# Project Design Phase-II
## Solution Requirements (Functional & Non-functional)

| | |
|---|---|
| Date | 30 January 2026 |
| Team ID | LTVIP2026TMIDS66676 |
| Project Name | Online Payments Fraud Detection using Machine Learning |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | Transaction Input | Capability to manually enter or upload transaction parameters (Type, Amount, Balances) through the UI. |
| FR-2 | Real-time Prediction | Integration of the **XGBoost engine** to generate instant fraud probability scores upon data submission. |
| FR-3 | Risk Classification | Automatic categorization of results into **Low, Medium, or High Risk** based on probability thresholds. |
| FR-4 | Action Triggering | Providing specific recommended actions (e.g., "Freeze Account" or "Send OTP") based on the model's output. |
| | | |
| | | |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | The Flask-based UI must be intuitive, requiring no technical knowledge to interpret the "Traffic Light" risk signals (Green, Yellow, Red). |
| NFR-2 | **Security** | Transaction data must be handled securely; the system ensures that sensitive features like User IDs are dropped before processing to protect privacy. |
| NFR-3 | **Reliability** | The system must consistently produce a high **F1-Score (99%)**, ensuring that legitimate transactions are not frequently blocked (minimizing False Positives). |
| NFR-4 | **Performance** | The prediction logic (XGBoost + Pickle) must execute in **sub-millisecond time** to prevent delays in the user's payment experience. |
| NFR-5 | **Scalability** | The architecture must be capable of handling a sudden surge in transaction volume (e.g., during holiday sales) without a drop in response time. |

| | | |
|---|---|---|