**PROPOSED SOLUTION TEMPLATE**

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| Date | 24 September 2022 |
| Team ID | PNT2022TMID22252 |
| Project Name | A Novel Method for Handwritten Digit Recognition System |
| Maximum Marks | 2 Marks |

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| **S.No.** | **Parameter** | **Description** |
| 1. | Problem Statement (problem to be solved) | -It is easy for the human to perform a task accurately by practicing it repeatedly and memorizing it for the next time. Human brain can process and analyse images easily. Also, recognize the different elements present in the images.  In this competition, the goal is to correctly identify digits from a dataset of tens of thousands of handwritten images and experiment with different algorithms to learn first-hand what works well and how techniques compare. |
| 2. | Idea / Solution Description | We will approach this project by using a three-layered Neural Network.   * **The input layer:** It distributes the features of our examples to the next layer for calculation of activations of the next layer. * **The hidden layer:** They are made of hidden units called activations providing nonlinear ties for the network. A number of hidden layers can vary according to our requirements. * **The output layer:** The nodes here are called output units. It provides us with the final prediction of the Neural Network on the basis of which final predictions can be made. |

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| 3. | Novelty / Uniqueness | **-Introduces an agent-centric approach to handle novelty in the visual recognition domain of handwriting recognition (HWR).**  **-** Novelty lies in the thorough investigation of all the parameters of CNN architecture to deliver the best recognition accuracy among peer researchers for MNIST digit recognition. The recognition accuracy delivered in this work employing a fine-tuned pure CNN model is superior to the recognition accuracies reported by peer researchers using an ensemble architecture |
| 4. | Social Impact / Customer satisfaction | Image processing in general can cause the opposition of some people from different societies. The reason behind this is because this field can be further developed for malicious intentions, perhaps in the military field to be able to target certain people, and many other similar possibilities. That is why if image processing is not well managed and used with a wise mentality and good intentions, it could represent a threat to societies. |
| 5. | Business Model (Revenue Model) | * Helpline support for resolving website related issues. * Service availability depends on the plan subscribed by the User. |
| 6. | Scalability of the solution | **.** A scalable Neural Network (NN) and Convolutional Neural Network (CNN) model can be used to recognize and determine handwritten digits from its image. Developing new algorithms and improving existing algorithms is determined by the accuracy and speed factor for training and testing models. |