**Project Design Phase-I Solution Architecture**

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| Date | 17th June 2025 |
| Team ID | LTVIP2025 TMID35397 |
| Project Name | Revolutionizing Liver Care : Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques |
| Maximum Marks | 4 Marks |
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**Solution Architecture**  
Revolutionizing Liver Care: Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques

This project enhances early liver cirrhosis detection through advanced machine learning applied to clinical, biochemical, and demographic data. The architecture includes five key components:

1. **Data Collection**: Aggregation of patient data from EHRs, lab results, and medical histories.
2. **Data Preprocessing**: Cleaning and transforming data to handle inconsistencies and prepare it for modeling.
3. **Model Training**: Using ML algorithms (e.g., Random Forest, XGBoost, Neural Networks) to identify patterns linked to cirrhosis.
4. **Model Validation**: Evaluating models based on accuracy, sensitivity, and reliability.
5. **Clinical Integration**: Embedding the best model into a decision support system for real-time, non-invasive risk prediction.

The architecture is scalable, accurate, and clinically practical—supporting earlier diagnoses and improved liver disease outcomes.

**Solution Architecture Diagram**

