**Project Design Phase-II**

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

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| Date | 03 October 2022 |
| Team ID | PNT2022TMID52672 |
| Project Name | Project - 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 | System Design | Image Data:  Handwritten digit recognition is the ability of a computer to recognise human handwritten digits from a wide range of sources, including pictures, papers, touch screens, etc., and classify them into ten predetermined categories (0-9). This has been the focus of innumerable studies in the field of deep learning. |
| FR-2 | Hosting | Website:  Web hosting enables online access to the HTML, graphics, and other components of a website. Every website you've ever visited is hosted by a server. The amount of server space provided to a website depends on the hosting type. The four primary types of hosting are shared, dedicated, VPS, and reseller. |
| FR-3 | Training | Digit Classifier Model:  Use the MNIST database of handwritten digits to train a neural network to predict the digit from a picture. Assemble the data for training and validation first. |
| FR-4 | Deployment | Cloud:  Cloud computing is defined as an internet-based virtual platform that allows for limitless data storage and access. The cloud provides a variety of IT services, such as server, database, virtual storage, networking, and servers. |
| FR-5 | Dataset | MNIST dataset:  Modified National Institute of Standards and Technology the shorthand for The MNIST dataset.  It consists of 60,000 minuscule square grayscale photos, each measuring 28 by 28, with handwritten single numerals from 0 to 9. |

**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** | The conversion of handwritten compositions on paper into legible computer text documents is made possible by handwriting recognition software.  The recognition of handwritten characters is one of the major issues with pattern recognition applications. Filling out forms, processing bank checks, and sorting mail are examples of applications using digit recognition. |
| NFR-2 | **Security** | In addition to categorising the digit, the algorithm also creates an extensive description of the instantiation parameters, which could reveal details like the writing style. The generative models have segmentation powered by recognition capabilities. |
| NFR-3 | **Reliability** | The handwritten digit recognition system uses neural network concepts. This neural network model is trained used various samples so it can automatically deduce the rules for reading handwritten digits. By increasing the number of training instances, the network may also learn more about handwriting and hence improve its accuracy.  To recognise handwritten numbers, a variety of methods and algorithms can be employed, including Deep Learning/CNN, SVM, Gaussian Naive Bayes, KNN, Decision Trees, Random Forests, etc. |
| NFR-4 | **Performance** | Written textual content in Graphical User Interface (GUI) technology offers accuracy rates of more than or equal to 75%. However, spacing discrepancies, handwriting anomalies, and human typeface variability reduce the accuracy of character identification. |