Case study

Developing an Advanced AI Language Tutor for an Educational Service

The challenge

The client requested an interactive AI-powered language learning tool that could comprehend human speech and maintain natural conversations with students in three languages: English, Spanish, and German. After a conversation, the AI tutor had to note the mistakes made by a student and provide explanations.

Our client is an eLearning solution provider. To expand their product's capabilities and maintain a competitive advantage, they decided to build an AI-powered language learning tutor for their existing platform. The tutor would enable interactive language learning and help users improve their skills in multiple languages.

To help our client reach these goals, we developed an AI-powered chatbot that facilitates natural conversations and detects and explains mistakes. We also seamlessly integrated the chatbot into the client's existing eLearning ecosystem.

The client

Our client is an eLearning solution provider that delivers digital tools to enhance the educational experience for learners and educators worldwide.

The result

Our client received an AI-powered chatbot that could:

- Understand human speech

- Answer user prompts and maintain a conversation like a native speaker

- Accurately detect mistakes in user input

- Explain mistakes clearly

We integrated the ready AI chatbot into our client's existing platform so they could offer it to their customers, expanding their product's capabilities and improving the user experience.

Our approach

We began developing an AI language tutor by discussing project details with the client to understand their vision and needs for the requested solution. After defining the key features, performance goals, and project requirements, Apriorit assembled a dedicated team to develop an advanced AI-driven chatbot for language learning.

Our AI tutor project team included AI developers, a data engineer, QA specialists, a business analyst, a project manager, and a UI/UX designer. To build the requested solution, we used Python along with the following AI models and frameworks:

- **Whisper** for speech recognition

- **Llama2** for mistake analysis

- **GPT-3.5** for providing explanations

- **LangChain** for seamlessly interacting with large language models

AI-driven chatbot development project details

Team	Tech stack
• AI developers • Data engineer • QA specialists • Business analyst • Project manager • UI/UX designer	• Whisper • Llama2 • GPT-3.5 • LangChain • Python

How we did it

During the first project stages, our UI/UX designer developed a detailed design document with wireframes and interface layouts tailored to the unique style of our client's platform interface and user experience design. After refining the design based on client feedback, we proceeded with the development phase.

We worked closely with our client to develop a comprehensive set of conversation topics tailored to specific language learning goals. The client provided a list of relevant topics that we used to train the AI model. We also used conversational data including sample dialogues, questions, and potential user responses in our training.

After completing the preparation stage, we started the development process.

To create a robust AI-powered language tutor, we focused on four key areas: speech recognition, natural conversation, mistake analysis, and error explanation.

AI language tutor development steps	
1. Implement speech recognition	2. Enable conversations with AI
3. Implement mistake analysis	4. Implement error explanation

1. Speech recognition

To facilitate smooth communication between users and the AI tutor, we implemented advanced speech recognition using the Whisper AI model. This model accurately transcribes spoken language into text, allowing students to interact with the tutor naturally without needing to type.

2. Natural conversation

To create an immersive learning environment, we needed to enable the AI tutor to engage in meaningful conversations. We used the **Cohere** multilanguage model and the LangChain library to give the tutor the ability to have natural, context-aware conversations.

Apriorit's data engineers prepared a high-quality dataset based on the client's data. Once trained on this dataset, the smart chatbot was able to select relevant topics and maintain conversations in a way that felt natural and engaging to users.

3. Mistake analysis

To provide users with feedback on their grammar, we integrated the Llama2 model for mistake analysis. This model identifies and lists errors in user input, allowing the AI-powered tutor to track progress and pinpoint areas that need improvement.

4. Error explanation

The final step in creating an educational chatbot was implementing the OpenAI GPT-3.5 model to offer clear and detailed explanations of mistakes identified within conversations. This feature allows the chatbot to highlight errors and educate users on why they occurred and how to avoid them in the future. Such tailored feedback is a necessary part of the quality language learning process.

At each stage of the development process, our QA team performed comprehensive and continuous testing to ensure the AI tutor maintained high performance and strong user privacy protection.

The impact

The client gained an efficient and competitive AI-based chatbot that is able to provide tutoring at scale and help platform users practice foreign languages efficiently. This smart chatbot improved user engagement by 11% in the first month compared to traditional language courses the platform previously provided. Additionally, our client managed to not only retain current users but attract new ones.

Impressed with the quality of our collaboration, the client has entrusted us with the ongoing improvement and expansion of their product. Currently, we are working on a new feature — pronunciation analysis — and are preparing to expand the range of languages supported by the chatbot, allowing the client to further enhance their product's capabilities and reach a broader audience.

References to consider (for either content or format inspiration):

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