

HYGIEIA

Project Description:

Hygieia - Revolutionizing Healthcare Communication and Management*

In today's healthcare landscape, effective communication and streamlined management are essential for delivering quality care. Hygieia is a groundbreaking project designed to address the myriad challenges faced by healthcare systems worldwide. By leveraging cutting-edge technology and innovative solutions, Hygieia aims to transform the way doctors, patients, pharmacies, and diagnostic services interact, collaborate, and deliver care.

Problem Statement:

Traditional healthcare systems often struggle with fragmented communication channels, disjointed information systems, and inefficient processes. This leads to delays in diagnosis, prescription errors, missed appointments, and suboptimal patient outcomes. Hygieia identifies these pain points and seeks to revolutionize healthcare delivery by providing a unified platform for seamless communication and management.

Key Objectives:

1. Enhanced Communication: Hygieia establishes secure and efficient communication channels between doctors, patients, pharmacies, and diagnostic services. Real-time messaging, video consultations, and instant notifications facilitate timely interactions and decision-making.

2. Integrated Information Systems: Hygieia centralizes electronic health records (EHRs), ensuring comprehensive and accessible patient information. From medical history to current prescriptions, all relevant data is seamlessly integrated, empowering healthcare providers to make informed decisions.

3. Streamlined Prescription Management: Hygieia introduces an e-prescription system that simplifies medication dispensing processes. Doctors can digitally prescribe medications, specify dosages, and monitor patient compliance, while pharmacies receive orders directly, reducing errors and delays.

4. Efficient Diagnostic Coordination: Hygieia integrates diagnostic services, enabling seamless exchange of test results and collaboration between healthcare providers. From imaging studies to laboratory tests, diagnostic data is readily available, facilitating accurate diagnosis and treatment planning.

5. Automated Appointment Scheduling: Hygieia offers an intuitive appointment scheduling system that enhances patient access and provider efficiency. Patients can easily book appointments, receive reminders, and manage their healthcare appointments, reducing no-shows and optimizing clinic workflows.

6. Empowered Remote Patient Monitoring: Hygieia incorporates remote patient monitoring capabilities, enabling healthcare providers to remotely track patient health metrics and intervene proactively when necessary. From chronic disease management to post-operative care, remote monitoring enhances patient outcomes and reduces hospital readmissions.

Project Features:

- **Symptom Input and Diagnosis:** Patients can input symptoms, receive automated diagnoses, and access educational resources for informed decision-making.
- **Medication Prescription and Pharmacy Integration:** Digital prescriptions are seamlessly transmitted to pharmacies, streamlining medication fulfilment and delivery.
- **Doctor Approval Process:** doctors can review patient's symptoms diagnoses history and set them prescriptions.
- **Emergency Doctor Recommendation:** In urgent situations, patients receive recommendations for healthcare providers and can schedule emergency consultations for prompt intervention.

Hygieia represents a paradigm shift in healthcare communication and management, promising to enhance patient care, improve clinical outcomes, and revolutionize the healthcare experience for all stakeholders. With its comprehensive suite of features and user-centric design, Hygieia is poised to redefine the future of healthcare delivery.

ID	Name	Email
21100911	Abdelrahman Mohamed mostafa project manager)	Abdelrahman.kamel.2022@Aiu.edu.eg
21100782	Adham Ayman Farouk	Adham.ibrahim.2022@Aiu.edu.eg
21100832	Abdelrahman Amr Mohamed	abdelrahman.mohamed.2022@aiu.edu.eg
21100861	NourBasem	noor.mohamed.2022@Aiu.edu.eg
22101442	MariamElrafeiMohamed	Mariam.abdelfttah.2023@Aiu.edu.eg

Front-end:

Registration + Home Pages: Mariam Elrafei Mohamed, Abdelrahman Mohamed mostafa

Patient-UI: Abdelrahman Mohamed Mostafa, Nour Bassem

Pharmacy-UI: Adham Ayman Farouk. Abdelrahman Mohamed mostafa

Doctor-UI: Abdelrahman Amr, Abdelrahman Mohamed mostafa

Back-end:

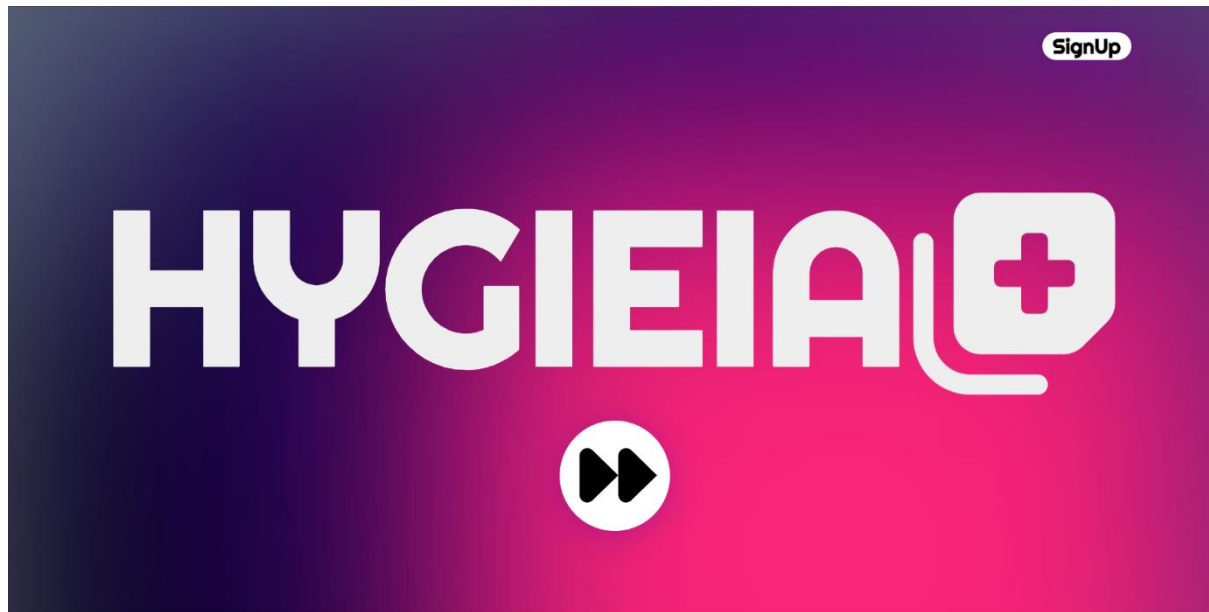
Database: Abdelrahman Mohamed Mostafa

Server: Abdelrahman Mohamed Mostafa

Home UI Pages

1. Landing Page:

This is the first page displayed to the user, the Double arrow logo lead them to the /login page, the signup button leads to the /signup page



2. Signup Page:

Sign Up

Username

Email

Password

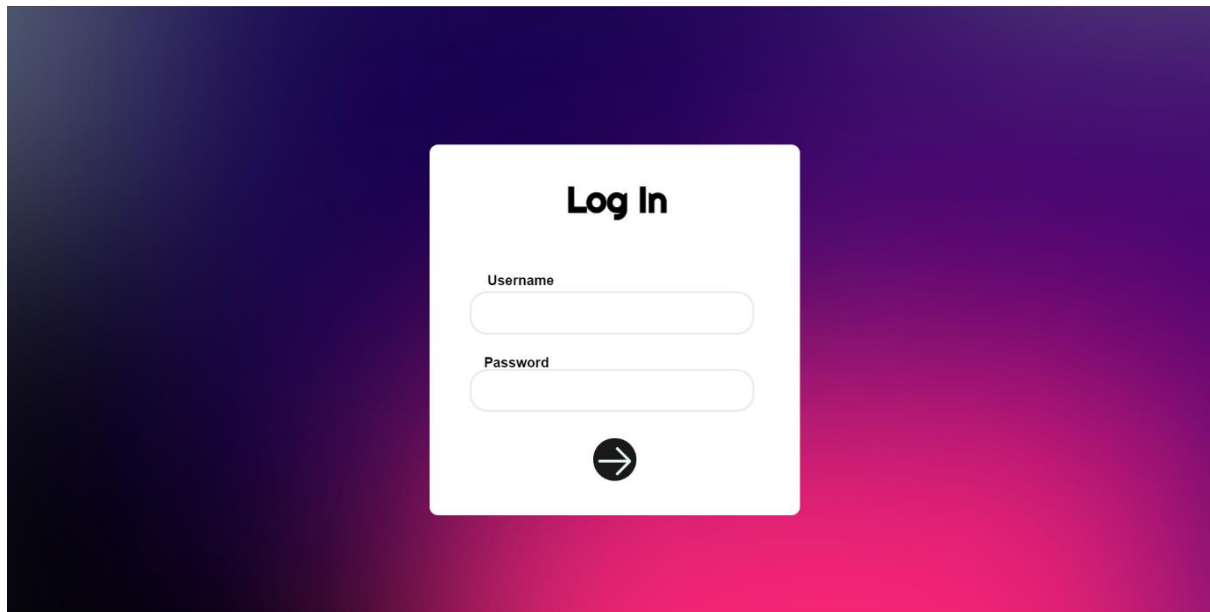
Date of Birth

Gender

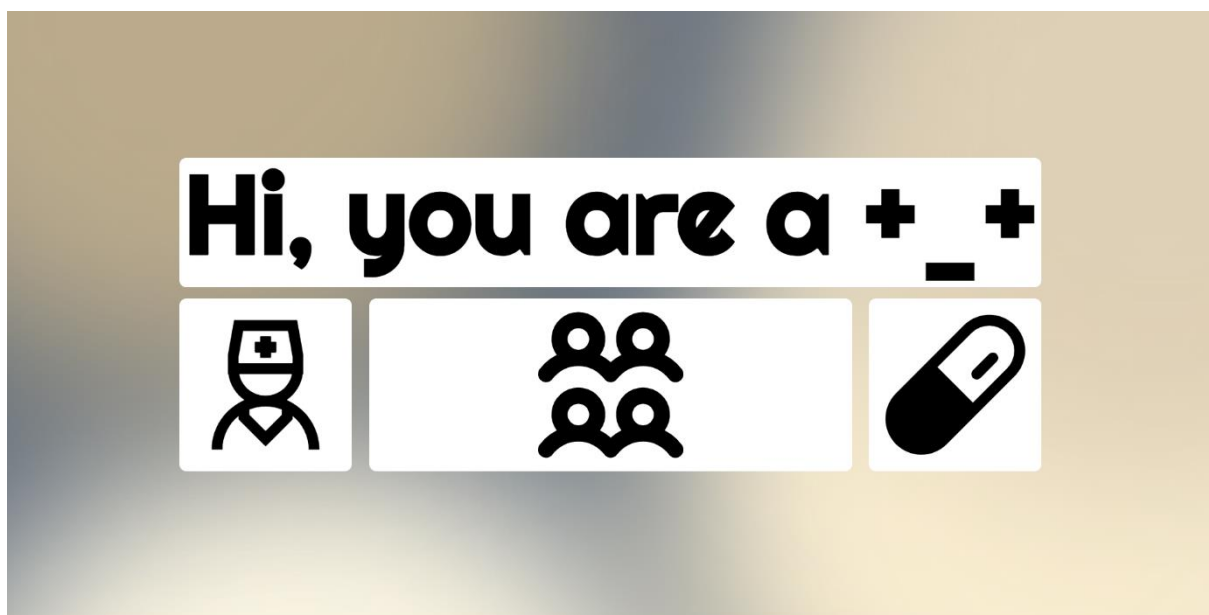
Location

Submit

3. Login Page:



4. Choice Page: (Only Displayed to Admin for testing):



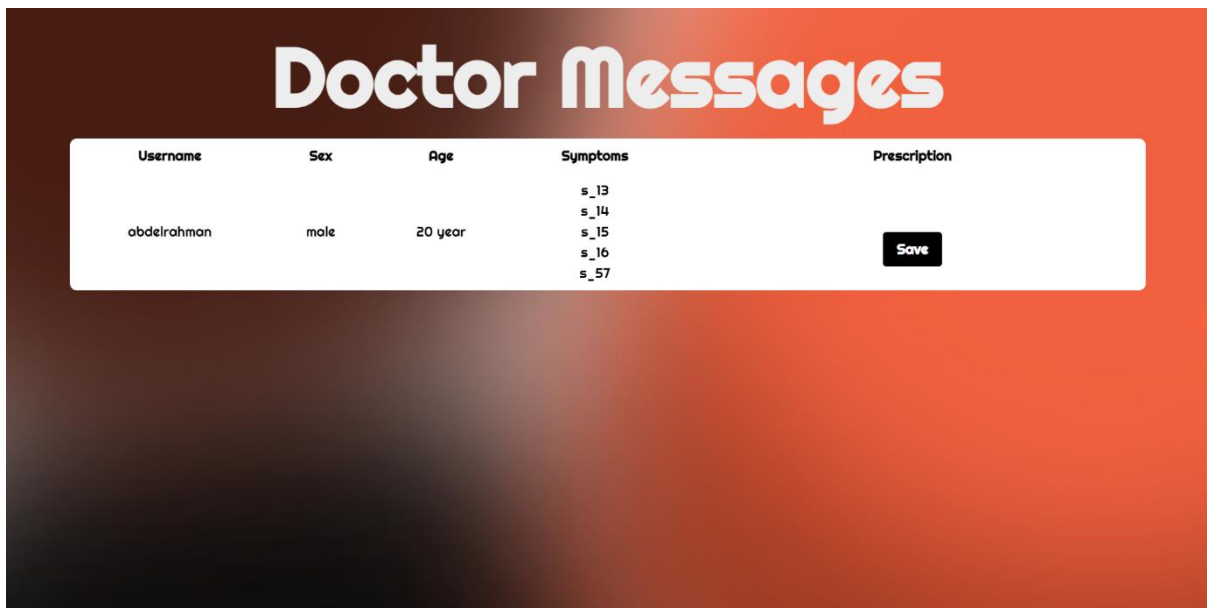
this page gives the admin the access to try all three UI's
(Patient, Doctor and Pharmacy)

Doctor's UI Pages:

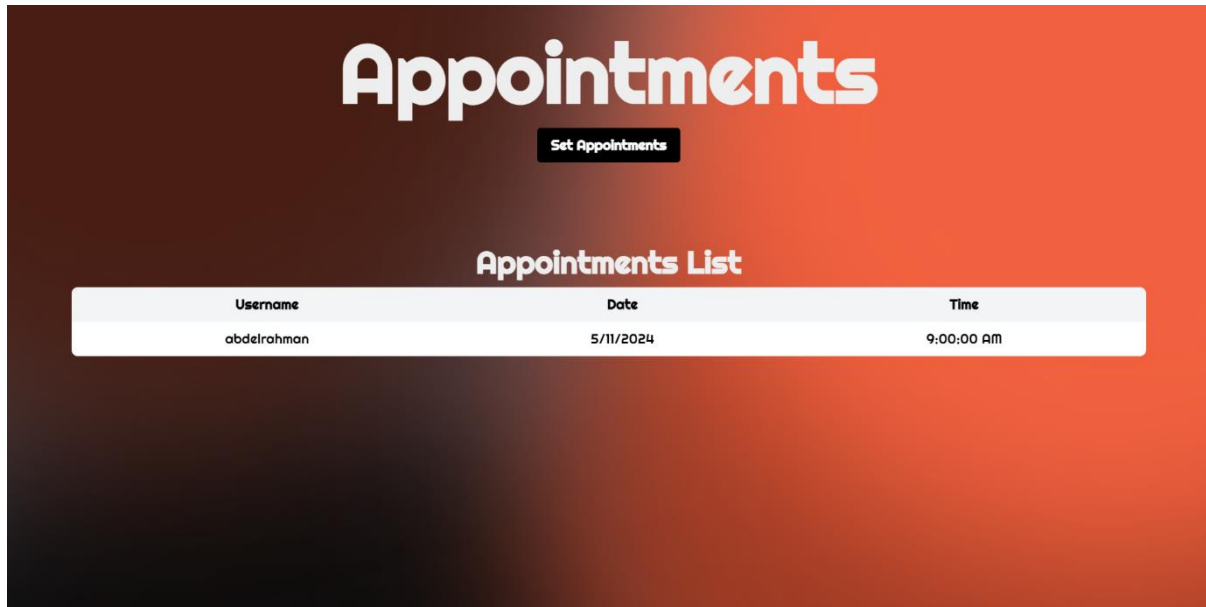
1. **Landing Page:** in the landing page, the doctor has three pages, /doctor Messages, /Appointments and /DoctorRequests .



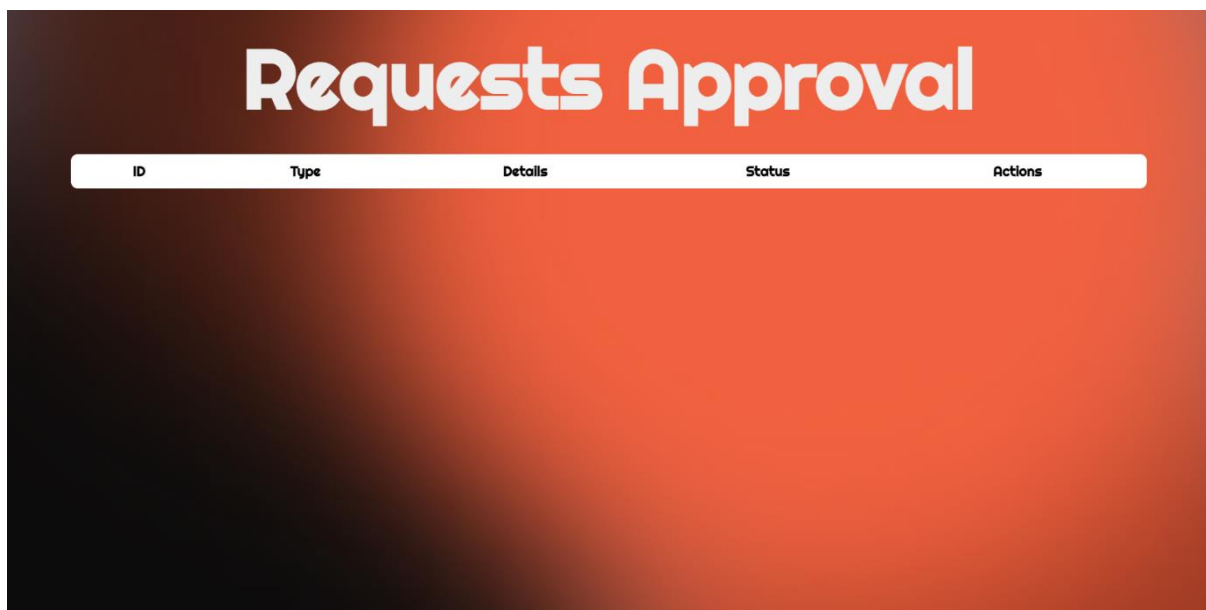
2. **Doctor messages:** this is where the doctor can review the users symptoms and send them prescriptions.



3. **Appointments:** in this page, appointments are automatically saved for users who used the symptom checker.



4. **Requests Approval:** in this page, extra appointments are queued.

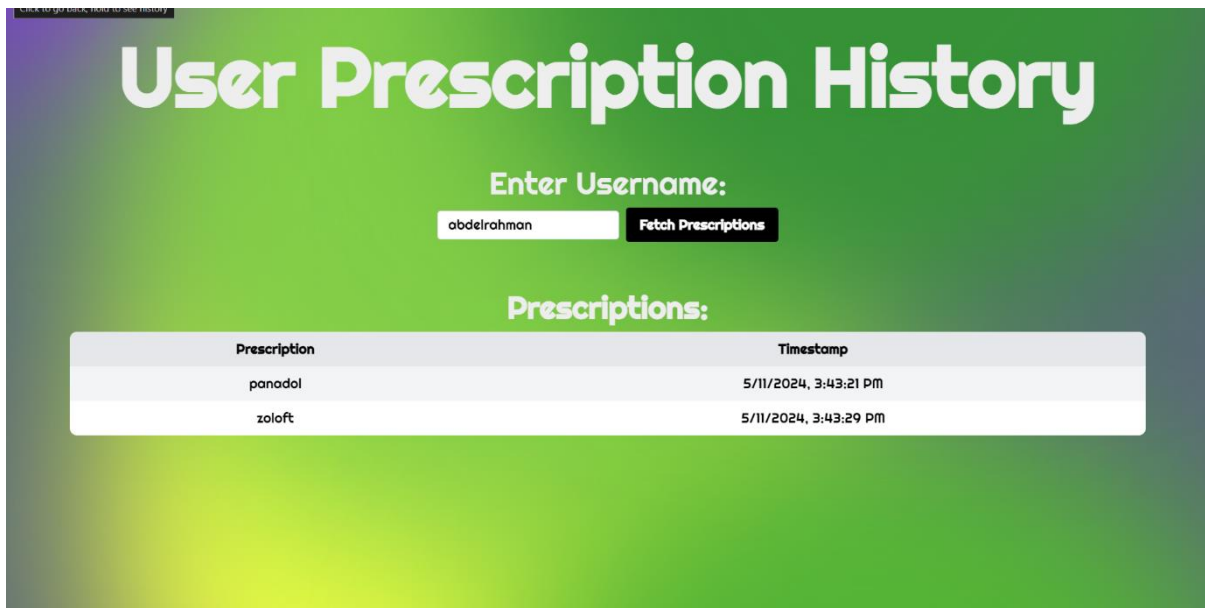


Patient UI Pages:

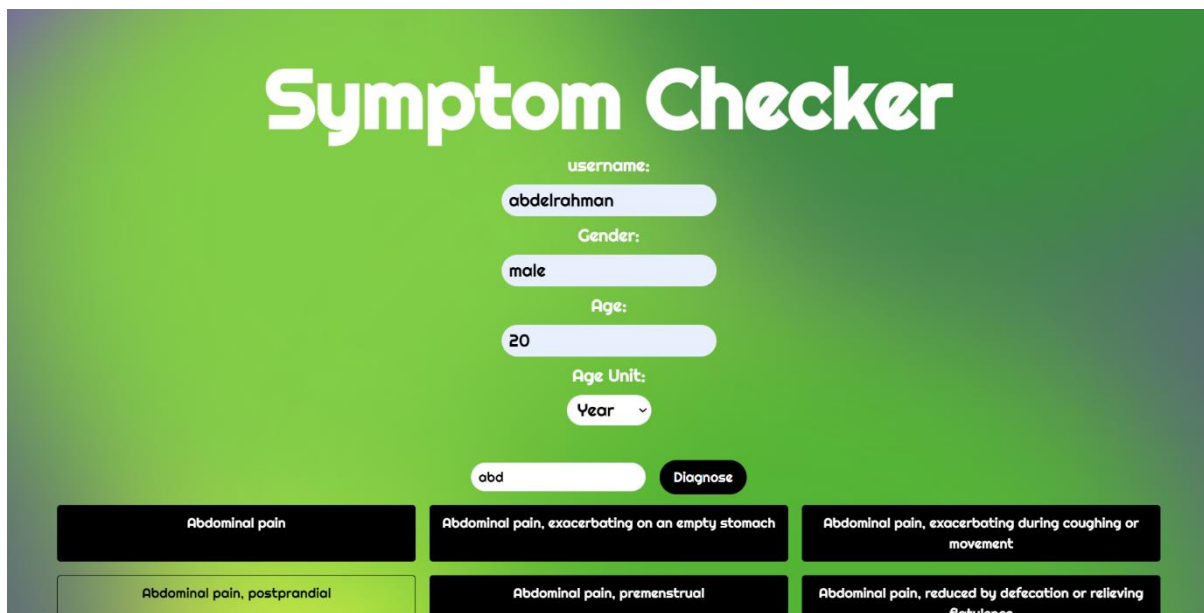
1. Landing Page:



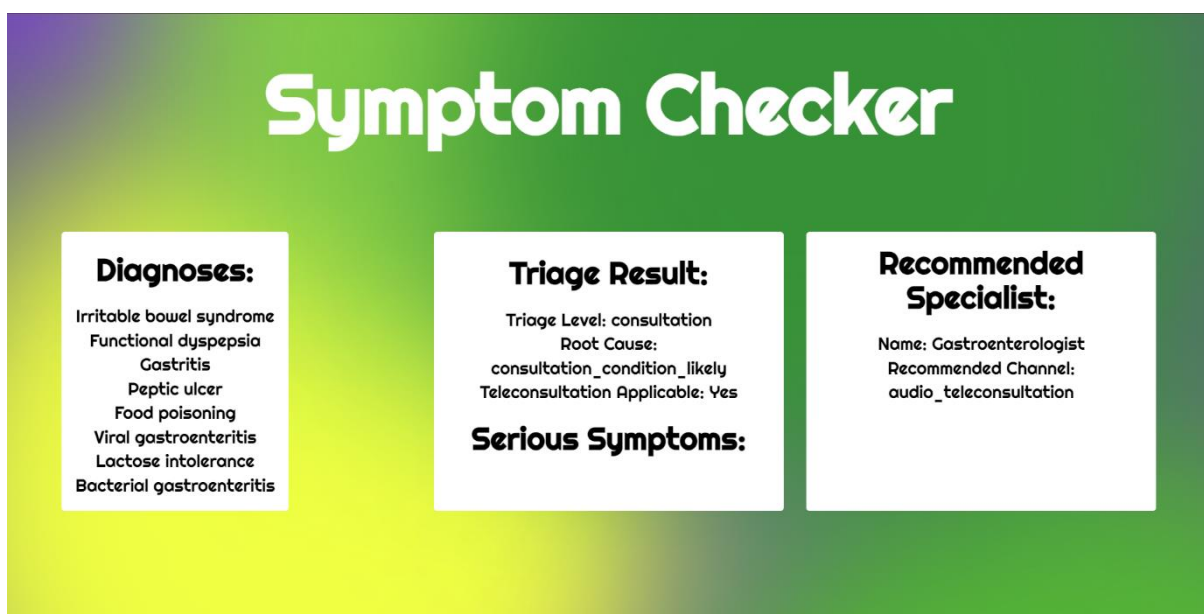
2. User Prescription History: in this page, the prescriptions made by the doctor and sent by the pharmacy are displayed with their date day and timestamp.



3. **Symptom Checker:** in this page the user enters their username, age, gender and search their symptoms, then this API, created by usa company **INFERMEDICA**, uses Artificial intelligence to present an output diagnose, triage and recommended approaches.



The screenshot shows the 'Symptom Checker' input form. It has a green header with the title 'Symptom Checker'. Below the title, there are input fields for 'username:' (filled with 'abdelrahman'), 'Gender:' (filled with 'male'), 'Age:' (filled with '20'), and 'Age Unit:' (a dropdown menu filled with 'Year'). Below these is a search bar filled with 'abd' and a 'Diagnose' button. At the bottom, there are six buttons with different abdominal pain descriptions: 'Abdominal pain', 'Abdominal pain, exacerbating on an empty stomach', 'Abdominal pain, exacerbating during coughing or movement', 'Abdominal pain, postprandial', 'Abdominal pain, premenstrual', and 'Abdominal pain, reduced by defecation or relieving flatulence'.



The screenshot shows the 'Symptom Checker' output results. It has a green header with the title 'Symptom Checker'. Below the title, there are three white boxes with black text. The first box is titled 'Diagnoses:' and lists: Irritable bowel syndrome, Functional dyspepsia, Gastritis, Peptic ulcer, Food poisoning, Viral gastroenteritis, Lactose intolerance, and Bacterial gastroenteritis. The second box is titled 'Triage Result:' and lists: Triage Level: consultation, Root Cause: consultation_condition_likely, and Teleconsultation Applicable: Yes. The third box is titled 'Recommended Specialist:' and lists: Name: Gastroenterologist and Recommended Channel: audio_teleconsultation. Below the third box, there is a section titled 'Serious Symptoms:' which is currently empty.

4. User Symptom History: in this page, the users Symptom checks are saved in logs and displayed, every symptom has an id, which it is displayed by for personal privacy, only a user with the proper indexing document can understand the symptom data.

User Symptoms History

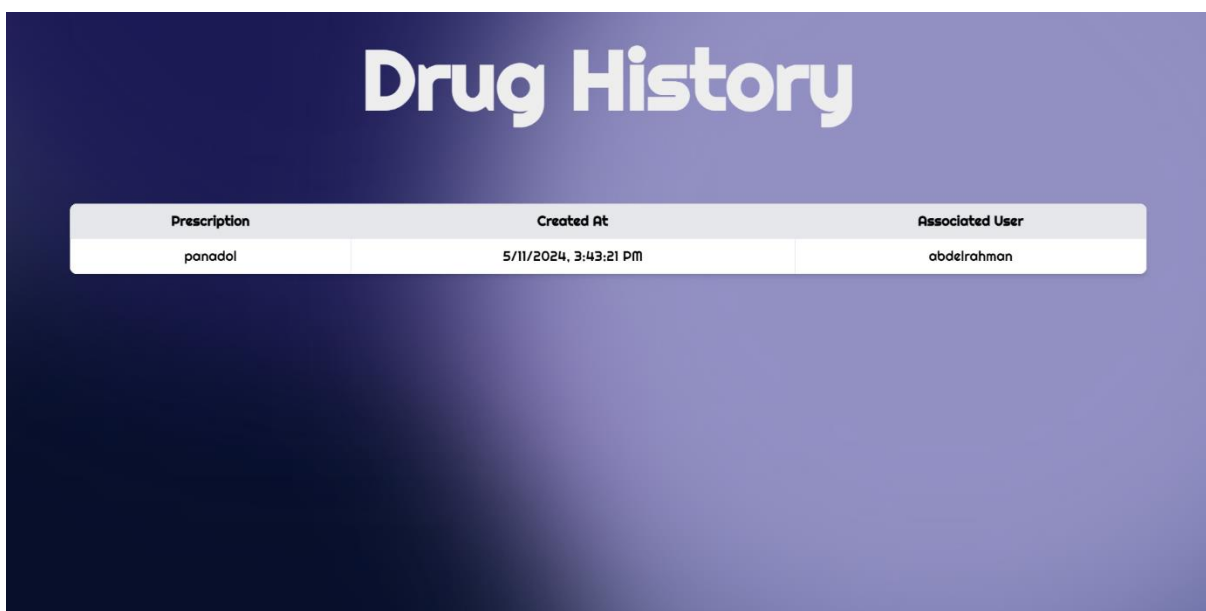
Username	Sex	Age	Symptoms
abdelrohman	male	20 year	s_13
			s_14
			s_15
			s_16
			s_57
abdelrohman	male	20 year	s_13
			s_14
			s_15
			s_57
			s_17

Pharmacy UI Pages

1. Landing Page:



2. Drug History: in this page the orders sent to the users are saved in a log and displayed.



3. Drug Prescriptions: in this page, the doctors orders for the users are sent to the pharmacy for user delivery, if the medication is available, the medication is sent, if not, it is set as unavailable.

Drug Prescriptions

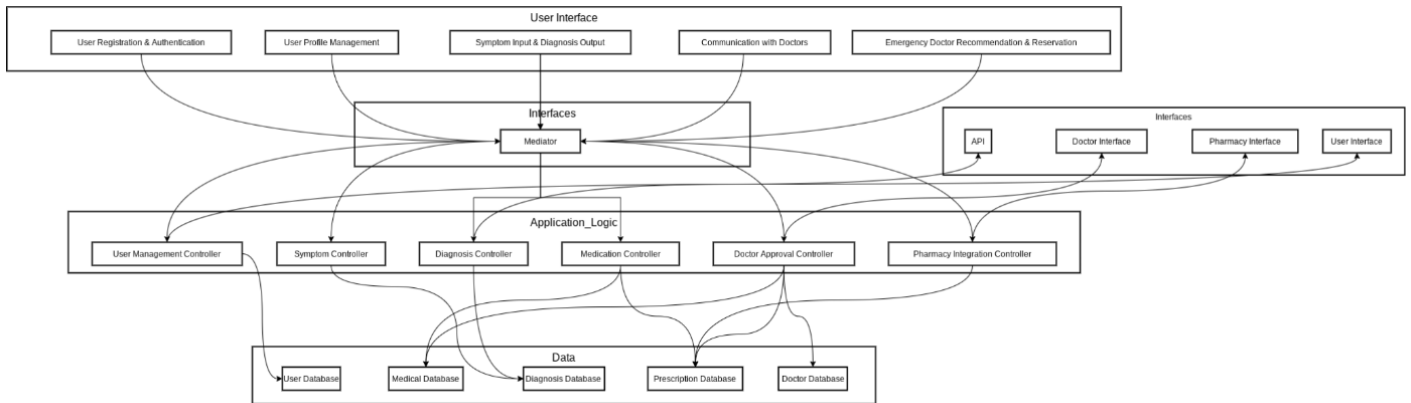
Prescription	Created At	Order Available	Actions
ponadol	5/11/2024, 3:43:21 PM	Available	<button>Toggle Availability</button> <button>Send Order</button>
zoloft	5/11/2024, 3:43:29 PM	Unavailable	<button>Unavailable</button> <button>Send Order</button>

4. Pharmacy inventory: here is where the pharmacy keeps their inventory in check by saving the quantity and the cost of their medication products.

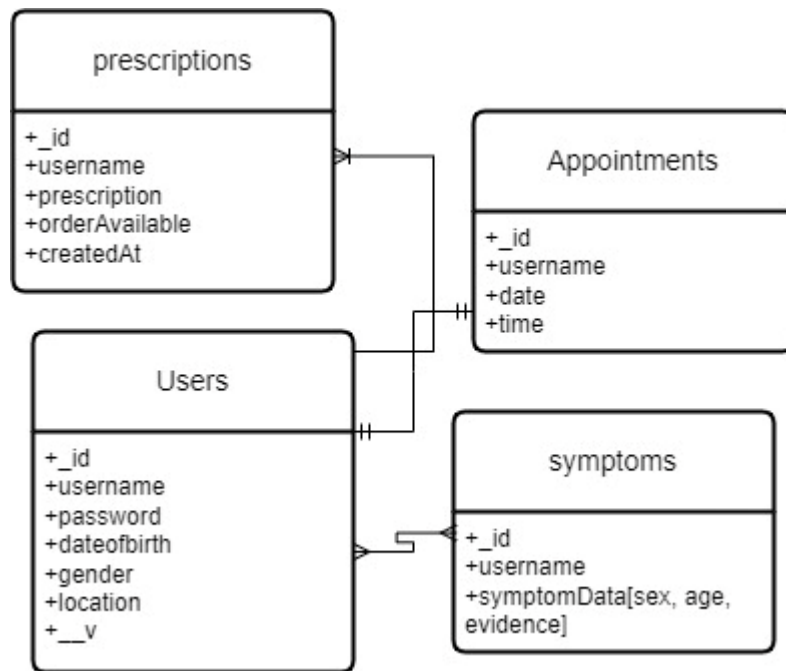
Pharmacy Inventory

ID	Name	Type	Quantity	Price
1	Medication A	Tablet	100	\$10.99
2	Medication B	Capsule	50	\$15.99
3	Medication C	Injection	20	\$25.99
4	Medication D	Syrup	80	\$8.99
5	Medication E	Tablet	60	\$12.99
6	Medication F	Cream	40	\$18.99
7	Medication G	Tablet	120	\$9.99
8	Medication H	Injection	30	\$22.99
9	Medication I	Capsule	70	\$14.99
10	Medication J	Syrup	90	\$11.99

Architecture Diagram:



File System Diagram:



Adopted technologies:

1. Front-End:

- React JS
- Tailwind CSS
- FlowBite
- Framer Motion
- Git (For file allocation and version control)

2. Back-End:

- Node JS
- Express JS
- Cors
- Nodemon
- Mongoose
- Axios

3. Database:

- Mongo Db Atlas (Cloud database)
- Mongo Db Compass (GUI tool for DB management)
- Body-Parser (For JSON configuration)

Integration of ACM Software Engineering Code of Ethics

As we embark on the development of Hygieia, we recognize the critical importance of adhering to ethical standards in software engineering. The ACM Software Engineering Code of Ethics provides a framework for ethical decision-making in the field of software engineering. We commit to upholding the following guiding principles throughout the development lifecycle of Hygieia:

1. Public: We will strive to ensure that our work contributes positively to society, respects the rights of individuals, and promotes the public good. Hygieia is designed to improve access to healthcare services, enhance patient outcomes, and advance the well-being of communities.

2. Client & Employer: We will act in the best interests of our clients and employers, providing honest and impartial advice, and disclosing any conflicts of interest that may arise. Our priority is to deliver value to our clients while maintaining integrity and professionalism.

3. Product: We will strive to build software products that are of high quality, reliable, and meet the needs of users. Hygieia is committed to data security, privacy protection, and adherence

to regulatory standards in healthcare information management.

4. Judgement: We will exercise professional judgement and integrity in all our software engineering decisions, considering the potential impacts on stakeholders and society at large. Hygieia will prioritize the safety, security, and well-being of patients and healthcare professionals.

5. Management: We will promote fair and transparent management practices, fostering an environment of trust, respect, and collaboration among team members. Hygieia's development process will emphasize accountability, communication, and continuous improvement.

6. Profession: We will advance the integrity and reputation of the software engineering profession, upholding ethical standards and supporting the professional development of our team members. Hygieia's team members will adhere to ethical guidelines and engage in lifelong learning to stay abreast of emerging technologies and best practices.

7. Colleagues: We will treat our colleagues with respect, fairness, and courtesy, valuing their contributions and fostering a diverse and inclusive work environment. Hygieia's success

relies on the collective expertise, creativity, and collaboration of our team members.

8. Self: We will strive for excellence in our professional work, maintaining honesty, integrity, and competence in our interactions with others. Hygieia's team members will uphold ethical standards both individually and collectively, recognizing the impact of their actions on the broader community.

“Incorporating the ACM Software Engineering Code of Ethics into the development process of Hygieia reflects our commitment to ethical conduct, responsible innovation, and the highest standards of professional practice in software engineering.”