

Project Report Template

Title of Project: HepaSmart – AI-Based Hepatitis Survival Prediction

Name of the Innovator: Shrawanthi.P

Start Date: 06-11-25

End Date: 11-11-25

Day 1: Empathise & Define

Step 1: Understanding the Need

o Which problem am I trying to solve?

Developing an AI-based system to predict the survival chances of hepatitis patients using medical and clinical data, to help doctors make faster and more accurate treatment decisions.

Who is affected by this problem?

Patients suffering from Hepatitis B and C, healthcare professionals, and hospitals managing chronic liver disease cases.

Step 2: What is the problem?

I am designing a solution for early prediction of hepatitis patient outcomes using machine learning, improving diagnostic accuracy and healthcare decision-making.

Why is this problem important to solve?

Hepatitis is one of the top global causes of liver-related deaths. Early outcome prediction enables timely treatment, improving survival rates and reducing hospital costs.

According to Data Bridge Market Research, the AI-in-healthcare market is growing at a CAGR of 23–25% (2024–2032) — highlighting the importance of AI-driven healthcare innovation.

Take-home task

Ask 2–3 people (you can speak to your family members, friends, teachers, trainers) what they think about this problem. Write down surprising or new things you learn below.

Insights Learned:

- Many people are unaware of AI's role in survival prediction and healthcare analytics.
- Doctors stressed the importance of interpretable AI models for patient trust.
- Early AI-based diagnosis reduces treatment costs and mortality rates.

1. **ChatGPT:** For brainstorming and workflow planning.

2. **Gemini AI:** For healthcare data exploration and insights gathering.

Day 2: Ideate

Step 3: List **at least 5 different solutions** (wild or realistic) :

1. Develop a Streamlit web app for hepatitis survival prediction.
2. Add a batch prediction feature for hospitals to upload multiple patient records via CSV.
3. Build visual dashboards for trend analysis using Matplotlib.
4. Integrate with healthcare APIs for real-time diagnosis support.
5. Use AI explainability tools (SHAP/LIME) to interpret predictions for clinicians.

Step 4: My favourite solution:

Creating a Streamlit-based interactive web application (HepaSmart) that predicts hepatitis patient survival using machine learning and provides both single and batch predictions with visual analytics.

Step 5: Why am I choosing this solution?

- Combines AI innovation with practical healthcare applications.
- Provides doctors and researchers with a decision-support system.
- Integrates scientific accuracy (ML modeling) with economic growth potential (healthcare AI CAGR 23–25%).

Take-home task

Generate the image of your solution and how it will look (eg: “a bag that charges your phone while you walk”)

[Prompt: “I am ideating a solution for <enter your problem in detail> I have selected a solution which includes <enter your solution description> Generate an image for this solution]

Attach the image in this box below:

The screenshot shows a web application titled "HepaSmart: Hepatitis-B Prediction App". The interface is dark-themed. On the left is a navigation sidebar with a "Prediction Form" icon and text, and other options like "Batch Prediction", "Dashboard", and "About". The main content area has a header with the app name and a description: "This AI-powered tool helps estimate a patient's Hepatitis B survival likelihood and detects Hepatitis-B positive/negative status using biological and clinical parameters." Below this is a section titled "Enter Patient Test Results" containing a grid of input fields. The fields are: Age (35), Sex (male), Steroid (yes), Anorexia (yes), Liver Big (yes), Liver Firm (yes), Varices (yes), Bilirubin (mg/dL) (1.00), and Alk Phosphate (U/L) (120). Each field has a minus, plus, or dropdown arrow icon for interaction. A "Deploy" button is visible in the top right corner.

Age	Anorexia	Varices
35	yes	yes

Sex	Liver Big	Bilirubin (mg/dL)
male	yes	1.00

Steroid	Liver Firm	Alk Phosphate (U/L)
yes	yes	120

Deploy

Navigation

- Prediction Form
- Batch Prediction
- Dashboard
- About

yes

yes

200

Fatigue

Spiders

Albumin (g/dL)

yes

yes

4.00

Malaise

Ascites

Histology

yes

yes

yes

Predict

Prediction: Patient is Hepatitis B Negative / Likely to Live

Confidence: 68.01%

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Deploy

Navigation

- Prediction Form
- Batch Prediction
- Dashboard
- About

Upload CSV for Batch Prediction

Upload a CSV file containing patient data with the following columns:
['Age','Sex','Steroid','Antivirals','Fatigue','Malaise','Anorexia','Liver Big','Liver Firm', 'Spleen Palpable','Spiders','Ascites','Varices','Bilirubin','Alk Phosphate','Sgot','Albumin','Histology']

Upload CSV File

Drag and drop file here
Limit 200MB per file • CSV

Browse files

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GITHUB LINK: <https://github.com/Shrawanthi06/HepaSmart.git>

AI Tools you can use for Step 3-5:

ChatGPT/Perplexity AI: You can use these tools to compare your solutions and choose the most effective one

AI Tools you can use for the take-home task:

Canva AI/CoPilot AI/Meta AI: Use these mobile-based tools to generate images for the solution they want to design

Day 3: Prototype & Test

Step 6: Prototype – Building my first version

o What will my solution look like?

A web-based app where users can input patient details such as Age, Sex, Bilirubin, Albumin, and other clinical parameters to instantly predict whether a patient is Hepatitis Positive or Hepatitis Negative.

The app also supports CSV batch uploads for hospital use and provides visual graphs showing survival and infection trends across patient groups.

o What AI tools will I need to build this?

AI Tools used: ChatGPT for idea structuring, Canva AI for diagram design, Python for pegRNA simulation, and Perplexity AI for research data.

o What AI tools I finally selected to build this solution? [Eg: Claude AI, Grok AI, Chatling AI]

1. **ChatGPT:** For app logic and ML explanation.
2. **Canva AI:** For UI concepts and presentation visuals.
3. **Python (Streamlit, scikit-learn, Matplotlib):** For model training and deployment.
4. **Gemini AI:** For medical dataset analysis and knowledge enhancement.
5. **Figma AI:** For prototype interface design.

Step 7: Test – Getting Feedback

o Who did I share my solution with? [You may share it with your trainer, peers or even AI]

Shared with mentors and peers.

o What feedback did I receive?

👍 What works well:

- Easy-to-use interface for both single and batch predictions.
- Realistic healthcare application using AI.

🔧 What needs improvement:

- Add confidence scores for predictions.
- Include AI explainability (why a prediction was made).

Take-home task

Record your solution and test feedback in voice notes. Upload your voice notes, images and your solution/model on GitHub

AI Tools you can use for Step 6-7:

ChatGPT/Perplexity AI/Claude AI/Canva AI/Chatling AI/Figma AI: You can use these tools to build solutions/models or mock-up dummy prototypes

Day 4: Showcase

Step 8: Presenting my Innovation

Final Project Title:

HepaSmart – AI-Based Hepatitis Survival Prediction

ProblemStatement:

Traditional clinical methods for hepatitis diagnosis are time-consuming and rely on manual interpretation. Lack of predictive analytics delays early intervention and limits precision medicine.

My Innovation:

- Built a Random Forest–based predictive model trained on hepatitis datasets.
- Developed a Streamlit app for real-time prediction and CSV batch analysis.
- Integrated Matplotlib visualizations for survival insights.
- Incorporated market trend analysis showing CAGR 23–25% growth in healthcare AI.

Feedback :

Presented to: Peers and mentors.

Positive Feedback:

- Clean UI and smooth app functionality.
- Real-world relevance with explainable AI concept.




Suggestions:

- Add real hospital data validation for broader testing.
- Include ethical data usage guidelines.

Impact of My Innovation:

- **Scientific:** Enables faster, data-driven diagnosis and better survival estimation.
- **Economic:** Aligns with the expanding AI healthcare market.
- **Social:** Empowers medical professionals with predictive decision tools.

SDGs Alignment:

-  SDG 3 – Good Health and Well-being
-  SDG 9 – Industry, Innovation and Infrastructure
-  SDG 17 – Partnerships for the Goals

Step 9: Reflections

o What did I enjoy the most during this project-based learning activity?

Exploring how AI and machine learning can enhance healthcare and creating a model that can make a real-world difference.

o What was my biggest challenge during this project-based learning activity?

Handling medical data preprocessing and ensuring the model's predictions are accurate and interpretable.

Take-home task

Upload your pitch document on GitHub

AI Tools you can use for Step 8:

1.CANVA AI

2.PERPLEXITY

Canva AI: You can use this to design your pitch document. Download your pitch document as a PDF file and upload on GitHub