

# How We Delivered an AI-based Plugin that Improved User Engagement on OpenEdx?



## Project Overview

The client wanted to simplify and reduce the time for course creation on the Open edX LMS platform. They had to manually upload documents, multimedia assets, and study materials that required considerable time and resources. The client wanted to increase the efficiency and convenience of generating a course through the Open edX platform so users won't have to struggle to access information.

## Key Objectives

The primary purpose of the client was to change their course creation process quickly, more efficiently, and more engagingly for the learners. Let us look at the different objectives they wanted to achieve:

- **Automate course creation:** Reduce the time and effort needed to build new courses with the help of content automation.
- **Content abundance:** Offer course materials with detailed and relevant resources from different channels.
- **Track course history:** Maintain a complete record of generated courses for better tracking and management.
- **Multi-language format:** Allow multi-language content and accessibility features to reach a wider and more vivid audience.
- **Simplify AI management:** Allow effective management of AI models used in content creation with a centralized dashboard.



## Key Challenges

Some of the challenges that we faced while integrating AI with Open edX LMS include:

### Manual Course Uploads

Creating courses needed an effective manual effort, slowing down content execution, and increasing the risk of errors were a few primary challenges we faced.

### Consistent Content Quality

Relying on multiple content sources and maintaining the relevancy, accuracy, and structure was challenging.

### Adding Interactive Elements

Adding coding arenas, evaluation blocks, and multimedia content added complexity to course design and delivery.

### Multi-Language Support

Providing content across multiple languages without quality on stake or accessibility-based technical challenges

### Managing AI Resources

Considering multiple AI models to generate relevant course material and making sure that smooth execution was practiced carefully.

## Solutions Provided

We delivered an advanced AI-based Open edX plugin for instant course creation and enriched learning experiences based on the client's requirements. Let us look at the different solutions we provided to deliver the final product.

### Course generation

- We built a proprietary Open edX plugin that automatically generates courses with AI, and as you enter the topic, the system browses online resources, structures relevant material, and creates a course outline based on them.
- The backend was developed with Python and Django, while React supported the front end.

### Multi-model AI integration

- For contextual accuracy, we integrated LLMs like Google's Gemini, OpenAI's ChatGPT, Grok, Anthropic's Claude, and Azure OpenAI for insightful content generation.
- Langchain was the framework that was used to integrate these models into the plugin.

### Data management

- A centralized dashboard was built to manage AI-based courses, track system performance, and offer admins visibility into activities.
- PostgreSQL was used for relational course and user data, while MongoDB managed unstructured content and multimedia assets for quick course management.

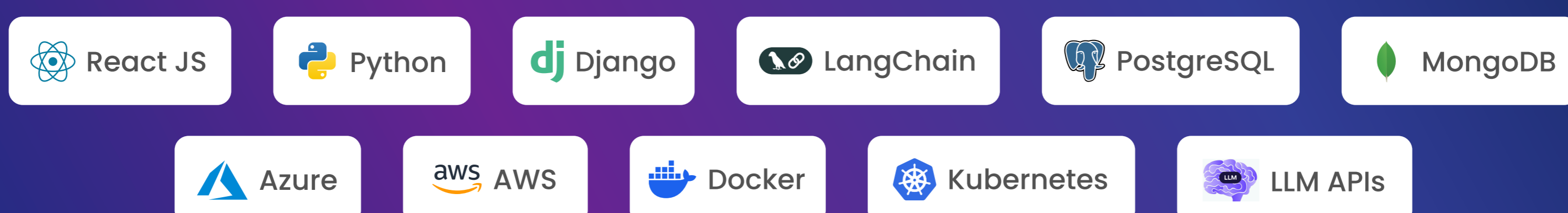
### Cloud and infrastructure

- We deployed the solution on Azure and AWS environments for reliable solutions.
- CI/CD was done with Docker and Kubernetes for minimal downtime and continuous deployment.

### Language and learning modules

- We developed different XBlocks to improve learner engagement by including coding evaluation blocks, PDFs, HTML, text, and video-based content.
- We also integrated in-house AI models for speech-to-text and text-to-speech functionalities.
- Multi-language embeddings ensured that courses can be generated and delivered in different languages.

## Tech Stack



## Business Impact

The Open edX AI plugin transformed the client's way of course creation in multiple areas:

- The time needed to generate multiple courses changed from several hours to a few minutes, helping the client to execute new courses quickly.
- AI-based courses helped new learners better than traditional courses due to the implementation of contextually relevant study materials.
- Interactive modules, coding arenas, and multimedia content offered real-time experiences, increasing the learner participation and satisfaction.
- Hybrid databases and centralized dashboards allowed smooth tracking of course histories, effective management of AI tools, and real-time system performance monitoring.



## Conclusion

The implementation of a webcam-based attention and motion tracking system significantly improved student engagement and academic integrity on the EdTech platform. By providing real-time monitoring and actionable analytics, the solution empowered educators to identify disengaged students, deter cheating, and refine digital content for maximum impact. The privacy-first, browser-based design ensured user trust while delivering robust, scalable monitoring capabilities for a modern digital learning environment.