Project Design Phase-I
Proposed Solution Template

Date	16-10-22
Team ID	PNT2022TMID13092
Project Name	A Novel Method for Handwritten Digit Recognition
Maximum Marks	2 Marks

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Handwritten digit recognition is the ability of computer system to recognize the handwritten characters from wide variety of sources like emails, papers, images, etc. Manually written digits are of different sizes, styles, orientation, thickness and position. The model should be able to identify them and predict the output correctly.
2.	Idea / Solution description	To solve this problem, we are going to use Convolutional Neural Network. The Convolutional Neural Network (CNN or ConvNet) is a subtype of the Neural Networks that is mainly used for applications in image and speech recognition. Its built-in convolutional layer reduces the high dimensionality of images without losing its information. That is why CNNs are especially suited for this use case.
3.	Novelty / Uniqueness	Preprocessing involves first converting the data type from unsigned integers to floats, then dividing the pixel values by the maximum value. Deep learning models outperform machine learning models in most cases, so we are going to use the deep learning model CNN for our project.
4.	Social Impact / Customer Satisfaction	The main social impact of this work is to reduce the errors that occur in banking sectors due incorrect recognition of handwritten digits that are written in cheques and other credit cards. Thus automating this digit recognition will greatly improve the goodwill of the organization and customer satisfaction.
5.	Business Model (Revenue Model)	Everyone of us have different styles of writing and perception. Manually recognizing the handwritten digits are error prone due to various factors. So if this digit recognition is

		done manually in business organizations, even if a single error occurs, it may cause severe damage to the organization. So here, we have proposed a solution to automate the digit recognition process. A deep learning model is trained with images of different styles, sizes, orientation and then the model is based to predict based on previous learning.
6.	Scalability of the Solution	We can extend this project into providing solutions to various other problems like solving handwritten mathematical equation by making some changes with the training data and final code. Organizations such as banks, revenue departments, accounting sectors are facing issues in recognizing written digits such as in cheques. This can be handled by our handwritten digit recognition project as they expand into different business domains without impacting performance. Our proposed solution is thus scalable and can fit into different domains and solve different problems.