

## Walchand College of Engineering, Sangli

#### (An Autonomous Institute)

**Department of Computer Science and Engineering**

TY CSE Mini Project 1

Report on

**Uttar. Ai: AI-based question-solving and**

**quiz setting portal**

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***Under the Guidance of***

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**2023 - 2024**



**Walchand College of Engineering, Sangli**

(An Autonomous Institute)

**Department of Computer Science and Engineering**

### CERTIFICATE

This is to certify that the Project Report entitled, **“Uttar.Ai”** submitted by Mr. Viraj Patil, Mr. Datta Gangji and Mr. Jyotiraditya Patil to Walchand College of Engineering Sangli, India, is a record of bonafide project work of course **Mini Project I** **(6CS341)**carried out by them under our supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Computer Science & Engineering of the Institute.

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| --- | --- | --- |
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Thank you to everyone who played a role in this project, as your support has been invaluable.

# Declaration

I hereby declare that work presented in this project report titled **“Uttar.AI”** submitted by me in the partial fulfillment of the requirement of the award of the degree of **Bachelor of Technology (B. Tech)** in the **Department of Computer Science & Engineering, Walchand College of Engineering, Sangli** is an authentic record of my project work carried out under the guidance of Prof. Siddharaj Pujari.

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#### Abstract

In an era characterized by the increasing integration of artificial intelligence into our daily lives, there exists a compelling opportunity to harness this transformative technology for educational and informational purposes. The project presented in this abstract introduces a pioneering web-based platform designed to streamline and enhance the way questions are extracted from images, answered accurately, categorized effectively, and ultimately utilized to create quizzes. The core challenges this project seeks to address is the automation of question recognition and answer generation from images, a task that holds significant potential in various domains, including education, content creation, and knowledge management. Current methods often rely on manual processes, limiting efficiency and scalability. Our project endeavors to bridge this gap by harnessing cutting-edge artificial intelligence techniques and image processing algorithms.

#### Introduction and Related work

In the modern age of technology, artificial intelligence (AI) has emerged as a transformative force, permeating various aspects of our lives. One area where AI holds immense potential is in the automation and augmentation of educational content creation and access. The project presented in this synopsis represents a pioneering step towards realizing this potential by seamlessly integrating AI into the process of recognizing and answering questions from images. This introduction sets the stage by providing context, motivation, and a clear understanding of the project's objectives.

The Context of AI in Education and Content Creation:

Education and knowledge dissemination have seen a remarkable shift towards digital platforms and technology-driven solutions. Online learning, e-books, and digital course materials are becoming increasingly prevalent. However, these advancements often lack the automation necessary to efficiently handle questions and answers within these contexts. Herein lies the opportunity for AI to play a transformative role.

Artificial intelligence is not just a buzzword; it is a technology with tangible capabilities. Machine learning, deep learning, and natural language processing have empowered AI systems to comprehend and respond to human language with remarkable accuracy. These capabilities are poised to revolutionize the way we interact with educational content, make learning more accessible, and facilitate content creation.

The Motivation:

The motivation behind this project stems from the recognition of the challenges and limitations associated with current methods of handling questions extracted from images. Manual transcription and categorization of questions are labor-intensive processes prone to errors. Additionally, there is a pressing need for more interactive and engaging educational content, which can be achieved through automated quiz generation.

The project's fundamental motivation is to automate these processes, making educational content creation more efficient and accessible. By harnessing AI's capabilities, we aim to empower educators, content creators, and learners alike with a tool that can transform images into valuable learning resources.

Significance of the Project:

The significance of this project extends beyond its technical components. It addresses a critical need in the educational and content creation sectors. It promotes accessibility, efficiency, and interactivity in learning materials.

#### Problem statement

The project addresses the challenge of automating question recognition and answer generation from images, particularly in educational and informational contexts. Current methods need more efficiency and automation in processing questions extracted from images.

#### Objectives

1. To use an image processing algorithm for accurate question extraction and implement an AI-based system for generating answers to extracted questions.
2. To create a robust categorization system to classify questions into relevant tags and topics and enable the generation of quizzes based on categorized questions.
3. To design a user-friendly interface to upload images and access the system's functionalities.

#### Methodology

#### Utilizing image processing techniques to extract questions from uploaded images.

#### Implementing NLP algorithms for generating answers.

#### Categorizing question based on relevant topic tags.

#### Developing a web-based user interface for seamless interaction.

#### Project diagrams

#### Question Answer Flowchart and Quiz Generation Flowchart

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#### UML Diagram

#### USE CASE DIAGRAM

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**Testing (Unit, Integration and System)**

|  |  |  |
| --- | --- | --- |
| Testcase | Execution | Result |
| User Login | Click on the login button for authentication | PASS |
| User Signup | Click on the signup button for authorization | PASS |
| Sending Question and receiving answer | Type the question and send it to the backend and receive answer for the same | PASS |
| Generating Quiz | Provide with proper tags and limit for questions and get quiz of provided tags | PASS |
| Model training and testing | Trained model using supervised learning on huggingface (platform for model training, testing and deployment) | PASS |
| Model Deployment | Deployed model along with backend on WIC Server of the College. | PASS |
| Integration of NodeJS Backend with Python | Done using PythonShell library in JavaScript | PASS |

#### Results and Conclusion

* Efficient Question Extraction and Answer Generation:
  + A highly accurate and efficient image processing algorithm capable of extracting questions from diverse images, including those with varying formats, qualities, and handwriting styles.
  + **Time Required**: 2-3 Second
  + An AI-based system for generating contextually relevant and accurate answers to the extracted questions, enhancing the overall educational experience.
  + **Time Required**: 15-18 Seconds
* Intelligent Categorization System:
  + A sophisticated categorization system that intelligently tags and sorts questions into relevant topics and difficulty levels. This system streamlines the organization of educational content, making it easier for educators, learners, and content creators to access and utilize specific types of questions.
  + **Time Required:** 110ms (aprox.)
* User-Friendly Web Platform:
  + A user-friendly web-based platform that allows seamless uploading of images, extraction of questions, access to answers, and generation of quizzes. The platform should be intuitive, accessible, and enhance the overall user experience.
* Quiz Generation Feature:
  + A robust quiz generation feature that enables users to create quizzes based on categorized questions. This functionality promotes interactivity in learning, allowing educators and learners to easily tailor quizzes to specific topics and difficulty levels.

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