Define CS, fit into CC

1. CUSTOMER SEGMENT(S)   CS

Who is your customer?
1) Banks- processing digits in the cheque
2) Automatic parking-license plate readers
3) Post office-code recognition written in envelope
4) Equation solver-recognize digits to solve mathematical equation
5) Accounting sectors- recognition of digits in forms, cheques

6. CUSTOMER CONSTRAINTS   CC

What constraints prevent your customers from taking action or limit their choices of solutions?
1) Requirement of high accuracy- correct prediction needed for processing in banks
2) Requirement of minimal error- errors due to variation in style, orientation, size of writing
3) Minimal processing time- algorithm should take less time to execute
4) Minimal storage space- algorithm should occupy less storage space

5. AVAILABLE SOLUTIONS   AS

Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have?

Past solution:
        Manual handwritten digit recognition

Pros:
- Human intuition in recognizing the digits is good
- Faster

Cons:
- Old people and people with errors in eye sight find it difficult to predict correctly

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS   J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

- Prepare dataset to train the model
- Dataset should contain handwriting from different people
- It should have digits written in different orientation, style, size, thickness, etc
- The model should make prediction with good accuracy
- Model should take less time to execute
- Model should occupy less storage space

9. PROBLEM ROOT CAUSE   RC

i) What is the real reason that this problem exists?
ii) What is the back story behind the need to do this job?

Reason:
- Certain digits look similar, difficult to recognize them
- Irregularities in handwriting

Need:
- Automation in banking, post offices, license plate Recognition, accounting and financial sectors to save time
- Integration with other technologies like IOT

7. BEHAVIOUR   BE

What does your customer do to address the problem and get the job done?

- Analyse benefits of using automated handwritten digit recognizer
- Find the applications of the automatic handwritten digit recogniser
- Analyse whether it will overcome the difficulties encountered in the past system

Focus on J&P, tap into BE, understand RC

3. TRIGGERS `TR`

What triggers customers to act?

* Need to automate everyting
* Integration of various technologies
* Reduce manual work
* Save time
* Reduce errors

4. EMOTIONS: BEFORE / AFTER `EM`

How do customers feel when they face a problem or a job and afterwards?

Before:
- Frustated, if the digits in large number of cheques and forms needed to be recognized
- Difficult for aged people and people with eye sight issues

After:
- Reduced work, reduced stress
- Time saving

10. YOUR SOLUTION `SL`

We have proposed a solution to automate the digit recognition process. A deep learning model is trained with images of different styles, sizes, orientation and then the model is based to predict based on previous learning. We can extend this project into providing solutions to various other problems like solving handwritten mathematical equation by making some changes with the training data and final code

8. CHANNELS of BEHAVIOUR `CH`

8.1 ONLINE
Digit recognition in scanned documents and cheques

8.2 OFFLINE
Digit recognition in postal envelope, banking cheques and forms