

Project Design Phase

Problem – Solution Fit

Date	28 June 2025
Team ID	LTVIP2025TMID41166
Project Name	<i>Revolutionizing Liver Care: Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques</i>
Maximum Marks	2 Marks

Problem – Solution Fit :

The Problem–Solution Fit means identifying a critical healthcare problem and ensuring that the developed machine learning solution truly addresses this need. In this project, we focus on detecting liver cirrhosis early to improve patient care and outcomes.

Purpose:

Solve complex medical challenges by enabling earlier diagnosis of liver cirrhosis using machine learning.

Succeed faster and increase adoption among doctors by offering a simple, non-invasive, and cost-effective diagnostic tool.

Sharpen communication by delivering clear, data-driven insights that doctors can trust and understand.

Increase touchpoints between patients and healthcare providers by allowing earlier intervention and ongoing monitoring.

Understand the current gaps in liver cirrhosis detection and provide a technological solution that improves accuracy and speed.

Template:

Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) Doctors (especially hepatologists and gastroenterologists) Hospitals and healthcare institutions Healthcare technology providers Health data researchers	6. CUSTOMER CONSTRAINTS Budget constraints in hospitals Limited access to advanced imaging in smaller clinics Patient reluctance toward invasive tests Need for regulatory approval of new tools in clinical practice	5. AVAILABLE SOLUTIONS Liver biopsy (invasive, painful, costly) Ultrasound/CT/MRI scans (expensive, limited availability) Clinical judgement based on lab tests alone (subjective, risk of errors) Pros & Cons: Accurate but invasive (biopsy) Non-invasive but expensive and not always conclusive (imaging) Quick but less reliable (pure clinical judgement)	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS Diagnose liver cirrhosis early before severe symptoms appear Reduce invasive diagnostic procedures like biopsies Make diagnosis faster, more accessible, and cost-effective Support clinical decisions with data-driven insights	9. PROBLEM ROOT CAUSE Liver cirrhosis progresses silently, showing no symptoms until significant damage occurs Existing diagnostic methods are either invasive, costly, or subjective There's a gap between available patient data and its effective use for early prediction	7. BEHAVIOUR Doctors currently order blood tests, imaging, and sometimes biopsies They manually interpret lab results and imaging findings Hospitals look for ways to reduce diagnostic costs Researchers explore predictive modeling using patient data	
Focus on J&P, tap into BE, understand RC	3. TRIGGERS Patients presenting mild symptoms or abnormal liver tests Pressure to improve patient outcomes and reduce costs Availability of new data analytics tools in healthcare Increasing awareness of AI/ML applications in diagnostics	10. YOUR SOLUTION Develop a machine learning model that predicts liver cirrhosis using routine blood test results Deploy it as a user-friendly web application (Flask) so doctors can quickly check a patient's risk Help reduce unnecessary biopsies, speed up diagnosis, and lower healthcare costs Provide data-backed confidence to doctors in making decisions	8. CHANNELS of BEHAVIOUR 8.1 ONLINE Research on PubMed, medical journals Participation in medical webinars about AI in healthcare Reading online case studies and tool comparisons 8.2 OFFLINE Medical conferences Clinical discussions and hospital meetings Doctor-to-doctor referrals and recommendations Workshops and training sessions	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER Before: Worry, uncertainty, fear of missing a diagnosis, frustration due to invasive tests After: Confidence, relief, trust in data-driven support, sense of control over patient care			

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References:

- <https://www.ideahackers.network/problem-solution-fit-canvas/>

2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>