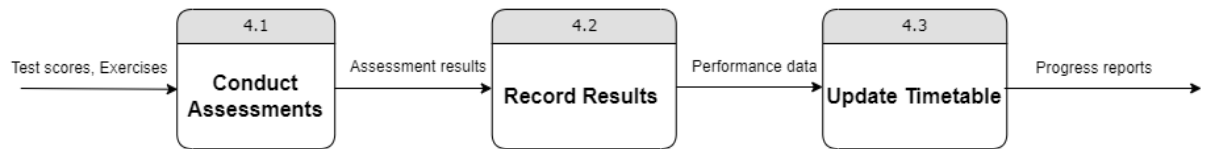
Process 2: Schedule Classes



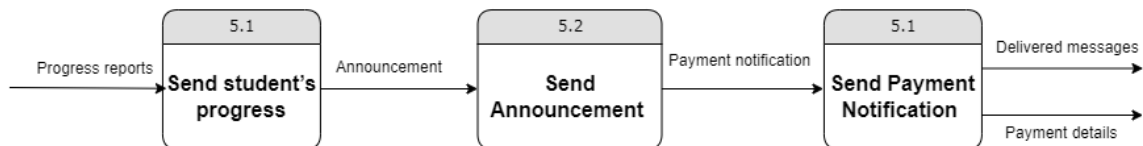
Process 3: Track Attendance



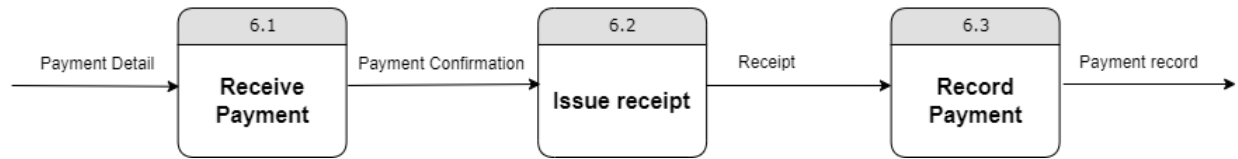
Process 4: Monitor Progress



Process 5: Communicate

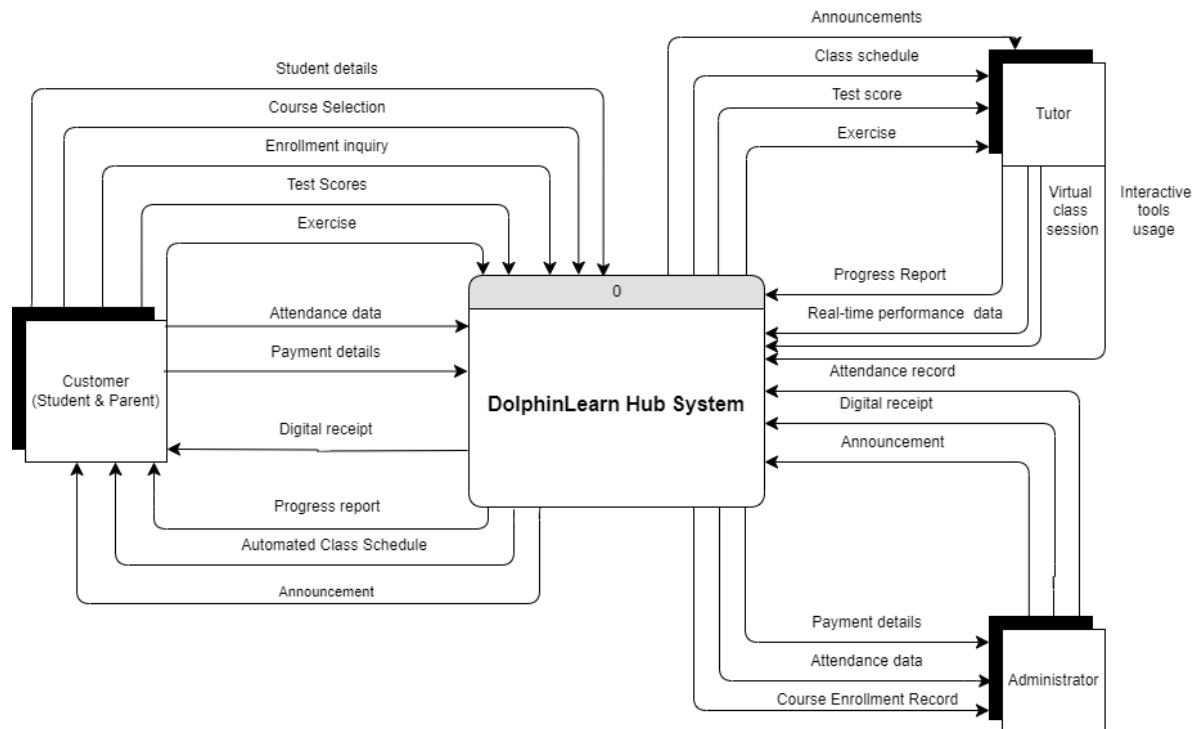


Process 6: Process Payments

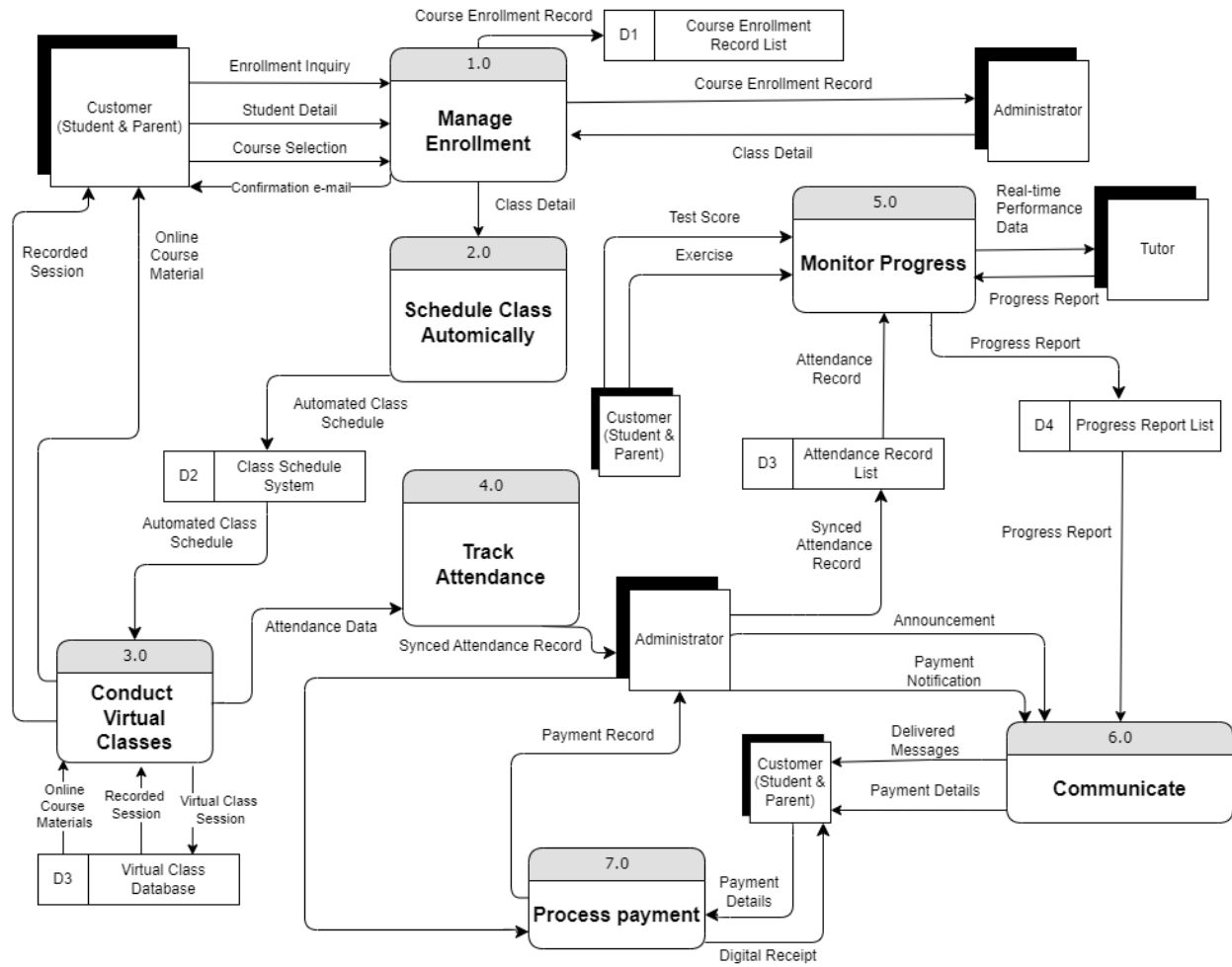


TO-BE System (DolphinLearn Hub System)

Context Diagram

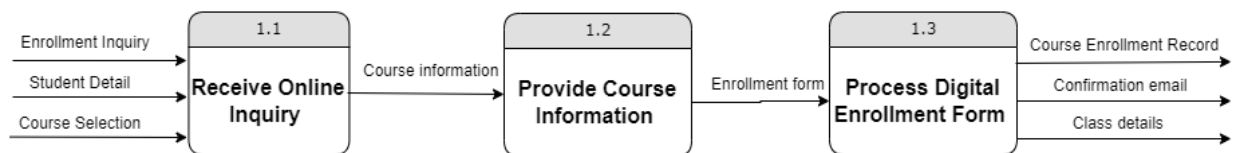


Level 0 Diagram

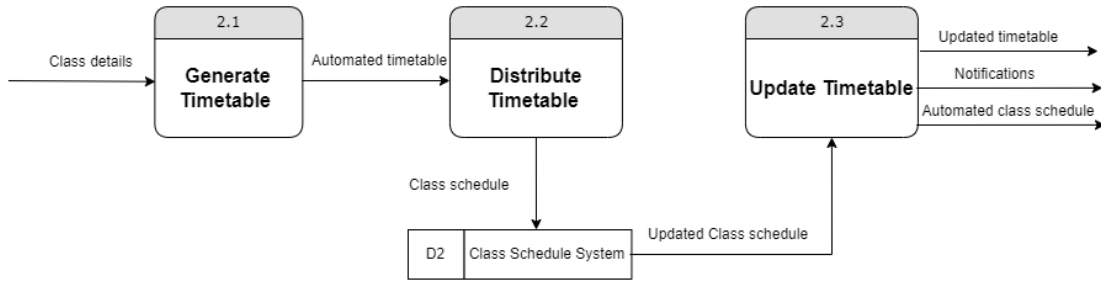


Level 1 Diagram

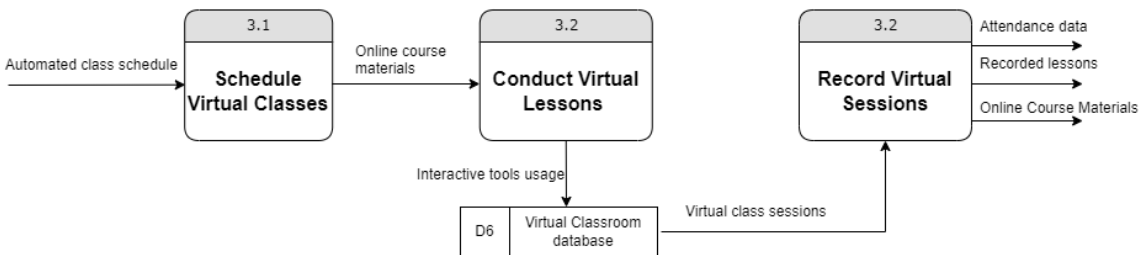
Process 1: Manage Enrollment



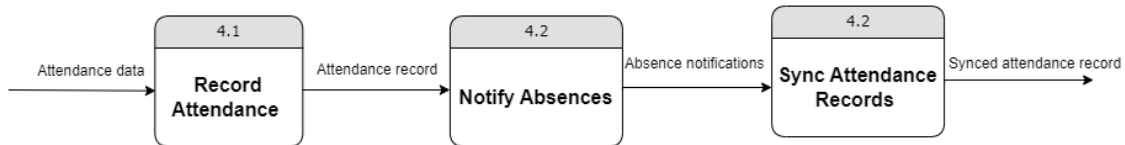
Process 2: Schedule Classes



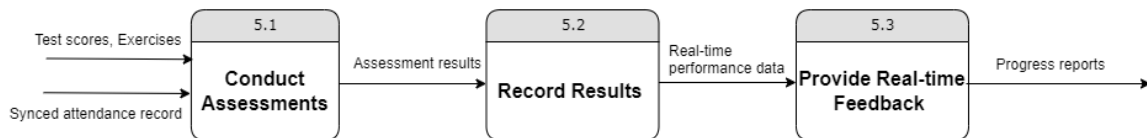
Process 3: Conduct Virtual Classes



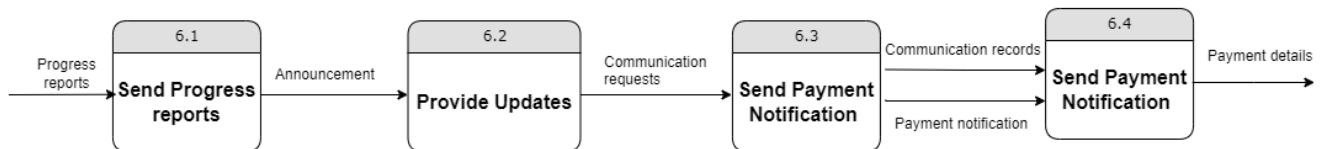
Process 4: Track Attendance



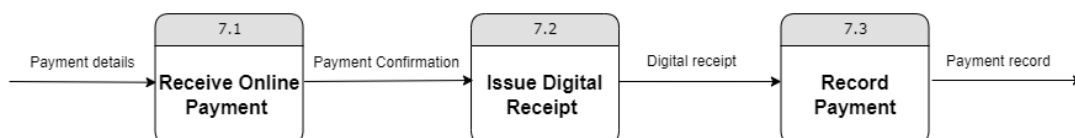
Process 5: Monitor Progress



Process 6: Communicate



Process 7: Process Payments



6.0 Summary of Requirement Analysis Process

The DolphinLearn Hub System is designed to revolutionize the way tuition is managed at Dolphin Tuition Centre by automating various processes, providing real-time support, and enhancing overall user experience. This system addresses the inefficiencies and issues present in the current manual system, such as enrollment errors, communication delays, and data security vulnerabilities. DolphinLearn Hub aims to create a seamless, efficient, and secure platform for students, parents, tutors, and administrators.

The functions of the To-Be system are as follows:

1. Automated Enrollment and Scheduling
2. Real-Time Class Management and Virtual Learning
3. Automated Attendance Tracking
4. Progress Monitoring
5. Instant Communication and Notifications
6. Efficient Payment Processing
7. Learning Resources Management

By implementing an automated enrollment and scheduling system, DolphinLearn Hub resolves the issues of manual errors and inefficiencies. Real-time class management and virtual learning features ensure that students and tutors can engage seamlessly without the need for physical presence. The automated attendance tracking system eliminates the need for manual attendance records, making the process faster and more accurate. Continuous progress monitoring helps tutors and parents keep track of student performance in real-time, providing timely feedback and support. The system's instant communication and notification features improve overall communication, ensuring that important messages are delivered promptly. Efficient payment processing and receipt generation reduce errors and streamline financial management. Finally, learning resources management allows for easy distribution and tracking of educational materials.