

VIDEO BASED QA SYSTEM USING AI

Project Reference No.: 49S_BE_2680

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Keywords:

Video-based Question Answering, Automatic Question Generation (AQG), Multiple Choice Question (MCQ) Generation, Speech-to-Text Transcription, Natural Language Processing (NLP), Deep Learning, Transformer Models, Text Summarization, Educational Technology (EdTech), AI-Based Assessment

Introduction:

The rapid growth of online learning and video-based education has created a need for automated assessment tools that can evaluate student understanding efficiently. Traditional manual creation of quizzes from video lectures is time-consuming and prone to human error. To address this, the proposed system utilizes Artificial Intelligence to automatically generate Multiple Choice Questions (MCQs) from any given video. By combining Whisper-based transcription and T5-based question generation, the project aims to make learning evaluation faster, smarter, and more accessible.

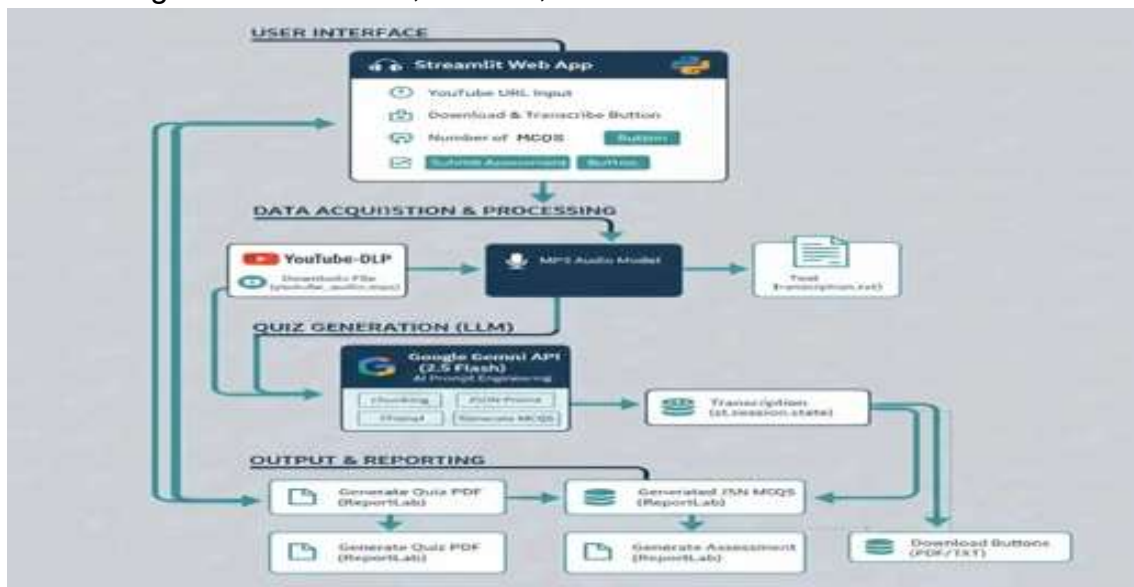


Figure 1: System Architecture

Objectives:

1. Automate transcription of video content using Whisper.
2. Chunk long transcripts to ensure efficient processing.
3. Generate contextually relevant MCQs using a T5-based model.
4. Provide a clean and interactive Streamlit UI for users.
5. Improve accessibility and reduce effort in academic assessment creation.

Methodology:

1. Audio extraction from video.
2. Whisper-based transcription.
3. Text segmentation and chunking using sliding window technique.
4. Feeding each chunk into T5 model for question generation.
5. Filtering and refining answer choices.
6. Presenting final MCQs through a web-based UI.

Result and Conclusion:



Figure 2: Home Screen



Figure 3: Upload Page

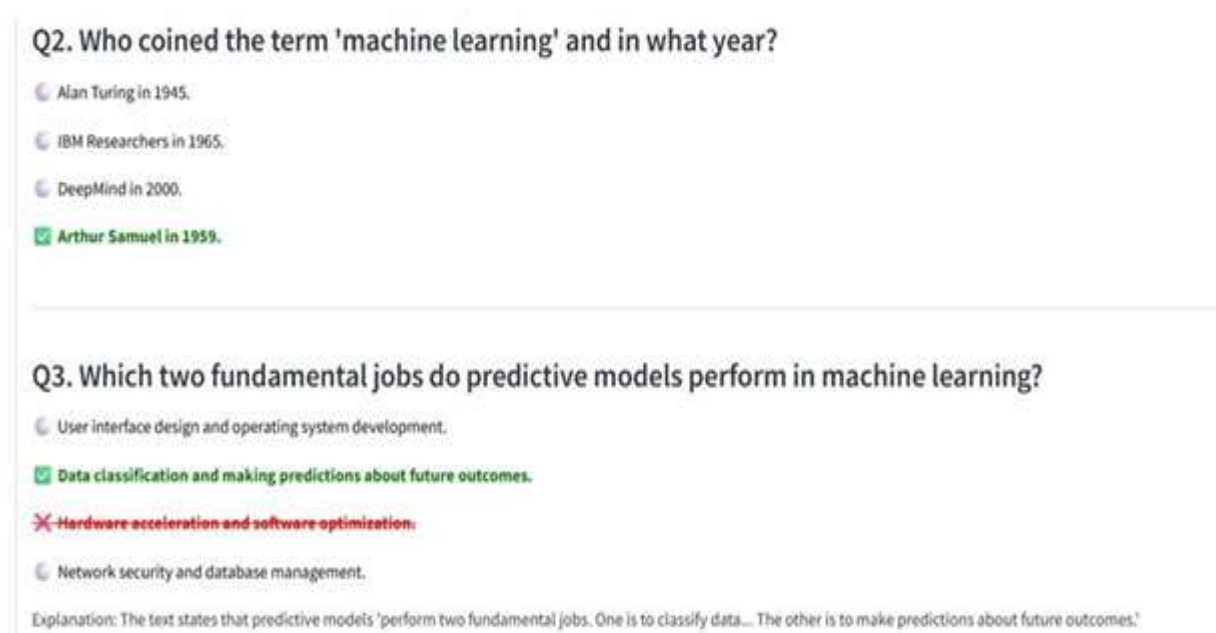


Figure 4: MCQ Result Page

Figure 5: visualization of the result

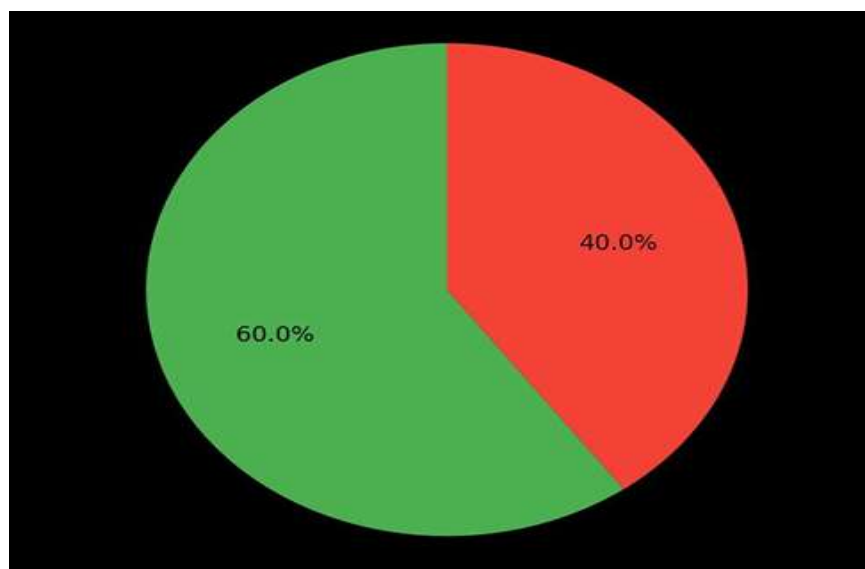
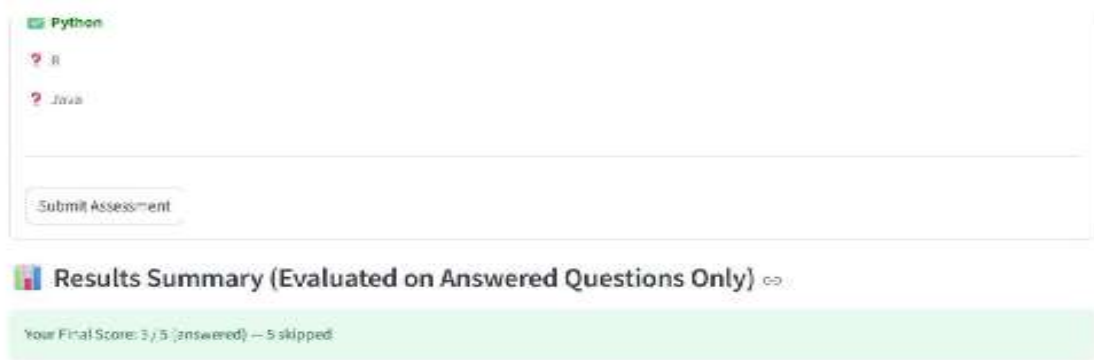


Fig 6: Score



Figure 7: Final quiz Result & Download

In Conclusion, The AI-based Video Quiz Generator project demonstrates an automated system that converts YouTube videos into interactive quizzes using yt-dlp, Whisper, and Gemini 2.5 Flash. It ensures accurate transcription, intelligent MCQ generation, and reliable processing with strong backend logic. The Streamlit interface provides a user-friendly experience with features like quiz evaluation, performance analytics, and PDF reports. Overall, the system is efficient, scalable, and useful for modern e-learning environments.

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Future Scope:

The future scope of this project includes:

1. **Enhanced AI Capabilities**
The system can be improved by adding multilingual transcription, adaptive difficulty levels, topic-wise video segmentation, and better distractor generation to produce high-quality MCQs.
2. **Integration and Learning Improvements**
It can be integrated with LMS platforms, include analytics dashboards, and generate automatic summaries or notes to enhance the overall learning experience.
3. **Scalability and Accessibility**
Deploying the system on the cloud, developing a mobile application, enabling voice-based interaction, and creating a reusable question bank will make it more scalable and user-friendly.