Bank of Baroda

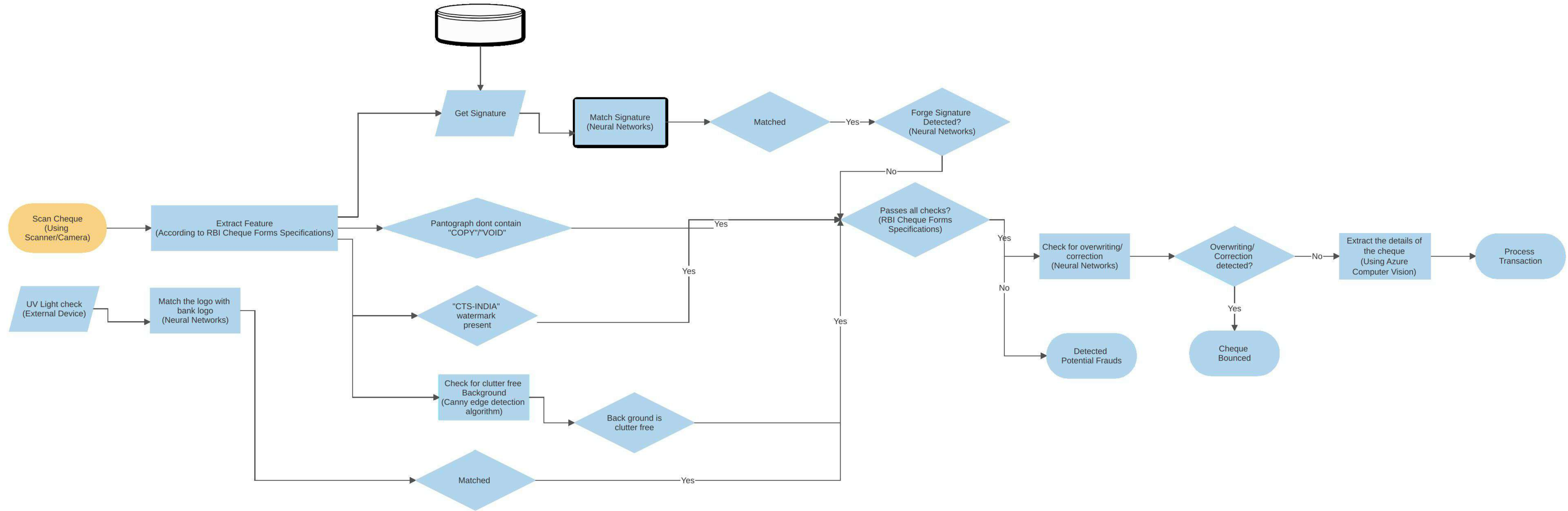# Automated Cheque Processing

Hackathon

Problem Statement

Bank handles large volumes of cheques in the clearing process. The process involves many technical verifications including signature verification. Some of these steps are manual and require human intervention to complete the process. The current process requires the high human capital deployment and longer processing time.

Goals

1. **Detecting Potential Frauds:** Automate the verification of security features given by RBI's [CTS-2010 Standard" for Cheque Forms – Specifications](#) using different Neural Network techniques and image processing.

2. **Signature Verification:** Extract and match the signature in the cheque with the signature in the bank database. Also check for signature forgery using convolutional neural network.

3. **Automatic Data Entry:** Extract the data from the cheque using [Azure Computer Vision API](#)(configured for Multiple Languages) and entry the data to process the transaction.

4. **Optimise the Neural Network models:** Use different optimisation techniques to make the verification process faster with high accuracy.

5. **Minimize Human effort:** Minimize human effort by minimizing false positive of fraud detection and signation verification. With accurate OCR.

Flow Chart

Scan Cheque
(Using Scanner/Camera)

Extract Feature
(According to RBI Cheque Forms Specifications)

Get Signature

Match Signature
(Neural Networks)

Matched — Yes

Forge Signature Detected?
(Neural Networks)

No

Pantograph dont contain "COPY"/"VOID" — Yes

"CTS-INDIA" watermark present

UV Light check
(External Device)

Match the logo with bank logo
(Neural Networks)

Check for clutter free Background
(Canny edge detection algorithm)

Back ground is clutter free

Matched — Yes

Passes all checks?
(RBI Cheque Forms Specifications)

Yes / Yes

No

Check for overwriting/correction
(Neural Networks)

Overwriting/Correction detected?

No

Extract the details of the cheque
(Using Azure Computer Vision)

Process Transaction

Yes

Detected Potential Frauds

Cheque Bounced

Implementation Plan

- **Scan the cheque:** Make a fontend in python that can take a picture from camera/scanner attached to the computer or import from file with support to import a large number of images together.

- **UV Light Check:** UV light check will be done using a external device with human intervention or automated with some IOT device and should be matched with bank logo with the help of neural networks.

- **Extract different parts of Cheque:** Extract different parts of cheque using RBI's "CTS-2010 Standard" for Cheque Forms – Specifications for verification.

- **Match Signature from bank database:** Match the signature from cheque with signature from bank database. Also check for forge signature using neural networks.

- **Check the Pantograph:** The pantograph will be checked for words like "VOID" / "COPY"

- **Check for clutter free background:** The background will be check for clutter free background(the writings in background should be distin) using canny edge detection algorithm.

- **Check for watermark:** The cheque should be checked for "CTS-INDIA" watermark.

- **Validating the cheque:** If all checks passes then proceed to next step else detection of potential frauds.

- **Check for overwriting/correction:** The writing should be checked for overwriting/correct using neural networks if found bounce the cheque.

- **Data Entry:** After all the verification is done the details of the cheque will be extracted using Azure Computer Vision API(configured for Multiple Languages) and start transaction process.

Banks Logo

XYZ Bank
Branch Address

IFSC :

Banks' Invisible Logo

24.5 MM

D D M M Y Y Y Y

MICRO-LETTERING

Pay या धारक को or Order

8 MM

Rupees रुपये

8.5 MM

8.5 MM

101 MM

अदा करें। रु. Rs.

39 MM

29 MM

101 MM

A/c No.

12.6 MM

25 MM

39 MM

CTS Water Mark

VOID PANTOGRAPH

11 MM

SAMPLE

Please sign above

MICR BAND

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