

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

|               |  |
|---------------|--|
| Team ID       | PNT2022TMID24632   |
| Project Name  | Project - Detecting Parkinson's Disease using Machine Learning |
| Maximum Marks | 4 Marks  |

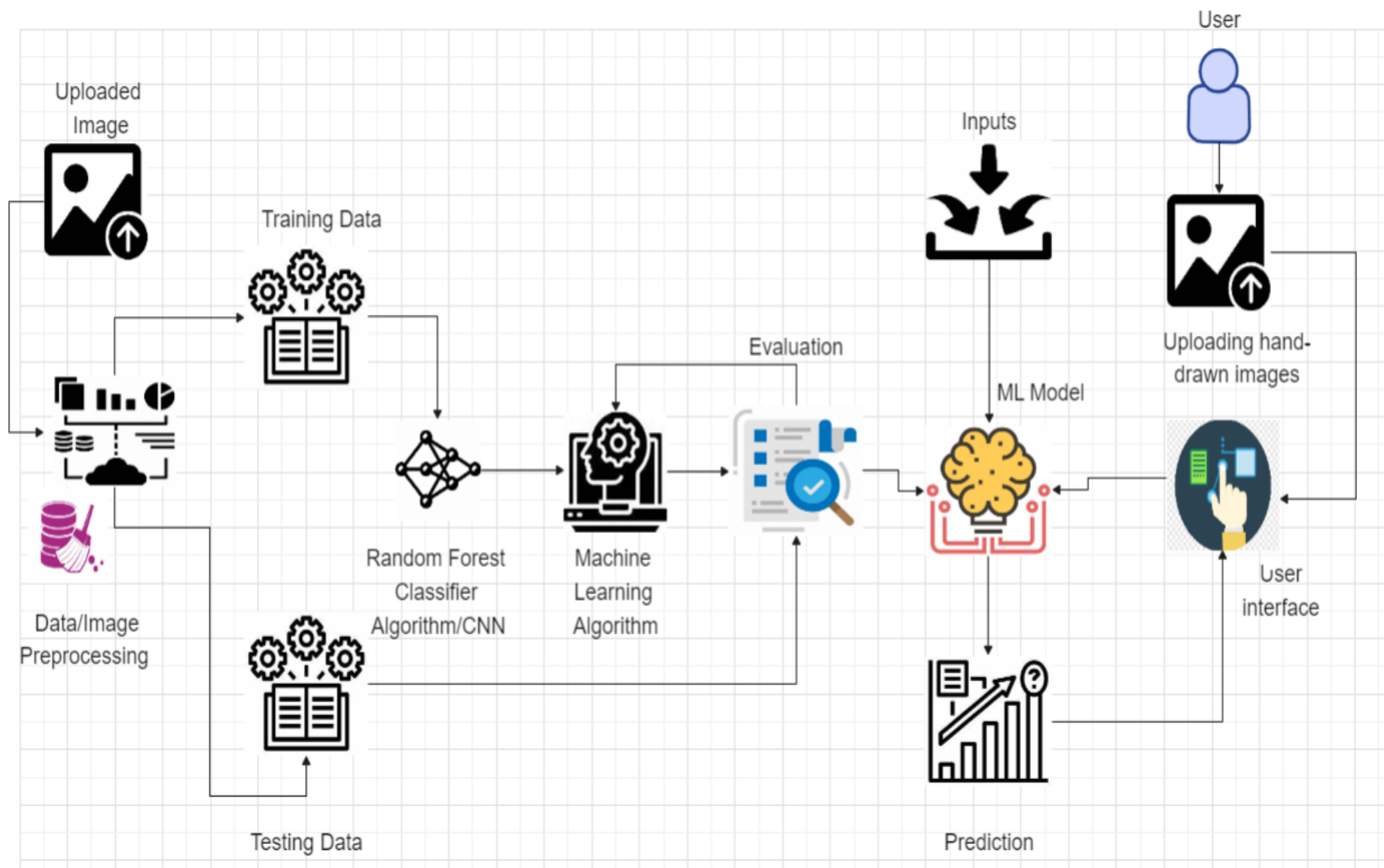
**Technical Architecture:**

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Guidelines:**

1. Include all the processes (As an application logic / Technology Block)
2. Provide infrastructural demarcation (Local / Cloud)
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable)

**Parkinson's Disease Detection Architecture:**



**Table-1: Components & Technologies:**

| S.No | Component              | Description  | Technology  |
|------|------------------------|--|---|
| 1.   | User Interface         | How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.  | HTML, CSS, JavaScript   |
| 2.   | Application Logic-1    | Home Page  | HTML, CSS, JavaScript   |
| 3.   | Application Logic-2    | Test Vital Page- Testing Image Uploading Page  | HTML, CSS, JavaScript, Python, Flask  |
| 4.   | Application Logic-3    | Logic for a process in the application   | Python, Flask   |
| 5.   | Database               | Data Type, Configurations etc... MySQL is an open-source relational database management system. A relational database organizes data into one or more data tables in which data types may be related to each other; these relations help structure the data. | MySQL   |
| 6.   | Cloud Database         | Database Service on Cloud  | IBM Cloud, IBM DB2  |
| 7.   | File Storage           | File storage requirements  | IBM Block Storage   |
| 8.   | External API-1         | Spiral and Waves hand-drawn images used for prediction of disease  | Dataset for pre-processing<br>IBM API Connect   |
| 9.   | External API-2         | Pre-processed dataset i.e Data analysis for Knowledge Base   | Dataset for training the model  |
| 10.  | Machine Learning Model | To train the Machine Learning Model to predict the parkinson's disease using Random Forest Classifier Algorithm  | Parkinson Disease prediction model using CNN, HOG, Random Forest Classifier methodologies |

|     |                                 |  |                                       |
|-----|---------------------------------|--|---------------------------------------|
| 11. | Infrastructure (Server / Cloud) | Application Deployment on Local System / Cloud<br>Local Server Configuration: Local System<br>Cloud Server Configuration: IBM Cloud (IBM Watson) | Local, IBM Watson (IBM Cloud Service) |
|-----|---------------------------------|--|---------------------------------------|

**Table-2: Application Characteristics:**

| S.No | Characteristics                    | Description  | Technology  |
|------|------------------------------------|--|---|
| 1.   | Open-Source Frameworks & Libraries | The libraries are used for data pre-processing, data visualization and to train ML model.  | Numpy, Pandas, Matplotlib, scikit-image, Open CV, imutils, scikit-learn and various other libraries |
| 2.   | Security Implementations           | List all the security / access controls implemented, use of firewalls etc.   | Built-in Encryptions, BYOK  |
| 3.   | Scalable Architecture              | Justify the scalability of architecture (3 – tier, Micro-services). Since various python libraries and Flask as server has been used, it may speed up the performance and accuracy . | Python, Flask   |
| 4.   | Availability                       | Justify the availability of application (e.g. use of load balancers, distributed servers etc.)   | IBM Cloud, IBM Watson   |
| 5.   | Performance                        | Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.  | Python, Flask (To handle multiple requests from the client side)                                    |