Basic Details of the Team and Problem Statement

SMART INDIA HACKATHON 2022

Organization Name: Dell Technologies, Bangalore, India
Problem Statement Title: Interpreting Doctors notes using handwriting recognition and Deep learning Techniques **PS Code**: UP1261
Team Name: **SWASTHYA VARDHAK** **Team Leader Name**: GARIMA SAROJ
Institute Name: AJAY KUMAR GARG ENGINEERING COLLEGE
Theme Name: MedTech/BioTech/HealthTech **Institute Code**: C-46109

PROBLEM STATEMENT:

Solution to digitize the handwritten prescriptions, doctor notes, lab reports, which can also help to integrate tightly with other healthcare systems for seamless digitization and data flow. Standardized forms can also be made machine readable with support for multiple local Indian languages to make digitization much simpler.

SOLUTION:

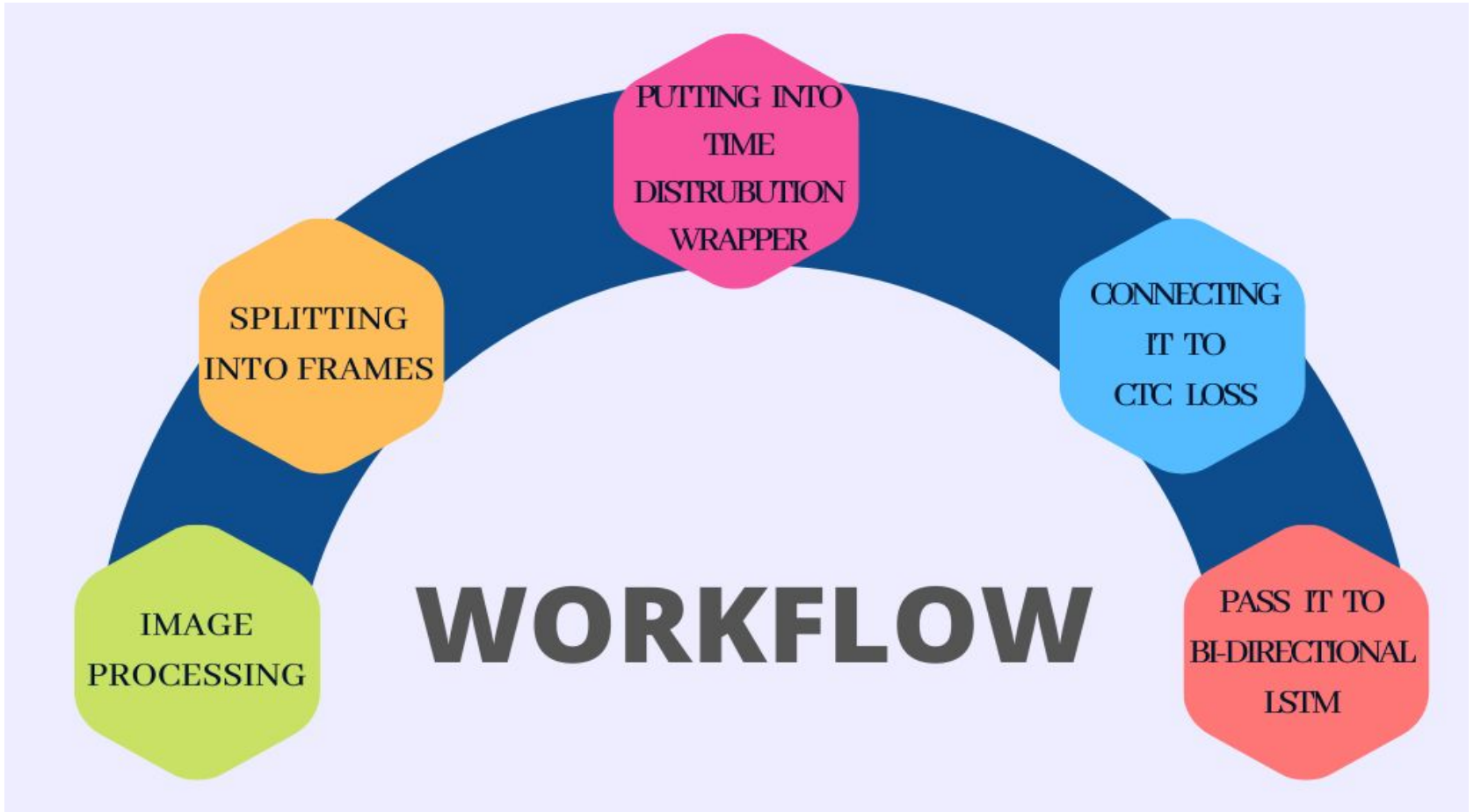
- CRNN based architecture with CTC(Connectionist Temporal Classification) loss to extract the visual features which are passed to an RNN and a CTC loss is applied to end with a greedy decoder to get the output.
- Zhang Suen Thinning Algorithm will be used for Image Processing.
- Optical Character Recognition (OCR) through which the bitmaps of the template character will be compared to the read character to determine which character would closely match the most.
- Three channel image would be first converted to grayscale image and then identification of contours would be done.

APPROACH

- To digitalize the Patients records of prescription , doctors notes and lab reports by providing a mobile app as well as web app solution.
- 90% of prescriptions in India are handwritten and doctors usually have illegible handwriting and patients face difficulties in reading them.
- Digitizing the prescriptions would help mitigate these concerns to a great extent and ease the patient's task of apprehending the doctors handwriting.
- Once the user login and register itself on the portal, the user may start scanning the prescription.
- Finally, the Prescription would be converted into a Readable format.

Technology stack

- Convolutional Recurrent Neural Networks
- Optical Character Recognition(OCR)
- Long Short Term Memory(LSTM)
- Zhang Suen Thinning Algorithm
- Flask, Rest API, ReactJS
- Flutter & Firebase



ML Model Workflow

Image of handwritten prescription

Line segmentation using OpenCV Contours

Part 1

Deep Convolution Recurrent Neural Network (CRNN)

Part 2

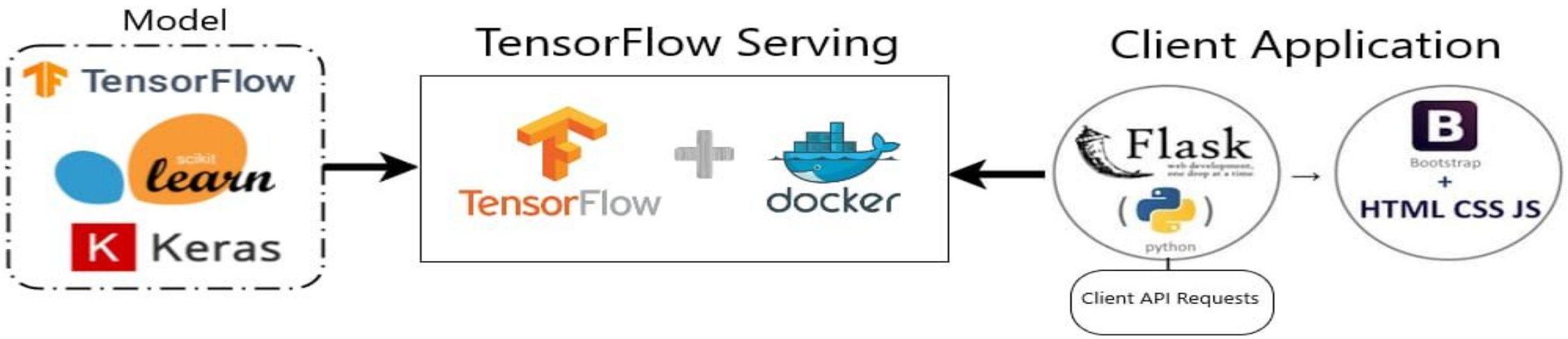
Probability matching with the closest word from pre-created dictionary

Part 3

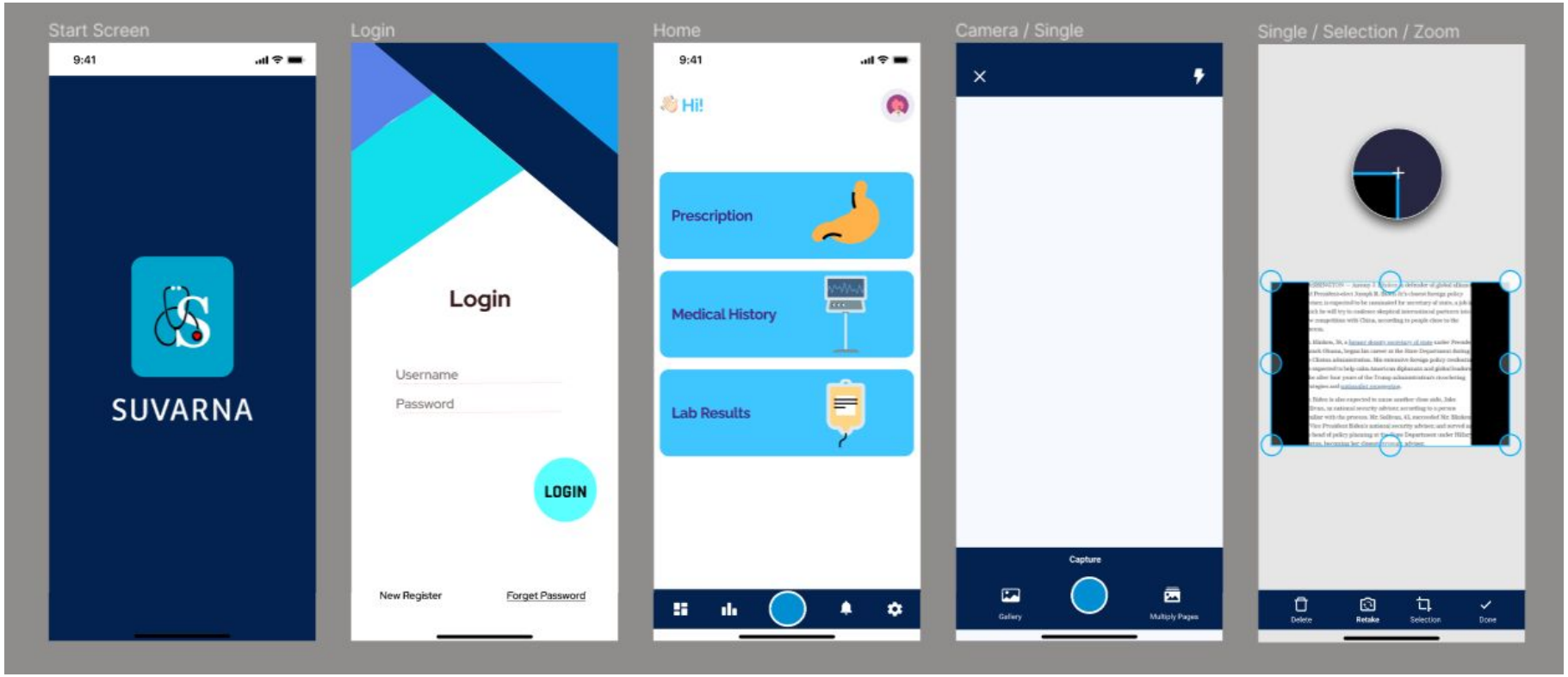
Output text

Final Output

APPLICATION/PROJECT WORKFLOW



Mobile Application UI



[Prototype Link]
[UI Link]

TEAM MENTOR :
Dr. Pratima Singh
(AI/ ML Domain 20+ years of experience)

Team Details

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