**Project Design Phase**

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| Date | 26 June 2025 |
| Team ID | SRGECVIP20251570 |
| Project Name | Revolutionizing Liver Care : Predicting Liver Cirrhosis using Advanced Machine Learning Techniques |
| Maximum Marks | 2 Marks |

**Proposed Solution Template**

**Proposed Solution Template:**

Project team shall fill the following information in the proposed solution template.

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| **S.No.** | **Parameter** | **Description** |
|  | Problem Statement (Problem to be solved) | Early-stage liver cirrhosis is difficult to detect due to asymptomatic progression and limited access to effective diagnostic tools. Current methods are invasive, time-consuming, or expensive, making early intervention challenging for healthcare professionals. |
|  | Idea / Solution description | The solution is a machine learning–based predictive model that analyzes non-invasive clinical data (e.g., ALT, AST, platelet count, age) to identify the risk of liver cirrhosis. |
|  | Novelty / Uniqueness |  Uses only non-invasive, readily available patient data   Offers interpretable AI predictions via SHAP to build trust among doctors |
|  | Social Impact / Customer Satisfaction |  Enables early detection and intervention, reducing morbidity and mortality   Improves accessibility for patients in rural or under-resourced settings   Reduces costs associated with late-stage treatment and unnecessary diagnostics |
|  | Business Model (Revenue Model) |  Freemium model: Basic prediction tool available freely for individual clinicians   Licensing to diagnostic labs or integration with EMR vendors   Consultancy for custom model tuning for large healthcare institutions |
|  | Scalability of the Solution | The solution is highly scalable due to its cloud-based deployment. It can be adopted by individual practitioners, small clinics, and large hospitals alike. The model can be fine-tuned for other liver-related conditions or integrated into broader diagnostic platforms, expanding across specialties and geographies. |