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

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| Date | 29 June 2025 |
| Team ID | LTVIP2025TMID59416 |
| Project Name | Revolutionizing Liver Care : Predicting Liver Cirrhosis using Advanced Machine Learning Techniques |
| Maximum Marks | 4 Marks |

**Technical Architecture:**

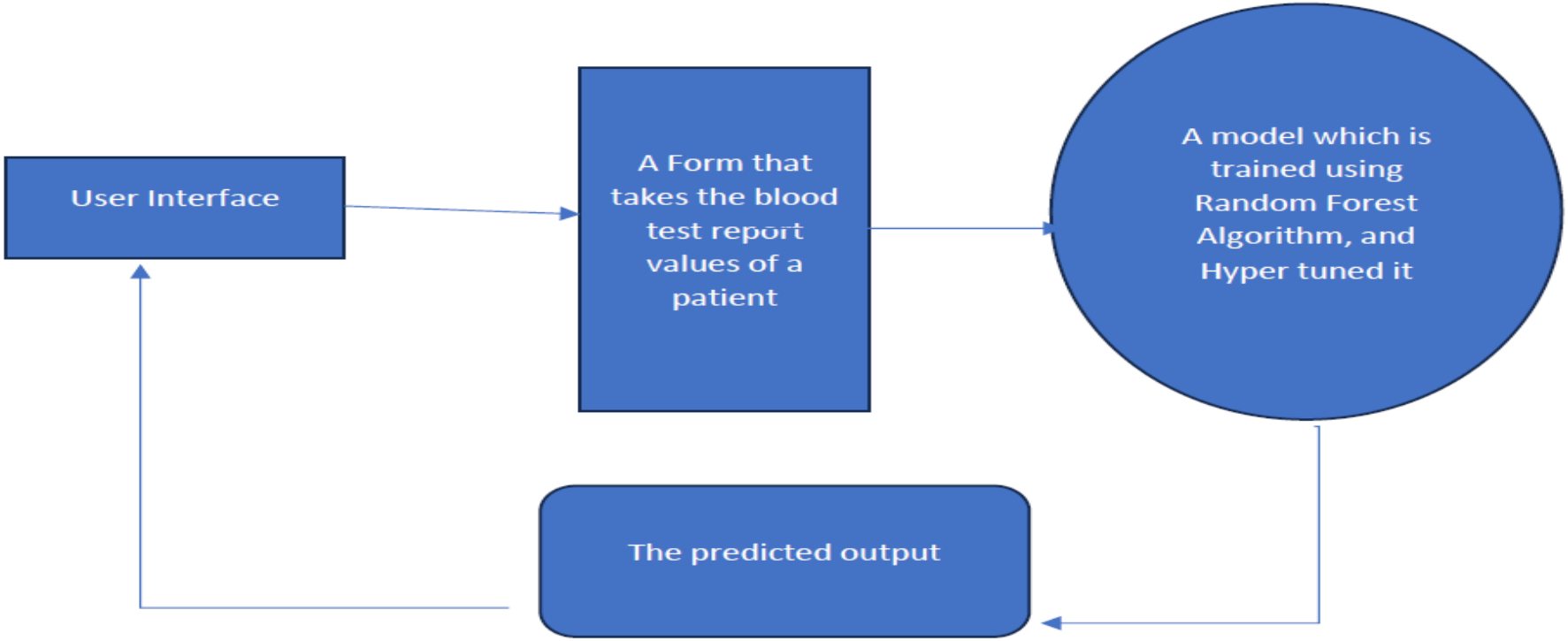

**Table-1: Components & Technologies:**

| S.No | Component | Description | Technology |
|---|---|---|---|
| 1. | User Interface | Web based interface for image upload and result display | HTML, CSS, Java script |
| 2. | Application Logic-1 | Web application framework and routing | Flask (Python) |
| 3. | Application Logic-2 | Image preprocessing and validation | PIL, OpenCV, Numpy |
| 4. | Machine learning model | Transfer learning model for classification | RandomForest Algorithm (scikit-learn) |
| 5. | Model storage | Trained model persistence | Pickle format (random_forest_model.pkl) |
| 6. | Development environment | Model development and experimentation | Jupyter Notebook, VS Code, Python 3.x |
| 7. | Version control | Code repository and collaboration | Git, GitHub |

**Table-2: Application Characteristics:**

| S.No | Characteristics | Description | Technology |
|---|---|---|---|
| 1. | Open-Source Frameworks | Advanced Machine learning and web frameworks | Scikit-Learn, Seaborn, Ensemble Learning |
| 2. | Transfer Learning | Pre-trained model utilization for faster development | Random Forest Algorithm with hyper tune |
| 3. | Scalable Architecture | Web-based architecture supporting multiple users | Flask WSGI, RESTFul design |
| 4. | Performance optimization | Efficient Image processing and model inference | Numpy vectorization, optimized preprocessing |
| 5. | Cross platform compatibility | Browser-based access from any device | Responsive web design |