Project Design Phase-II Technology Stack (Architecture & Stack)

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| --- | --- |
| Date | 03 October 2022 |
| Team ID | PNT2022TMID17703 |
| Project Name | Project - A Novel Method for Handwritten Digit Recognition System |
| Maximum Marks | 4 Marks |

Technical Architecture:

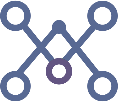


USER CLOUD

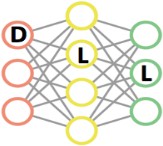
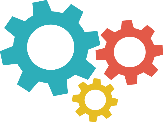
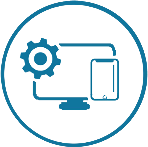
Input Image



Handwritten Digit



Application



**P**[**ROCESSIN**](https://freepngimg.com/png/66311-design-ppt-data-gear-icon-download-hq-png)**G**

**Grayscale**

**conversion**

**Noise**

**Filtering**

**CNN**

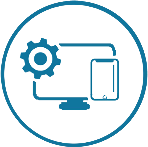


**Train**

Predicted Digit

MNIST

Test



Application

Table-1 : Components & Technologies:

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Component** | **Description** | **Technology** |
| 1. | User Interface | Web UI, Mobile App, Desktop Application | HTML, CSS, JavaScript |
| 2. | Application Logic-1 | Make GUI Interface | HTML , CSS |
| 3. | Application Logic-2 | Importing library and Code for Digit recognition | Python , Flask |
| 4. | Application Logic-3 | Train the model on IBM | Flask |
| 5. | Prediction | Digit prediction on the image | Keras , CNN |
| 6. | Cloud Database | Database Service on Cloud | IBM DB2, IBM Cloudant etc. |
| 7. | File Storage | File storage requirements | IBM Block Storage or Other Storage Service or Local Filesystem |
| 8. | Machine Learning Model | Purpose of Machine Learning Model is to train and test the data and predict the user input. | Object Recognition Model, etc. |
| 9. | Neural network | Automatically infer rules for recognizing  handwritten digits | Convolutional neural network |

Table-2: Application Characteristics:

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **Characteristics** | **Description** | **Technology** |
| 1. | Open-Source Frameworks | Enables developers to develop complex code and web application quickly. | Jupyter, anaconda navigator, flask framework. |
| 2. | Security Implementations | After predicting the data, we don’t store any data so we can’t manipulate it in future. | Encryption |
| 3. | Scalable Architecture | The scalability of architecture (3 – tier, Micro-services) | Browser, Web server(Database) |
| 4. | Availability | Speed of Digit Detection with any handwritten | Convolutional Neural Networks |
| 5. | Performance | Neural networks achieve an accuracy of 98-99 percent in correctly classifying the handwritten digits | Convolutional Neural Networks |