Project Design Phase-I Proposed Solution Template

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| Date | 25 September 2022 |
| Team ID | B2-2M4E (Batch) |
| Project Name | Project - A Novel Method For Handwritten  Digit Recognition With Neural Networks |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

Project team shall fill the following information in the proposed solution template.

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| **S.No.** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to be solved) | Digit recognition is crucial in the contemporary environment. It can resolve more difficult issues while also simplifying human tasks. A handwritten digit is one instance. HANDWRITTEN Digit recognition refers to a computer system's capacity to identify handwritten inputs, such as numbers from a range of sources, including emails, papers, photographs, letters, etc. Humans can easily do a task accurately by frequently rehearsing it and recalling it for the next time. Images are easily processed and analysed by the human brain. Recognize the various components that each image has. |
| 2. | Idea / Solution description | The MNIST dataset, which includes 10,000 test images and 60,000 training images of handwritten digits from zero to nine, is used to perform handwritten digit recognition. Thus, there are 10 different classes in the MNIST dataset. In this project, we'll put into practice a Convolutional Neural Networks model–trained application for handwritten digit recognition. In the end, a GUI is created in which the user enters a handwritten digit, which is then identified, and the answer is shown right away. |
| 3. | Novelty / Uniqueness | In this project, a practical method for addressing novelty in the field of handwriting visual recognition is introduced. A flawless transcription agent would be able to recognise recognised and unrecognised characters in a picture as well as any aesthetic differences that might exist within or across texts. |

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|  |  | Even the most reliable machine learning-based algorithms for these activities have demonstrated to be severely hindered by the presence of novelty. Novelty in handwritten documents can take many different forms, such as a change in the author, character traits, writing skills, or overall document appearance. We think that an integrated agent that can handle well-known characters and innovations simultaneously is a better approach than looking at each aspect separately. |
| 4. | Social Impact / Customer Satisfaction | The handwriting recognition system offers a wide range of advantages. It is helpful for reading forms in addition to reading postal addresses and bank check amounts. Additionally, it is employed in the detection of fraud since it makes it simple to compare two texts and identify which is a copy. Because it employs an innovative technique for identifying handwritten digits, this system ensures high accuracy for the model and meets all customer expectations. Users will save a lot of time and effort if the system provides various synonyms for the words recognized. Due to the fact that the users in rural areas will be using their own regional language, this proposed system should be able to detect those digits as well. As the system is being used in socially crowded places such as banks to check amounts, it should be fast and reliable. As it is designed to solve real-world problems, it should be highly reliable and trustworthy in every way, and users throughout the world should be able to use it effectively |
| 5. | Business Model (Revenue Model) | A revenue model means understanding how a startup can make money. Our major revenue sources consist of ***sales, government funds, and public donations.*** The introduction of novel ideas increases revenue streams, such as introducing gesture or touch features , voice read out of recognised digits,  etc.. |
| 6. | Scalability of the Solution | Making use of cloud-native techniques is one way to scale the handwritten digit recognition system. IBM Cloud, for instance, is one of the cloud-based AI scalability options. Run and manage AI models, as well as optimise decisions at scale across any cloud, with the aid of IBM Cloud Build. The benefit of using the cloud to scale solutions is that we can install our AI programme there. |

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|  |  | the specific cloud environment that best supports our business needs. We can take advantage of built-in security capabilities and AI model monitoring. We can Automate AI lifecycles with ModelOps pipelines, deploy and run models through one-click integration and also prepare and build models visually and programmatically. Looking at these advantages, we can drive better business outcomes by optimizing our decisions and also make  our solution scalable using cloud. |