Visualizing and Predicting Heart Diseases

With an Interactive Dashboard

NALAIYA THIRAN PROJECT REPORT

2022

Submitted by

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1. INTRODUCTION

Heart disease has been the leading cause of death for decades in the United States so it's no surprise that heart failure rates, which is a specific type of heart disease characterized by when the heart is too weak to pump blood throughout the body, are on the rise. In fact, the number of American adults with heart failure is expected to increase by 46 percent by 2030. That means eight million people will have heart failure by then; and about half of people who have heart failure die within five years of diagnosis.

Heart failure is very hard to detect early, but with the help of a National Institutes of Health (NIH) grant, Over the last three years, using the latest advances in artificial intelligence (AI) like natural language processing, machine learning and big data analytics, the team trained models to identify heart failure one to two years earlier than a typical diagnosis today. This research uncovered important insights about the practical trade offs and types of data needed to train models, and developed new application methods that could allow future models to be more easily adopted.

It helps to the major number of people's who injured in their personal problems of their health issues they may identify their problems with their smart mobile itself.

1.1 Project Overview

Visualizing and predicting heart diseases is the project. Heart diseases are fata land if not taken care of at the right time, they can be fatal. In India , heart diseases and strokes contribute to 12% to 15% of our annual death rate. A large majority of the fatal strokes are unforeseen and can strike to seemingly healthy individuals. Doctors have proved that even though the strokes and other heart diseases seem unprecedented to an individual ,they can be prevented by following certain healthy which implies that there is a pattern ora correlation between the person's habits and the risk of stroke oro ther heart diseases . This has motivate dust study the health care data of heart patients and compare it with other healthy people. We developed a machine learning model which will take a variety of inputs and predict whether a person issusceptibleto heart diseases or not . This way they can start taking precautions early on an davert the risk of having a stroke.

1.2 Purpose

Our project work is to create a system for predicting potential Heart Diseases in people using Machine Learning algorithms. The algorithms include dare K Neighbours Classifier, Support Vector Classifier, Decision Tree Classifier ,Random Forest Classifier and Neural Networks. The dataset has been taken from Kaggle. Our objective is to analyse prediction systems for Heart disease using a greater number of input attributes. The system uses medical terms such as Sex,Age,bloodpressure,cholesterollike13attributestopredictthelikelihoodofpatient gettingaHeartdisease.

We will also compare the accuracy by which these algorithms can predict the heart disease.

This project helps the general people to identify and predict them self for their problems.

2. LITERATURE SURVEY

- ✓ V. Manikantan & S.Latha,"Predicting the Analysis of Heart Disease Symptoms UsingMedicinal Data Mining Methods", International Journal on Advanced Computer Theory andEngineering,Volume-2,Issue-2, pp.5-10, 2013.
- ✓ Dr.A.V.Senthil Kumar, "Heart Disease Prediction Using Data Mining pre processing and Hierarchical Clustering", International Journal of Advanced Trends in Computer Science andEngineering,Volume-4,No.6, pp.07-18, 2015.
- ✓ Uma.K, M.Hanumathappa, "Heart Disease Prediction Using Classification Techniques with Feature Selection Method", Adarsh Journal of Information Technology, Volume-5, Issue-2,pp.22-29, 2016.
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- ✓ K.VanisreeandJ.Singaraju,“Decisionsupportsystemforcongenitalheartdisease diagnosisbased on signs and symptoms using neural networks,” International Journal of Computer Applications,vol. 19, no. 6, pp. 6–12, 2011.
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- ✓ PattersonK(2016)MatthiasNahrendorf.CircRes119:790-793.
- ✓ Soni, J., Ansari, U., Sharma, D., & Soni, S. (2011). Predictive data mining for medical diagnosis: An overview of heart disease prediction. International Journal of ComputerApplications,17(8), 43-48.
- ✓ Masethe, H. D., & Masethe, M. A. (2014, October). Prediction of heart disease using classification algorithms. In Proceedings of the world congress on engineering and computer science (Vol. 2, pp. 22-24).
- ✓ Methaila, P. Kansal, H. Arya, and P. Kumar, “Early heart disease prediction using datamining techniques,” in Proceedings of Computer Science & Information Technology (CCSIT-2014),vol. 24, pp. 53–59, Sydney, NSW, Australia, 2014.

2.1 Existing Problem

- **The EHDPS** predicts the likelihood of patients getting heart disease. It enables significant knowledge, eg, relationships between medical factors related to heart disease and patterns, to be established. We have employed the multilayer perceptron neural network with backpropagation as the training algorithm.
- Disease prediction system **provides only possible outcomes** it does not guarantee that it will predict the disease correctly. But it has significantly higher accuracy for predicting possible diseases. In our research, we have analyzed the accuracy of this system for 5 different diseases and our accuracy can go up to 87%.

2.2 References

1. Palaniappan S, Awang R. Intelligent heart disease prediction system using data mining techniques. *Int J Comput Sci Net Secur.* 2008;**8**:343–350.

2. Sayad AT, Halkarnikar PP. Diagnosis of heart disease using neural network approach.*Int J Adv Sci Eng Technol.* 2014;**2**:88–92.

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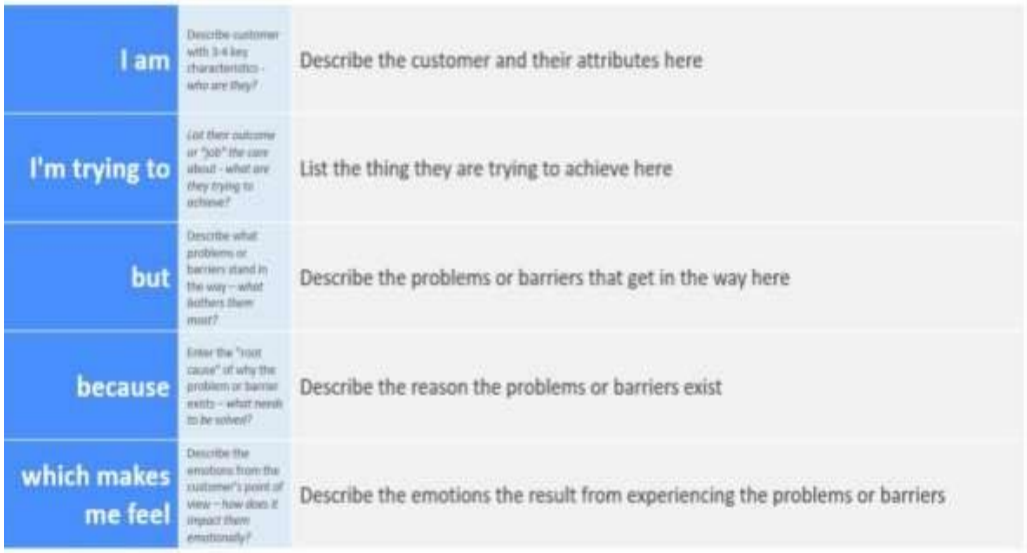
2.3 Problem Statement Definition

Customer Problem Statement :

- ✓ Create a problem statement to understand your customer's point of view.
- ✓ The Customer Problem Statement template helps you focus on what matters to create experiences people will love.
- ✓ A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face.

- ✓ Throughout the process, you'll also be ableto empathize with your customers, which helps you better understand how they perceive your product or service.



Example:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A Patient	To check the health in hospitals	Health report is come in late	Lot of test for check heart Disease	Is no feel good
PS-2	A Patient	To use app for health check	Sometimes not properly work internet	Loss the data in upload time	All are good work to feel happy

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

✓ An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

✓ It is a useful tool to help steams better understand their users.

✓ Creating an effective solution requires understanding the true problem and the person who is experiencing it.

✓ The exercise of creating the map helps participants consider things from the user's perspective along with his orhergoals and challenges.

✓ Example:VisualizingandPredictingHeart DiseaseswithanInteractiveDashBoard

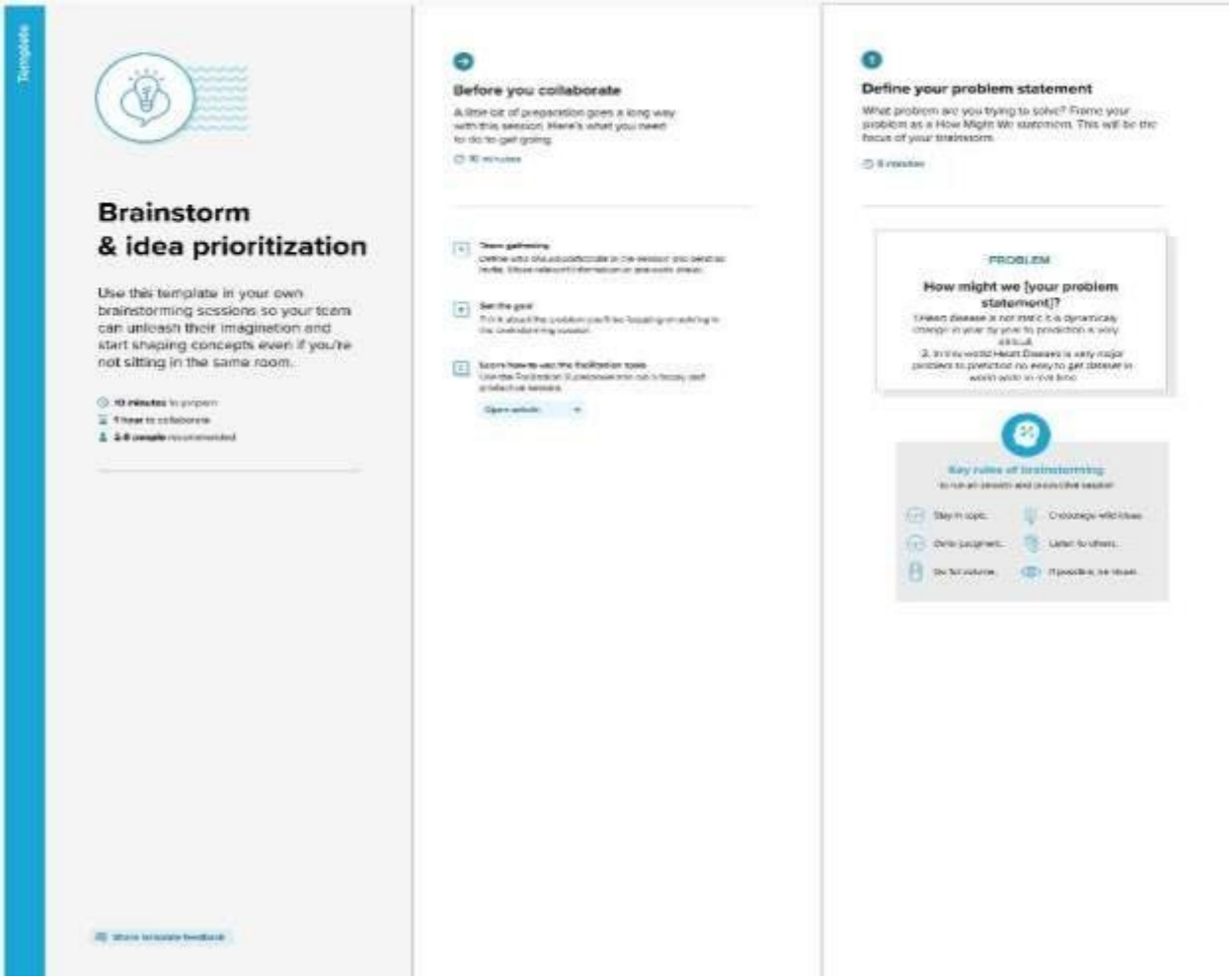
3.2 Ideation & Brainstorming

- ✓ Brainstormingprovidesafreeandopenenvironmentthatencourageseveryonewithinateamto participate in the creative thinking process that leads to problem solving.

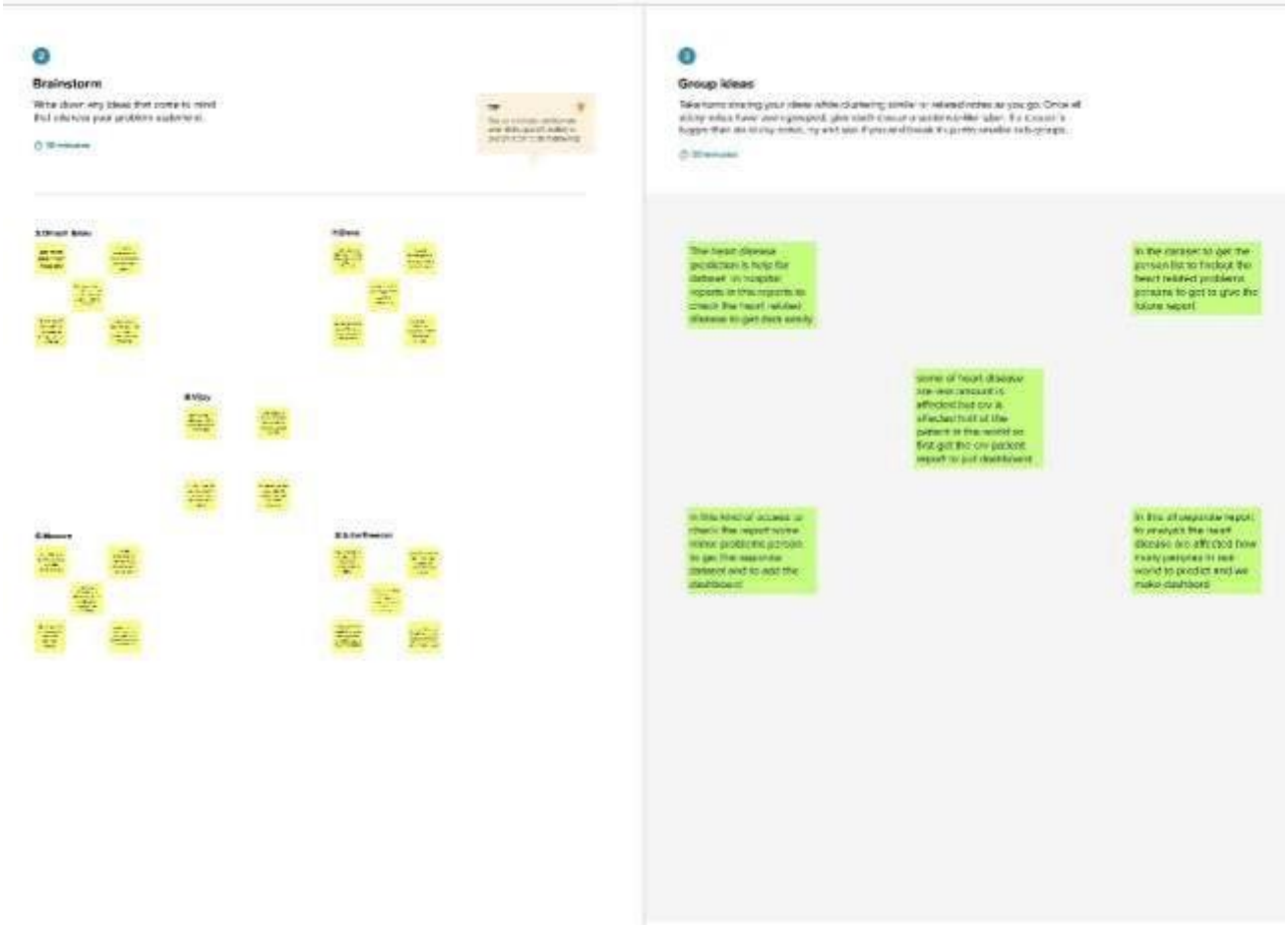
- ✓ Prioritizing volume over value,out-of-the box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

- ✓ Usethistemplateinyourownbrainstormingsessionssoyourteamcanunleashtheirimaginationandstart shaping concept seven if you're not sitting in the same room.

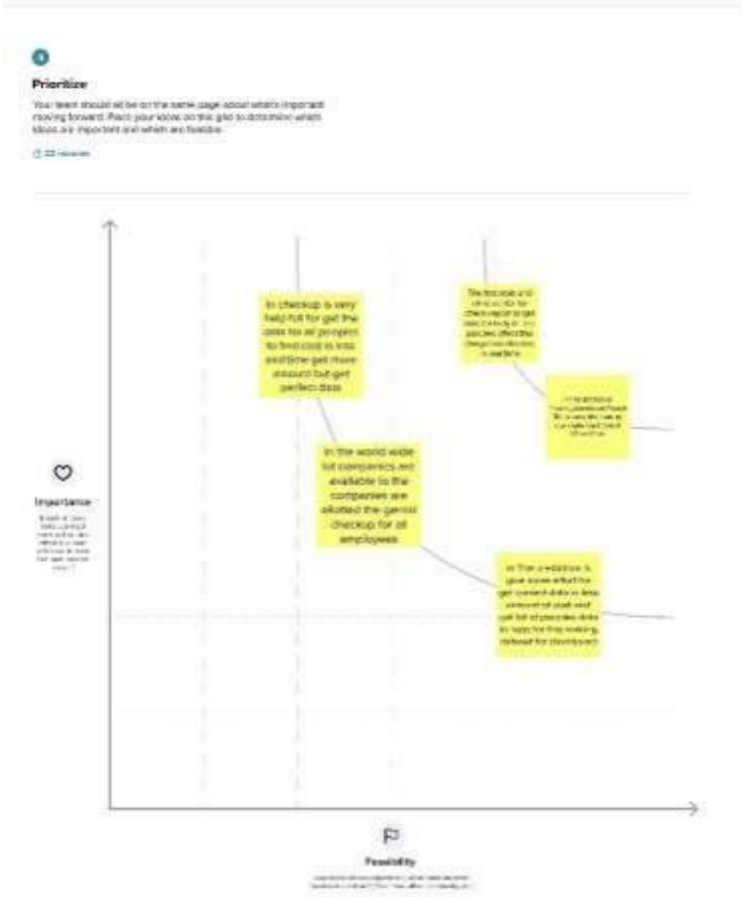
Step-1:TeamGathering,CollaborationandSelecttheProblemStatement



Step-2:Brainstorm,IdeaListingandGrouping



Step-3:IdeaPrioritization

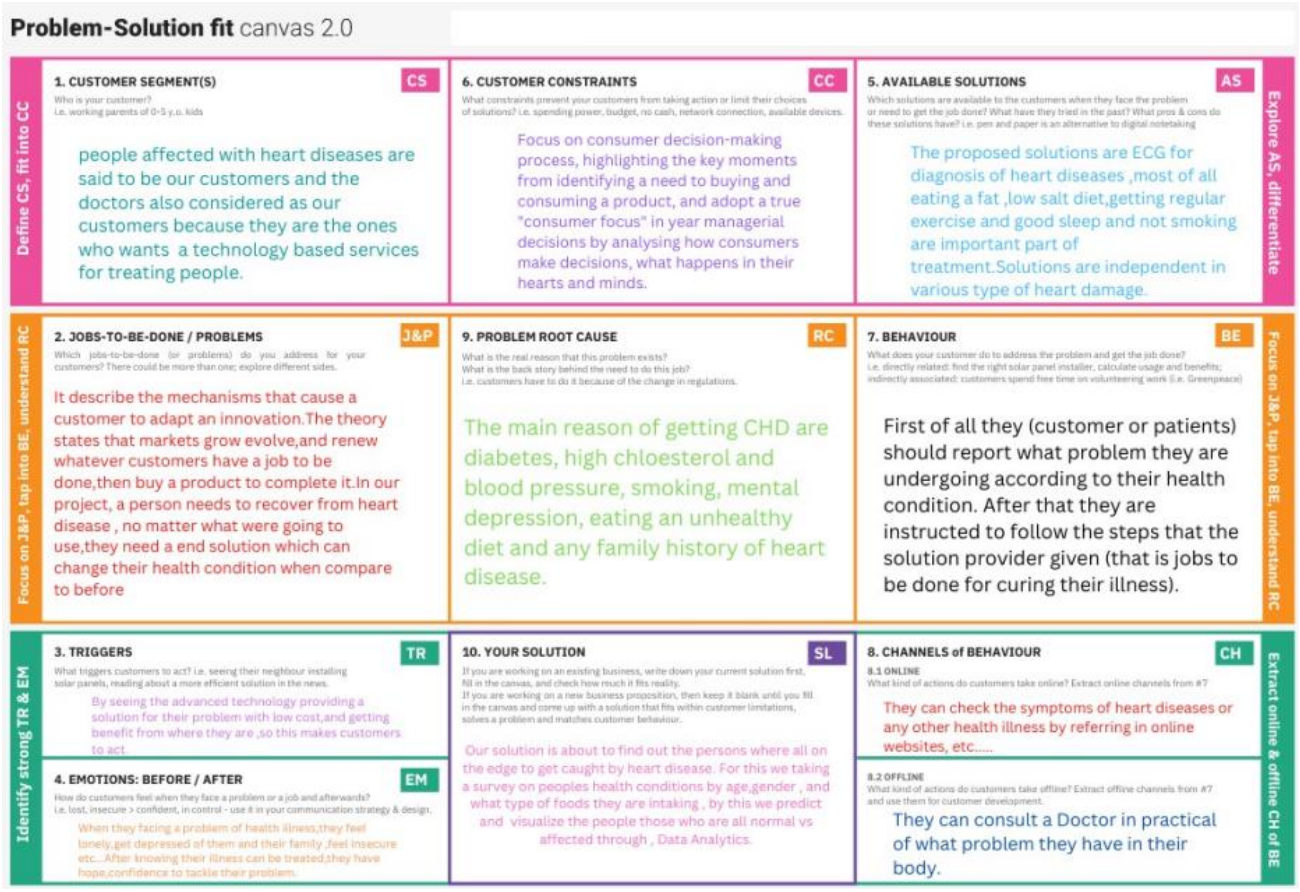


3.3 Proposed Solution

Project team shall fill the following information in proposed solution.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• The leading cause of death in the developed world is heart diseases. • There fore,there needs to be work done to help prevent the risk so having heart disease.
2.	Idea/Solution description	• It can be prevented by creating an interactive dashboard by data analytics. • By doing this we can predict the fore coming dangerous events.
3.	Novelty/Uniqueness	• It can give correct age and place to live. • To give accurate information data to give the hospital.
4.	Social Impact/ Customer Satisfaction	• Inthepointofsocialimpactithasagreatintera ctivedashboardforpredictingthediseases. • In the data to predict the heart disease to use dataset of collection of information
5.	Business Model(Revenue Model)	• It has auger venue when it comes to the market. • It give lot of opening market share it give some demand items also. • It get the medicine is very difficult so rate is high.
6.	Scalability of the Solution	• It is has the easy manipulation of data. • In this data fore a so to find the disease person to take quick treatment.

3.4 Problem Solution fit



4. REQUIREMENT ANALYSIS

4.1 Functional Requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement(Epic)	Sub Requirement(Story/Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through Linked IN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User verification	Verification through CAPTCHA Verification through I'm nota robot.
FR-4	User Authentication	Recognition of correct person Resending the code in Case of forgot password.
FR-5	User validation	Reconfirming the new password Sending a two digit number in (Google account) your Old devices, so that you can enter into an ew device By entering the two Digit number.
FR-6	User Submission	Submission through Google form Submission through Email.

4.2 Non-Functional Requirement

Following are the non-functional requirement so the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The EHDPS predicts the likelihood of patients getting heart disease. It enables significant knowledge, eg, relationships between medical factors related to heart disease and patterns ,to be established.
NFR-2	**Security**	When it deals with(comes to)health factors, we should provide more security services. There shouldn't be no errors, lagging , base of data of a patient profile ,while working on the software or product.
NFR-3	**Reliability**	Our app is made accessible whenever needed. It Responds within the time frame needed It is regularly update do modified as needed by the user. Provide security and privacy to the extent needed by the user. Provide bug free operation that is simple and easily predictable
NFR-4	**Performance**	The performance should be fast relaying. This prediction system should be made available in cloud to ensure better accessibility and setting a milestone in providing good quality affordable healthcare.
NFR-5	**Availability**	By setting up An Application Performance Monitoring (APM) system that helps to monitor the availability of application. Consistent performance monitoring and optimization help you to tackle issues as quickly as they show up. The Availability of getting used to this software or product design is through by accessing IBM cognos Analytics and IBM cloud.
NFR-6	**Scalability**	A scalable app can easily accommodate double, triple, or even ten times its current amount of users by withstanding no crashes, no downtime, Fast loading speeds, Top -notch security. We're gone make our app more scalable by using right Tech stack & Infrastructure scaling to process millions of data with bug free , multiple database servers that accommodate millions of user to secure our app's fail -safe performance, using caching and stateless approach to reduce the load, Content Delivery Networks (CDN) to minimal response time

5. PROJECT DESIGN

5.1 Data Flow Diagrams

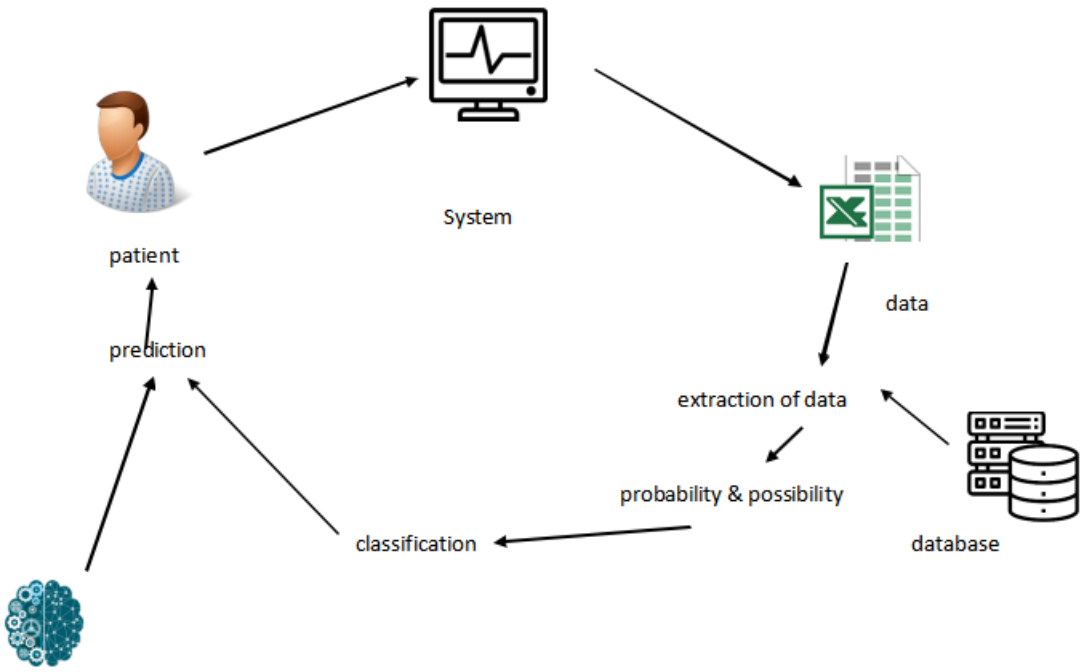
- ✓ A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system.
- ✓ A neat and clear DFD can depict the rightamount of the system requirement graphically.
- ✓ It shows how data enters and leaves the system, what changes the information, and where data isstored.

5.2 Solution & Technical Architecture

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed , and delivered.

Solution Architecture Diagram:



5.3 User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement(Epic)	User Story Number	User Story/Task	Acceptance criteria	Priority	Release
Customer (Mobileuser)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account/dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register & access The dashboard with Gmail Login	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email& password	I can register & access the dashboard with Gmail Login	High	Sprint-1
	Dashboard	USN-6	Profile-view &update your profile	I can see the profile.	Medium	Sprint-2
		USN-7	Change Password-user can change the Password	I can able to change the password.	High	Sprint-1
		USN-8	Home - Analyze your Heart	I can detect the health condition from where ever I want.	High	Sprint-1
		USN-9	The user will have to fill in the below 13 fields for the system to predict a disease -Age in Year -Gender -Chest Pain Type -Fasting Blood Sugar -Resting Electro graphic Results (Restecg) –Exercise Induced Angina (Exang) -The slope of the peak exercise ST segment -CA – Number of major vessels colored by fluoroscopy –Tha l –T rest Blood Pressure -Serum Cholesterol -Maximum heart rate achieved(Thalach) –ST depression induced By exercise(Old peak)	These are the categories available in that application.	High	Sprint-2

User Type	Functional Requirement(Epic)	User Story Number	User Story/Task	Acceptance criteria	Priority	Release
		USN-10	View Doctors -view doctor detail by searching by names or filter by specialty	Using this application, people can known that The speciality doctors.	Medium	Sprint-1
Customer (Web user)	System Requirement	USN-11	I. Hardware Requirement i. Laptop or PC • I5processorsystemorhigher • 4 GB RAM or higher • 128 GB ROM or higher ii. Android Phone (12.0andabove)	These are all the specification available in your PC.	High	Sprint-2
		USN-12	II. Software Requirement iii. Laptop or PC • Windows10or higher • Android Studio	Install your application. This system can be used to predict the presence of heart disease.	Medium	Sprint-2
		USN-13	Reference-https://ieeexplore.ieee.org/document/9619208/	Go and Check our Reference link.	Medium	Sprint-1
Customer Care Executive	Dashboard	USN-14	Query	You can post your queries in the text box available In that application.	High	Sprint-1
		USN-15	Toll Free	Ask your doubt Sin given Number (8365492107).	High	Sprint-1
		USN-16	Ratings	Give your ratings as your wish.	Medium	Sprint-1
Administrator	Dashboard	USN-17	Verification	Verification through CAPTCHA Verification Through I'm not a robot	High	Sprint-1
		USN-18	Validation	Reconfirming the new password Sending a two digit number in (Google account) your Old devices, so that you can enter into a new device by entering the two digit number.	High	Sprint-2

		USN-19	Feedback –send feed back to the Admin.	Please send your Feed back to host.	Medium	Sprint-2

6. PROJECT PLANNING & SCHEDULING

Product Backlog , Sprint Schedule , and Estimation.

Use the below template to create product back log and sprint schedule

Sprint	Functional Requirement(Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by Entering my email, password, and confirming my password.	3	High	1
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	3	High	3
Sprint-1		USN-3	As a user, I can register for the application through Facebook	5	Low	2
Sprint-1		USN-4	As a user, I can register for the application through Gmail	3	Medium	1
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	6	High	5
Sprint-2	Dashboard	USN-6	Attractive dashboard For the Application	3	Medium	3
Sprint-2		USN-7	Profile- view & update your profile	5	Low	2
Sprint-2		USN-8	Home - Analyse your Heart problem	2	High	4
Sprint-2		USN-9	User fill the details to predict the disease	7	High	2
Sprint-3	Support	USN-10	Get feedback from users	10	Medium	3

Sprint	Functional Requirement(Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
Sprint-3		USN-11	Responds to user queries via telephone, email etc.	3	Medium	2
Sprint-3		USN-12	The team must respond immediately to the queries based on the priority	5	High	5

Sprint-4	System Requirements	USN-13	Hardware Requirement 1. Laptop or PC • i5processorsystemorhigher • 4GBRAMorhigher • 128GBROM or higher 2. Mobile • (12.0andabove)	5	Low	2
Sprint-4		USN-14	Software Requirement 1. Laptop or PC • Windows10or higher • AndroidStudio	8	Medium	4

Project Tracker, Velocity & Burn down Chart: (4Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date(Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date(Actual)
Sprint-1	20	6Days	24Oct2022	29Oct2022	20	29Oct2022
Sprint-2	20	6Days	30Oct2022	04Nov2022	17	04Nov2022
Sprint-3	20	6Days	05Nov2022	11Nov2022	18	11Nov2022
Sprint-4	20	6Days	12Nov2022	17Nov2022	19	17Nov2022

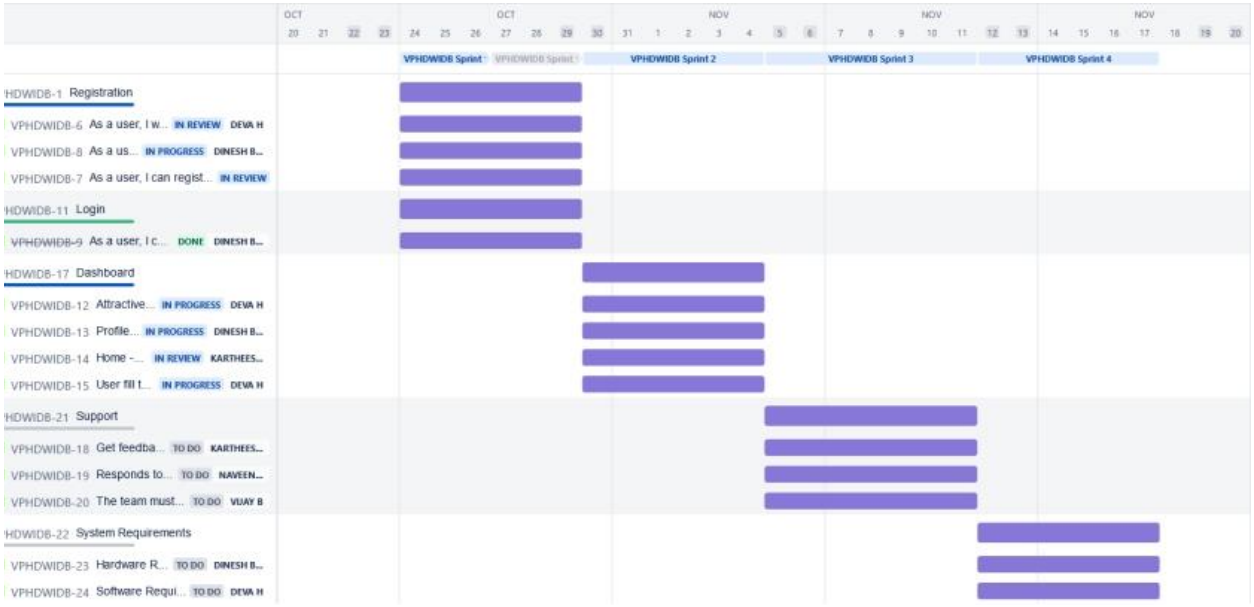
Velocity:

Imagine we have a 6-daysprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

AV=Sprint duration/velocity=20/6=3

Burn down Chart:

- ✓ A burn down chart is a graphical representation of work left to do versus time.
- ✓ It is often used in agile software development methodologies such as Scrum. How ever burn down charts can be applied to any project containing measurable progress over time.



7. CODING & SOLUTIONING (Explain the features added in the project along with code)

7.1 Feature 1

Dashboard

Code:

```
<html>
<title>Healthcare</title>
<body>
<section id="Dashboard" class="Dashboard">
<div class="container" data-aos="fade-up">
 <div class="section-title">
  <h2>Dashboard</h2>
  <p>The Dashboard is the over all prediction of our project. In IBM we used an datasets to showthe results to the general peoples in their daily affiers.</p>
 </div>
 <center>
 <iframe class="ibm" src="https://us1.ca.analytics.ibm.com /bi/?perspective = dashboard&pathRef=.my_folders%2FData%2BModules%2FHD%2BDashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=emb
```

```
edded&action=view&mode=dashboard&subView=model0000018469caba3f_00000
001" width="1050" height="725" frameborder="0" gesture="media"
allow="encrypted-media" allowfullscreen=""></iframe>

    </center>

    </div>

  </section>

  </body></html>
```

Output :

7.2 Feature 2

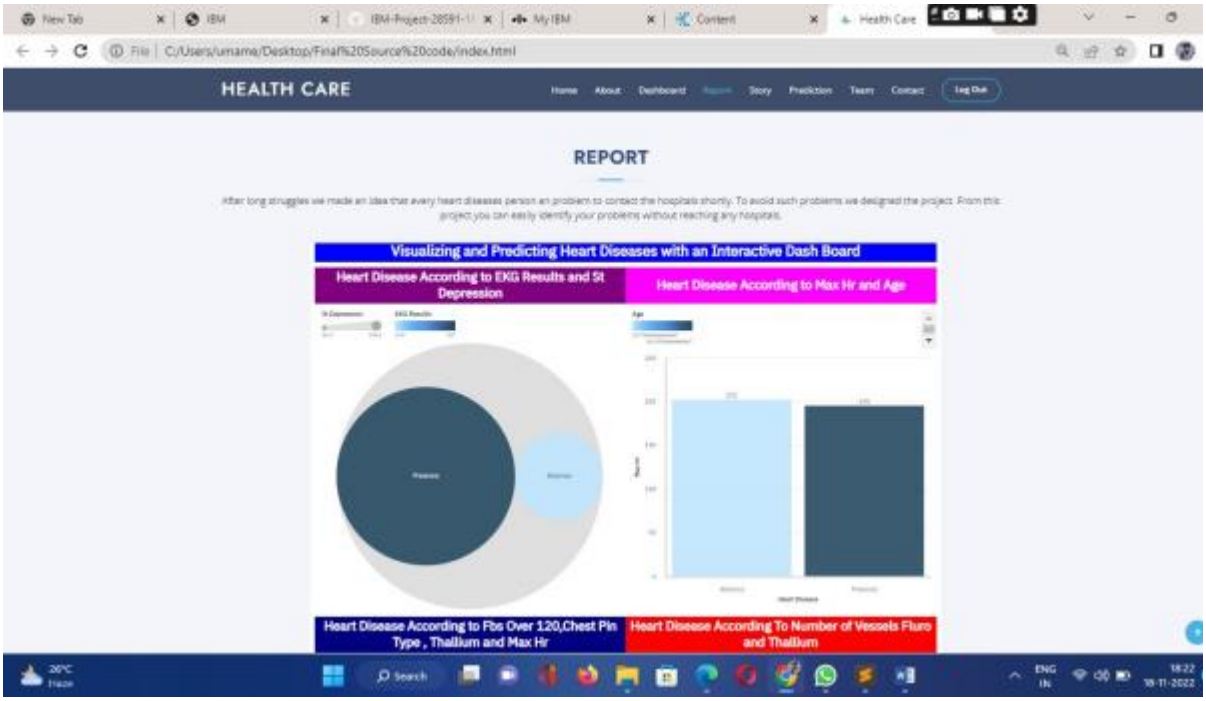
Report

Coe:

```
<html>

<title>Healthcare</title>
<body>

<section id="Reports" class="Reports section-bg">
<div class="container" data-aos="fade-up">


 <div class="section-title">
```

```
<h2>Report</h2>

        <p>After long struggles we made an idea that every heart diseases person an problem to contact the hospitals shortly. To avoid such problems we designed the project. From this project you can easilyidentify your problems without reaching any hospitals.</p>

</div>
        <center>

<iframe class="ibm" src="https://us1.ca.analytics.ibm.com/bi/?pathRef=. my_folders%2FData%2BModules%2FHD%2BReport &closeWindowOnLastView =true &ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format= HTML&prompt=false" width="1050" height="1250" frameborder="0" gesture = "media" allow="encrypted-media" allowfullscreen=""></iframe>

</center>

</div>
</section>

        </body>

        </html>
```

Output :



8. TESTING

8.1 Test Cases

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Out source Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

8.2 User Acceptance Testing

Defect Analysis

This report shows the number of re solved or closed bugs at each severity level, and how they were resolved

Resolution	Severity1	Severity2	Severity3	Severity4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

9. RESULTS

9.1 Performance Metrics

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Dashboard design	No of Visulizations / Graphs - 8
2.	Data Responsiveness	No of Scene Added – 8
3.	Amount Data to Rendered (DB2 Metrics)	No of Scene Added – 1
4.	Utilization of Data Filters	No of Scene Added – 2
5.	Effective User Story	No of Scene Added – 1
6.	Descriptive Reports	No of Visulizations / Graphs - 4

10. ADVANTAGES & DISADVANTAGES

10.1 Advantages

- The system uses 15 medical parameters such as age, sex, blood pressure, cholesterol, and obesity for prediction.
- The EHDPS predicts the likelihood of patients getting heart disease.
- **It enables significant knowledge, eg, relationships between medical factors related to heart disease and patterns, to be established**.
- Predicting **encourages children to actively think ahead and ask questions**.
- It also allows students to understand the story better, make connections to what they are reading, and interact with the text.
- Making predictions is also a valuable strategy to improve reading comprehension

- These techniques can **provide managers and executives with decision-making tools to influence upselling, sales and revenue forecasting, manufacturing optimization, and even new product development**.

10.2 Disadvantages

- Prediction of cardiovascular disease. results is not accurate.
- International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056. ...
- Data mining techniques does not help to. provide effective decision making.
- Cannot handle enormous datasets for.
- Those with heart failure can develop **swelling, dizziness, and other symptoms that can affect their ability to complete daily tasks**.
- A person with diagnosed heart disease must also live with the stress of knowing they have a long-term illness that could result in a cardiac event, such as heart attack or stroke.

11.CONCLUSION

This Heart Disease detection system assists a patient based on his/her clinical information of them been diagnosed with a previous heart disease. The algorithms used in building the given model are Logistic regression, Random Forest Classifier and KNN . The accuracy of our model is 87.5%.Use of more training data ensures the higher chances of the model to accurately predict whether the given person has a heart disease or not . By using these, computer aided techniques we can predict the patient fast and better and the cost can be reduced very much. There are a number of medical databases that we can work on as these Machine learning techniques are better and they can predict better than a human being which helps the patient as well as the doctors. Therefore, in conclusion this project helps us predict the patients who are diagnosed with heart diseases by cleaning the dataset and applying logistic regression and KNN to get an accuracy of an average of 87.5% on our model which is better than the previous models having an accuracy of 85%. Also, it is concluded that accuracy of KNN is highest between the three algorithms that we have used i.e. 88.52%. 44% of people that are listed in the dataset are suffering from Heart Disease.

11. FUTURE SCOPE

To check whether the patient is likely to be diagnosed with any cardiovascular heart diseases based on their medical attributes such as gender, age, chest pain, fasting sugar level, etc.

12. APPENDIX

Source Code

INDEX:

```
<!DOCTYPE html>
<html lang="en">

<head>
<meta charset="utf-8">
<meta content="width=device-width, initial-scale=1.0" name="viewport">

<title>Health Care</title>
<meta content="" name="description">
<meta content="" name="keywords">

<link href="assets/img/icon.png" rel="icon">
<link href="assets/img/icon.png" rel="icon">

<link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|Jost:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i" rel="stylesheet">

<link href="assets/vendor/aos/aos.css" rel="stylesheet">
<link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
<link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
<link href="assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
<link href="assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
<link href="assets/vendor/remixicon/remixicon.css" rel="stylesheet">
<link href="assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">
```

```
<link href="assets/css/style.css" rel="stylesheet">

</head>

<body>

<header id="header" class="fixed-top ">
<div class="container d-flex align-items-center">

<h1 class="logo me-auto"><a href="index.html">Health Care</a></h1>

<nav id="navbar" class="navbar">
<ul>
<li><a class="nav-link scrollto active" href="#hero">Home</a></li>
<li><a class="nav-link scrollto" href="#about">About</a></li>
<li><a class="nav-link scrollto" href="#Dashboard">Dashboard</a></li>
<li><a class="nav-link scrollto" href="#Reports">Report</a></li>
<li><a class="nav-link   scrollto" href="#portfolio">Story</a></li>
<li><a class="nav-link scrollto" href="#team">Team</a></li>
<li><a class="nav-link scrollto" href="#contact">Contact</a></li>
<li><a class="getstarted scrollto" href="Login.html">Log Out</a></li>
</ul>
<i class="bi bi-list mobile-nav-toggle"></i>
</nav>

</div>
</header>

<section id="hero" class="d-flex align-items-center">

<div class="container">
<div class="row">
<div class="col-lg-6 d-flex flex-column justify-content-center pt-4 pt-lg-0 order-2
order-lg-1" data-aos="fade-up" data-aos-delay="200">
<h1>Better Solutions For Your Healthy Life</h1>
<h2>We are team use dataset to making websites for Heart Disease</h2>
<div class="d-flex justify-content-center justify-content-lg-start">
```

```
<a href="#about" class="btn-get-started scrollto">Get Started</a>
<a href="https://www.youtube.com/watch?v=jDDaplaOz7Q" class="glightbox btn-watch-video"><i class="bi bi-play-circle"></i><span>Watch Video</span></a>
</div>
</div>
<div class="col-lg-6 order-1 order-lg-2 hero-img" data-aos="zoom-in" data-aos-delay="200">
<img src="assets/img/hero-img.png" class="img-fluid animated" alt="">
</div>
</div>
</div>

</section>

<main id="main">

<section id="clients" class="clients section-bg">
<div class="container">

<div class="row" data-aos="zoom-in">

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-content-center">
<img src="assets/img/clients/client-7.png" class="img-fluid" alt="">
</div>

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-content-center">
<img src="assets/img/clients/client-8.png" class="img-fluid" alt="">
</div>

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-content-center">
<img src="assets/img/clients/client-9.png" class="img-fluid" alt="">
</div>

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-content-
```

```
center">
<img src="assets/img/clients/client-10.png" class="img-fluid" alt="">
</div>

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-content-center">
<img src="assets/img/clients/client-11.png" class="img-fluid" alt="">
</div>

<div class="col-lg-2 col-md-4 col-6 d-flex align-items-center justify-c ontent-center">
<img src="assets/img/clients/client-12.png" class="img-fluid" alt="">
</div>

</div>

</div>
</section>

<section id="about" class="about">
<div class="container" data-aos="fade-up">

<div class="section-title">
<h2>About Us</h2>
</div>

<div class="row content">
<div class="col-lg-6">
<p>
        Heart disease is one of the major causes of life complicacies and subsequently leading to death. The heart disease diagnosis and treatment are very complex, especially in the developing countries, due to the rare availability of efficient diagnostic tools and shortage of medical professionals and other resources which affect proper prediction and treatment of patients. Inadequate preventive measures, lack of experienced or unskilled medical professionals in the field are the leading contributing factors.
</p>
<p>Although, large proportion of heart diseases is preventable but they continue
```

to rise mainly because preventive measures are inadequate. In today's digital world, several clinical decision support systems on heart disease prediction have been developed by different scholars to simplify and ensure efficient diagnosis. This paper investigates the state of the art of various clinical decision support systems for heart disease prediction, proposed by various researchers using data mining and machine learning techniques.

 Classification algorithms such as
 Naive Bayes (NB)
 Decision Tree (DT)
 Artificial Neural Network (ANN)
have been widely employed to predict heart diseases

Where various accuracies were obtained. Hence, only a marginal success is achieved in the creation of such predictive models for heart disease patients therefore, there is need for more complex models that incorporate multiple geographically diverse data sources to increase the accuracy of predicting.

Learn More

</section>

<section id="Dashboard" class="Dashboard">

<h2>Dashboard</h2>
The Dashboard is the over all prediction of our project. In IBM we used an datasets to show the results to the general peoples in their daily affiers.

<iframe class="ibm" src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FData%2BModules%2FHD%2BDashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018469caba3f_00000001" width="1050" height="725" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</section>

<section id="Reports" class="Reports section-bg">

<h2>Report</h2>
After long struggles we made an idea that every heart diseases person an problem to contact the hospitals shortly. To avoid such problems we designed the project. From this project you can easily identify your problems without reaching any hospitals.

<iframe class="ibm" src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2FData%2BModules%2FHD%2BReport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="1050" height="1250" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</section>

<section id="Story" class="Story">

<h2>Story</h2>
The moral story of this project is to check whether the patient is likely to be diagnosed with any cardiovascular heart diseases based on their medical attributes such as gender, age, chest pain, fasting sugar level, etc. A dataset is selected from the UCI repository with patient's medical history and attributes.

<iframe class="ibm" src="https://us1.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2FData%2BModules%2FHD%2BStory&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=model000001846ffa042c_00000001&sceneTime=19950" width="1050" height="780" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</section>

<section id="team" class="team section-bg">

<h2>Team</h2>
For this visualizing and predicting heart disease with an interactive dashboard. We need some invention ideas and creativity towards the prediction project. So we made an team with strong ideas to work together in the environment.

```
<div class="pic"><img src="assets/img/team/team.png" class="img-fluid" alt=""></div>
<div class="member-info">
<h4>S Dinesh Babu</h4>
<span>Team Leader</span>
<p>GRT Institute Of Engineering And Technology</p>
<div class="social">
<a href=""><i class="ri-twitter-fill"></i></a>
<a href=""><i class="ri-facebook-fill"></i></a>
<a href=""><i class="ri-instagram-fill"></i></a>
<a href=""><i class="ri-linkedin-box-fill"></i></a>
</div>
</div>
</div>
</div>
</div>

<div class="col-lg-6">
<div class="member d-flex align-items-start" data-aos="zoom-in" data-aos-delay="100">
<div class="pic"><img src="assets/img/team/team.png" class="img-fluid" alt=""></div>
<div class="member-info">
<h4>H Deva</h4>
<span>Team Member 1</span>
<p>GRT Institute Of Engineering And Technology</p>
<div class="social">
<a href=""><i class="ri-twitter-fill"></i></a>
<a href=""><i class="ri-facebook-fill"></i></a>
<a href=""><i class="ri-instagram-fill"></i></a>
<a href=""><i class="ri-linkedin-box-fill"></i></a>
</div>
</div>
</div>
</div>

<div class="col-lg-6 mt-4 mt-lg-0">
<div class="member d-flex align-items-start" data-aos="zoom-in" data-aos-
```

```
delay="200">
<div class="pic"><img src="assets/img/team/team.png" class="img-fluid" alt=""></div>
<div class="member-info">
<h4>G Naveen</h4>
<span>Team Number 2</span>
<p>GRT Institute Of Engineering And Technology</p>
<div class="social">
<a href=""><i class="ri-twitter-fill"></i></a>
<a href=""><i class="ri-facebook-fill"></i></a>
<a href=""><i class="ri-instagram-fill"></i></a>
<a href=""><i class="ri-linkedin-box-fill"></i></a>
</div>
</div>
</div>
</div>

<div class="col-lg-6 mt-4">
<div class="member d-flex align-items-start" data-aos="zoom-in" data-aos-delay="300">
<div class="pic"><img src="assets/img/team/team.png" class="img-fluid" alt=""></div>
<div class="member-info">
<h4>B S Kartheesan</h4>
<span>Team Member 3</span>
<p>GRT Institute Of Engineering And Technology</p>
<div class="social">
<a href=""><i class="ri-twitter-fill"></i></a>
<a href=""><i class="ri-facebook-fill"></i></a>
<a href=""><i class="ri-instagram-fill"></i></a>
<a href=""><i class="ri-linkedin-box-fill"></i></a>
</div>
</div>
</div>
</div>

<div class="col-lg-6 mt-4">
<div class="member d-flex align-items-start" data-aos="zoom-in" data-aos-
```

```
delay="400">
<div class="pic"><img src="assets/img/team/team.png" class="img-fluid" alt=""></div>
<div class="member-info">
<h4>B Vijay</h4>
<span>Team Member 4</span>
<p>GRT Institute Of Engineering And Technology</p>
<div class="social">
<a href=""><i class="ri-twitter-fill"></i></a>
<a href=""><i class="ri-facebook-fill"></i></a>
<a href=""><i class="ri-instagram-fill"></i></a>
<a href=""><i class="ri-linkedin-box-fill"></i></a>
</div>
</div>
</div>
</div>

</div>

</div>
</section>

<section id="contact" class="contact">
<div class="container" data-aos="fade-up">

<div class="section-title">
<h2>Contact</h2>
<p>Visualizing and predicting heart disease with an interactive dashboard is made of our knowledge with the creativity for the future generation. If you have any doubts regarding this project you may contact our team.</p>
</div>

<div class="row">

<div class="col-lg-5 d-flex align-items-stretch">
<div class="info">
<div class="address">
<i class="bi bi-geo-alt"></i>
```

```
<h4>Location:</h4>
<p>Tiruttani,Thiruvallur(DT),TN Zip Code : 631209</p>
</div>

<div class="email">
<i class="bi bi-envelope"></i>
<h4>Email:</h4>
<p>IbmHealthcare@gmail.com</p>
</div>

<div class="phone">
<i class="bi bi-phone"></i>
<h4>Call:</h4>
<p>+91 88488 44844</p>
</div>
<iframe
src="https://www.google.com/maps/embed?pb=!1m18!1m12!1m3!1d1872.95564
6786618!2d79.61282060297269!3d13.179547624245911!2m3!1f0!2f0!3f0!3m2!
1i1024!2i768!4f13.1!3m3!1m2!1s0x3a52a4e4f25f2dbd%3A0x9acb9d879e9d2fe
6!2sTiruttani!5e0!3m2!1sen!2sin!4v1668234421555!5m2!1sen!2sin"
frameborder="0" style="border:0; width: 100%; height: 290px;"
allowfullscreen></iframe>
</div>

</div>

<div class="col-lg-7 mt-5 mt-lg-0 d-flex align-items-stretch">
<form action="forms/contact.php" method="post" role="form" class="php-email-
form">
<div class="row">
<div class="form-group col-md-6">
<label for="name">Your Name</label>
<input type="text" name="name" class="form-control" id="name" required>
</div>
<div class="form-group col-md-6">
<label for="name">Your Email</label>
<input type="email" class="form-control" name="email" id="email" required>
</div>
```

```
</div>
<div class="form-group">
<label for="name">Subject</label>
<input type="text" class="form-control" name="subject" id="subject" required>
</div>
<div class="form-group">
<label for="name">Message</label>
<textarea class="form-control" name="message" rows="10" required></textarea>
</div>
<div class="my-3">
<div class="loading">Loading</div>
<div class="error-message"></div>
<div class="sent-message">Your message has been sent. Thank you!</div>
</div>
<div class="text-center"><button type="submit">Send Message</button></div>
</form>
</div>

</div>

</div>
</section>

</main>

<footer id="footer">

<div class="footer-top">
<div class="container">
<div class="row">

<div class="col-lg-3 col-md-6 footer-contact">
<h3>Health Care</h3>
<p>
        Tiruttani,Thiruvallur(DT) <br>
        Tamil Nadu, Zip Code : 631209 <br>
        India <br><br>
<strong>Phone:</strong> +91 88488 44844<br>
```

```
<strong>Email:</strong> IbmHealthcare@gmail.com<br>
</p>
</div>

<div class="col-lg-3 col-md-6 footer-links">
<h4>Useful Links</h4>
<ul>
<li><i class="bx bx-chevron-right"></i><a href="#">Home</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">About us</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Services</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Terms of service</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Privacy policy</a></li>
</ul>
</div>

<div class="col-lg-3 col-md-6 footer-links">
<h4>Our Services</h4>
<ul>
<li><i class="bx bx-chevron-right"></i><a href="#">Prediction</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">visualization</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Dashboard</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Give Solutions</a></li>
<li><i class="bx bx-chevron-right"></i><a href="#">Health Support</a></li>
</ul>
</div>

<div class="col-lg-3 col-md-6 footer-links">
<h4>Our Social Links</h4>
<div class="social-links mt-3">
<a href="#" class="twitter"><i class="bx bxl-twitter"></i></a>
<a href="#" class="facebook"><i class="bx bxl-facebook"></i></a>
<a href="#" class="instagram"><i class="bx bxl-instagram"></i></a>
<a href="#" class="google-plus"><i class="bx bxl-skype"></i></a>
<a href="#" class="linkedin"><i class="bx bxl-linkedin"></i></a>
</div>
</div>

</div>
```

```
</div>
</div>

<div class="container footer-bottom clearfix">
<div class="copyright">
&copy; Copyright <strong><span>IBM Health Care Team</span></strong>. All Rights Reserved
</div>
<div class="credits">
      Designed by <a href="#hero">IBM Health Care Team</a>
</div>
</div>
</footer>

<div id="preloader"></div>
<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i class="bi bi-arrow-up-short"></i></a>

<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/waypoints/noframework.waypoints.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>

<script src="assets/js/main.js"></script>

</body>

</html>
```

SIGN IN.html

```
<html>
<head>
<title> Login </title>
<link rel="stylesheet" type="text/css" href="login.css">
```

```
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.min.css">
<script type="text/javascript">
        function validate(){
    var Username = document.login.Username.value;
    var password = document.login.password.value;

    if(Username == "admin"&& password == "admin")
    {
  alert("Login Successfully");
  return true;
    }
    else
    {
  alert("Login Failed");
  return false;
    }
    }
    function myfunction(){
    var x =document.getElementById("password");

    if(x.type === "password"){
        x.type = "text";
    }
    else{
        x.type = "password";
    }
}
</script>
</head>
<body>
<div class="container">
<div class="form">
<div class="login">
<form action="index.html" method="post" name="login" onsubmit="return validate()">
<h1> Login </h1>
<div class="Username"><label>Username : </label>
```

<input type="text" name="Username" placeholder="Username" size="20" id="Username">
<label>password : </label>
<input type="password" name="pass" placeholder="Password" size="20" id="password">
To use (Username : admin && Password : admin)
Forgot Password?<input type="checkbox" onclick="myfunction()" class="show"> Show Password
<button id="btn" type="submit">Login</button>

<a href="https://www.facebook.com/login.php?skip_api_login=1&api_key=113869198637480&kid_directed_site=0&app_id=113869198637480&signed_next=1&next=https%3A%2F%2Fwww.facebook.com%2Fv15.0%2Fdialog%2Foauth%3Fapp_id%3D113869198637480%26auth_type%26cbt%3D1667802295776%26channel_url%3Dhttps%253A%252F%252Fstaticxx.facebook.com%252Fx%252Fconnect%252Fxd_arbiter%252F%253Fversion%253D46%2523cb%253Df1ba6276f1c262%2526domain%253Ddevelopers.facebook.com%2526is_canvas%253Dfalse%2526origin%253Dhttps%25253A%25252F%25252Fdevelopers.facebook.com%25252Ff36234788d48a12%2526relation%253Dopener%26client_id%3D113869198637480%26config_id%26display%3Dpopup%26domain%3Ddevelopers.facebook.com%26e2e%3D%257B%257D%26fallback_redirect_uri%3Dhttps%253A%252F%252Fdevelopers.facebook.com%252Fdocs%252Ffacebook-login%252Fweb%252Flogin-button%252F%26force_confirmation%3Dfalse%26id%3Dfe32f008e45d24%26locale%3Den_US%26logger_id%3D09623361-33c2-4bc1-a39b-ad67149fb531%26messenger_page_id%26origin%3D1%26plugin_prepare%3Dtrue%26redirect_uri%3Dhttps%253A%252F%252Fstaticxx.facebook.com%252Fx%252Fconnect%252Fxd_arbiter%252F%253Fversion%253D46%2523cb%253Df3efef6fe7d85ba%2526domain%253Ddevelopers.facebook.com%2526is_canvas%253Dfalse%2526origin%253Dhttps%25253A%25252F%25252Fdevelopers.facebook.com%25252Ff36234788d48a12%2526relation%253Dopener.parent%2526frame%253Dfe32f008e45d24%26ref%3DLoginButton%26reset_messenger_state%3Dfalse%26response_type%3Dsigned_request%252Ctoken%252Cgraph_domain%26scope%26sdk%3Djoey%26size%3D%257B%2522width%2522%253A600%252C%2522height%2522%253A679%257D%26url%3Ddialog%252Foauth%26version%3Dv15.0%26ret%3Dlogin%26fbapp_pres%3D0%26tp%3Dunspecified

&cancel_url=https%3A%2F%2Fstaticxx.facebook.com%2Fx%2Fconnect%2Fxd_arbiter%2F%3Fversion%3D46%23cb%3Df3efef6fe7d85ba%26domain%3Ddevelopers.facebook.com%26is_canvas%3Dfalse%26origin%3Dhttps%253A%252F%252Fdevelopers.facebook.com%252Ff36234788d48a12%26relation%3Dopener.parent%26frame%3Dfe32f008e45d24%26error%3Daccess_denied%26error_code%3D200%26error_description%3DPermissions%2Berror%26error_reason%3Duser_denied&display=popup&locale=en_GB&pl_dbl=0">

Not a member?
Registration now

</form>

</body>
</html>

LOG IN.html

<html>
<head>
<title>Registration Page</title>

```
<link rel="stylesheet" type="text/css" href="signup.css">
<script type="text/javascript">
        function validate(){
var Username = document.signup.Username.value;
var Email = document.signup.Email.value;
var Name = document.signup.name.value;
var Mobile = document.signup.Mobile.value;
var Blood = document.signup.Blood.value;
var Date = document.signup.Date.value;
var password = document.signup.password.value;
var password1 = document.signup.password1.value;
var Gender = document.signup.Gender;
var x = document.signup.password;
var sel = document.getElementById("Blood");
var selectedText = sel.options[sel.selectedIndex].text;


if(Username == null || Username == "")
{
   alert("Enter Username Name");
   return false;
}
else if(Name == null || Name == "")
{
   alert("Enter Email ID");
   return false;
}
else if(Email == null || Email == "")
{
   alert("Enter Email ID");
   return false;
}
else if(Mobile == null || Mobile == "")
{
   alert("Enter Mobile no");
   return false;
}
else if(document.signup.Blood.selectedIndex=="")
```

```
{
alert ( "Please select Blood!");
return false;
}

else if(Date == null || Date == "")
{
   alert("Enter Date Of Birth");
   return false;
}
else if (Gender[0].checked == false && Gender[1].checked == false)
{
   alert("please enter gender");
   return false;
}
else if(password == null || password == "")
{
   alert("Enter valid password");
   return false;
}
else if(password1 == null || password1 == "")
{
   alert("Enter vald confrim password");
   return false;
}
else if(password != password1)
{
   alert("password and confrim password not match");
   return false;
}
}
function showing(){
   var x =document.getElementById("password");
   var y =document.getElementById("password1")

   if(x.type === "password"){
      x.type = "text";
   }
```

```
    else{
        x.type = "password";
    }
    if(y.type === "password"){
        y.type = "text";
    }
    else{
        y.type = "password";
    }
}
</script>

</head>
<body>
<div class="container">
<div class="form">
<div class="signup">
<form action="" name="signup" onsubmit=" validate(); return false">
<h1> Registration </h1>
<div class="Username"><label> Username : </label>
<input type="text" name="Username" placeholder="Username" size="20" id="Username" pattern="[a-Z0-9]"></div>
<div class="name"><label> Name : </label>
<input type="text" name="name" placeholder="name" size="20" id="name" pattern="[a-Z0-9]"></div>
<div class="Email"><label> Email : </label>
<input type="Email" name="Email" placeholder="Email" size="20" id="Email" pattern="[a-Z0-9]+@+[a-Z]+.+[a-Z]"></div>
<div class="Mobile"><label> Mobile : </label>
<input type="tel" name="Mobile" placeholder="Mobile Number" size="20" id="Mobile" pattern="[6-9]{1}[0-9]{9}"></div>
<div class="Blood"><label> Blood Group : </label>
<select name="Blood" id="Blood" class="required">
<option value="select">Select</option>
<option value="A+">A+</option>
<option value="B+">B+</option>
<option value="AB+">AB+</option>
<option value="O+">O+</option>
```

```
<option value="A-">A-</option>
<option value="B-">B-</option>
<option value="AB-">AB-</option>
<option value="O-">O-</option>
</select></div>
<div class="Date"><label> DOB : </label>
<input type="Date" name="Date" placeholder="Date of Birth" size="20" id="Date"></div>
<div class="Gender"><label>Gender : </label><input type="radio" name="Gender" value="Male" id="Male">Male
 
<input type="radio" name="Gender" value="Female" id="Female">Female</div>
<div class="password"><label> password : </label>
<input type="password" name="password" placeholder="Password" size="20" id="password"></div>
<div class="password1"><label> Confrim password : </label>
<input type="password" name="password1" placeholder="confrim Password" size="20" id="password1"></div>
<error id="alert"></error>
<div class="check"><label><input type="checkbox" id="check" onclick="showing()">Show Password</label></div>
<div><center><button id="btn" type="submit">Register Now</button></center></div>
<div class="login-signup">
<span class="text">Already member?
<a href="login.html" class="text login-link">Login now</a>
</span>
</form>
</div>
</div>
</div>
</body>
</html>
```

Github Link: https://github.com/IBM-EPBL/IBM-Project-28591-1660114067

Project Demo Link:

https://drive.google.com/file/d/1qCzY5cIdU_gCmEISy0L54TOAENVJwmNq/view?usp=sharing