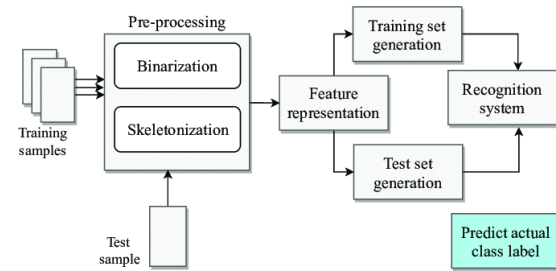


Project Design Phase-I
Proposed Solution

Date	19 September 2022
Team ID	PNT2022TMID39952
Project Name	Project - Novel method for handwritten digit recognition
Maximum Marks	2 Marks

Proposed Solution:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The handwritten digits are not always of the same size, width, orientation and justified to margins as they differ from writing of person to person, so the general problem would be while classifying the digits due to the similarity between digits such as 1 and 7, 5 and 6, 3 and 8, 2 and 5, 2 and 7, etc.
2.	Idea / Solution description	<ol style="list-style-type: none"> 1.Image Acquisition 2.Pre-processing 3.Segmentation 4.Feature Extraction 5.Classification 6.Post Processing
3.	Novelty / Uniqueness	<ol style="list-style-type: none"> 1.Support Vector Machine 2.Multilayer Perceptron 3.Convolutional Neural Network
4.	Social Impact / Customer Satisfaction	<ol style="list-style-type: none"> 1..The impact of image resolution reduction on recognition accuracy for handwritten digits 2. 1% accuracy degradation impact 3.Reduction of the size for the features vector due to image rescaling
5.	Business Model (Revenue Model)	 <pre> graph LR TS[Training samples] --> PP[Pre-processing] subgraph PP [Pre-processing] B[Binarization] S[Skeletonization] end PP --> TSG[Training set generation] TSG --> FR[Feature representation] TSG --> RSG[Test set generation] TSs[Test sample] --> PP PP --> FR FR --> RS[Recognition system] RSG --> RS RS --> PACL[Predict actual class label] </pre>
6.	Scalability of the Solution	The US Postal (USPS) handwritten digit dataset is derived from a project on recognizing handwritten digits on envelopes [7, 8]. The digits were downsampled to 16 × 16 pixels and scaled without distortion (i.e., retaining the aspect ratio; 1 : 1 scaling). The training set has 7291 samples, and the test set has 2007 samples.

