VIRTUAL ASSISTANT FOR TEACHERS

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Introduction

- An assistant for teachers which would help them in their day to day routine.
- An assistant for students to quickly find relevant answers in a research paper or any general topic.

PRESENTATION FLOW

KEY CONCEPTS COVERED

Understanding Problem Statement
Proposed Solution
Key Features
Technology Stack
References

PROBLEM STATEMENT

To design and develop an efficient cloud based sytem that is capable of providing supportand assistance to teaching faculty . Also to implement Handwritten Text Recognition for student's scanned assignments, Question and Answer Generating System from any given data and Closed Domain Question Answering System for answering any questions from available resources for Teacher's Assistance.

LITERATURE REVIEW

QA1: EDUQA: EDUCATIONAL DOMAIN QUESTION ANSWERING SYSTEM USING CONCEPTUAL NETWORK MAPPING

Introduction: This paper reviews the concept of dividing the whole process into 3 chunks of processes
1:Entity recognition
2:Question Analysis that filters relevant features
3:Answer Retrieval for extracting the answer based on the above two processes.

Summary: The Entity Recognition is done using the DCN (Dynamic Concept Network). the main task of this module is to extract entities and their relationships
The list of the entities are passed to the Question Analysis module.
This module takes the input as a question and then tokenizes it and extracts the longest prefix sequence from the entity list provided by the DCN module.
After this the information is passed on to the answer retrieval module which tries to match the entities with the most relevant relationship i.e it extracts the
relationships from the entities found by the Question analysis module. If we find any relation then it is passed to the concept network to extract the answer and
then it's given back to the user.
But if we don't find a relation, then the person has to find the answer and mark it and this is updated in the concept network. This process is called as on the fly learning.

Scope of the System:

The project tries to develop an online platform that facilitates the existing traditional processes by introducing a virtual assistant to give support to our information technology programme. We believe that the whole Question-Paper generation and assignments grading process could be a tedious job for the teachers.

Our system puts forward a solution to automatically generate questions and provide sample answers for the same from a given document. Based on these generated Q&A, it could also grade a student's handwritten answer sheet/assignment. Finding internal information from a PDF or docs should be easier. We believe that everyone should be able to use modern search technologies to find information in their documents. Our Virtual assistant allows the teachers to ask a question in natural language and get an answer without having to read the internal documents relevant to the question, making it easy for them to prepare notes for their upcoming lectures.

FLAWS IN EXISTING SYSTEMS:

MANUAL Q/A GENERATION:

Most of the Q/A Genration are done by the Teaching Faculty which is stressful as well as time-consuming

HTR ON MULTI HANDWRITING

Most of the current HTR do not support multiple handwriting recognition due to single dataset.

OPEN DOMAIN ANSWERING SYSTEM:

Open Domain answering system sometimes provide with unrelated answers with respect to a particular domain.

Key Features

HANDWRITING TEXT RECOGNITION (HTR)

system transcribes text contained in scanned images into digital text and interprets intelligible handwritten input from sources such as paper documents, photographs, and other devices.

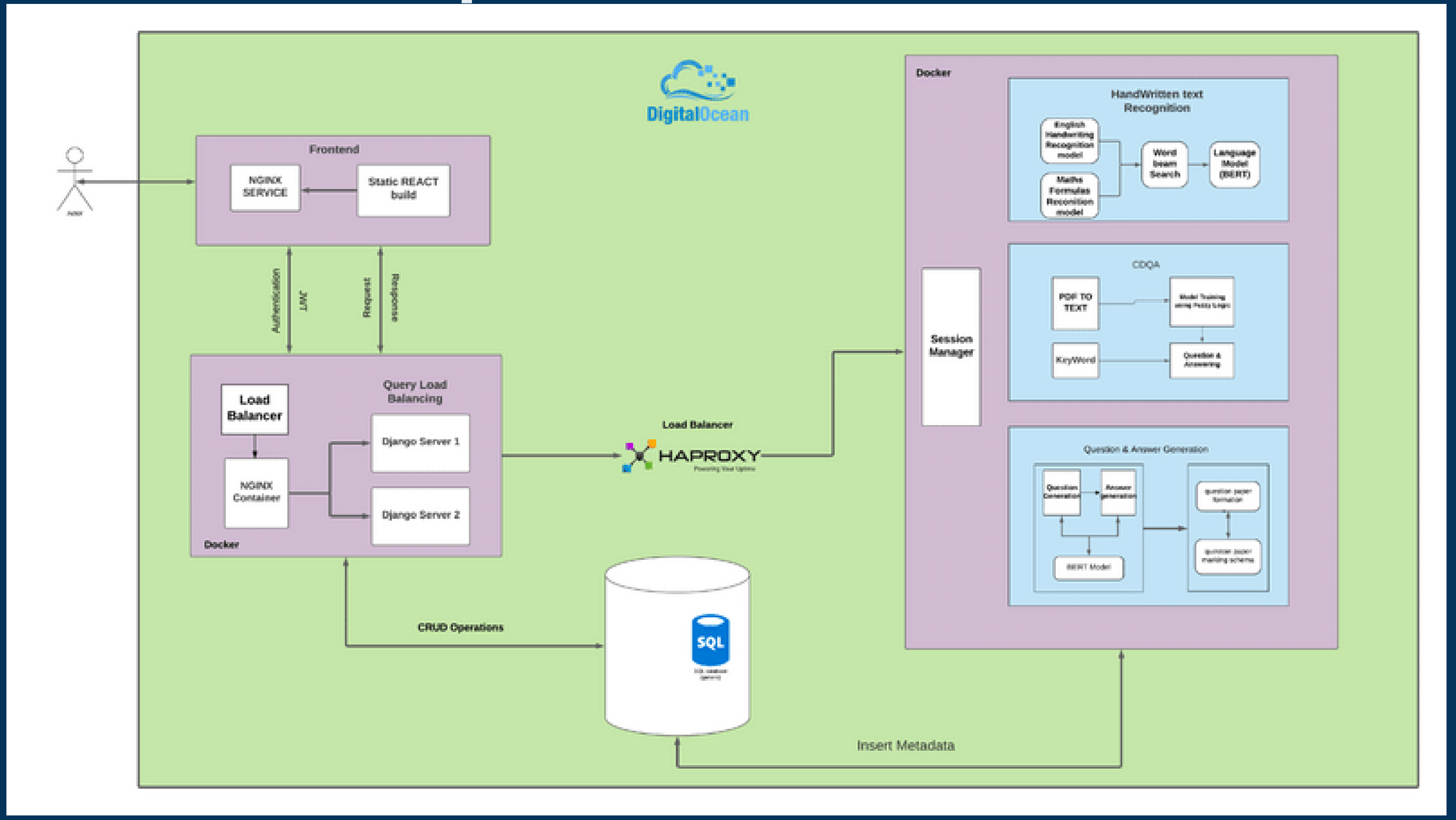
QUESTION & ANSWER GENERATION

Generating Questions and their respective answers, using the power of Natural Language Processing(NLP), from a given text which could be useful, easy and time-efficient in making of a question paper for an exam.

CLOSED DOMAIN QUESTION ANSWERING SYSTEM (CDQA)

Textbook Based Answering System that will allow anyone to ask a question in natural language and get an answer without having to read the internal documents relevant to the question.

Proposed Architechture



Algorithms Used:

- **SEQ2SEQ**

  seq2seq is a general-purpose encoder-decoder framework

- **BERT/T5**

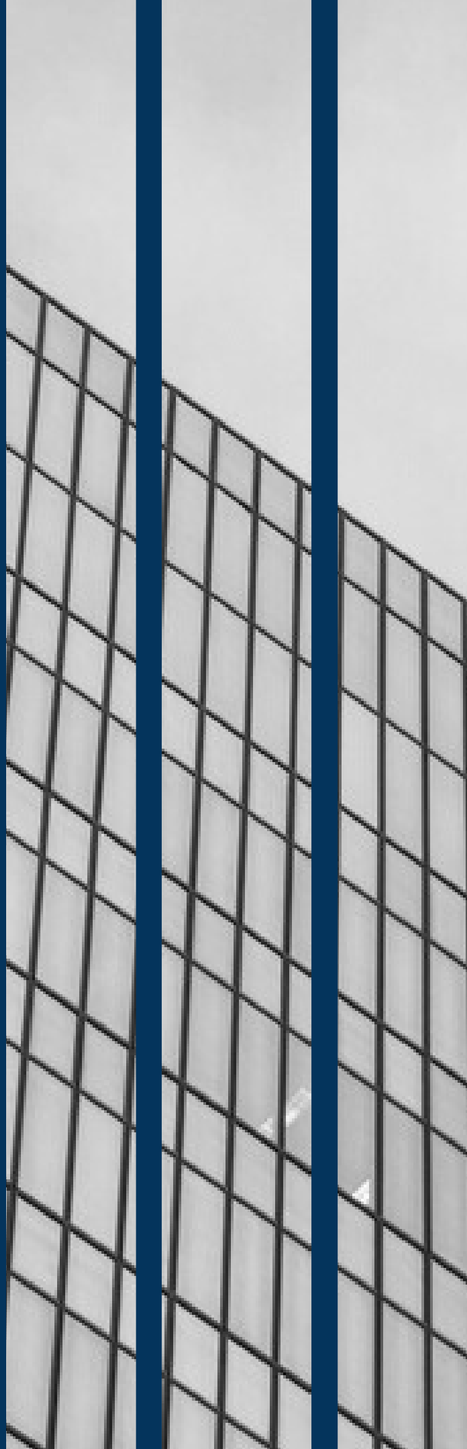
  BERT/T5 makes use of Transformer, an attention mechanism that learns contextual relations between words (or sub-words) in a text.

- **LSTM**

  It is a model or architecture that extends the memory of recurrent neural networks.

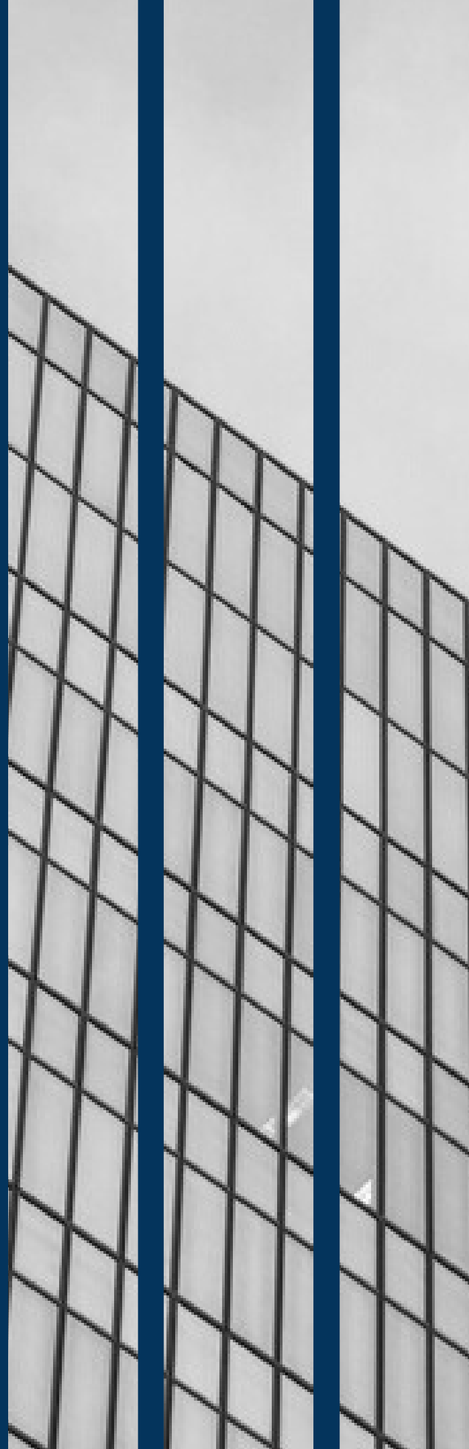
- **GPT-2**

  GPT is a pretrained transformer architecture provided by OPEN AI, that gives us a base model to build on.



Technology Stack

- DJANGO, FLASK
- REACT.JS
- PY-TORCH
- TENSORFLOW



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THANK YOU !