

Ideation Phase

Brainstorm & Idea Prioritization Template

Date	19 July 2025
Team ID	LTVIP2025TMID41526
Project Name	Revolutionizing liver care: predicting liver cirrhosis using advanced machine learning techniques
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming helps us generate innovative solutions by combining medical insights with technological possibilities. In this project, our goal is to develop a machine learning model that accurately predicts liver cirrhosis at an early stage, empowering patients and healthcare professionals alike.

This template enables our team to collaborate creatively—whether in person or remotely—to explore a wide range of ideas across data collection, feature selection, user experience, model accuracy, clinical relevance, and ethical concerns like patient privacy.

By encouraging open discussion, we can prioritize impactful ideas such as:

- Non-invasive data collection methods
- Features most relevant to early cirrhosis detection
- Patient-friendly interfaces and report generation
- Clinical integration and real-world usability
- Awareness tools and feedback loops

Using this structure, we ensure that our most valuable and feasible ideas are recognized, refined, and implemented—ultimately leading to a predictive tool that not only works, but truly serves the people who need it.

This brainstorming session is focused on identifying ways to **improve the lives of patients** at risk of liver cirrhosis. By encouraging all voices—technical, clinical, and user experience—we can generate a wide variety of ideas, from better symptom tracking methods to enhanced patient communication tools. Using this template, we'll prioritize those ideas that not only improve model performance, but also increase **trust, accessibility, and early intervention** in liver care.

Step-1: Team Gathering, Collaboration and Select the Problem Statement



Brainstorm & idea prioritization

Use this framework to launch the "Predicting Liver Cirrhosis" project. This session will align the team on the core objectives, technical approach, and expected impact on early patient diagnosis.

15 minutes to prepare

1 hour to collaborate

2-5 people recommended

Before you collaborate

A little bit of preparation goes a long way when working on this innovative healthcare project. Here's what you need to do to get started effectively.

10 minutes

1 Team gathering

Identify the team members involved in this liver cirrhosis prediction project. Assign roles such as data scientist, domain expert (e.g., medical specialist), developer, and reviewer. Share relevant datasets, previous models (if any), or research papers in advance.

2 Set the goal

Clarify the problem you'll be addressing: "How can we use machine learning to accurately predict liver cirrhosis at an early stage and support better liver care?" Ensure all participants understand the objective and desired outcomes of this brainstorming session.

3 Learn how to use the facilitation tools

Familiarize yourself with the collaborative tools (e.g., Google Colab, GitHub, Miro, or Figma) and workflow platforms (like Jupyter or AutoML tools) to ensure a smooth and productive session. Use facilitation techniques to foster open communication and innovation.

Define your problem statement

What challenge are we addressing? Frame your problem as a **How Might We** statement. This will serve as the core of your brainstorming session.

5 minutes



Step-2: Brainstorm, Idea Listing and Grouping

2

Brainstorm

"How might we use machine learning to predict liver cirrhosis early and accurately?"

10 minutes

TIP

You can select a sticky note and use the pencil tool to search for it to start drawing!

Person 1

Identifying key medical indicators (e.g., ALT, AST, bilirubin)

Person 2

Choosing suitable ML models like Decision Trees, Random Forest, or Neural Networks

Person 3

Preprocessing patient data for better model performance

Person 4

Improving model transparency with explainable AI tools (e.g., SHAP, LIME)

Person 5

Designing a simple web-based liver health prediction tool

3

Group ideas

Take turns sharing your thoughts related to **ML-based liver cirrhosis prediction**. Begin clustering similar or connected sticky notes — such as ideas related to data collection, modeling, deployment, or patient impact. Once grouped, give each cluster a clear, sentence-style label (e.g., "Clinical Features to Prioritize" or "Deployment Strategies for Healthcare Settings"). If a cluster exceeds six sticky notes, try breaking it into smaller, more specific sub-groups to keep discussions focused and actionable.

20 minutes

TIP

Use **cluster tags** on sticky notes like Data, Model, and Medical Deployment to make grouping, organizing, and categorizing ideas easier. This helps in defining themes or steps in your ML project roadmap.

Grouped Idea Categories:

- ◇ **Medical Data & Features** – Selection of key clinical attributes like bilirubin, albumin, enzyme levels, etc.
- ◇ **Modeling Approaches** – Use of Random Forest, XGBoost, Neural Networks, and ensemble techniques for prediction.
- ◇ **Preprocessing & Accuracy Enhancement** – Techniques like normalization, handling missing values, and cross-validation.
- ◇ **Explainability & Trust** – Applying SHAP or LIME for model transparency to gain clinical trust.
- ◇ **Deployment & Accessibility** – Building a user-friendly web app or dashboard for doctors and patients.

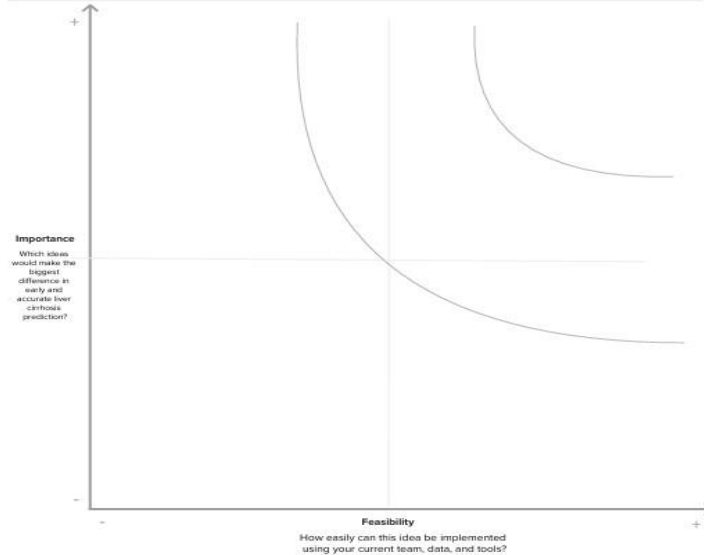
Step-3: Idea Prioritization

3

Prioritize

Your team should evaluate the liver cirrhosis prediction ideas based on their **clinical importance** and **technical feasibility**. Use this grid to categorize which ideas to move forward with—such as dataset preparation, model selection, or deployment plans. Focus on ideas that can create **real-world impact in liver disease diagnosis** and can be **implemented with available resources**.

20 minutes



4

After you collaborate

You can export your liver cirrhosis prediction board as an image or PDF to share with medical professionals, mentors, or project evaluators. This ensures your team's insights and outcomes are accessible and can be referenced for model building, feedback, or reporting.

Quick add-ons

- Share the mural**
Share a link to your session with stakeholders (e.g., healthcare experts, guides) to keep them aligned with progress and decisions made.
- Export the mural**
Download your full brainstorming and prioritization board as a PNG or PDF to attach to your project report, or include it in slides for your final presentation.

Keep moving forward



ML Model Planning Blueprint

Define the core components of your liver cirrhosis prediction model. Key clinical features (e.g., bilirubin, albumin, enzyme levels).

- Data preprocessing steps
- Model architecture (e.g., Random Forest, XGBoost, Neural Network)
- Output labels and performance metrics



Clinical Integration Map

Visualize how the model will fit into actual healthcare workflows.

- How doctors will input patient data
- Where and how predictions will appear
- How model decisions will assist in clinical diagnosis



SWOT Analysis for Deployment

Analyze your project's:

- **Strengths:** Accuracy, interpretability, medical usefulness
- **Weaknesses:** Data limitations, model bias
- **Opportunities:** Healthcare digitization, early diagnosis
- **Threats:** Regulatory concerns, clinical acceptance