Project Design Phase-I
Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID45634
Project Name	A Novel Method for Handwritten Digit Recognition System
Maximum Marks	2 Marks

Proposed Solution Template:

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

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	● The handwritten digit recognition is the capability of computer applications to recognize the human Hand written digits. It is a hard task for the machine because handwritten digits are not perfect and Can be made with many different shapes and sizes. ● The handwritten digit recognition system is a way tackle this problem which uses the image of a digit and recognizes the digit present in the image. Convolutional Neural Network model created using by Torch library over the MNIST dataset to handwritten digits.
2.	Idea / Solution description	● MNIST database contains 60,000 training images of handwritten digits from zero to nine and 10,000 images for testing. • We will create our CNN model. It works better for data that are represented as grid structures; this is the reason why CNN works well for image classification problems.

3.	Novelty / Uniqueness	● Handwritten digit recognition using MNIST dataset is a major project made with the help of neural network. It basically detects the scanned images of handwritten digits. ● We have taken this a step further where are handwritten digit recognition system not only detects the scanned images of handwritten digits but also allows writing digits on the screen with the help of an Integrated GUI for recognition
4.	Social Impact / Customer Satisfaction	• Digital Recognition is nothing other than recognizing or identifying digits in any document. The framework of digital recognition is simply the operation of the machine to prepare or Interput digits. • Handwritten Digit Recognition is the power of computers to translate handwritten digits from a variety of sources such as text messages, bank checks, papers, photos, etc. method With the use of in-depth learning methods, human efforts can be reduced in perception, learning, perception and in too many regions.
5.	Business Model (Revenue Model)	• Handwritten digit recognition refers to a model's (machine's) capacity to detect any handwritten digits from various sources, such as photographs, papers, and touch displays, and classify them into ten specified categories 0-9. • Several ways and algorithms are used to recognize handwritten digits, such as Deep Learning/CNN, SVM (Support Vector Machine), Gaussian Naive Bayes, KNN (K-Nearest Neighbour), Decision Trees, Random Forests, etc. • We used the CNN (Convolutional Neural network) algorithm to recognize handwritten digits in this project.

6.	Scalability of the Solution	• The variations of accuracies for handwritten digit were observed for 15 epochs by varying the hidden layers using CNN model and MNIST digit dataset. • The maximum accuracy in the performance was found 99.64% and the total lowest test loss is 0.0239 approximately.