

Project Design Phase-I
Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID35588
Project Name	Project - 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)	To develop a system that can automatically recognize a sequence of handwritten images from an image, using Computer Vision and Deep Learning techniques.
2.	Idea / Solution description	Using the benchmark MNIST dataset containing 60,000 images of handwritten digits, a Deep Learning model can be trained and tuned to a high level of accuracy. This model can be integrated with existing systems to make the business processes efficient.
3.	Novelty / Uniqueness	<p>Besides recognizing individual digits from given images, our system will also be able to detect a sequence of handwritten digits, isolate the individual digits, and recognize each such digit.</p> <p>Instead of building and training a Deep Learning model from scratch, Transfer Learning can be used which enables the use of pre-trained, state of the art models which generally perform highly accurately.</p>
4.	Social Impact / Customer Satisfaction	<p>The proposed system will provide a faster way to process cheques in banks wherein the handwritten digits can be recognized automatically.</p> <p>In postal offices, the delivery packages can be sorted based on the delivery address' zip code in an automatic manner by recognizing the handwritten zip code on the package, thus resulting in a reduction of manual workload.</p>
5.	Business Model (Revenue Model)	In Banks, the developed system can be deployed as a software/web application which requires batches of cheque images to be uploaded and performs recognition of the handwritten digits within.

		In postal offices, the developed system can be integrated/embedded with a mechanical setup that can move/lift packages, thereby removing the need for human intervention.
6.	Scalability of the Solution	<p>The proposed system can be developed in a cost-efficient manner through the use of various open-source software and standard benchmark datasets. It can also be made available in offline mode, thus eliminating the need for the system to be connected to the Internet.</p> <p>In the future, the system can be extended to handwritten characters as well, which would allow it to be used even in the Traffic Control and Monitoring system to monitor over-speeding or vehicles violating traffic rules, by identifying their License Plate Numbers through surveillance footage, thus resulting in a real-time monitoring system.</p>