**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 03October 2022 |
| Team ID | PNT2022TMID34173 |
| Project Name | A Novel Method For Handwritten Digit Recognition System |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | **User Visibility** | **People are continuously trying to make computers intelligent so that they can do almost all the work done by humans. Handwriting recognition system is the most basic and an important step towards this huge and interesting area of Computer Vision.** |
| FR-2 | **User Reception** | **The data like recognize the handwritten digit via create GUI to predicts digits.  Convolutional Neural Network model created using PyTorch library over the MNIST dataset** to **recognize handwritten digits .** |
| FR-3 | **User Understanding** | **The Artificial Neural Networks can almost mimic the human brain and are a key ingredient in image processing field. Based on the capability of the computer to identify and understand handwritten digits or characters automatically.** |
| FR-4 | **User Action** | **A lot of machine tools have been developed like scikit-learn , scipy-image etc and pybrains, Keras, Theano, Tensorflow by Google, TFLearn etc for Deep Learning.** |
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**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | **MNIST is a dataset which is widely used for handwritten digit recognition. The dataset consist of 60,000 training images and 10000 test images.**  **We use Artificial neural networks to train these images and build a deep learning model**. |
| NFR-2 | **Security** | **With high security it makes banking operation easier and error free .It gives security for postal mail sorting.** |
| NFR-3 | **Reliability** | **Handwriting recognition is one of the compelling research works going on because every individual in this world has their own style of writing. It is the capability of the computer to identify and understand handwritten digits or characters automatically. Because of the progress in the field of science and technology, everything is being digitalized to reduce human effort** |
| NFR-4 | **Performance** | **In this image is analyzed by the model and the detected result is returned on to UI. It convert handwritten digits into machine readable.** |
| NFR-5 | **Availability** | **AI-enhanced technologies and solutions are now more widely available than before across industries, though they are not necessarily cheap to implement.Research in the handwriting recohnition field is focused around deep learning techniques and has achieved breakthrough performance in the last few years. Still the rapid groeth in the amount of handwritten data and the availability of massive processing power demands improvement in recognition accuracy and deserves further investigation.** |
| NFR-6 | **Scalability** | **It is a dataset of 60,000 small square 28×28 pixel grayscale images of handwritten single digits between 0 and 9.**  **The task is to classify a given image of a handwritten digit into one of 10 classes representing integer values from 0 to 9, inclusively.** |