Project Title: A Novel Method For Handwritten Digit Recognition System **Project Design Phase-I - Solution Fit Template** **Team ID: PNT2022TMID05774**

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is you customei?
i.e. working patents of 0-5 y.o. Kids

Organizations who want to recognize the handwritten digits of people
Example:

- ✓ Post office,
- ✓ Data entry offices,
- ✓ Forensic Departments.

6. CUSTOMER CONSTRAINTS CC

What constraints prevent you customeis from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

In mobiles and laptop, there are possibilities for lack of stable internet connections and unavailability of devices. It is hard task for the machine to recognize the handwritten digits which are not perfect.

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customeis 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? i.e. pen and paper is an alternative to digital note taking.
Already there are existing solutions available for handwritten
recognition. But, most of them are inaccurate.
The solution proposed by our system has more accuracy
and it is efficient in recognition of manually written digits.

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 customeis? There could be more than one; explore different sides.

Jobs to be done: To identify the digits in the manually written forms,

Cheques filled by people in banks,
Phone numbeis written manually in registei notebook of hospitals.

Problems: Dim lighting and weak eyesight

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists? What is the backstory behind the need to do this job?

i.e. customeis have to do it because of the change in regulations.

Handwritten digits are in different fonts and sizes, hard to recognize the digits due to various factors such as dim lighting, weakening eyesight.

7. BEHAVIOUR BE

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

i.e. directly related: find the right solar panel installei, calculate usage and benefits; indirectly associated: customeis spend free time on volunteering work (i.e. Greenpeace)

customei wants available devices with stable internet connection and quality cameras.

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

Identify strong TR & EM

3. TRIGGERS

TR

What tiiggeís customeís to act? i.e. seeing theií neighbouí installing solaí panels, íeading about a moíe efficient solution in the news.

Adveítisement in the maíket about the efficient íecognition of digits.

Aíticles about the achievements made by ouí píoject.

4. EMOTIONS: BEFORE / AFTER

EM

How do customeís feel when they face a píoblem oí a job and afteíwaíds?
i.e. lost, insecuíe > confident, in contíol - use it in youí communication stíategy & design.

Defects aíe common and ouí píoject is not an exception

When the system failed to íecognize the digit,

Customeí Mentality:
Befoíe:(Failuíe)
We would give guaíantee that it would woík most of the time
and if any eííoí occuís, they can contact us at any time.
So, customeís can feel at ease.
Afteí:(Failuíe)
They have no need to panic when the failuíe occuís
They can easily contact us to íectify the eííoí.
We would solve the defect as soon as possible.

10. YOUR SOLUTION

SL

If you aíe woíking on an existing business, wíite down youí cuíient solution fiíst, fill in the canvas, and check how much it fits íeality.
If you aíe woíking on a new business píoposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customeí limitations, solves a píoblem and matches customeí behaviouí.

Ouí solution aims to íecognize handwíitten digits using machine leaíning techniques theíeby saving costs to the oíganization impíoving employee píoductivity.

In ouí model we use AlexNet , which is one of the CNN aíchitectuíes . AlexNet allows foí multi-GPU tíaining by putting half of the model's neuíons on one GPU and the otheí half on anotheí GPU. Not only does this mean that a biggeí model can be tíained, but it also cuts down on the tíaining time. It also íeduces the oveífitting píoblem by Data Augmentation and Díopout.

8. CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

What kind of actions do customeís take online?
Extíact online channels fíom #

Requiíes Stable inteínet connection foí image píocessing.

8.2 OFFLINE

What kind of actions do customeís take offline?
Extíact offline channels fíom # and use them foí customeí development.

Obtain modeín electíonic devices and check they aíe woíking

Identify strong TR & EM