

# **1st Round Submission**



# Class Monitor Pitch Deck



Here is where your presentation begins



Kitlong Wong 😍



Yao Chen 😎



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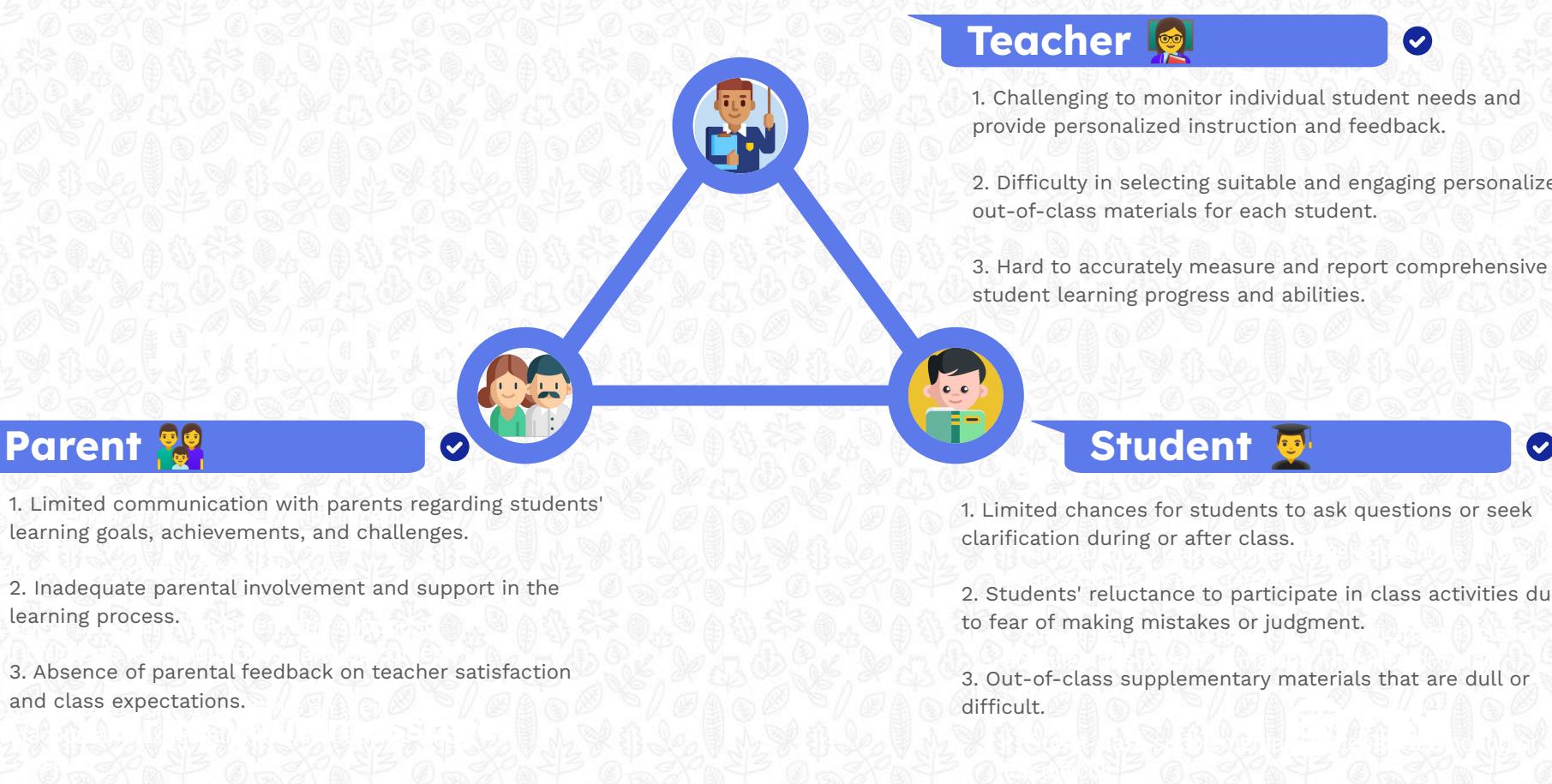
Xianrui He 😎

Attend class in a SMART way 😁😎





# Problem Statement





# Product Overview



## Ask Me 💬



An AI-powered Chatbot that answers students' questions. If the answer is not satisfied, it will be passed to the teacher for further assistance.

## Instant Learning 🎓



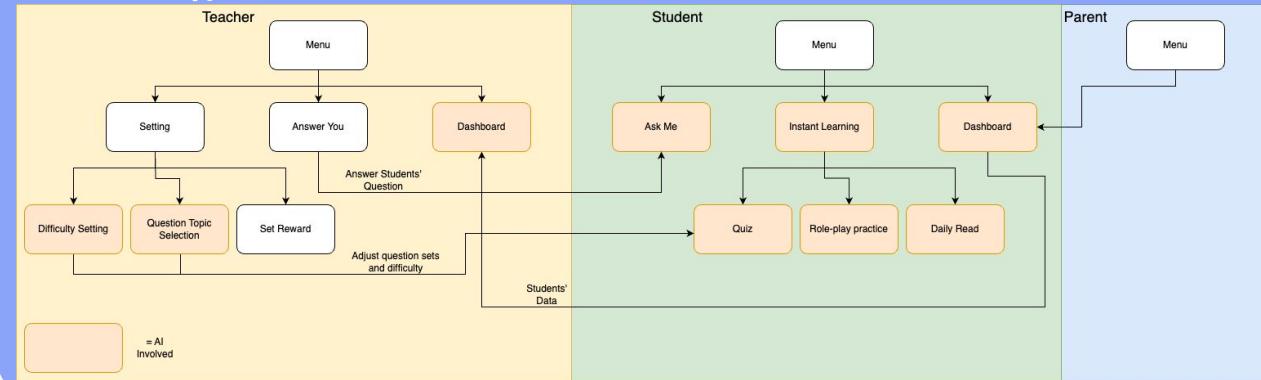
Provide personalized learning materials for language skills, system and culture.

## Clear Dashboard 📊



A transparent and comprehensive visualization of student learning progress.

### 3 account types with different functions:





# Unique Selling Point



## Flexible & User-friendly



- Based on WhatsApp for **seamless accessibility** and **ease of use**
- **Cost-effective** solution for learning
- Learn and teach **anywhere, anytime**
- Achieve **scalability** with a highly adaptable Framework

## Crystal Clear Learning Progress



- **Tracking** improvement and **Identifying** strengths and weaknesses
- **Personalized advice** from AI, teachers and parents

## AI-Powered Personalization



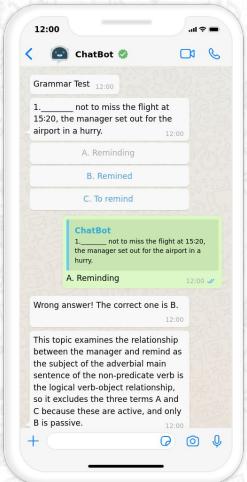
- **Customized** difficulty and content based on students' goal, interest and ability
- **AI-assisted** quiz and question preparation



# Feature 1: Instant Learning



## Quiz 🧠



## Writing Improve✍



## Daily Read 📖



## Role Play 🎭



- multiple-choice, fill-in-the-blank, matching, and word formation
- Difficulty and content based on students' past performance

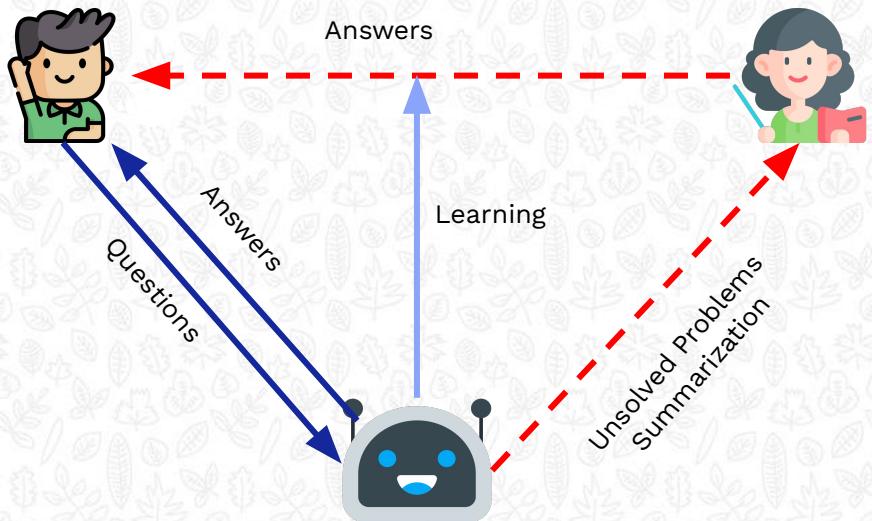
- Chatbot helps **modify** students' writing, **give advices** and score

- **Personalized recommendations** for Articles, News, and Videos
- Short question to check students' understanding

- The Chatbot is designed to **adopt various themes** and engage in lively communication with students **Voice and text messaging**



## Feature 2: Ask Me



### Quick Answer ✓

The chatbot responds to students' inquiries and provides them with accurate answers.



### Efficient Management

The chatbot assists teachers in swiftly comprehending students' situations, eliminating the need for repetitive inquiries.



### AI Evolution

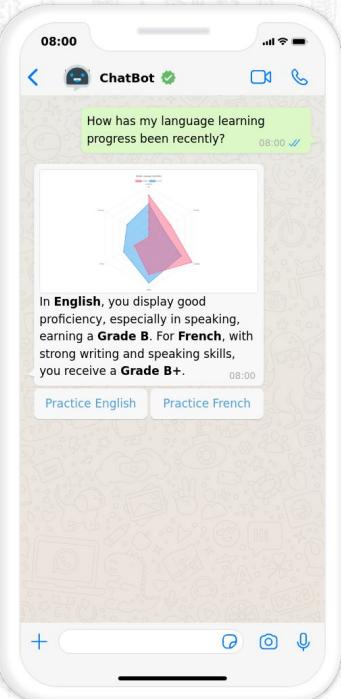
The chatbot learns from teachers' responses and incorporates that knowledge to offer improved solutions in future interactions.



# Feature 3: Students' Dashboard

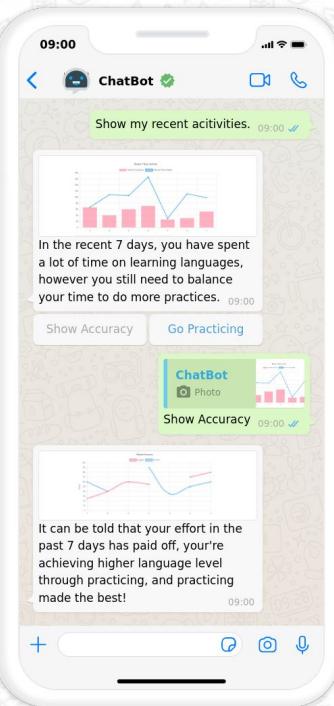


## Performance Summary



- **Quick review** of students' overall learning performance and activeness
- **A comprehensive review** of various language skills and system
- **Insightful feedback** and analysis generated by AI

## Detail Analysis



- **Drill-down analysis:** compare students' performance over time, compare with classmates, progress towards personal goals, etc

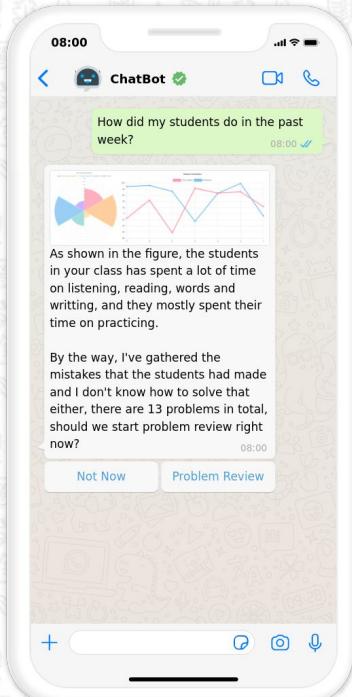
- Clear graphs are utilized to present the analysis and comparisons in a **visually understandable** manner.



# Feature 4: Teachers' Dashboard

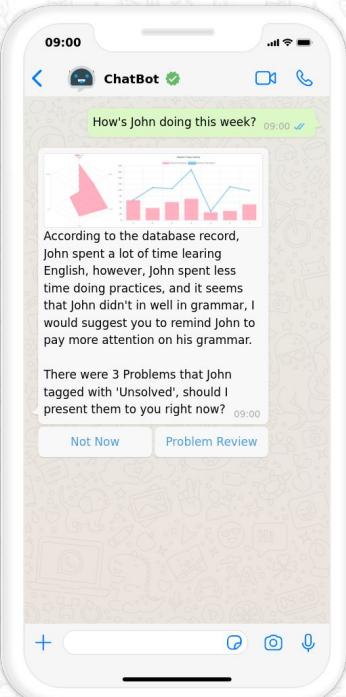


## Class Summary



- **Quick review** of class' overall learning performance and activeness
- **A comprehensive review** of various language skills and system
- Students' questions and parents' feedback are **analyzed and consolidated** by AI

## Detail Analysis



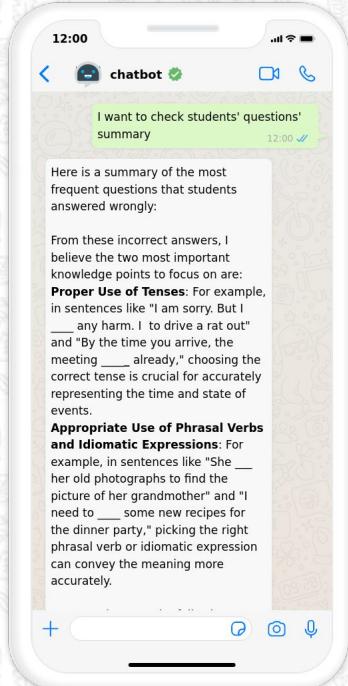
- **Drill-down analysis** of a specific student
- Clear graphs are utilized to present the analysis and comparisons in a **visually understandable** manner.



# Feature 5: Smart Customization



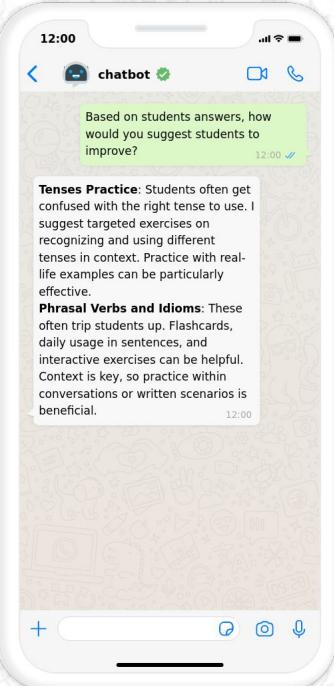
## Customized Reply



- Teachers have the capability to **respond** to questions and feedback from both students and parents

- The AI system **learns from the comments** and responses provided by teachers, enabling it to improve its future responses based on the acquired knowledge

## Content Adjustment



- Teachers have the ability to **modify** the **difficulty level** and **learning content** for the entire class or individual students

- The AI provides **helpful suggestions** to assist teachers in making appropriate adjustments based on their inputs and requirements.



# Tech Stack & Advantages



01

## Intelligent Assistant

AI-powered assessments, dynamic quiz generation, and common query summarization

02

## Evolutionary Assistant

Harnessing the power of **vector store** for **self-optimizing intelligence** and **adaptive learning**. Never repeating the same mistake.

03

## Multi-Scenario Knowledge Base

using **vector store** to achieve **intelligent function dispatch** and ensuring **accuracy on relevant topics** while avoiding **off-topic/sensitive content**

04

## Personalized Study Material

using **reinforcement learning** & **recommendation system** to **tailoring learning resources** to individual needs & abilities

# **2nd Round Submission**



# Class Monitor Pitch Deck



Here is where your presentation begins



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Attend class in a SMART way 😁😎



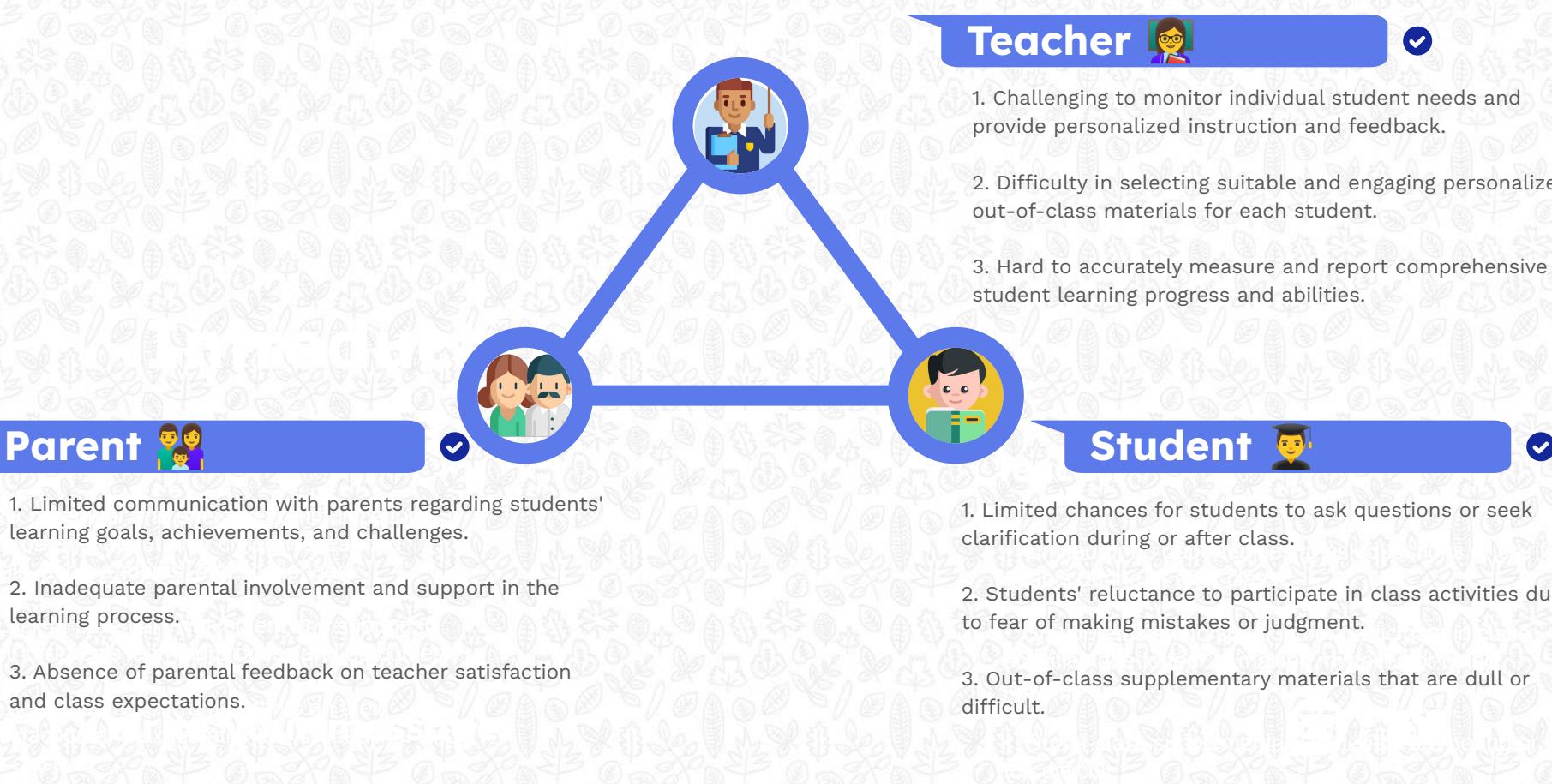


01

Background



# Problem Statement



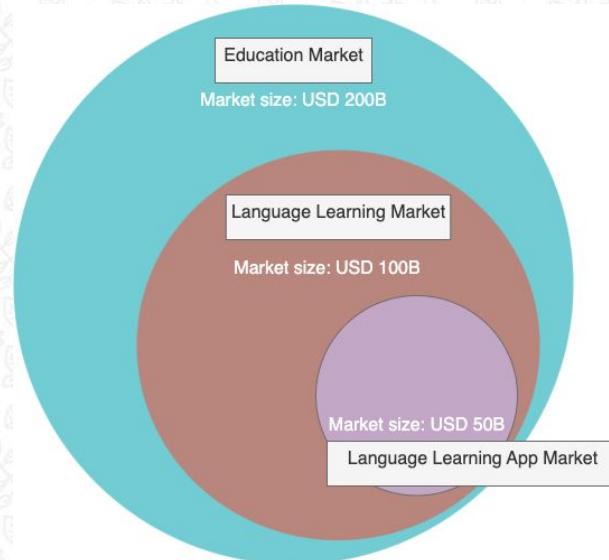


# Market Opportunity



The **educational market**, Language Learning market is **massive**.

| App name  | Number of downloads |
|-----------|---------------------|
| Duolingo  | 13,381,172          |
| OckyPocky | 2,187,941           |
| Buddy.ai  | 1,229,426           |
| Lingokids | 1,190,272           |
| Languager | 1,056,601           |





# Unique Selling Point



Our product is a WhatsApp chatbot for language learning that leverages the power of large language models (LLMs) to provide a personalized and interactive learning experience. Unlike other platforms, our product offers:

## Flexible & User-friendly



- Based on WhatsApp for **seamless accessibility** and **ease of use**
- **Cost-effective** solution for learning
- Learn and teach **anywhere, anytime**
- A comfortable and engaging learning environment that simulates **real-life conversations and scenarios**, making language learning more fun and **natural**.

## Crystal Clear Learning Progress



- A supportive and collaborative system that empowers teachers, students, and parents with **clear** and **timely feedback, insights, and guidance**
- **Personalized advice** from AI, teachers and parents

## Comprehensive Learning Approach



- covers all aspects of language skills, such as **writing, listening, speaking, and Q&A**.

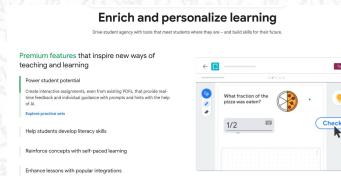
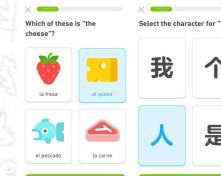
## AI-Powered Personalization



- **Data driven & customized** difficulty and content based on students' goal, interest and ability
- **AI-assisted** quiz and question preparation
- Cutting edge techniques to ensure the **stability** and **accuracy** of chatbot



# Competitor Analysis



Enrich and personalize learning  
Drive student agency with tools that meet students where they are—and build skills for their future.

Premium resources that inspire new ways of teaching and learning

- Assign student projects
- Create interactive assignments, even from existing PDFs, that provide real-time feedback and individual guidance with prompts and hints with the help of AI
- Explore practice sets
- Help students develop literacy skills
- Reinforce concepts with self-paced learning
- Enhance lessons with popular integrations

| Website             |                                       | <a href="https://www.duolingo.com/">https://www.duolingo.com/</a> | <a href="https://www.fluentu.com/">https://www.fluentu.com/</a> | <a href="https://edu.google.com/intl/ALL_us/workspace-for-education/classroom/">https://edu.google.com/intl/ALL_us/workspace-for-education/classroom/</a> |   |
|---------------------|---------------------------------------|---|---|---|---|
| Aspect              |                                       | Duolingo  | FluentU   | Google for Education  | Class Monitor   |
| Student Perspective | Learning Experience & Content Variety | Fun but limited content, mainly quizzes                           | Video-focused with limited exercises                            | Highly dependent on teacher's material design   | Comprehensive, including quizzes, role-play, and daily readings |
| Teacher Perspective | Flexibility & Material Preparation    | Limited flexibility   | Limited flexibility   | Too high flexibility  | Moderate flexibility and low workload with AI support           |



FluentU Schools

Site language: English [Log In](#) [Sign Up](#)

FluentU brings language learning to life with real world videos!

Movie Scenes

Get 14 Days Free

Spanish English French Chinese German Japanese



# Class Monitor



**Estimated Daily  
Messages: 3 million.**

Assumption:

Average Messages per Student: 20 messages with the chatbot each day, based on typical WhatsApp user behavior.

Number of Student: Nearly 1.5 billion people globally are learning a second language. Assume we reach 0.01% of them, then the number of student is 0.15M.



# Product Overview



## Ask Me 🤖



An **AI-powered Chatbot** that answers students' questions. If the answer is not satisfied, it will be passed to the teacher for further assistance.

## Instant Learning 🎓



Provide **personalize & fun learning materials** for language skills, system and culture.

## Clear Dashboard 📊



A **transparent and comprehensive visualization** of student learning progress.

## 3 Account Types 📝



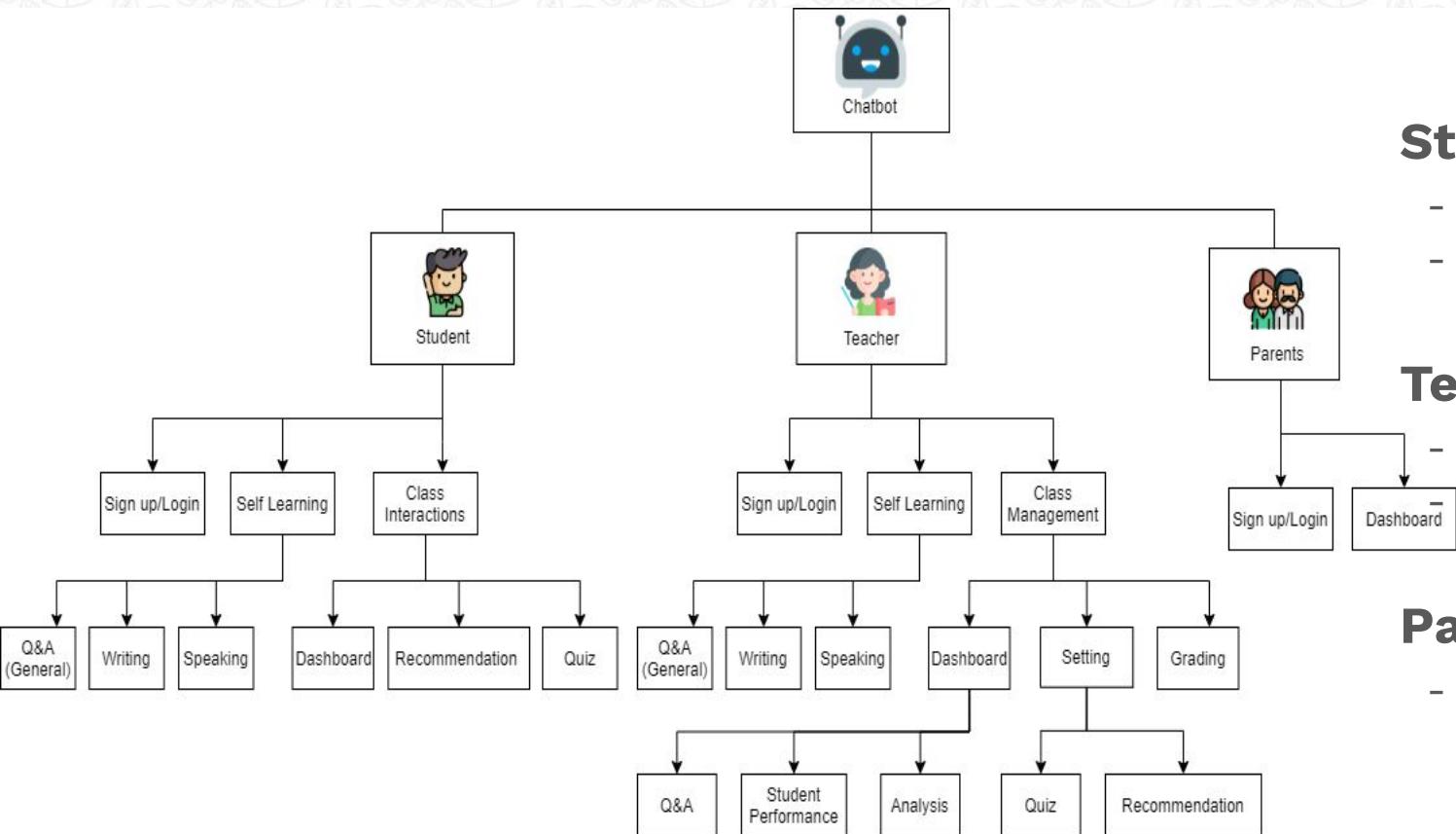
**Parent:** view students' performance

**Student:** work on the exercise

**Teacher:** monitor students' performance and manage the class



# Product Overview



## Student

- Self-learning
- Class Interactions

## Teacher

- Self-learning
- Class Management

## Parents

- Monitor

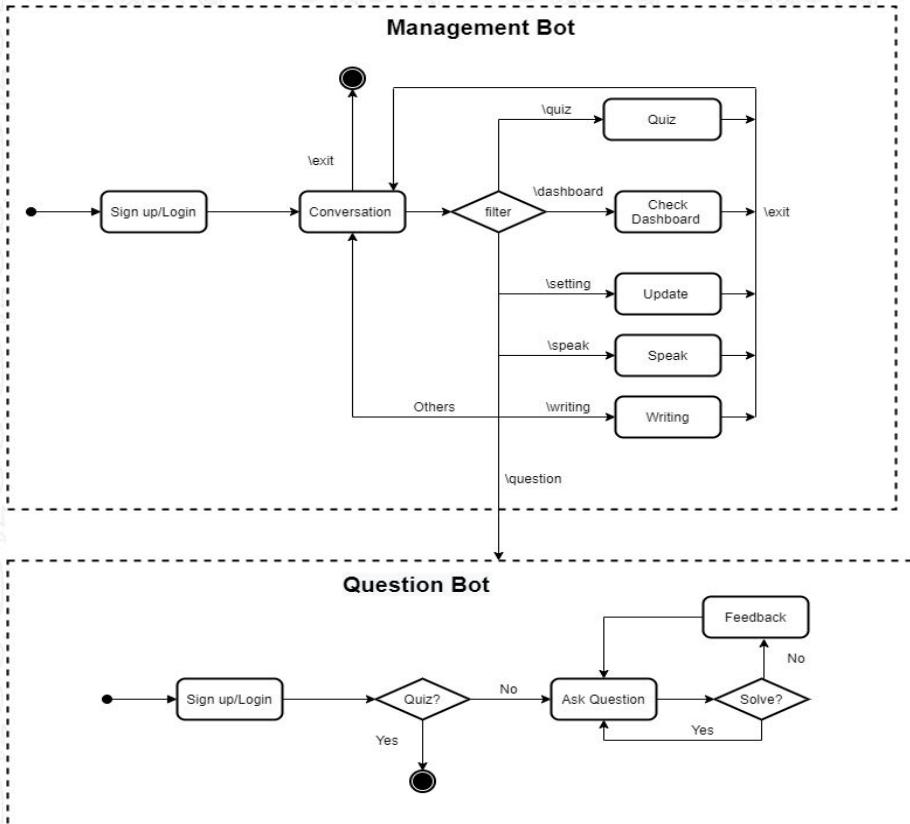


02

## Product Description



# State Diagram



## Two Bots for Efficient Learning

During the conversation, each sentence from a user is a command for chatbot. So, for simplicity, we design two bots for language learning.

**Management Bot:** Aim for general user cases. Students can use the bot for self-learning and check their performances. Teachers can also enrich their language knowledge and analyse the overall records.

**Question Bot:** deal with students' problems and report to a teacher if the problem hasn't been solved. It will be deactivated when students take quiz.

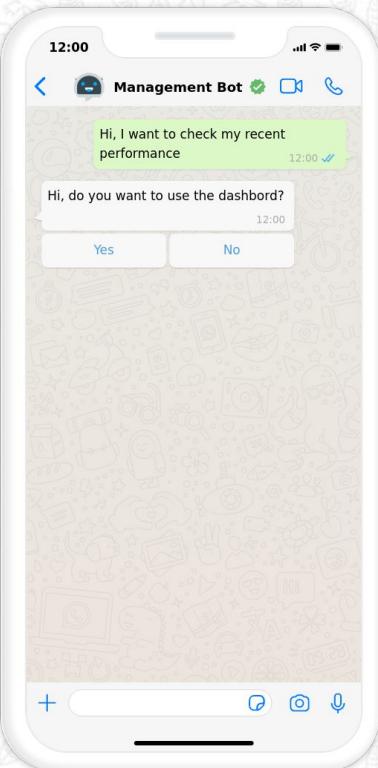
**Note:** We apply a LLM filter that supports the natural language to match correct statements not just using hardencoding commands.



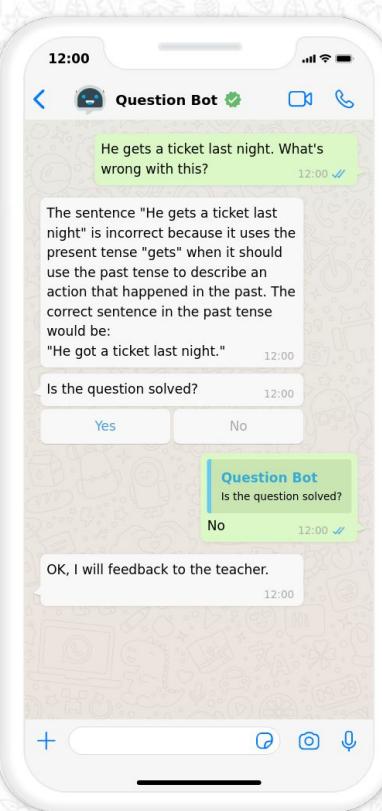
# State Diagram UI



## Management Bot



## Question Bot



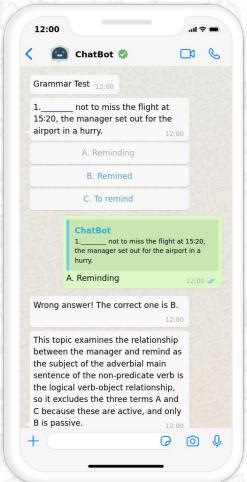
Management bot handles general learning user cases while question bot deals with student problems.



# Feature 1: Instant Learning



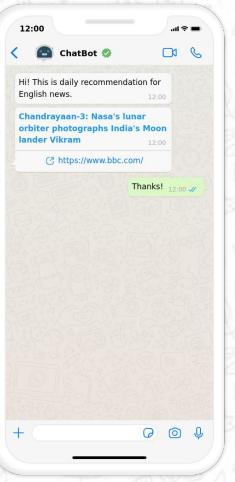
## Quiz 🧠



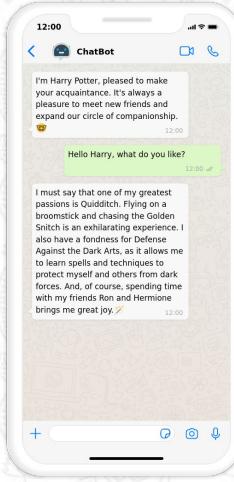
## Writing Improve✍



## Daily Read 📖



## Role Play 🎭



- multiple-choice, fill-in-the-blank, matching, and word formation
- Difficulty and content based on students' past performance

- Chatbot helps **modify** students' writing, **give advices** and score

- **Personalized recommendations** for Articles, News, and Videos
- Short question to check students' understanding

- The Chatbot is designed to **adopt various themes** and engage in lively communication with students **Voice and text messaging**



# Instant Learning: Quiz



The image displays two side-by-side screenshots of a mobile application interface, likely from an iPhone. Both screenshots show a conversation with a 'ChatBot'. The top screenshot shows the initial message: 'Hi, Peter! Are you ready for some English practice? Can we start with a question?' followed by a timestamp '12:00'. The bottom screenshot shows a response from the ChatBot: 'Of course! Let's work on your pronunciation. Please try pronouncing the word: "Ephemeral."'. Below this message is a recording player with a play button, a duration of '01:34', and a timestamp '12:00'. A second recording player below it shows a duration of '01:11' and a timestamp '12:00'. The ChatBot then provides feedback: 'I see you made an effort, but there's room for improvement. Here's the correct pronunciation: [ee-fem-uh-ruhl]. Try repeating it a few times, and we'll work on it together.' This message includes a timestamp '12:00'. At the bottom of the screen, there are three small icons: a plus sign, a blue speech bubble, and a microphone.

- The questions types include:

- Multiple Choice Questions (MCQs)
- Fill in the Blanks
- Matching Questions
- True or False
- Listening Comprehension
- Sentence Rearrangement
- Vocabulary Matching
- Translation
- Grammar Questions
- Reading Comprehension

- It operates through a real-time response loop, taking into account students' past performance and adjusting question difficulty accordingly.

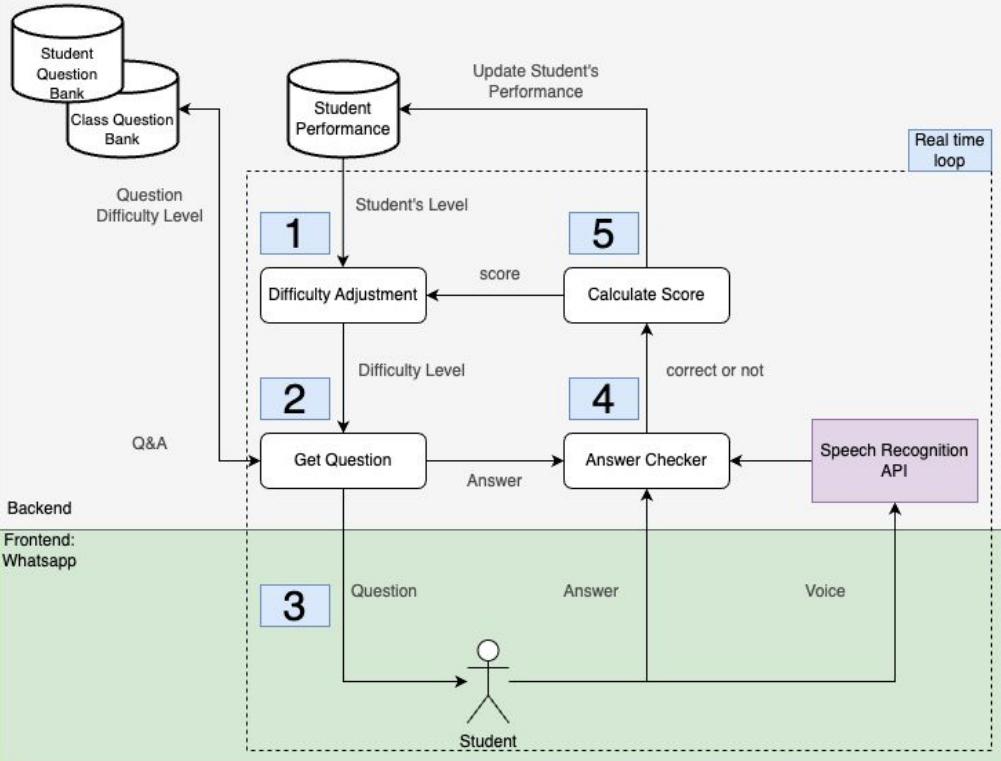
- Speech Recognition API is used to evaluate student's pronunciation.



# Instant Learning: Quiz



## Quiz



### 1. Difficulty Adjustment:

Based on the student's past performance, the system determines an appropriate difficulty level for the quiz.

### 2. Question Selection:

The system inputs the difficulty level into the "GetQuestion" function. It retrieves questions from the student question bank tailored to the determined difficulty level.

### 3. Question Delivery:

The chatbot sends a question to the student.

### 4. Student Response and Tracking:

The student answers the question, and the chatbot tracks their response. For speaking questions, speech recognition technology is used to assess pronunciation and accuracy.

### 5. Real-Time Scoring:

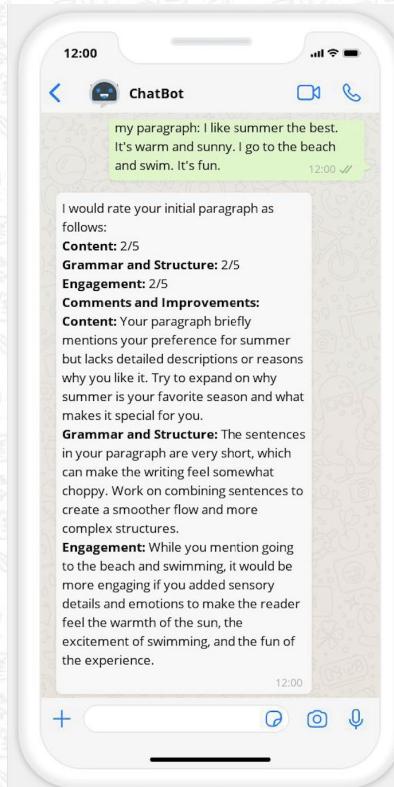
The system calculates the student's score immediately after they provide an answer. The score is influenced by factors such as response time and accuracy.

### 6. Dynamic Difficulty Adjustment:

Based on the student's performance on the current question, the system adjusts the difficulty level for the next question. If a student struggles, the next question may be less difficult to provide a supportive learning experience.



# Instant Learning: Writing



- This module provides tailored writing practice and constructive feedback, facilitating students' progressive improvement in their writing skills.

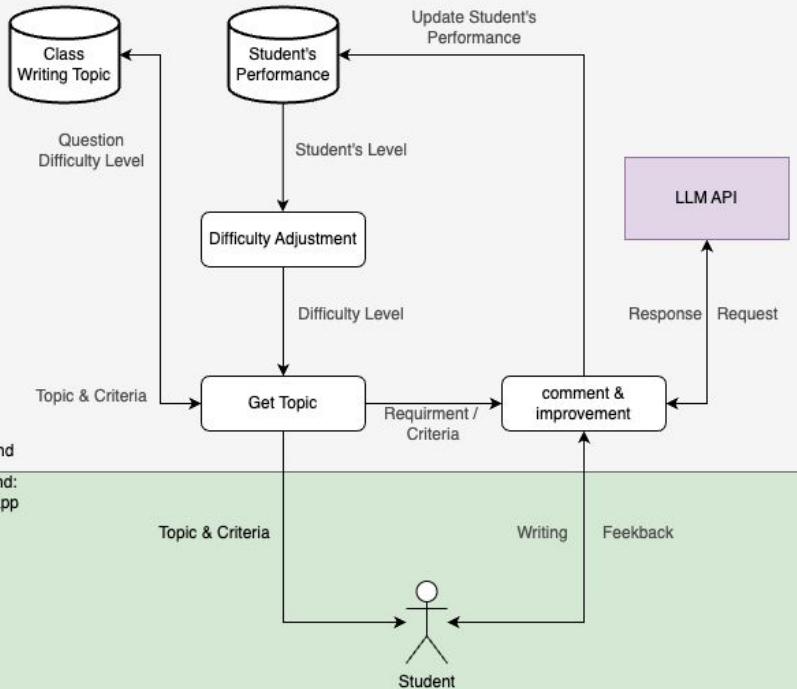
- The writing tasks are usually a short paragraph. As it is inconvenient to type long passages in phone.



# Instant Learning: Writing



## Writing Improvement



### Adaptive Difficulty:

The system evaluates the student's historical performance to ascertain their proficiency in writing and dynamically adjusts assignment difficulty levels accordingly.

### Topic Presentation:

Following the assessment of the student's skill level, the system introduces an appropriate writing topic.

### Student Submissions:

Students are tasked with composing and submitting their written work based on the assigned topic.

### AI Feedback:

Leveraging a Large Language Model API, the system provides comprehensive feedback on students' submissions, offering valuable suggestions for enhancement.

### Performance Tracking:

A meticulous record of students' writing submissions and feedback is meticulously maintained within their performance profiles. This allows for continuous monitoring of progress.



# Instant Learning: Daily Read



The image displays two screenshots of a mobile application interface, likely a messaging app, showing a conversation with a 'ChatBot'. The top screenshot shows the initial welcome message from the bot, followed by two article options: 'Exploring the Wonders of the Amazon Rainforest' and 'Innovation and Technology Trends in 2023'. The bottom screenshot shows the selected article on quantum computing, followed by a question for comprehension.

Good day! Welcome to your Daily Read session. Today, I have some interesting articles and stories for you to choose from. Which one would you like to read today?

**Title:** "Exploring the Wonders of the Amazon Rainforest"  
**Description:** Discover the incredible biodiversity and hidden secrets of the Amazon rainforest.

**Title:** "Innovation and Technology Trends in 2023"  
**Description:** Explore the latest innovations and tech trends shaping the world in 2023.

In 2023, we stand at the precipice of an era defined by **groundbreaking** (adjective, meaning innovative and pioneering) technological advancements. One of the standout trends driving innovation is the rise of quantum computing. Quantum computers, **harnessing** (verb, meaning effectively utilizing or employing) the principles of quantum mechanics, promise to revolutionize data processing by performing calculations at speeds that were once **inconceivable** (adjective, meaning impossible to imagine or believe) with classical computers. This transformative technology has the potential to reshape industries ranging from cryptography to drug discovery.

After reading, please answer the following question to check your understanding:

**Question:** What is one prominent technological trend discussed in the article?

This module encourages daily reading and comprehension practice while providing students with content that aligns with their interests and skill levels.

## Benefit:

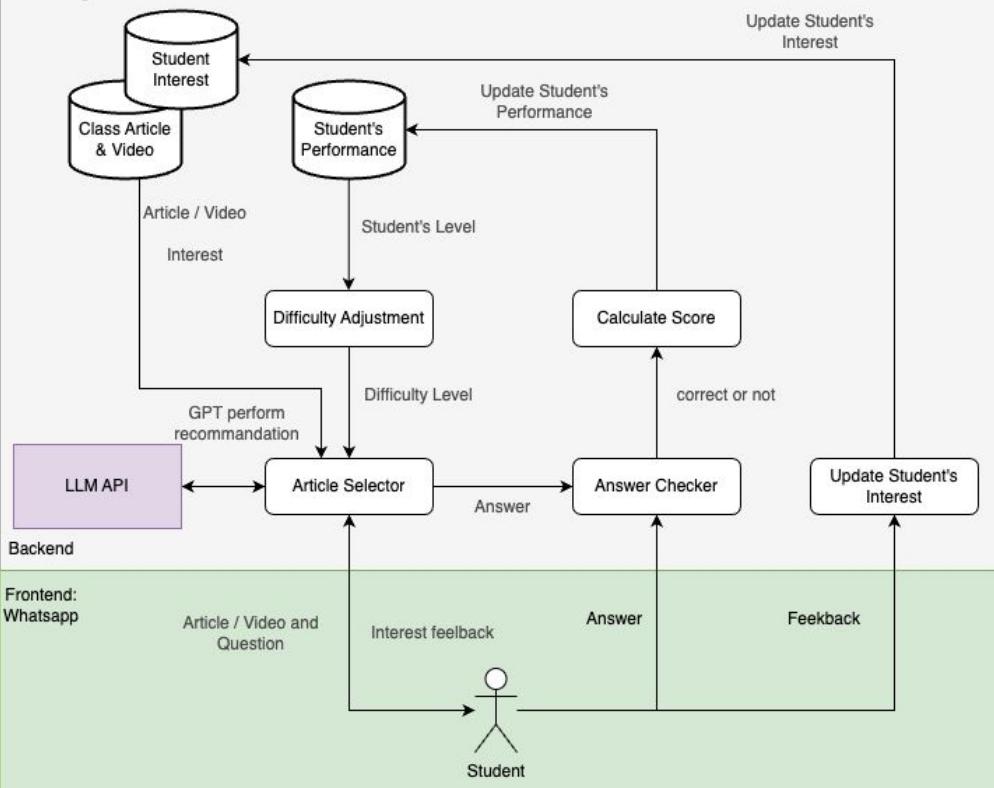
- Vocabulary Expansion:** Exposure to diverse vocabulary enhances language skills.
- Improved Comprehension:** Regular reading improves understanding of written content.
- Enhanced Fluency:** Reading helps with natural language flow and rhythm.
- Cultural Insight:** Literature provides cultural context and insights.
- Better Writing:** Exposure to well-written content aids in writing skills.



# Instant Learning: Daily Read



## Daily Read



### Adaptive Content Selection:

The system examines students' past performance records to gauge their reading proficiency and interests.

### Content Recommendation:

Utilizing data from class articles, videos table, and student interest tables, the system employs a recommendation algorithm, possibly utilizing LLM, to propose pertinent articles or videos.

### Content Delivery:

The chosen content is presented to the student, typically with a selection of five options. Students can opt for the one they prefer to read or view.

### Comprehension Assessment:

After reading, students are required to answer questions to evaluate their comprehension of the content.

### Scoring and Performance Tracking:

The system computes a score based on the student's responses and stores it in their performance profile for ongoing progress monitoring.



# Instant Learning: Role-Play



The image displays two screenshots of a mobile messaging application interface. Both screenshots show a conversation with a 'ChatBot' at 12:00.

**Screenshot 1:** The user asks the ChatBot if they can engage in a football-themed role-play session. The ChatBot responds by welcoming the user to the Football Legends Museum and asking if they are excited to explore the rich history of football. The user replies positively, expressing their passion for football and looking forward to seeing all the exhibits.

**Screenshot 2:** The ChatBot informs the user that they will find an audio recording providing a detailed narration of Pelé's illustrious career within the museum. It includes a thumbnail image of a museum exhibit featuring several jerseys and memorabilia. Below the thumbnail, there are two audio playback controls: one for 01:51 and another for 01:25.

## Benefit of role-play:

Students assume specific roles in scenarios.

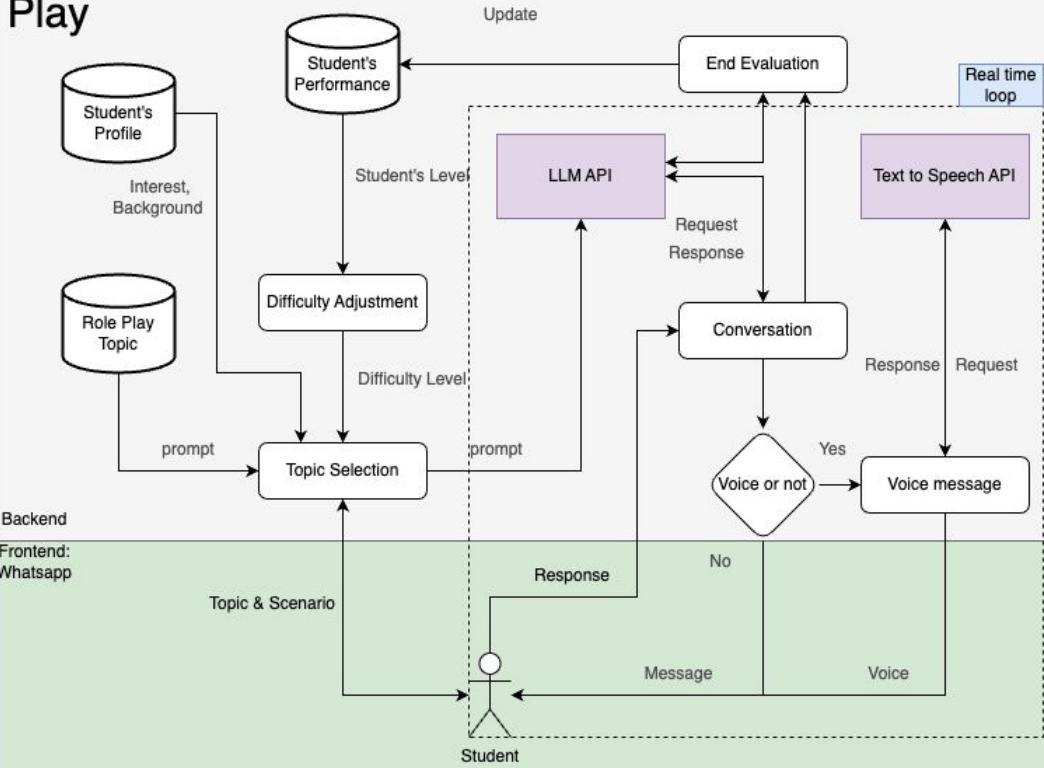
- **Practice English:** Engage in conversations, decision-making, and problem-solving.
- **Develop skills:** Improve speaking, listening, and critical thinking.
- **Gain confidence:** Use English in practical situations.
- **Versatile:** Suitable for various scenarios like job interviews and everyday conversations.
- **Interesting & interactive:** Enhances engagement and enjoyment in learning. Especially when targeting students' interest.



# Instant Learning: Role-Play



## Role Play



**Adaptive Difficulty:** The system assesses the student's past performance records to determine their language proficiency level, allowing for tailored difficulty adjustments.

**Topic Selection:** Based on the student's profile background, the system selects a suitable conversation topic.

**Topic Presentation:** The chosen topic is presented to the student, who can decide whether to continue with it or select a new one.

**Conversation Initiation:** If the student confirms the chosen topic, the conversation begins. There are two modes: text-based and voice-based.

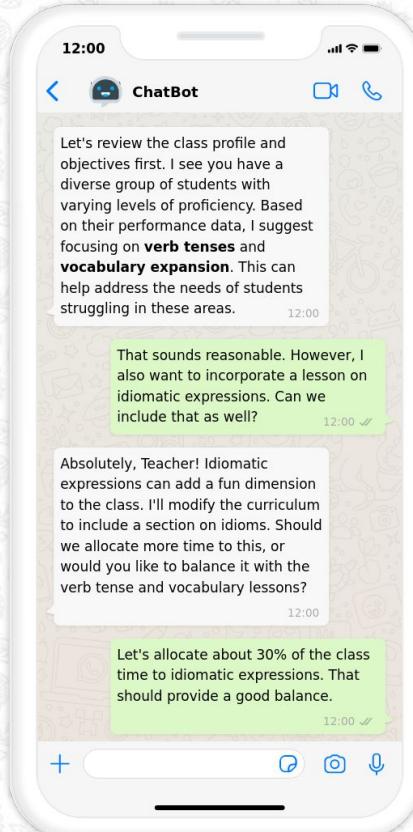
**Voice-Based Interaction:** In voice mode, the system utilizes text-to-speech and voice recognition APIs to facilitate interactive voice conversations, making it a more immersive experience.

**Continuous Interaction:** The conversation continues until both parties feel it is complete.

**AI Evaluation:** Upon completion, the system employs GPT to evaluate the quality of the student's responses and provides constructive feedback.



## Feature 2: Smart Customization



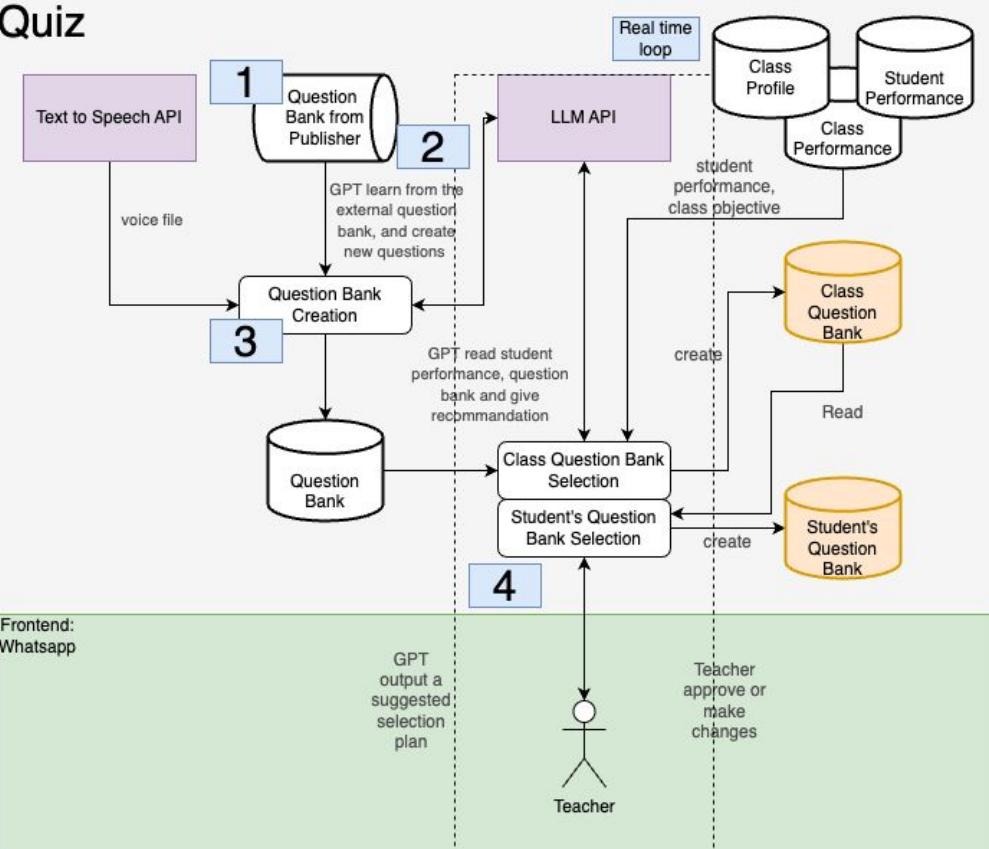
- Teachers have the ability to **modify the difficulty level** and **learning content** for the entire class or individual students
- The AI provides **helpful suggestions** to assist teachers in making appropriate adjustments based on their inputs and requirements.



# Smart Customization: Content Adjustment



## Quiz



Data Management Process for Instant Learning Features:

**Question Bank:** Initial questions sourced from publishers and online materials. LLM expands the database by creating questions.

**Teacher Interaction:** Teachers engage in question bank selection. LLM analyzes data to understand student goals.

**Curriculum Suggestions:** LLM offers advice based on student performance, e.g., recommending more past tense-related questions when LLM sees students not do well.

**Customization:** Teachers tailor question selection, adjusting question proportions to suit classroom needs.

**Question Creation:** LLM retrieves questions based on teacher's choices, creating both class and personalized student question banks.

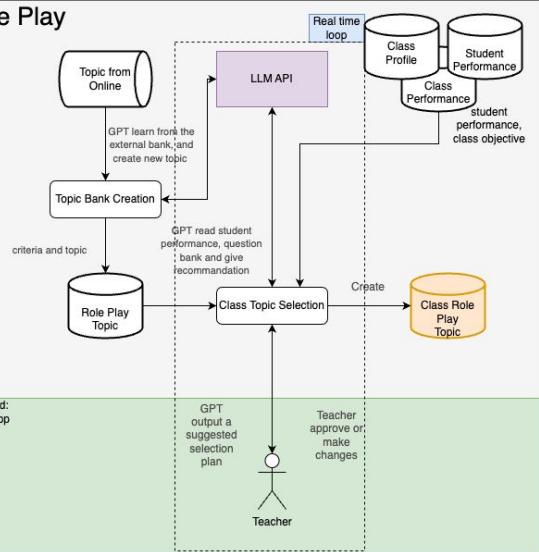
**Class vs. Student Banks:** Class bank for most students; student bank highly customized, addressing individual or subgroup learning requirements.



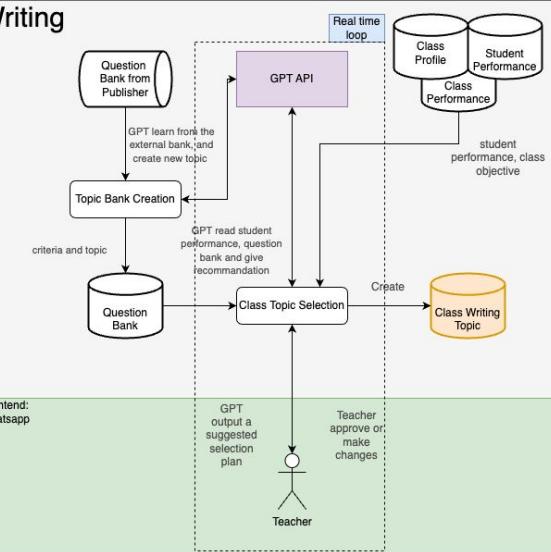
# Smart Customization: Content Adjustment



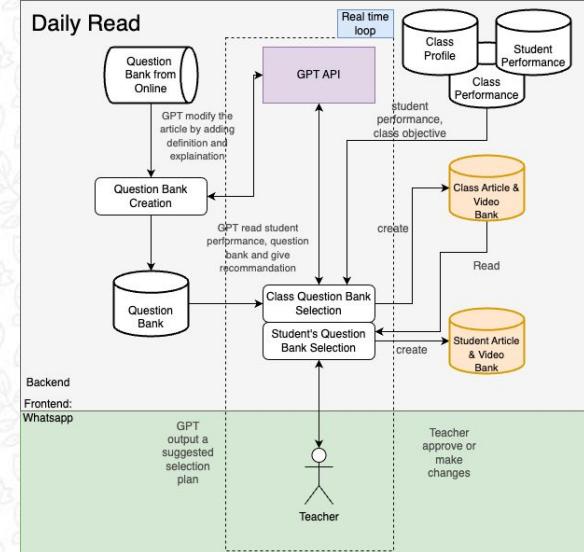
## Role Play



## Writing



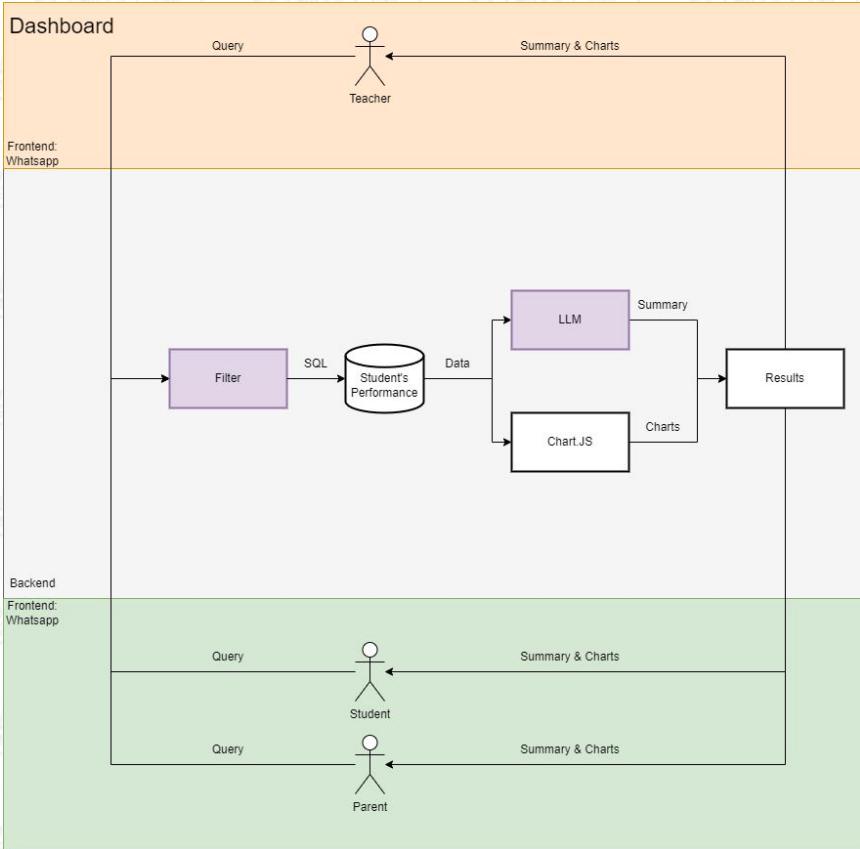
## Daily Read



Similar structure with quiz table.



# Feature 3: Dashboard



The dashboard provides tailored insights for Students, Parents, and Teachers, enabling them to make informed academic decisions:

## 1. User Access:

Students: View personal academic metrics.

Parents: Monitor their child's academic growth.

Teachers: Overview the performance of their entire class.

## 2. Data Retrieval:

Instantly fetches and processes user-specific academic data for accurate insights.

## 3. Summaries via GPT API:

Leverages GPT API for crisp, meaningful performance summaries.

## 4. Visualization with Chart.JS:

Transforms data into intuitive charts for quick insights.

## 5. Platform Integration:

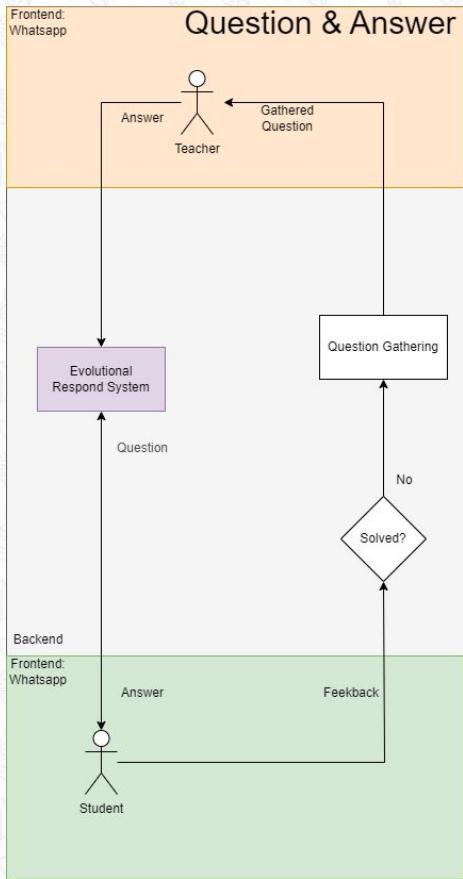
Accessible via the familiar WhatsApp platform for ease of use.

## 6. Dynamic Difficulty Adjustment:

By streamlining data and visual insights, the Dashboard empowers users to optimize their academic experiences.



# Feature 4: Question & Answer



## 1. Evolutionary Response System:

At the heart of the interaction lies the sophisticated respond system. It's equipped with AI capabilities, aiming to provide the most accurate answers based on the input it receives.

**Question Gathering:** Whenever a student poses a query, the system initially attempts to provide an immediate answer, drawing from its vast database of predefined responses and dynamic AI algorithms.

## 2. Feedback and Refinement:

The system values the student's feedback. If a student isn't satisfied with the initial response, the query undergoes further scrutiny. This feedback loop ensures continuous improvement in the system's answering capabilities.

## 3. Human Oversight with Teacher's Intervention:

Recognizing the limits of machine learning, the system seamlessly escalates unresolved queries to a human teacher. This blend of AI and human insight ensures that students receive comprehensive answers, bridging the gap between automated and human-led education.

## 4. Integrated Experience:

The entire interaction is streamlined through Whatsapp, providing students with a familiar and user-friendly platform. This integration ensures that students can focus on learning without navigating a new digital landscape.



03

## Technological Specifications



# Tech Stack



| API / Model                   | Description                                    | Features that use the API           |
|-------------------------------|--|-------------------------------------|
| <b>openai/whisper-base</b>    | Speech Recognition                             | Role-play, Quiz, Q&A                |
| <b>microsoft/speecht5_tts</b> | Text to Speech                                 | Role-play, Quiz, Q&A                |
| <b>Pollinations.ai</b>        | Image GPT                                      | Role-play, Quiz, Quiz Question Bank |
| <b>Chart.js</b>               | Json to Chart                                  | Dashboard                           |
| <b>ChatGPT 3.5</b>            | LLM for performing simple interaction          | Menu and All Features               |
| <b>ChatGPT 4.0</b>            | LLM for Q&A evaluation and question generation | Q&A, Quiz Question Bank             |
| <b>Cohere Extracter</b>       | SQL Parameter Detector                         | Dashboard                           |



# Multimedia Learning Experience



This is applied in **Role-play, Writing, Quiz and Question bank generation.**

## Speech Recognition & Text to Speech API:

- These APIs are pre-trained and allow for seamless conversion of text to voice files and vice versa.
- Our chatbot will interact with these APIs by sending and receiving text data
- openai/whisper-base & microsoft/speecht5\_tts are fast, simple and stable

## Image GPT:

- Our chatbot will generate a prompt for generating image and send it to image GPT.
- Pollinations.ai has their own user-friendly API



Browse for file or  Record from browser or

Realtime speech recognition

Librispeech sample 1

0:12 / 0:13   :

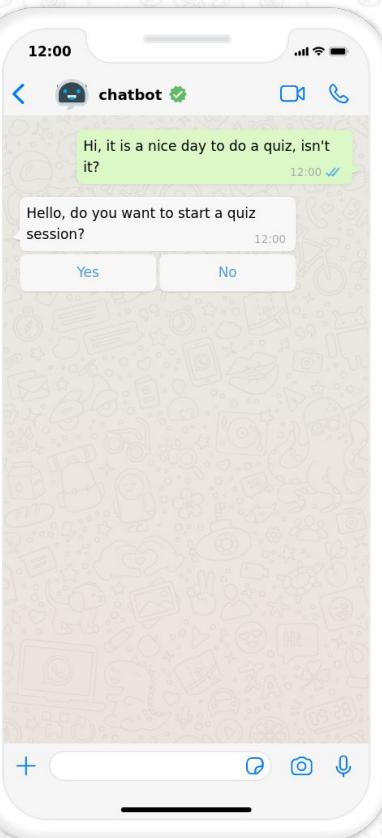
Compute

Computation time on Intel Xeon 3rd Gen Scalable cpu: cached

going along slushy country roads and speaking to damp audiences in drafty schoolrooms day after day for fortnight. He'll have to put in an appearance at some place of worship on Sunday morning, and he can come to us immediately afterwards.

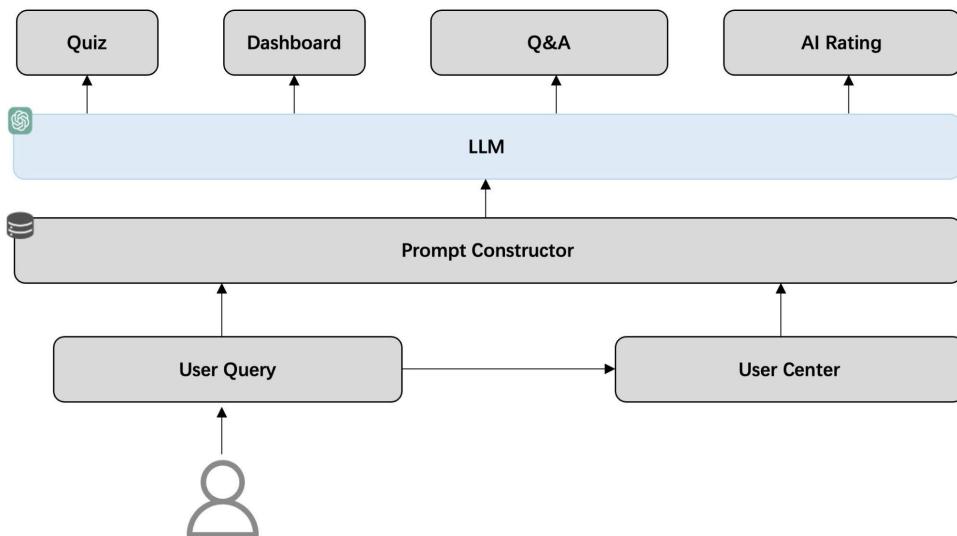


# Menu: Mapping Natural Language to Functions



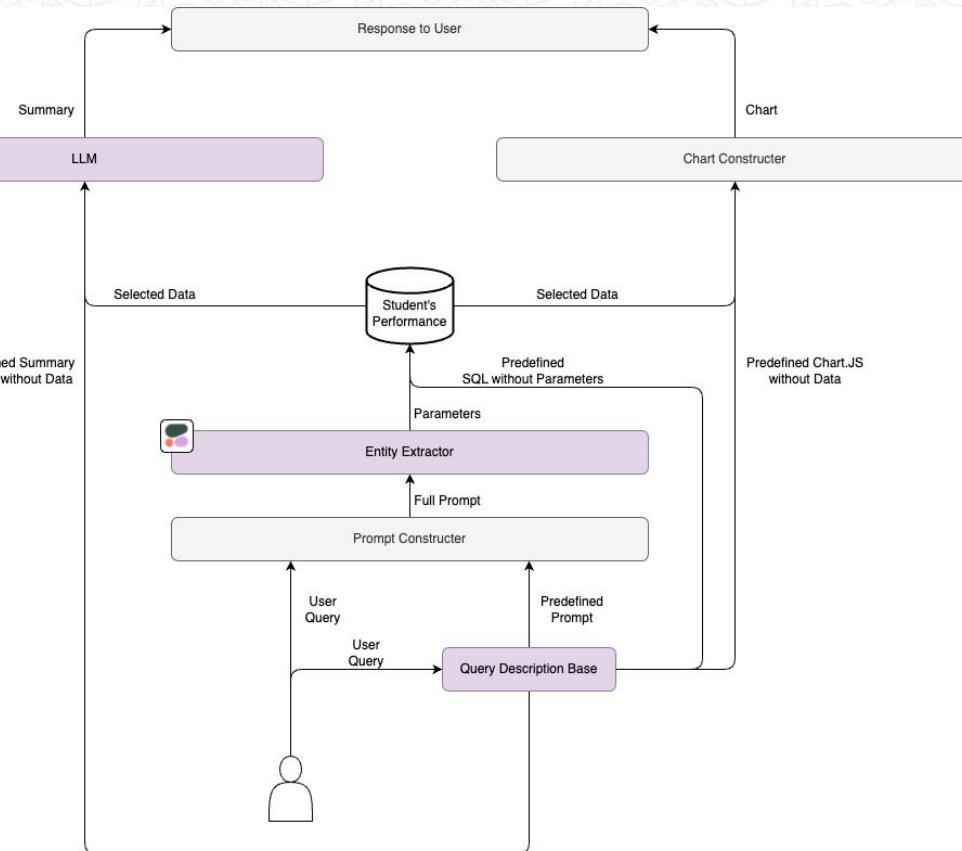
- This is applied in **Menu**.
- Guiding user to different functions.

**LLM-based Intelligent Distributor:** Map a natural language expression to a navigation function call through prompt engineering techniques. Make decision based on user query and information from user center.





# Dashboard: Generate SQL



The central intelligence of this Filter method lies with the **LLM**, adeptly decoding user queries and coordinating with the suite of functional modules to produce the charts and summaries.

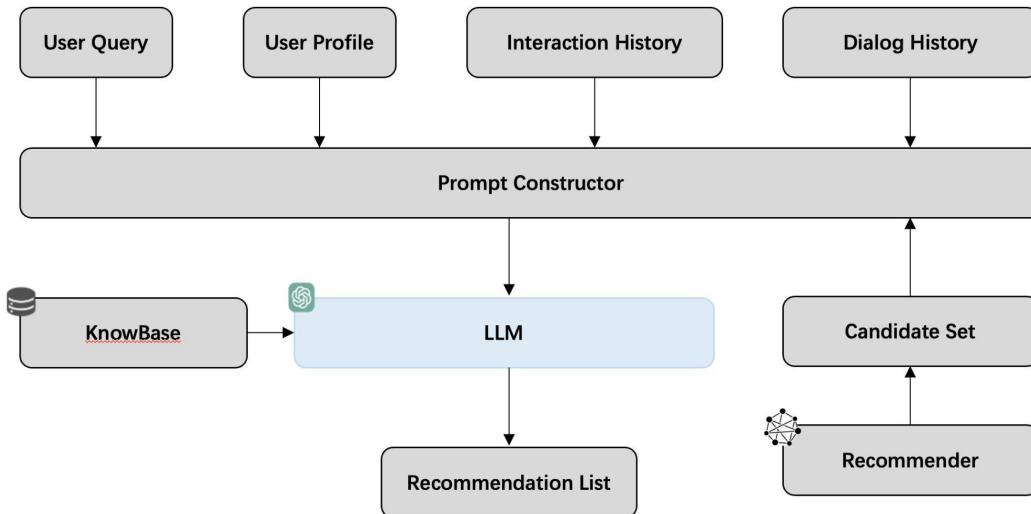
Upon receiving a user query, the **Entity Extractor** swiftly identifies salient data points, harnessing reference templates from the SQL Prompt Base. This dynamic base, armed with a spectrum of SQL templates and visualization blueprints, serves as the foundational bedrock, enabling other components to derive structured, actionable insights.

Then, the **Prompt Constructor** steps in, sculpting precise data requests by weaving inputs from the Entity Extractor with SQL blueprints. Its adeptness ensures that the most pertinent data slices are always at the forefront.

Concluding the user experience, the **Chart Constructor** translates the curated data into compelling visual narratives. It draws its design cues from a set of predefined chart templates in the SQL Prompt Base, ensuring that insights are not only accurate but also visually engaging.



# Daily Read: Recommendation System

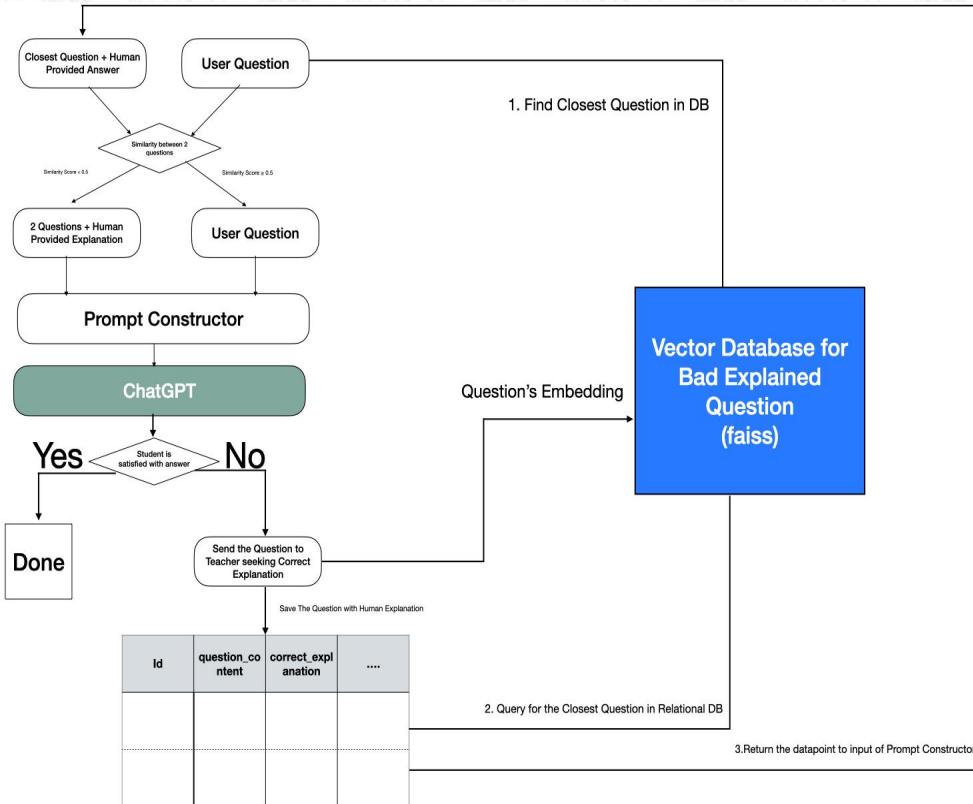


**LLM-enhanced Recommendation System** is applied on **Daily Read** function.

- Concatenate the user query, user profile, interaction history, dialog history and candidate set to construct a prompt, asking LLM to generate the recommendation list.
- Apply **KnowBase**(Vector Store like Faiss) to handle cold-start problems, for example, some information after 2022 is unrecognised by LLM. So if a user asks about a recent event, we can utilize KnowBase to handle recommendation tasks.
- Candidate set is generated by **deep-learning based recommender**, which can be updated with the increase of user data.



# Q&A: Evolutionary AI



This is applied in **Q&A**.

- Using well-designed **Prompt Constructor** and **Vector Database** to give LLM premise or correct explanation of a question.
- Then AI has an ability to learn from previous similar mistake, which makes LLM can answer the question better.
- As time goes on, the **vector database** getting more completed, the AI can answer the question better by considering more previous explanation.



04

Scalability



# Business

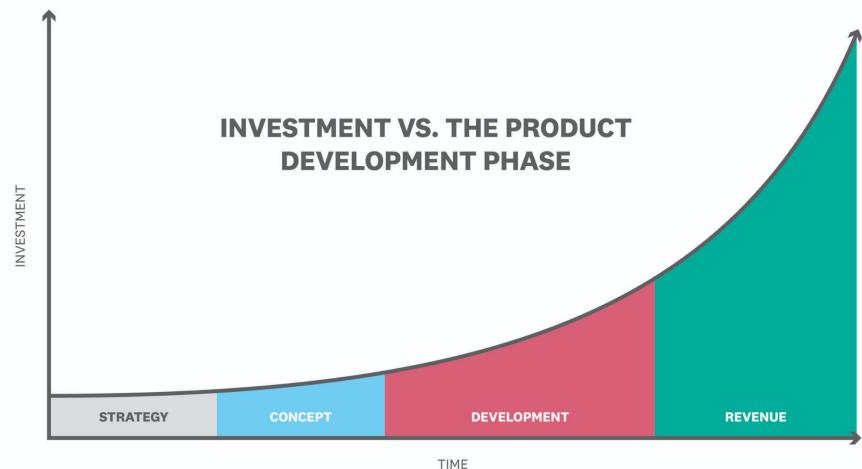


## Business Model:

**Partnership & Free Trial:** Begin by partnering with schools, tutorial classes, and organizations to offer free trials. Gather valuable feedback and insights to refine the platform. In this stage, we are looking for user growth.

**Funding:** In the early stages, secure funding from angel investors and funding rounds to support initial development and growth.

**Subscription Model:** As the platform matures, transition to a subscription-based model where schools pay a fee per student to access and utilize the platform for their classes. And some advanced features will only open to subscribers.





# Market Expansion



## Phase 1: English Language Learning Dominance

Initially, we aim to establish a strong presence in English language learning, capitalizing on our expertise and technology.

As we gain experience and user trust, we will continually enhance our English language learning offering to become a dominant player in this space.

## Phase 2: Expansion into Other Languages

Leveraging our successful English language platform, we'll gradually introduce additional languages, broadening our user base and catering to diverse language learning needs.

Each new language expansion will be strategically planned and executed to ensure seamless user experiences.

## Phase 3: Diverse Subject Matter

Beyond languages, we envision expanding into a wider array of subjects, such as coding and various school subjects.

Our adaptable platform will facilitate this expansion by accommodating subject-specific content and interactive features.

## Customization for Different Subjects

We will offer tailored features to match the unique learning requirements of different subjects.

For instance, coding courses might include interactive coding challenges, while language courses focus on pronunciation exercises.

## Scalability and Cost Efficiency

Our flexible software architecture, refined during language learning expansion, allows us to quickly enter new markets.

This scalability is instrumental in keeping development costs low, ensuring cost-effective expansion into diverse subject areas.



## API

- Create general frameworks for personalized developing
- Provide API to access our service and allow to integrate into developers' applications

## Massive Users

- Database:
  - Database sharding
  - Middleware caching
- Scalable Architecture:
  - Apply microservice architecture with load balancing technique.
- Server-side:
  - Use elastic computing services
  - Buy more servers



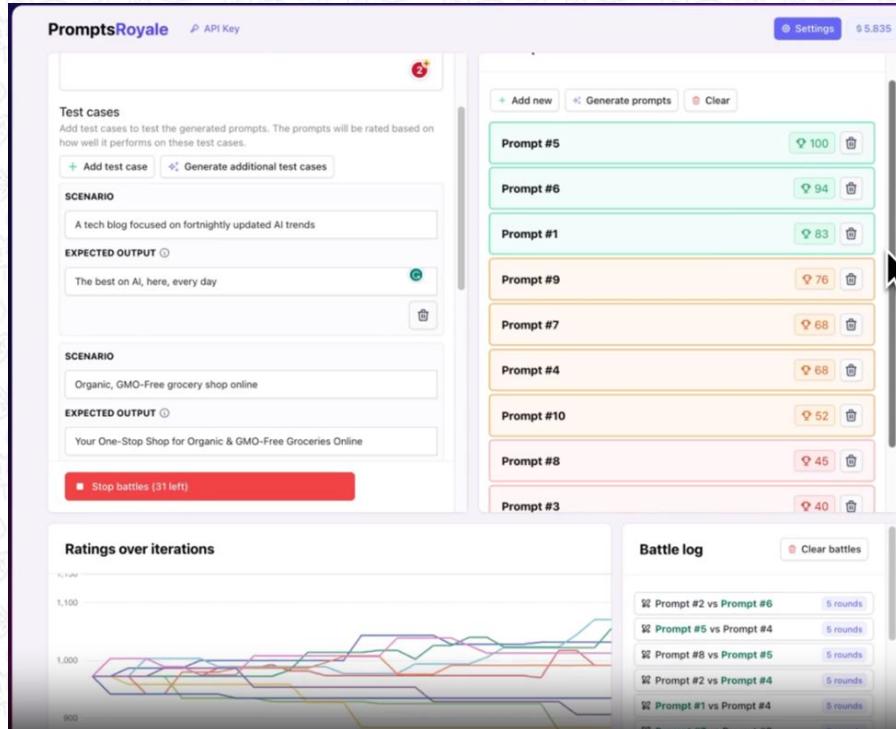
# LLM Stability



**Prompt Engineering** is employed to improve the reliability and performance of the LLM.

Sometimes LLM does not function as anticipated.

To further enhance its effectiveness, we can utilize frameworks such as "promptroyale" to generate a wide range of test cases, enabling us to evaluate different prompt versions and optimize the system's performance.



<https://www.promptsroyale.com/>



## Other Methods:

- **Synchronization**
  - Multi-process + multi-thread asynchronous calling of LLM API to speed up the response.
- **Distributed deployment of large models**
  - With the increase of request number, we may consider deploy our own LLM on cloud. It is possible to utilize some platform like HuggingFace.
  - Finetune a LLM like LLaMA to improve the conversation quality and also improve the chatbot's ability of language teaching.
- **Off-topic Prevention**
  - Design a “Tree of Thought” (ToT) to detect off-topic Conversation.
- **Prevent Hallucination:**
  - Knowledge Base can provide LLM some facts.



# Data Security and De-identification



The workflow of our system based on a data-centric infrastructure optimized for **scalability** and **security**. As users initiate interactions through queries, these inputs undergo **structured transformation**, aligning them to database norms and making them suitable for further processing.

Subsequent **anonymization protocols** strip sensitive identifiers, reinforcing the sanctity of user privacy. This sanitized data is then housed in **encrypted storage systems** that utilize multi-layered security strategies, such as tokenization and access control mechanisms.

Leveraging this repository, **machine learning algorithms** evolve, trained on aggregated, non-personal data, ensuring no single user's details are discernible. These algorithms, when deployed, offer **adaptive responses** to user queries, reflecting the balance of dynamic user-centric services with uncompromising data security.