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: 11-10-25

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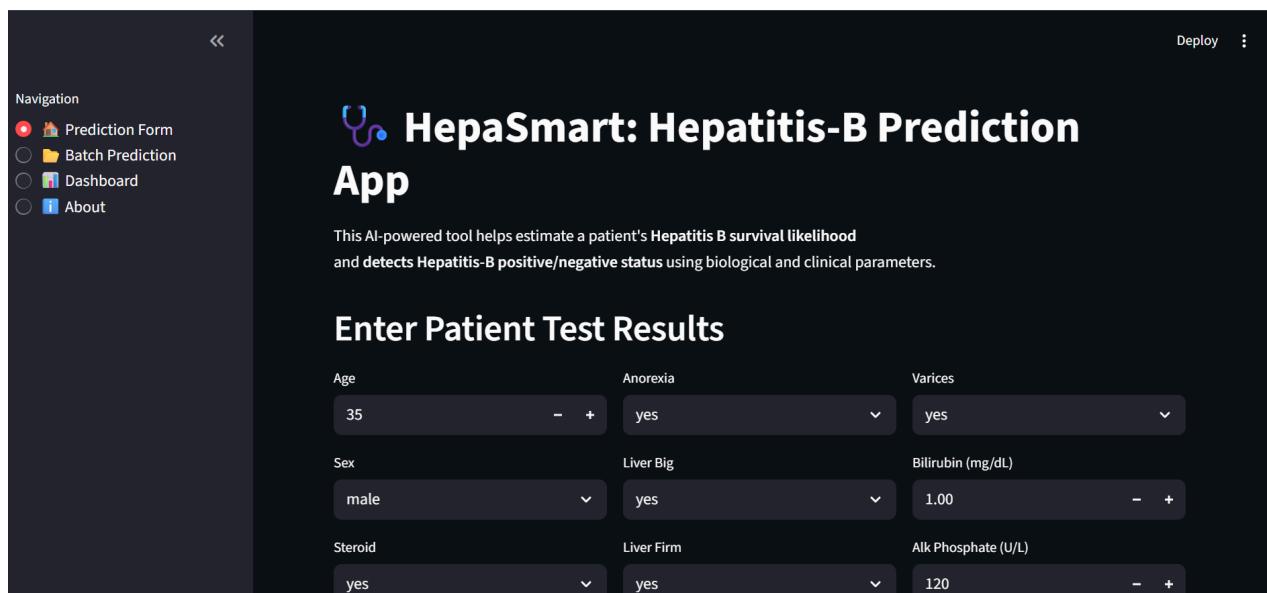
- Combines AI innovation with practical healthcare applications.
- Provides doctors and researchers with a decision-support system.
- Integrates scientific accuracy (ML modeling) with economic growth potential (healthcare AI CAGR 23–25%).

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:

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