uSpark Al Medical Assistor

Sprint 1 Presentation

Team 1 – Rush Hour CS691
March 2025



AGENDA



Team:

- Roles and Responsibilities
- Improvements

Project Overview:

- Problem Statement
- Project Description
- Working Agreement
- Personas
- Product Design
- MVP Design

Technology:

- Technologies
- Algorithms
- Diagrams

Product Backlog

Sprint Backlog:

- Backlog
- Test Cases
- Completed
- Not Completed

Sprint 1 Metrics:

- Velocity
- Burndown Chart
- Committed Ratio

Sprint 1 Retrospective

Sprint 2 Planning

Product Demo





FULL STACK TEAM



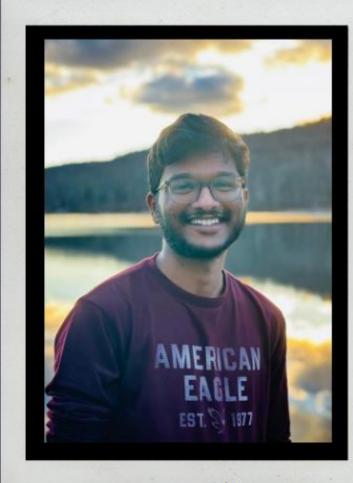
Avinash Manchala Full Stack Developer/ UI Designer



Rathan Famanath Singavarapu Team Lead/Scrum Master/Full Strekpeveloper



Koundinga Pidaparthy Lead Full Stack Developer



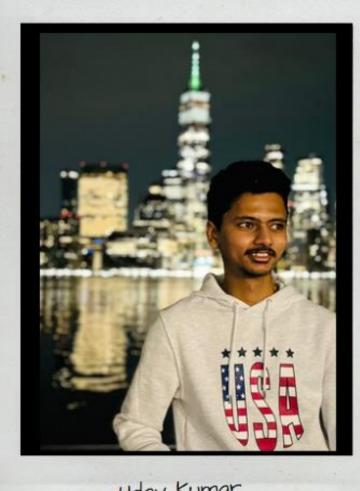
Sairam Maddela Full Stack Testing Engineer



MLAITEAM



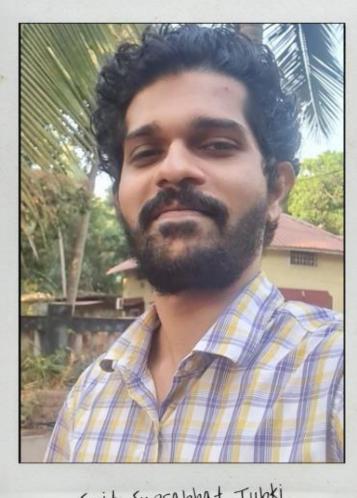
Pranay Kumar Reddy Lead Al, ML Engineer



Uday Kumar Al, ML Engineer/Tester



Murali Kummari Al, ML Engineer/Tester



Suit Suprabhat Tubki Tester/Quality Assurance

Improvements from professor

- Removed the Jira Screenshots
- Made slides to communicate what needs to be delivered for each sprint



PROBLEM STATEMENT

Continuous Medical Assistance is one of a non-negotiable requirement these days and it can't be ignored. It is tedious to manage and store data related to a diagnosis of a patient for hospitals and for the patient as well. A simplified way of managing health care is needed, which can be achieved through AI chatbot and smart data storage system and like wise professionals in the medical sector can use a trained ML based algorithm service to reduce manual effort in the patient diagnosis. This creates a hassle-free environment for both patient and doctors.



A robust approach to ease the process of health care and management with just one click!

- → "uSpark" is an Intelligent full stack application incorporated with machine learning that is an ultimate go-to point for the users/patients for all their healthcare related issues. uSpark allows users to schedule appointments in a hassle-free manner.
- → These appointments can be virtual or in-person using "Uheal" a smart chatbot in the application that diagnoses the patient condition with the help of few questions. uSpark stores all the assessment details of the patient for further usage.
- → Doctors can use uSpark as their personal virtual assistant that helps them in their work for managing appointments and patients records. It provides doctors with "Useg" a well-trained ML algorithm that precisely processes bio-medical images that produces an output

uSpark Application

FEATURE 1

BOOK APPOINTMENTS!!

uSpark allows users to make appointments which can be in-person or virtual based on their availability and doctor's availability, in contrast to the traditional way of making appointments

FEATURE 3

CHATBOT - Uheal

uHeal conducts assessment for the patients with the help of series of questions and also gives few preventive measures and also it makes appointments for the user by giving recommendations about hospitals, in contrast to traditional method of searching hospitals

FEATURE 5: Useg

Useg is an ML algorithm that is used by doctors as a part of their diagnosis.

This makes their work easier and helps them to narrow down the issue in a much quicker way

FEATURE2

HOSPITAL RECOMMENDATIONS

Users can now see recommendations of hospitals that might be suitable for their issue. These recommendations on their assessment done via a series of questions asked by our chatbot "Uheal"

Distance from Hospital, working hours can be seen.

FEATURE 4 ONE CARD

M

uHeal stores the details of the health issue of the patient which is obtained from the conducted assessment, all the assessment details are saved on ONE CARD along with the date of assessment. One card involves patient's assessment details, insurance details, personal details and a QR code that is used to share the ONE CARD, this completely eliminates the need for physical documents to store information.



Team Working Agreement

Link: Team working agreement

CS 691 Capstone Project

Team – 1: Rush Hour Team Working Agreement

To produce a viable result at the end of the project duration is the aim by w team "Rush Hour" is driven by. Our sole purpose is to give a working product capable of handling real life scenarios so that it ultimately leads to customisatisfaction. We as a team understand the need to work together to make the project happen. We strive to give our best to meet the pre-decided plans, commitments, goals. Individually, we are responsible to the tasks that have assigned to us and will work to the best of our capacity to prioritize the suct the team and to achieve the goal of making our product "uSpark"

Team Rush Hour

As a part of the project and the norms associated to it, we have decided fev that are incorporated into the team which ensures the success of the team policies/terms have been discussed in the agreement.

Terms of Agreement:

Individual Accountability:

As an individual it is one's duty to be responsible and be accountable for the actions. It is an obvious thing that such a big project cannot be completed be single person or a small team. Individual work is important as much as tea in capstone project. This fact is acknowledged by all the team members. We team of eight members understand this and are willing to take responsibility work and actions through the course of this project.

In all the discussions team members are expected to bring something to the that adds value to the team and the project. We as a team recognize the important of our own self and our peers as well in the team.

Communication and Resource Sharing:

Interaction in the team makes a whole lot of difference when a complex propress. This makes many things like idea analysis, brain storming, planni easier and fluent. It is understood that the team assembled has members t

belong to various demographic areas, based on this the technical resources like Laptops, mobiles or other software devices, software they provide to the team might vary. To make the learning and the working more generic we decided to employ a shared resource system so that all can have access to them.

We use Zoom, WhatsApp as our primary way to communicate within the team. For resource sharing we use google docs, word documents are uploaded to a private google drive space which can be accessed only by the team members. All other working software and tools like figma, canva, jira, GitHub can be accessed by the team.

Communication plays an integral part in any team, the team members understand this and are open towards any discussion as a whole team or needed divisions of the team. All the team members agree to be available to rest of the team, so that the work doesn't get stuck at any point.

Team Division and Synchronization:

After finalizing the project idea and the features that are included, we have decided to split the team in to two divisions namely ML/AI team and Full Stack team. "Lead Developer" of each team is head of the their team. This division was done in the best interest of the application and this segregates the task for each division.

This might lead to few mishaps or disturbances in terms of synchronization when work from both the fronts are combined together. The team is expected to understand this and work bearing this in mind as any decision in one team can change the way in which the other team works. The work done one team must compliment the work done by other team, we agree to this and will strive to do the same in the duration of the project.

Participation:

A team of eight member is expected to give a viable output at the end of the project and due to this there might occur two completely contrast scenarios. First one, a particular team member is burdened with a lot of work and has no time to help others. Team members are to understand this situation and are expected to provide with needed space to that person. On the contrary, if a team member has not been assigned any other work, it is to be noted that he must take stand and try to help the team in any way possible. Active participation of the entire team is expected at all times and this ensures on time completion of works.

Openness and Helping:

It is understood that all the team members are acquainted with their own skill sets and might be lacking the skill sets that are needed in the project. The team should

User: Doctor



About

Age: 40

Gender: Female

Occupation: Senior Radiologist

Location: NewYork

Hospital: NYC Health + Hospitals

DR. SARAH JOHN

DESCRIPTION

A dedicated medical professional striving to provide accurate diagnoses while managing time efficiently, seeking Al-driven support to enhance patient care.

CHALLANGES

- Spends too much time manually reviewing medical images.
- Struggles with unstructured patient history and reports.
- Managing appointments and lastminute schedule changes is inefficient.

- Wants Al-powered tools to assist in faster and more accurate diagnostics.
- Prefers a centralized system to access patient history easily.
- Needs a well-organized appointment and consultation management system.



User: Patient



About

Age: 45

Gender: Male

Occupation: Bank Manager

Company: TD Bank Location: New Jersey

MARK THOMPSON

DESCRIPTION

A devoted parent striving to manage his family's health efficiently, looking for a hassle-free way to keep medical information organized and accessible.

CHALLANGES

- He struggles to keep track of family health records.
- Maintaining work and health care responsibilities.
- Lack of a system to monitor recurring health issues.

- Wants the best way to access and organize health information.
- Needs a straightforward approach to track symptoms and past treatments.
- Want more efficient way to navigate healthcare for his family.



User: Admin



About

Age: 38

Gender: Female

Occupation: Lab Technician
Hospital: NYC Health + Hospital

Location: New York



EMILY CARTER

DESCRIPTION

A diligent coordinator responsible for keeping healthcare operations smooth, looking for an efficient way to manage appointments and patient records seamlessly.

CHALLANGES

- Managing a large volume of patient appointments manually.
- Ensuring that doctors' schedules are not overbooked.
- Keeping track of patient medical records efficiently.

- Wants a streamlined system to handle patient bookings and cancellations.
- Needs an easy way to access inbound and outbound patient records.
- Requires integration with hospital management systems (HMS).

User: Patient



About

Age: 32

Gender: Female

Occupation: Software Employee

Company: Accenture Location: Brooklyn



LISA BROWN

DESCRIPTION

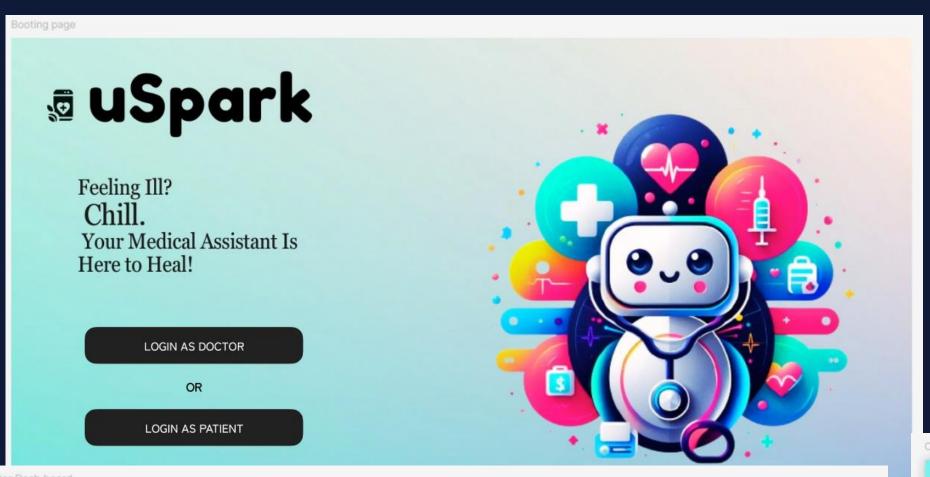
An individual who values convenience and reliable health guidance, looking for a simple way to make informed healthcare decisions without unnecessary hospital visits.

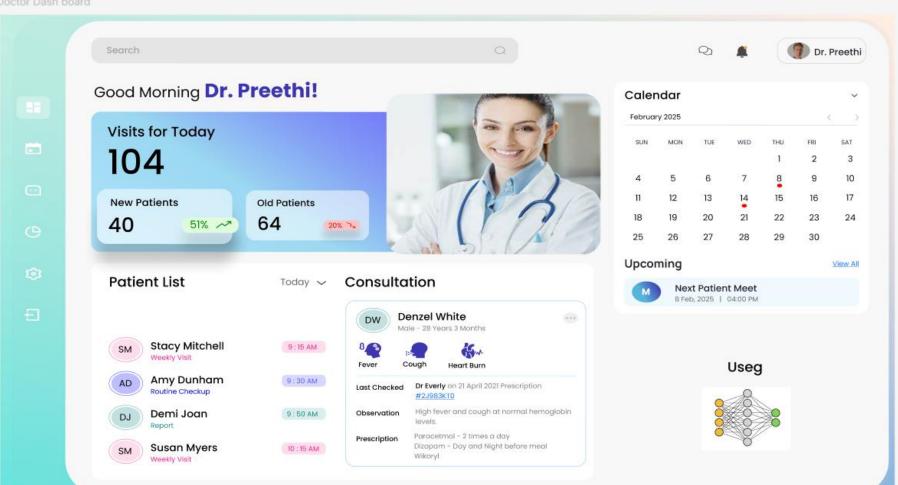
CHALLANGES

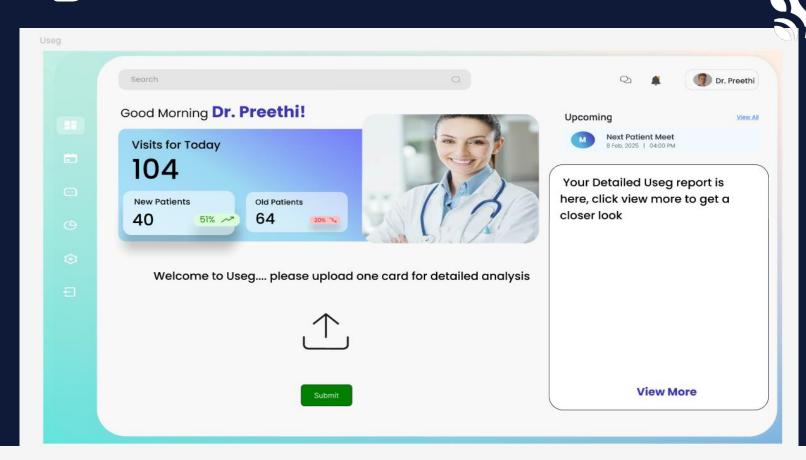
- Doesn't visit hospitals often but needs occasional medical guidance.
- Wants reliable health information instead of Googling symptoms.
- Prefers flexible, on-demand healthcare services.

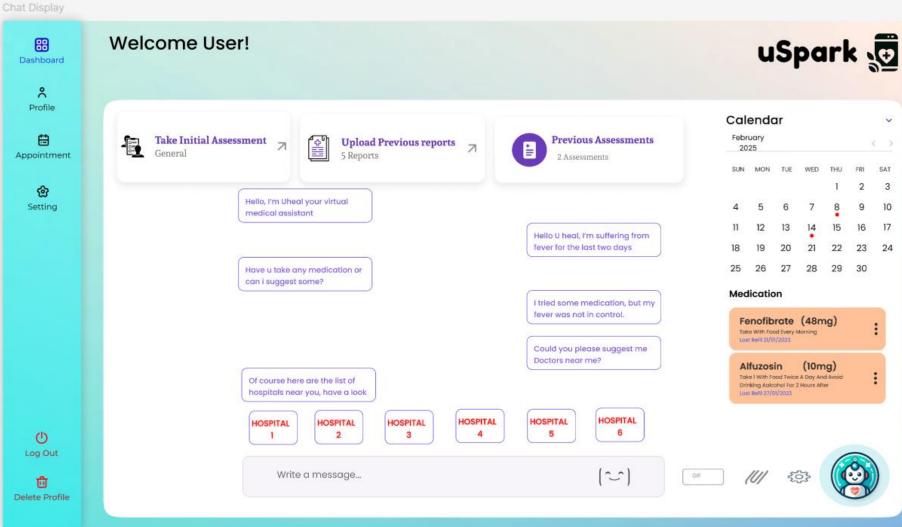
- Wants access to trusted medical advice without needing an appointment.
- Needs a way to consult a doctor only when necessary.
- Require better way to understand symptoms and health concerns.

Product Design



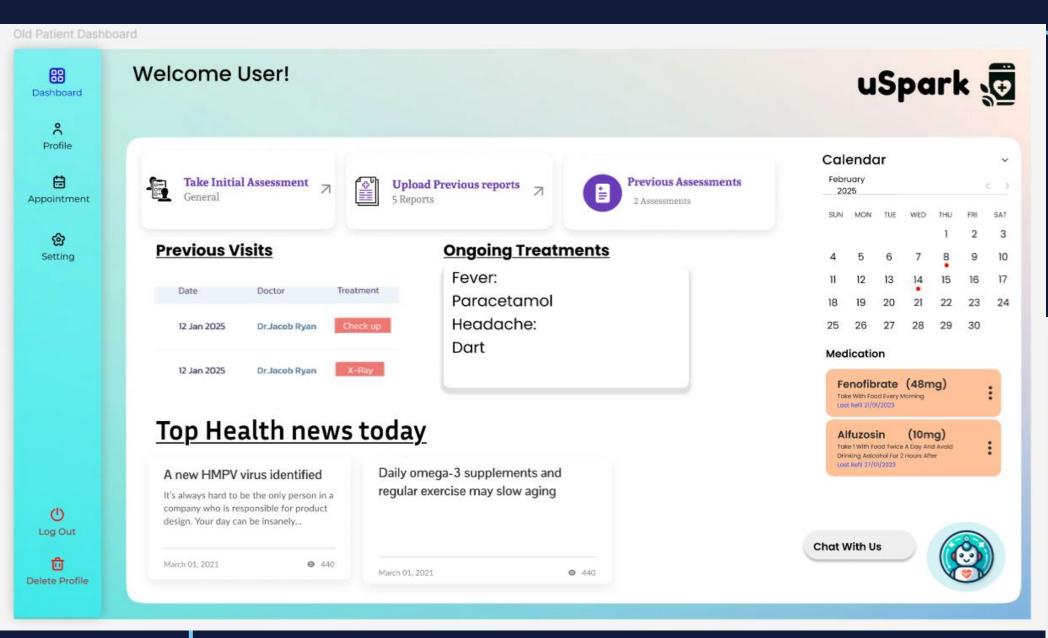


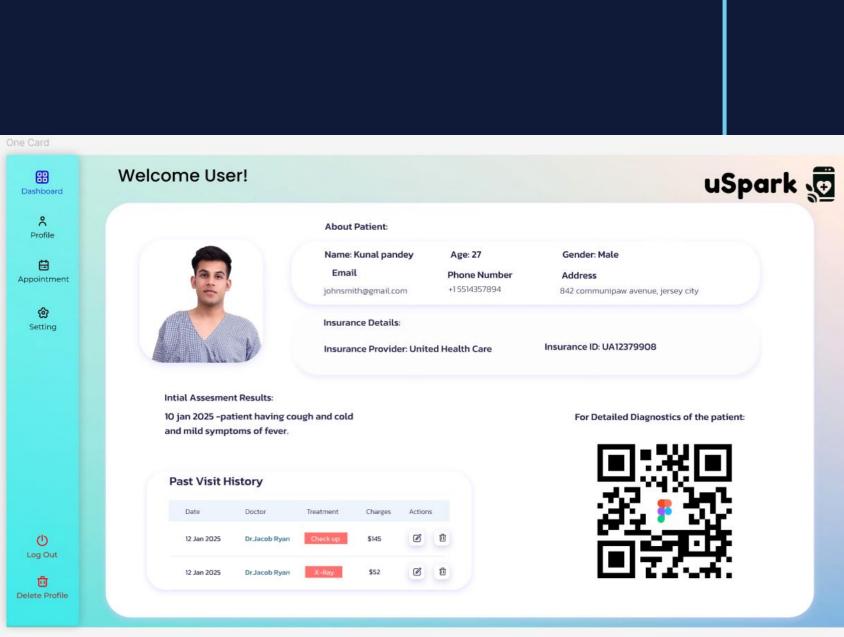




MVP Design

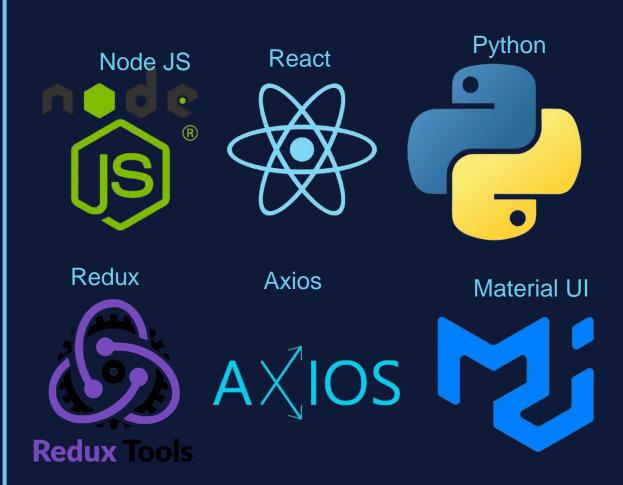






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Technologies and Tools







Libraries, Algorithms and Frameworks, Database



Tools

POSTMAN

<u>Algorithms And Models:</u>

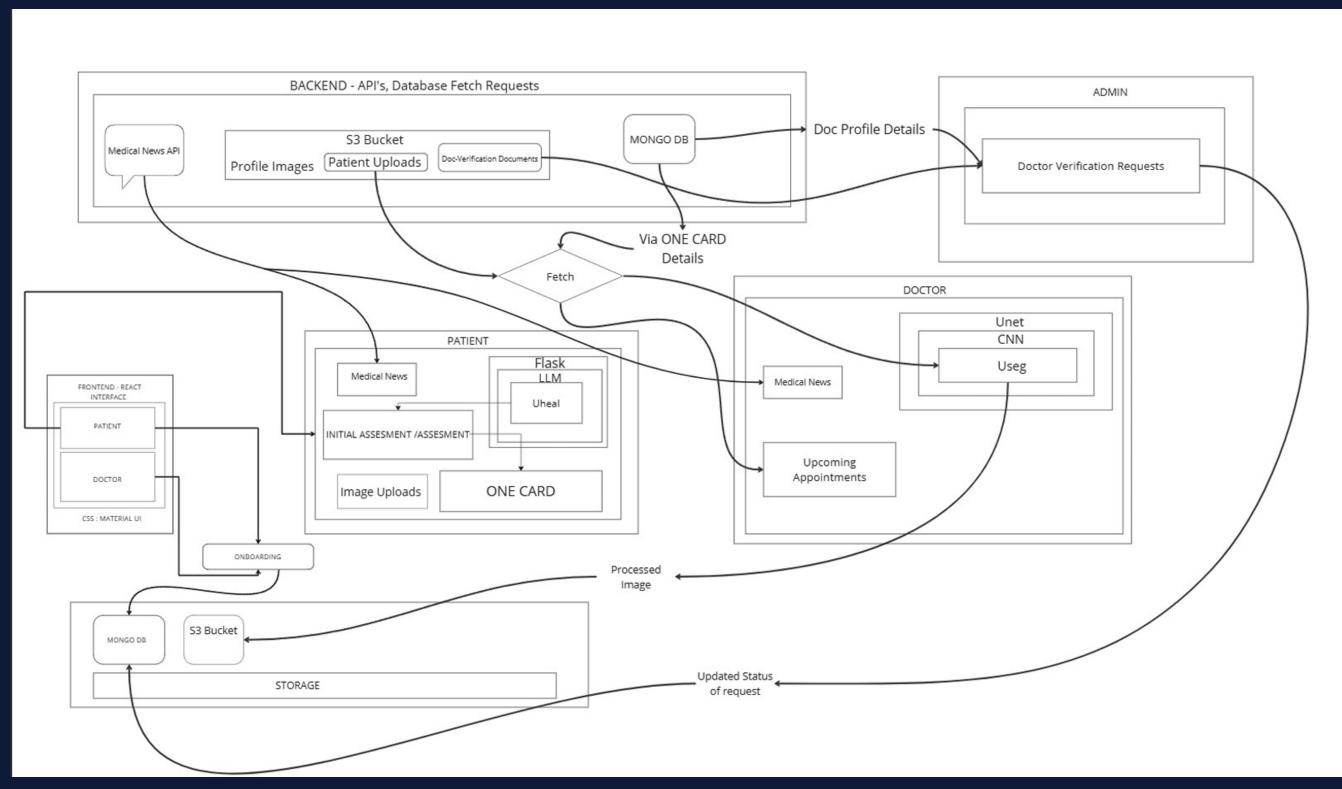
- Rag Retrieval-Augmented Generation
- Densnet
- Resnet
- DialoGPT



Diagrams

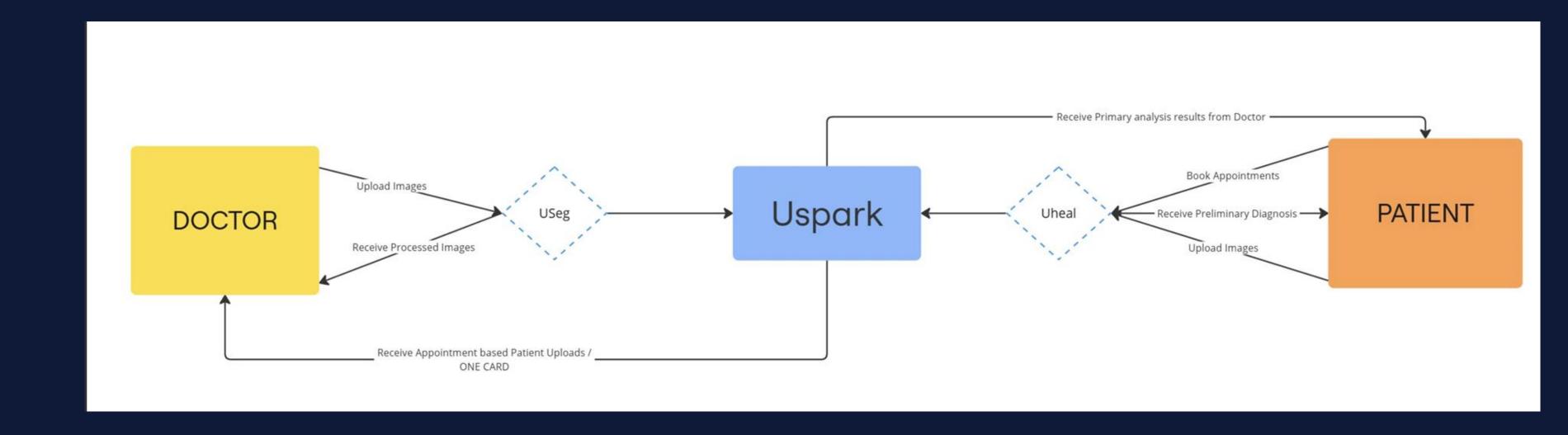
Architecture Diagram





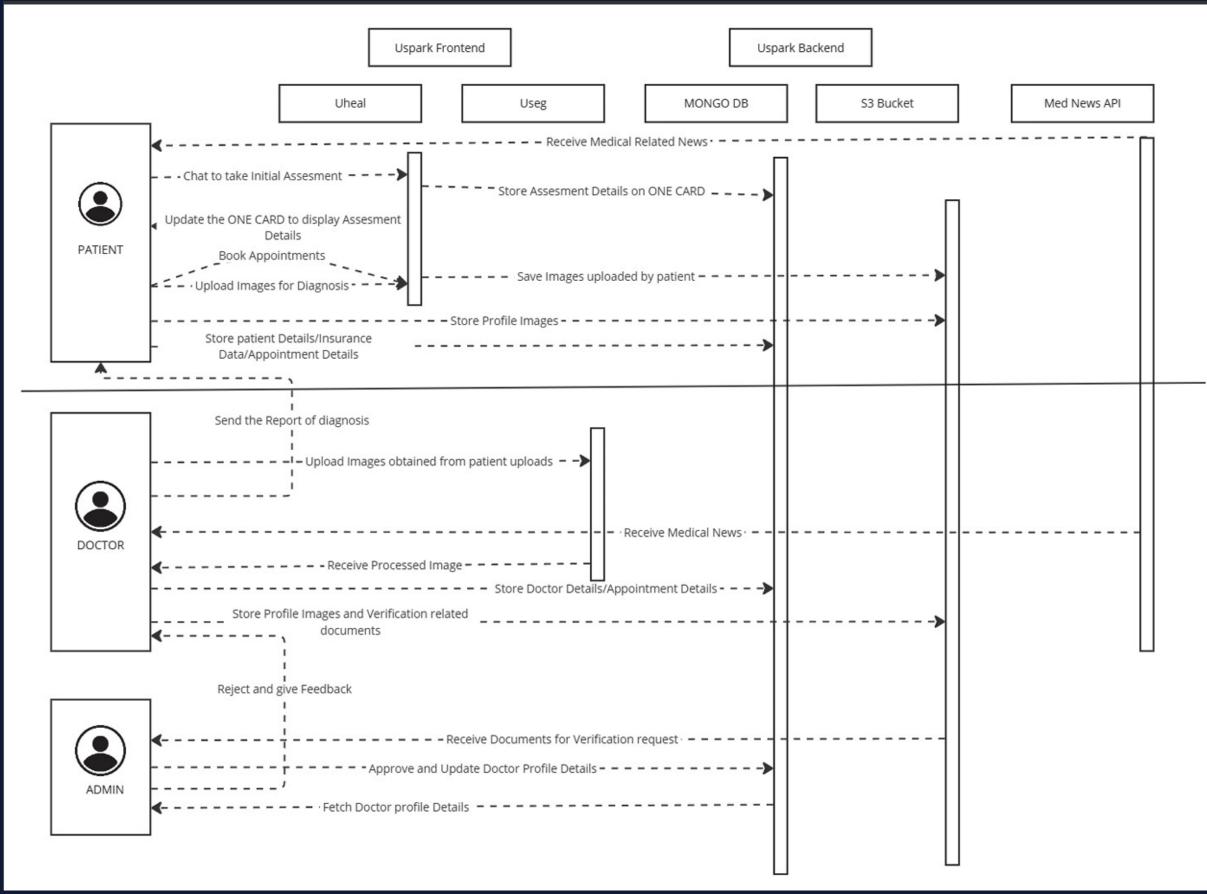


Context Diagram



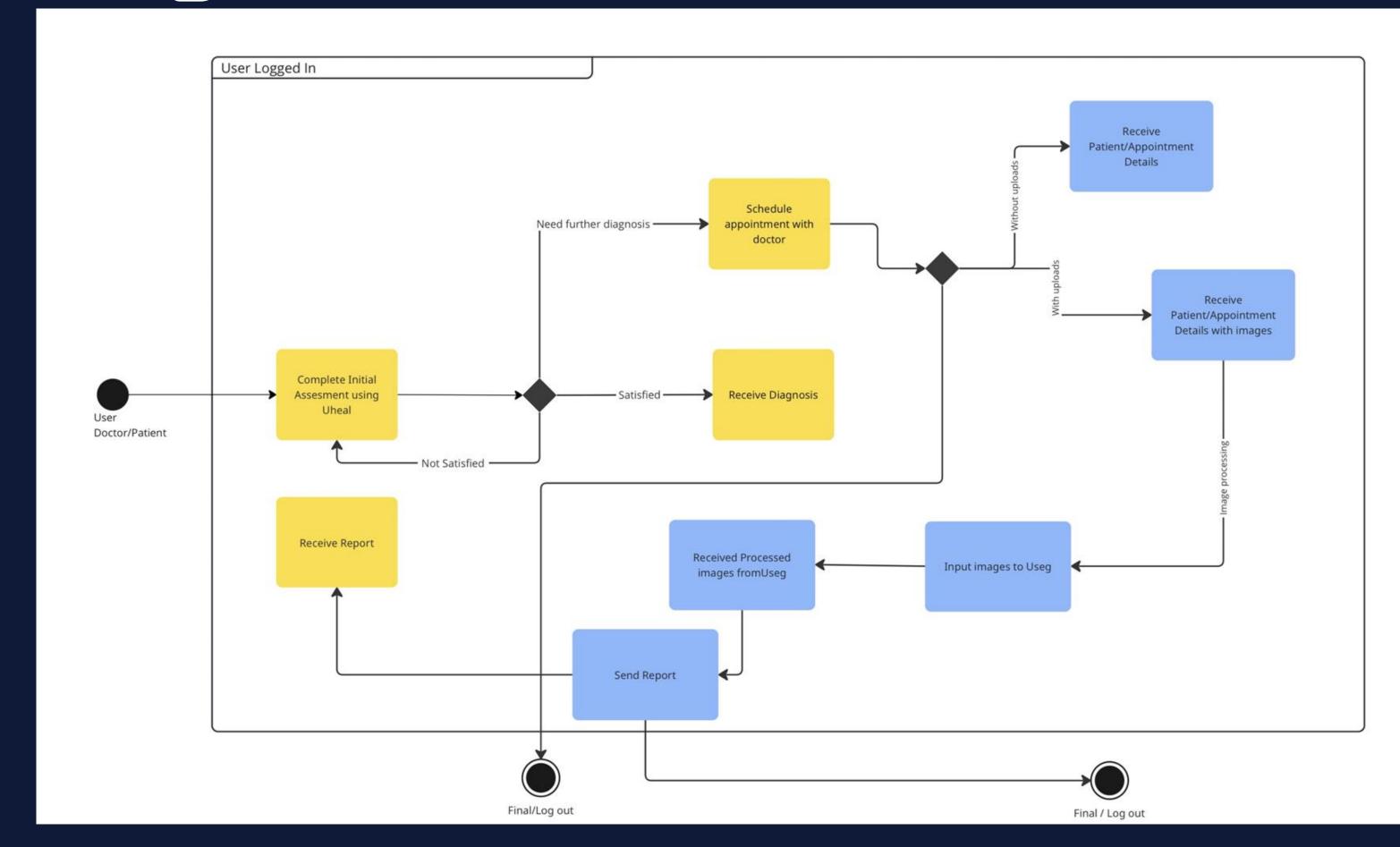
Sequence Diagram





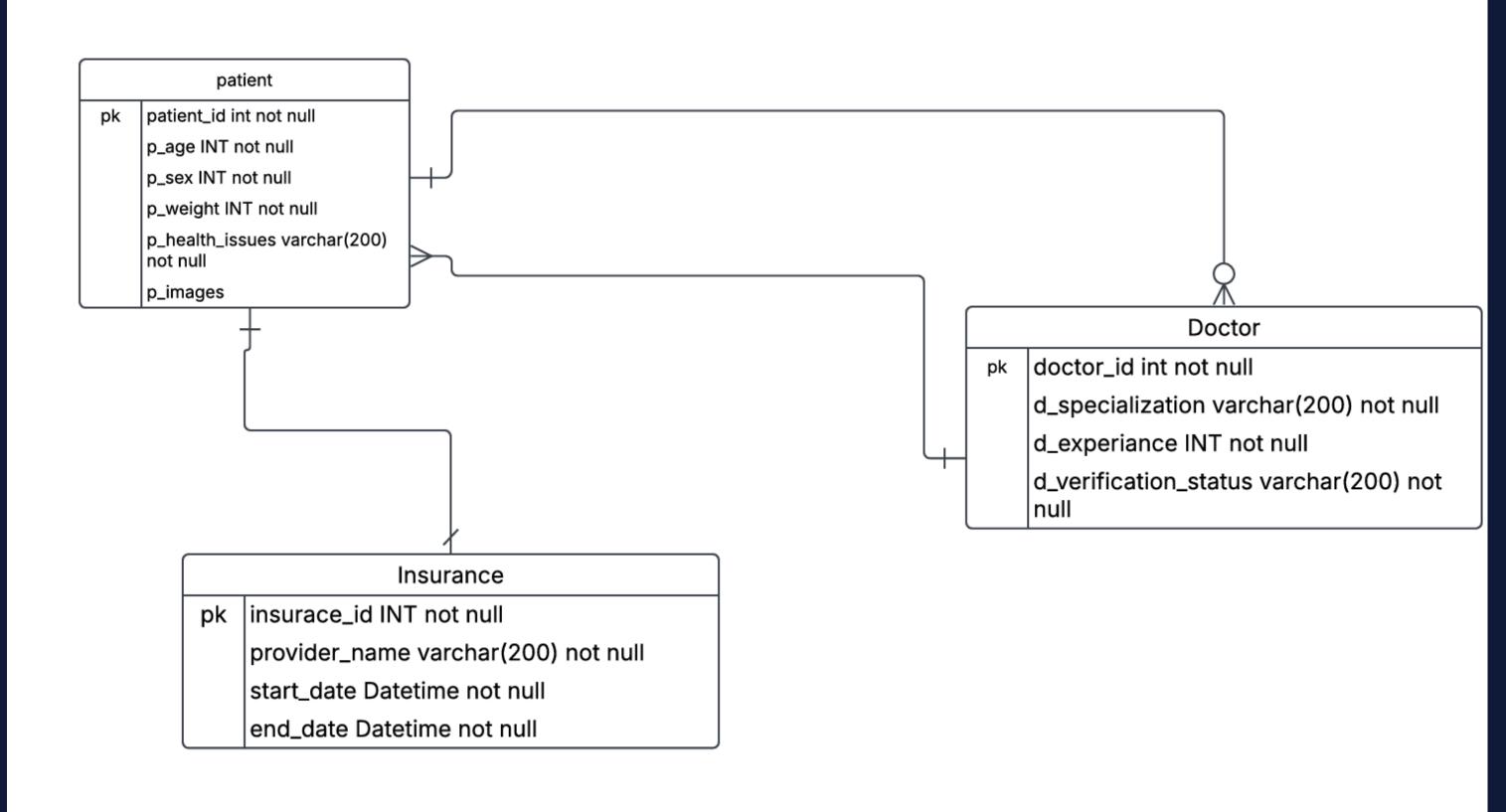
State Diagram





Class Diagram





Product Backlog



S.NO	USER STORIES	ACCEPTANCE CRITERIA	FEATURE	STORY POINTS
US_1	As a patient, I want to sign up using email, phone, or social media so that I can access the application.	Given a patient accesses the signup page, When they enter valid credentials (email, phone, or social media), Then they should successfully create an account and log in.	Patient sign-up via email, phone, or social media	3
US_2	As a patient, I want to reset my password in case I forget it.	Given a patient clicks on "Forgot Password," when they enter a registered email or phone, then they should receive a reset link or OTP.	Password reset functionality	
US_3	As a patient, I want to create and update my profile with personal details, and insurance information.	Given a patient is logged in, when they update personal, medical, or insurance details, then the changes should be saved.	Patient profile management	
US_4	As a patient, I want to view my past appointments and prescriptions in my profile.	pointments and prescriptions in my "Appointments" or "Prescriptions," then they should see a history o		
US_5	As a patient, I want to store my past medical assessments and reports for future reference.	Given a patient uploads a report, when the file is successfully processed, then it should be saved securely	Upload & store medical assessments and reports	
US_6	As a patient, I want to share my medical history with doctors for better diagnosis.	Given a patient selects a doctor, when they choose to share medical history, then the doctor should be granted access.	Share medical history with doctors	
US_7	As a patient, I want to schedule an appointment with a doctor based on available time slots.	Given a patient search for a doctor, when they select a time slot and confirm, then the appointment should be booked.	Appointment scheduling via Uheal.	
US_8	As a patient, I want to choose between virtual or in-person appointments.	Given a patient is booking an appointment, when they select "Virtual" or "In-Person," then the system should confirm their choice.	Choose virtual or in-person consultation via Uheal.	



US_9	As a patient, I want to receive appointment confirmation via email or SMS.	Given a patient books an appointment, when it is confirmed, then they should receive an email or SMS notification.	Appointment confirmation via email/SMS via Uheal.	
US_10	As a patient, I want to reschedule or cancel an appointment.	Given a patient has an appointment, when they request to reschedule or cancel, then the system should update accordingly.	Reschedule or cancel appointments via Uheal.	
US_11	As a patient, I want to search for doctors based on specialty, availability, and location.	Given a patient is on the search page, when they filter by criteria, then only matching doctors should be displayed.	Search doctors based on specialty, availability, and location via Uheal.	
US_12	As a patient, I want to see ratings and reviews for doctors before booking an appointment	Given a patient views a doctor's profile, when reviews exist, then they should be displayed.	View doctor ratings and reviews via Uheal.	
US_13	As a patient, I want to receive a preliminary diagnosis from application based on my symptoms.	Given a patient interacts with the chatbot, when they provide symptoms, then the chatbot should generate a preliminary diagnosis.	Al-based preliminary diagnosis via Uheal.	
	As a patient, I want suggestions whether I need an in-person visit, virtual consultation, or self-care.	Given a patient enters symptoms, when the AI assesses them, then it should suggest self-care, virtual, or in-person visits.	Al-based consultation suggestions via Uheal.	
US_15	As a patient, I want to join a video call for virtual consultations	Given a patient has a virtual appointment, when they click "Join Call," then they should be connected.	Video call for virtual consultations via Uheal.	
US_16	As a patient, I want recommend doctors based on my condition.	Given a patient provides symptoms, when AI processes the data, then it should recommend the best doctor.	Al doctor recommendations based on condition.	

US_17	As a patient, I want to link my health insurance to cover consultation charges.	Given a patient has insurance, when they enter valid details, then the system should verify and apply coverage.	Link health insurance for payment coverage	5
US_18	As a doctor, I want to register and submit my credentials for verification.	Given a doctor registers, when they submit credentials, then the system should send it for admin approval.	Doctor registration and Onboarding	5
US_19	As a doctor, I want to login to my profile, and view my details	Given a doctor logs in, they should be directed to their dashboard and should be able to view their profile details.	Doctor profile management	3
US_20	As a doctor, I want to see a list of my upcoming and past appointments.	Given a doctor is on the dashboard, when they check "Appointments," then they should see scheduled consultations.	Appointment Management	
US_21	As a doctor, I want to manage my patients' health records and notes.	Given a doctor accesses a patient profile, when they add or update notes, then the system should store the data securely.	Manage patient health records and notes can be done with one card	
US_21	As a doctor, I want to upload medical images (X-rays, MRIs, CT scans) for AI processing.	Given a doctor uploads an image, when AI processes it, then results should be displayed.	Upload medical images (X-rays, MRIs, CT scans) for Al processing via Useg.	
US_22	As a doctor, I want to get heat maps and segmented outputs for easier diagnosis.	Given an image is processed, when AI detects anomalies, then the doctor should receive a heatmap/segmentation output.	Al-based heat maps & segmented output via Useg.	8
US_23	As a doctor, I want to get potential diagnoses based on biomedical images.	Given a doctor uploads an image, when AI evaluates it, then the system should provide diagnostic insights.	Al-generated potential diagnosis based on biomedical images via Useg.	
US_24	As a doctor, I want to receive notifications when a patient books or cancels an appointment.	Given a patient books or cancels, when the status changes, then the doctor should receive a notification.	Receive notifications for appointments	
US_25	As an admin, I want to manage and verify doctors' credentials before they are approved.	Given a doctor submits credentials, when the admin reviews them, then they should be able to approve or reject the request.	Manage doctor verification & approval via Admin dashboard.	5
US_26	As an admin, my dashboard needs access by me only not by others for security purposes.		Monitor system activity & security	7 5





S.NO	USER STORIES	ACCEPTANCE CRITERIA	FEATURE	STORY POINTS
US_01	As a patient, I want to sign up using email, phone, or social media so that I can access the application.	Given a patient accesses the signup page, When they enter valid credentials (email, phone, or social media), Then they should successfully create an account and log in.	Patient sign-up via email, phone, or social media	3
US_03	As a patient, I want to create and update my profile with personal details and insurance information.	Given a patient is logged in, when they update personal, medical, or insurance details, then the changes should be saved.	Patient profile management	4
US_18	As a doctor, I want to register and submit my credentials for verification.	Given a doctor registers, when they submit credentials, then the system should send it for admin approval.	Doctor registration and Onboarding	5
US_22	As a doctor, I want to get heat maps and segmented outputs for easier diagnosis.	Given an image is processed, when AI detects anomalies, then the doctor should receive a heatmap/segmentation output.	Al-based heat maps & segmented output via Useg.	8
US_25	As an admin, I want to manage and verify doctors' credentials before they are approved.	Given a doctor submits credentials, when the admin reviews them, then they should be able to approve or reject the request.	Manage doctor verification & approval via Admin dashboard.	5
US_19	As a doctor, I want to login to my profile, and view my details	Given a doctor logs in, they should be directed to their dashboard and should be able to view their profile details.	Doctor profile management	3

SPRINT 1 TEST CASES



US_19: As a doctor, I want to login to my profile, and view my details.

-	

TC	Test Case	Steps	Expected Result	Status	Execution date	Tester
TC_19_01	Load Login Page	1. Navigate to /login2. Check if the login page loads successfully	Login page should be displayed with all necessary elements visible	Pass	Feb-20	Uday
TC_19_02	Invalid Login	 Enter an incorrect email and password Click the login button 	An error message should be displayed indicating incorrect credentials	Pass	Feb-20	Uday
TC_19_03	Valid Login	 Enter a valid email and password Click the login button Wait for authentication and redirection 	User should be successfully logged in and redirected to the	Pass	Feb-20	Uday

Us_01 As a patient, I want to sign up using email, phone, or social media so that I can access the application.



ТС	Test Case	Steps	Expected Result	Status	Execution date	Tester
TC_01_01	Load Signup Page	 Navigate to /signup Check if the signup page loads successfully 	Signup page should be displayed with all necessary elements visible	Pass	Feb-22	Sairam
TC_01_02	Password Mismatch	 Enter a valid name and email Enter two different passwords Click the signup button 	An error message should be displayed indicating that passwords do not match	Pass	Feb-22	Sairam
TC_01_03	Successful Signup	 Enter a valid name, email, and matching passwords Click the signup button Wait for redirection 	User should be successfully registered and redirected to the onboarding page	Pass	Feb-22	Sairam
TC_01_04	Required Fields	1. Click the signup button without entering any details	Error messages should be displayed indicating that all fields are required	Pass	Feb-22	Sairam
TC_01_05	Google Signup	 Click the 'Sign up with Google' button Wait for Google OAuth to initiate 	User should be redirected to Google's authentication flow	Pass	Feb-22	Sairam
TC_01_06	Apple Signup	 Click the 'Sign up with Apple' button Wait for Apple OAuth to initiate 	User should be redirected to Apple's authentication flow	Pass	Feb-22	Sairam



US_18: As a doctor, I want to register and submit my credentials for verification.

тс	Test Case	Steps	Expected Result	Execution Status	Execution date	Tester
TC_18_01	Signup and Complete Onboarding	user 2 Click the signup button	User should be successfully signed up and redirected to the dashboard with a welcome message	Pass	Mar-03	Sujit
TC_18_02	Unauthenticated	2. Directly visit the	User should be automatically redirected to the login page, preventing unauthorized access	Pass	Mar-03	Sujit
	Dashboard	3. Click the login button	User should be redirected to the dashboard and see a welcome message	Pass	Mar-03	Sujit

US_03: As a patient, I want to create and update my profile with personal details and insurance information.



ТС	Test Case	Steps	Expected Result	Execution Status	Execution date	Tester
TC_03_01	Signup and Complete Onboarding	 Navigate to the signup page and signup with a new user Click the signup button Fill in onboarding details and submit the onboarding form 	User should be successfully signed up and redirected to the dashboard with a welcome message	Pass	Mar-05	Sairam
TC_03_02	Redirect Unauthenticated Users	 Open a new browser session Directly visit the /onBoarding URL without logging in 	User should be automatically redirected to the login page, preventing unauthorized access	Pass	Mar-05	Sairam
TC_03_03	Login and Go to Dashboard	Navigate to the login page Enter valid credentials of an already	User should be redirected to the dashboard and see a welcome message	Pass	Mar-05	Sairam
TC_03_04	Setup and Unlock OneCard	1. Enter a 4-digit PIN 2. Click set PIN button 3. Verify PIN is stored in localStorage 4. Enter PIN and unlock OneCard 5. Verify access to Patient Profile	User should successfully set up and unlock OneCard using the correct PIN	Pass	Mar-05	Sairam



TC_03_05	Submit Initial Assessment	1. Navigate to Initial Assessment2. Enter details and comments3. Submit the form	Assessment should be submitted successfully, and confirmation should be visible	Pass	Mar-05	Sairam
TC_03_06	Edit and Save Insurance Details	Click the edit icon in insurance details Modify insurance provider, start date, end date, and holder name Click save and verify details are updated	Insurance details should be updated successfully and displayed correctly	Pass	Mar-05	Sairam
TC_03_07	Fetch and Display Health News	 Check for 'Health Tip of the Moment' Ensure news cards are displayed 	Health tips and news cards should be visible	Pass	Mar-05	Sairam
TC_03_08	Navigate and Logout	Click the sidebar menu Select logout Selection to login page	User should be logged out and redirected to the login page	Pass	Mar-05	Sairam

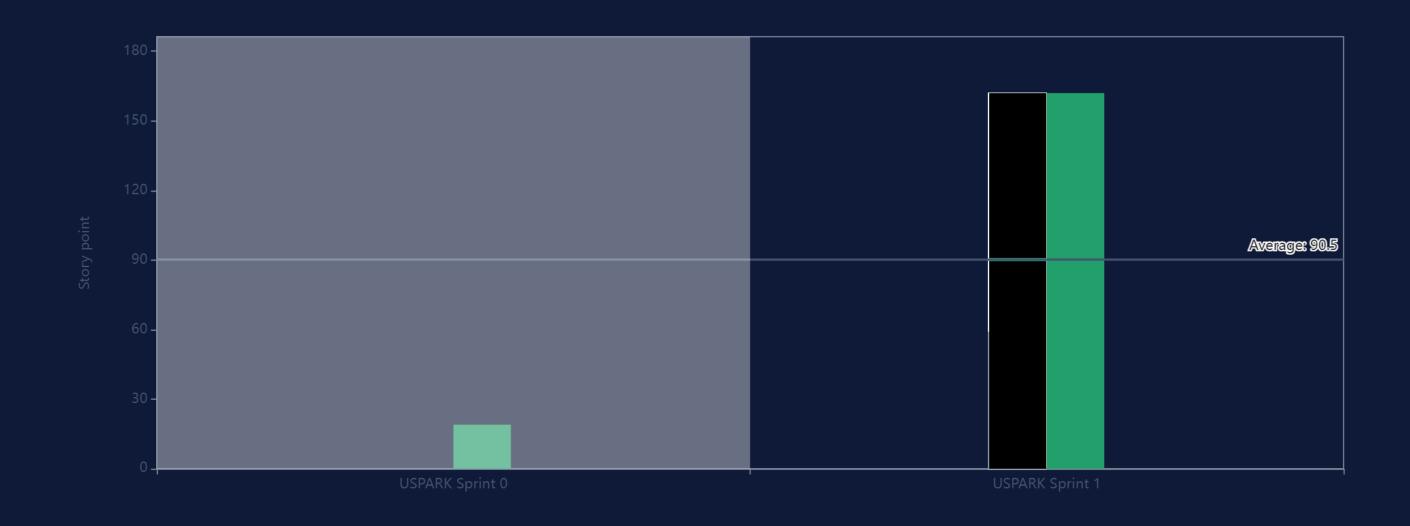
SPRINT 1 STORIES COMPLETED AND NOT:

US_ID	User Story	Completed Date	Story Points	Completed
US_01	As a patient, I want to sign up using email, phone, or social media so that I can access the application.		3	3
	ReactJs with Vite for frontend	Feb 16		
	User OnBoarding Flow (Register / Login using Firebase)	Feb 20		
	Creating Documentation for Login and Registration Screens in React and Nodejs	Feb 27		
US_17	As a patient, I want to link my health insurance to cover consultation charges.		5	5
	Test the One Card Flow and landing page flow after login.	Mar 7		
	Create specific routes in backend - One card Questionaries	Mar 7		
	Document the Landing and One Card Pages and routes	Mar 7		
US_18	As a doctor, I want to register and submit my credentials for verification.		5	5
	Routes creation for backend and user validations	Feb 20		
	Doctor Registration and verification process	Feb 20		
	Setting up State management using Redux.	Feb 20		

	User OnBoarding Flow (Register / Login using Clerk)	Feb 20		
US_22	As a doctor, I want to get heat maps and segmented outputs for easier diagnosis.		8	8
	Data collection for Image Analysis	Feb 15		
	Processing the data for Image Analysis	Feb 20		
	Prototype Design for Image Analysis	Feb 27		
US_25	As an admin, I want to manage and verify doctors' credentials before they are approved.		5	5
	Admin Portal to control	Feb 20		
	Create Valid schema in the backend	Mar 7		
US_26	As an admin, my dashboard needs access by me only not by others for security purposes.		5	5
	Admin Portal to control	Feb 20		
	Create Valid schema in the backend	Mar 7		

Sprint Velocity





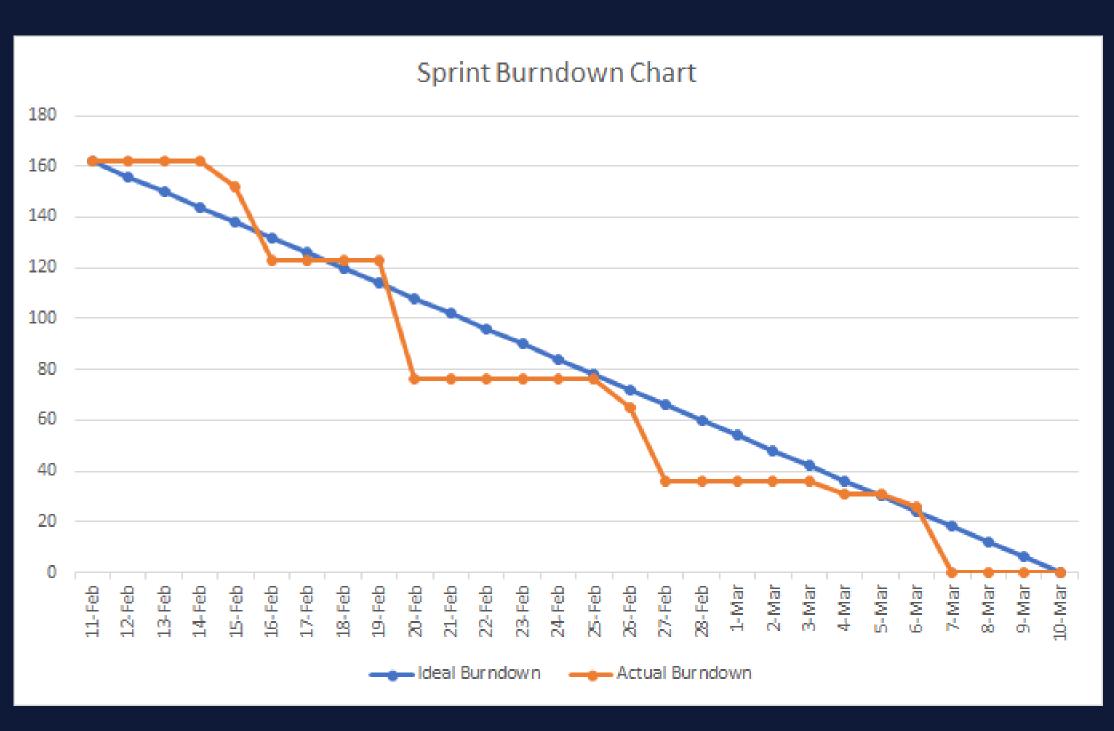
Committed



Completed

METRICS - BURNDOWN CHART

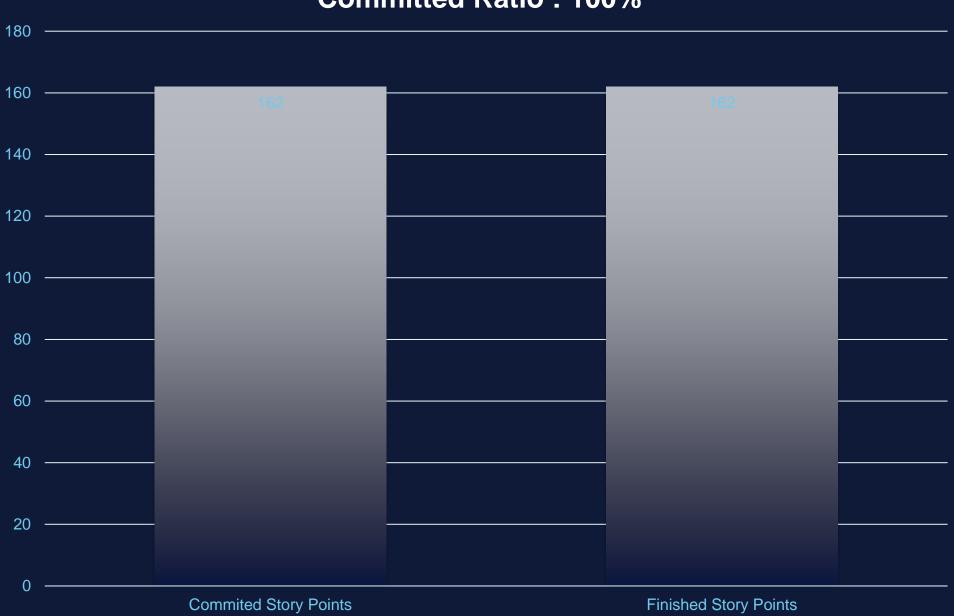




METRICS - COMMITTED RATIO



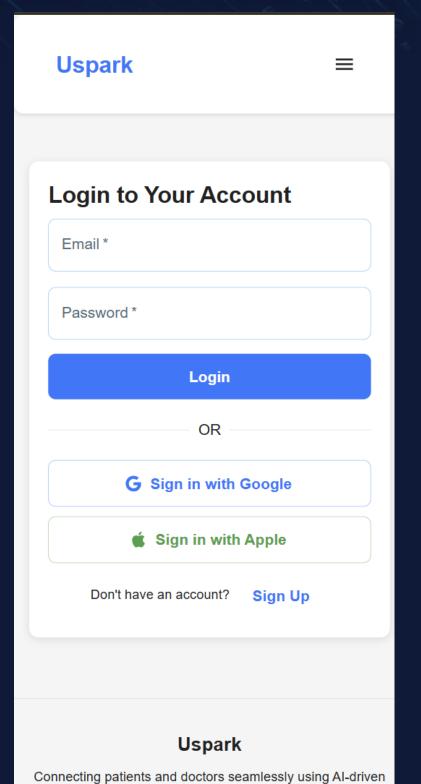




Project Demo

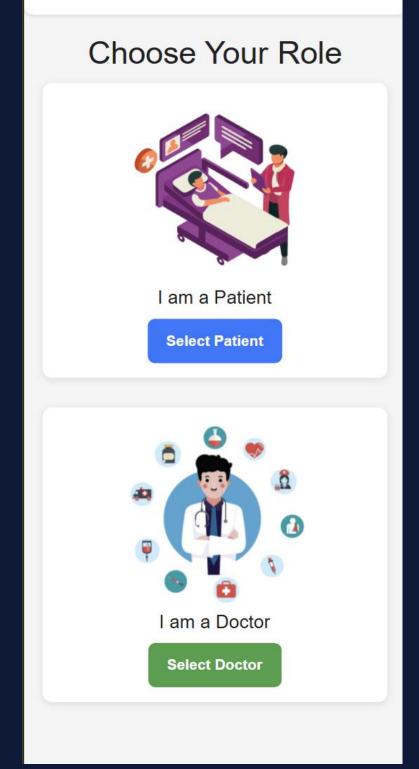
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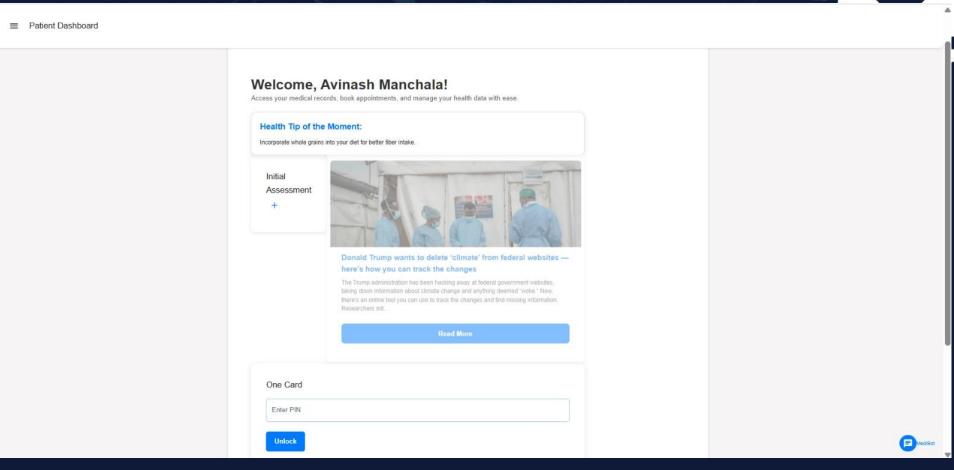


solutions.

Quick Links



Uspark





Age: 22 Gender: male Height: 176 Weight: 76

Health Issues: leg pain

Insurance Details

Provider: NY Insurance

Start Date: 2025-03-05

End Date: 2025-03-31

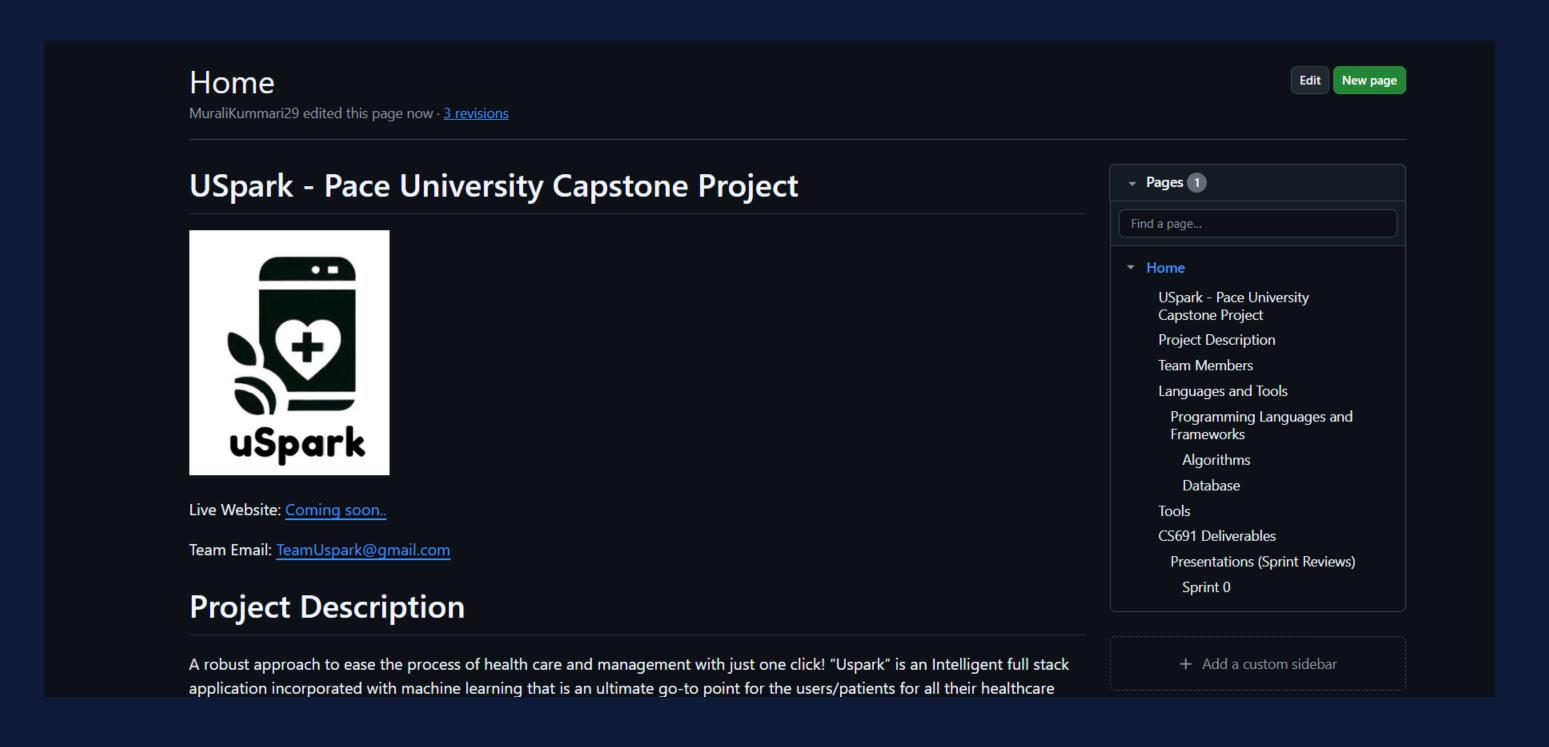
Holder Name: Avinash M

Close

WIKI PAGE



https://github.com/htmw/2025S-RushHour/wiki



THANK YOU

CONTACT US:

teamuspark@gmail.com

