Project Title: A Novel Method for Handwritten Digit Recognition System **Project Design Phase-I - Solution Fit Template** **Team ID:** PNT2022TMID13012

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?
i.e. working parents of 0-5 y.o. kids

Handwritten Digit Recognition has various real-life time uses. It is used in the detection of vehicle number, banks for reading cheques, post offices for arranging letter, and many other tasks.

6. CUSTOMER CONSTRAINTS CC

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

The variety of handwriting styles and how handwriting should look varies depending on the amount of data a model is trained with. Similarity of characters also make it difficult to predict the character sometimes. Awkward angles to take the photo of the writing can also cause issues

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? i.e. pen and paper is an alternative to digital notetaking

Google lens has the ability to majorly recognize typed out digits rather than handwritten ones. Some forms of Optical Character Recognition software (OCR) helps convert written text to digital form

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.

Having a model which can accurately identify text and convert it reduce the time required in a lot of operations which are done manually such as typing out the text. Incorrect recognition to lead to problems such as incorrectly identifying an address or having an incorrect bank cheque amount input

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists?
What is the back story behind the need to do this job?
i.e. customers have to do it because of the change in regulations.

Mostly due to time constraints and as automating processes has become the new norm, handwriting recognizers were developed. Problems that usually occur while recognition are due to the various styles and languages people can write in

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?
i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)

Directly Related: Customers may find ways to adapt their style to match up more to the style that is recognized.
Indirectly Related: Customer learns a new style of writing

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

Identify strong TR & EM

3. TRIGGERS TR

What triggers customers to act? i.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.

A customer prefers to adopt this as it eases workflow and reduces time taken while working

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

The customer feels relieved that their typing work is substantially reduced and time taken to search records written in letters is much quicker

10. YOUR SOLUTION SL

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

The resultant application uses machine learning model in order to make informed decisions which helps the user to find out what is the given input (numerical) image could be. The prediction is made using a Convolutional neural network that is computationally efficient and is more efficient.

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE
What kind of actions do customers take online? Extract online channels from #7

Online resources could include the software required to detect and convert the scanned text and website where it is converted and displayed

8.2 OFFLINE
What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

Offline resources could include the paper or sheet they write on taken for scanning

Identify strong TR & EM