

Project Design Phase
Problem – Solution Fit Template

Date	26 June 2025
Team ID	LTVIP2025TMID39531
Project Name	Revolutionizing Liver Care : Predicting Liver Cirrhosis using Advanced Machine Learning Techniques
Maximum Marks	2 Marks

Problem – Solution Fit Template:

Section	Details
Identified Problem	Liver cirrhosis is often diagnosed at advanced stages due to the absence of early symptoms and limited access to affordable diagnostic tools. Late diagnosis leads to poor treatment outcomes and high healthcare costs.
Target Audience / Affected Group	Patients with liver disorders, general physicians, hepatologists, diagnostic centers, and public healthcare organizations.
Customer/End-User Behavior	Patients often rely on manual check-ups and liver function tests that require specialist interpretation. Doctors face challenges in early detection due to overlapping symptoms with other diseases.
Solution Provided	Developed a machine learning-based predictive model using clinical and laboratory data to detect liver cirrhosis early. Integrated into a user-friendly Flask web app for real-time prediction and easy access by healthcare professionals.
How It Solves the Problem	Enables early and affordable detection of liver cirrhosis without invasive procedures. Assists doctors with decision-making by providing immediate insights based on historical patient data.
Why It Fits	The model leverages widely available clinical parameters and is accessible through a lightweight web interface. It fits seamlessly into existing hospital systems or clinics with minimal technical setup.

Purpose:

- ✓ **Solve complex healthcare problems** like delayed liver cirrhosis detection by leveraging predictive technology.
- ✓ **Succeed faster** by using already existing data points (lab reports) to provide accurate predictions.
- ✓ **Sharpen communication** between patient and doctor by presenting risks clearly through a simple UI.
- ✓ **Build trust** through non-invasive and early-stage detection capabilities, helping reduce panic and delayed treatments.
- ✓ **Understand the healthcare workflow** and create a digital tool that integrates easily with how doctors already operate.

Template:

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Who is your customer? I.e. working parents of 0-5 y.o. kids	6. CUSTOMER CONSTRAINTS CC What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	5. AVAILABLE SOLUTIONS AS Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	10. YOUR SOLUTION SL If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER EM How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure > confident, in control - use it in your communication strategy & design.		8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.	

References:

1. <https://www.javatpoint.com/supervised-machine-learning>