Project Design Phase-I
Proposed Solution Template

Date	October 2022
Team ID	PNT2022TMID19039
Project Name	Project – A Novel based handwritten digit recognition
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)	Handwritten digit recognition is the capability of computer applicationto recognize the handwritten digits.in machine it is difficult task for identifying handwritten digits.It is not perfect and different size. The handwritten digit recognition uses image of digit and recognize the digits present in image.CNN model used to find the handwritten detection.
2.	Idea / Solution description	The handwritten digit recognition system follows the standard model for feature based classification system consisting of the digit image database,essential feature extraction sub-block and a main classification sub-block.The MNIST benchmark database of handwritten digits has been considered in this work by using a new Multiple-cell size(MCS). The module provides the basis of the rest of the course by introducing the basic concepts behind machine learning and specifically how to perform machine learning by using python and the scikit-learn machine learning module.First you will learn an important step before applying machine learning algorithms,data preprocessing finally you wil learn how to leverage different types of machine learning algorithms in

		a python sript.
3.	Novelty / Uniqueness	The proposed recognition system is implemented on handwritten digits taken from MNIST database. Handwritten digit recognition system can be extended to a recognition system that can also able to recognize handwritten character and handwritten symbols. Future studies might consider on hardware implementation of Írecognition system.This project is a very much preliminary project
4.	Social Impact / Customer Satisfaction	A handwritten digit recognition is one of the practically important issues in pattern recognition applications.it's used for postal mail sorting, bank check processing ,form data entry.
5.	Business model	A handwritten detection is used in a business model digits accuracy is high the customers can easily satisfied for example in bank the normal people give cheque to bank employee that time employee can't understand number that time very helpful to find the accuracy of digits.
6.	Scalability of solution	Recognition of handwritten digit is one of the popular problem associated with computer vision applications.The goal of our research work is develop scalable Neural Network and Convolutional Neural Network(CNN).

Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) — CS

Recognise the handwritten digit detection.

6. CUSTOMER — CC

Its helpful for customers such as postal mail sorting,bank check processing form data entry.to ensure effective and reliable approaches for recognition of handwritten digits and reliable approaches for recognition of handwritten digits and banking operation free

5. AVAILABLE SOLUTIONS — AS

Lot of available solutions are there to recognize handwritten digits including deep learning/cnn,SVM,Gausdsian Naïve Bayes,KNN,decision tree,Random process.

Explore AS, differentiate

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

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

To recognize the handwritten digits are more accuracy in CNN model

9. PROBLEM ROOT CAUSE — RC

Handwriting recognition helps a transform the writings in the paper to a text document format which can also said as readable electronic format.historical facts can be stored reviewed and shared easily too many people. to ensure effective and reliable approaches for recognition of handwritten digits and banking operation free

7. BEHAVIOUR — BE

Deep learning methods can now turn natural language into synthesized iages,here,written descriptions for images are used to build a new hallucinated Image.

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

Identify strong TR & EM

3. TRIGGERS — N TR

The perils of poor handwriting .perhaps the most obvious problem when processing handwritten forms during data capture process is poor quality

4. EMOTIONS: BEFORE / AFTER — EM

Before: Handwritten text classifiers were first required for classification of postalmail.using Scanning equipment handwired logic recognized monospaced fonts.
After: neural network are able to learn features from analyzing a dataset and classify an unseen Image based on weighs.features are extracted in convolutional layer where kernalis passed over the image to extract certain feature.in end result multiple kernel learn all features within a dataset in order to make classification.

10. YOUR SOLUTION — SL

Solutions for handwritten detection to using CNN and aother models to train Our input dataset it gives a above 90% accuracy output for us.

8. CHANNELS of BEHAVIOUR — CH

8.1 ONLINE
Handwriting recognition (or HWR) is the ability of a computer to receive and interpret intelligible handwritten input from sources such as paper documents, photographs, touch-screens and other devices.

8.2 OFFLINE
In offline handwriting recognition,text is analysed after being written.the only information that can be analysed in binary output of a character against a backgroung.although shifts towards digital stylus for writing gives more information such as pen stroke,pressure and speed of writing still a necessity for offline methods..

Extract online & offline CH of BE

AMALTAMA

SOLUTION ARCHITECTURE

HANDWRITTEN DIGIT RECOGNITION