SMART INTERNZ

MODERN APPLICATION DEVELOPMENT

(JAVA SPRING BOOT)

PROJECT REPORT

COLLEGE: VELLORE INSTITUTE OF TECHNOLOGY

CAMPUS: VELLORE

BRANCH NAME: INTEGRATED M. TECH SOFTWARE ENGINEERING

TOPIC CHOSEN FOR THE PROJECT:

HOSPITAL MANAGEMENT SYSTEM

(VIVID)

TEAM MEMBERS:

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1. INTRODUCTION

1.1. OVERVIEW

Our project is about creating a hospital management system using html, CSS, JavaScript for Front end and MySQL, Java spring boot for Back end. where we have partitioned the whole system into three parts the first part is the admin where the admin can add, update, delete the details of doctors and patients and can assign doctors to the patients. The second part is the patient where the patient can view what are all the doctors available in the hospital and can book appointment to consult a doctor and the third part is the doctor where doctors can view the appointment done by the patients and accept or reject the appointment. So, we club these three parts together to create a full web interface.

1.2. PURPOSE

A hospital management system serves the purpose of streamlining and automating various aspects of hospital operations. It efficiently manages administrative, financial, and operational processes within a healthcare facility, leading to improved efficiency and effectiveness. The system facilitates patient management by enabling smooth registration and appointment scheduling. The system enhances communication and collaboration among hospital staff members, facilitating seamless information exchange. Regulatory compliance is ensured, safeguarding patient confidentiality, data security, and privacy. Ultimately, a hospital management system aims to enhance patient care, optimize resource utilization, and improve overall hospital performance.

2. LITERATURE SURVEY

- Hospital Management System by Prajakta Musale, Aryan.S.Pokharkar, Apoorva.B.Pophalghat, Akhilesh.D.Poke, Harsh.J.Pokharna, Abhishek.M.Pote. This research paper presents the development of a Hospital Management System website aimed at addressing the challenges encountered during the COVID-19 pandemic. The website offers a solution for patients to conveniently book appointments with their preferred doctors, thereby reducing overcrowding at hospitals. The system is built using HTML, CSS, JavaScript, PHP, and Bootstrap, and incorporates a database for storing patient information and appointment data. The paper also references relevant research papers and proposes potential enhancements for the website in the future.
- "Hospital Management System " by Esha Bisht. Akansha Rathi. Monika Chaudhary. This study explores the Hospital Management system with patient registration, data storage, and appointment booking. It provides unique IDs for each patient and automatically stores details. Users can search doctor availability and doctor details. The system is accessible to administrators and receptionists, with a user-friendly interface and secure data. It has two modules: administration and user-level, with authentication for access. Administrators manage doctor and patient information, while users can check appointments, prescriptions, and pay doctor's fees online.
- "A Study of Advanced Hospital Management System by Kumaran S, Dr Pusphagaran ,Kalai Selvi, Christopher ,Deepak This research paper describes the growing demand for medical treatment and services in India necessitates the creation of electronic medical records. This study aims to transform the manual method of searching, sorting, and accessing hospital information into electronic medical records. Computer-based software is provided to replace the manual method, generating patient reports and information about doctors and nurses. The software allows for accurate, reliable, and efficient patient record-keeping, registration, and computerized billing in general hospitals. It features a user-friendly interface, data protection, and fast processing, making

it a more efficient and accurate solution to the current manual method of patient medical record-keeping.

- "Model Hospital Management System by Pranjali Anpan, Roshni Udasi, Susneha Jagtap, Shon Thakre, Chalika Kamble. This literature review explores the Web-based technology offers numerous online services, reducing tasks, costs, and efforts. A web-based platform for medical procedures can streamline patient management, doctor schedules, patient records, and communication. This personalized application streamlines time-consuming and inconvenient tasks, enhancing hospital efficiency and efficiency.
- " ONLINE HOSPITAL MANAGEMENT SYSTEM" by Majed Hossam Oqaylan. This research paper describes that they handle inpatients, outpatients, records, treatments, and billings. However, many reports are unavailable to patients outside the system. This project aims to store reports in a database and make them accessible from anywhere. The system supports effective decision-making for patient care, administration, and financial accounting. The software product suite aims to improve hospital management quality and efficiency, enabling organizations to develop and improve their operations.

2.1. EXISTING PROBLEM

System Downtime: Unplanned system outages or frequent downtime can disrupt hospital operations, hinder access to patient records, and impact patient care. This can be caused by hardware failures, network issues, or inadequate system maintenance.

Limited Interoperability: Incompatibility between different systems and lack of standardized data formats can hinder the seamless exchange of patient information between healthcare providers, laboratories, or pharmacies. This can result in delays, redundant data entry, and compromised continuity of care.

User Interface Complexity: A complex and non-intuitive user interface can lead to user frustration, errors, and reduced productivity. It can also require additional training time and hinder user adoption.

Data Integrity and Data Entry Errors: Inaccurate or incomplete data entry can lead to errors in patient records, incorrect diagnoses, and compromised patient safety. Duplication of records or incorrect data linkage can also create challenges for accurate reporting and analysis.

2.2. PROPOSED SOLUTION

Implement a robust infrastructure with backup servers, redundant network connections, and regular maintenance schedules to minimize system downtime. Additionally, conduct proactive monitoring and rapid response protocols to swiftly address any system failures or interruptions.

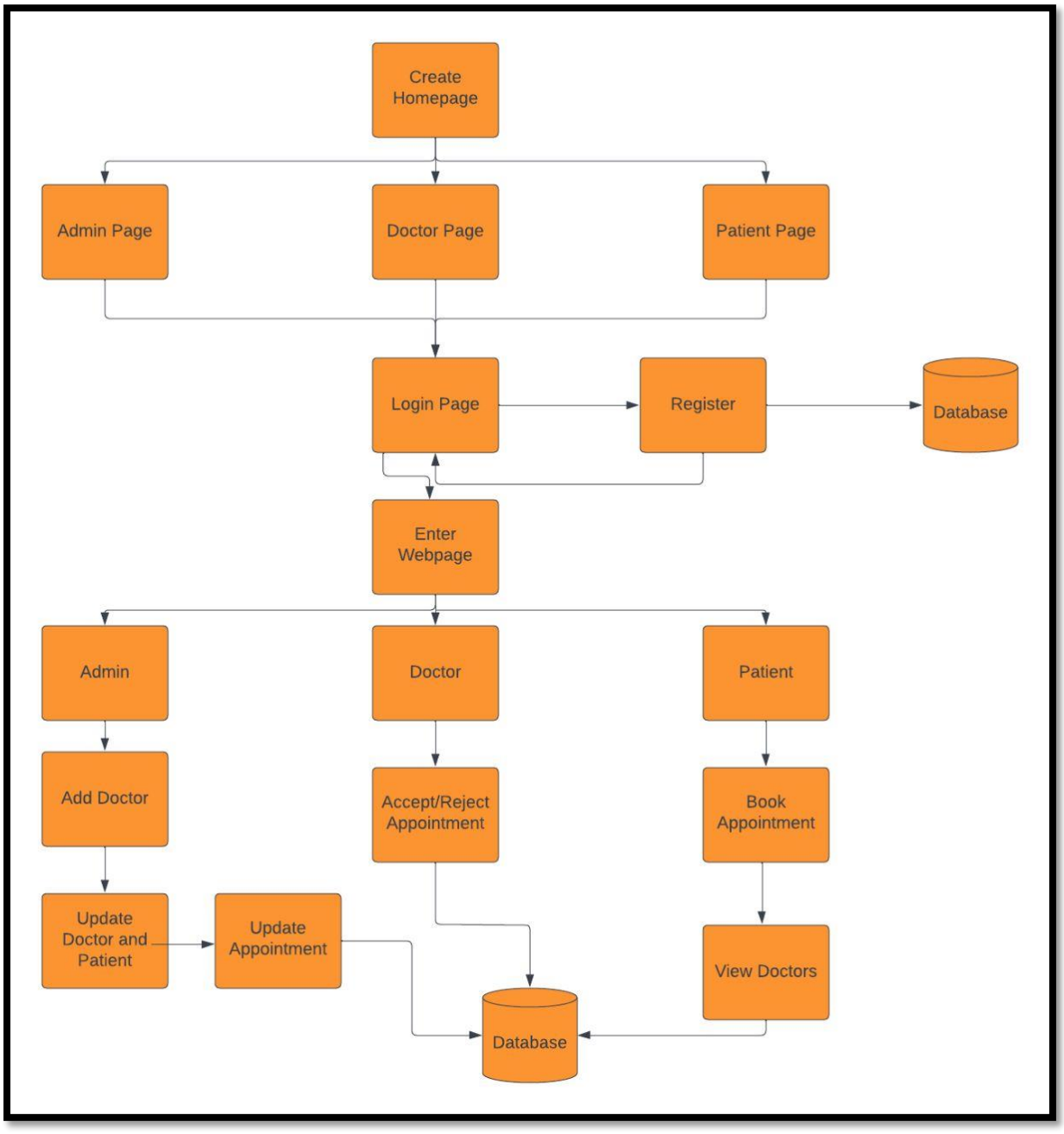
Adopt industry-standard data exchange protocols such as HL7 or FHIR to promote interoperability. Implement integration interfaces and APIs that enable the secure and efficient transfer of patient data between systems, ensuring consistent and accurate information sharing.

Design a user-friendly interface with clear navigation, intuitive workflows, and responsive design principles. Conduct user testing and gather feedback to refine the interface and optimize user experience. Provide comprehensive user training and ongoing support to ensure effective system utilization.

Implement data validation mechanisms, including mandatory fields, format checks, and data consistency rules, to enforce accurate data entry. Provide training and guidelines to users on proper data entry practices and conduct regular data quality audits to identify and rectify any issues.

3. THEORETICAL ANALYSIS

3.1. BLOCK DIAGRAM



3.2. HARDWARE/SOFTWARE DESIGNING

HARDWARE DESIGN

- Computer System: A normal computer system with sufficient memory and may include a processor, a suitable amount of RAM, and ample storage capacity.

- Storage: Sufficient storage capacity is needed and a high-capacity hard disk drive (HDD) or solid-state drive (SSD) may be required.

SOFTWARE DESIGN

The software components for our project would involve various tools and technologies. Here are some essential elements:

- Notepad++ (HTML,CSS,JS)
- MySQL Workbench
- Spring Boot 4.1+
- Spring Framework 5.2.6
- Spring Data JPA (Hibernate)
- Thymeleaf
- Eclipse STS
- Maven
- Java 17

4. EXPERIMENTAL INVESTIGATIONS

- Online hospital management systems typically involve conducting research studies or trials to evaluate the effectiveness, usability, and impact of the system in a real-world healthcare setting. These investigations aim to gather empirical evidence and assess various aspects of the system's performance. Here are some examples of experimental investigations that can be conducted.
- Usability Testing: Usability testing involves observing and gathering feedback from users (e.g., healthcare professionals, administrative staff) while they interact with the online hospital management system. This investigation assesses the system's ease of use, efficiency, learnability, and overall user satisfaction.
- Performance Evaluation: Performance evaluation experiments focus on measuring and analyzing the system's response time, scalability, and resource utilization under different workloads. It aims to assess the system's ability to handle concurrent users, process transactions, and maintain acceptable performance levels.
- Impact on Workflow Efficiency: Researchers can investigate how the online hospital management system affects workflow efficiency and productivity. This can involve time-motion studies, where the time taken to complete specific tasks or processes is measured and compared before and after implementing the system.
- Data Security and Privacy Assessment: Experimental investigations can focus on evaluating the security measures and privacy safeguards implemented within the system. This involves assessing vulnerabilities, conducting penetration testing, and verifying compliance with data protection regulations to ensure patient data confidentiality.

5. FLOWCHART

ADMIN MODULE:

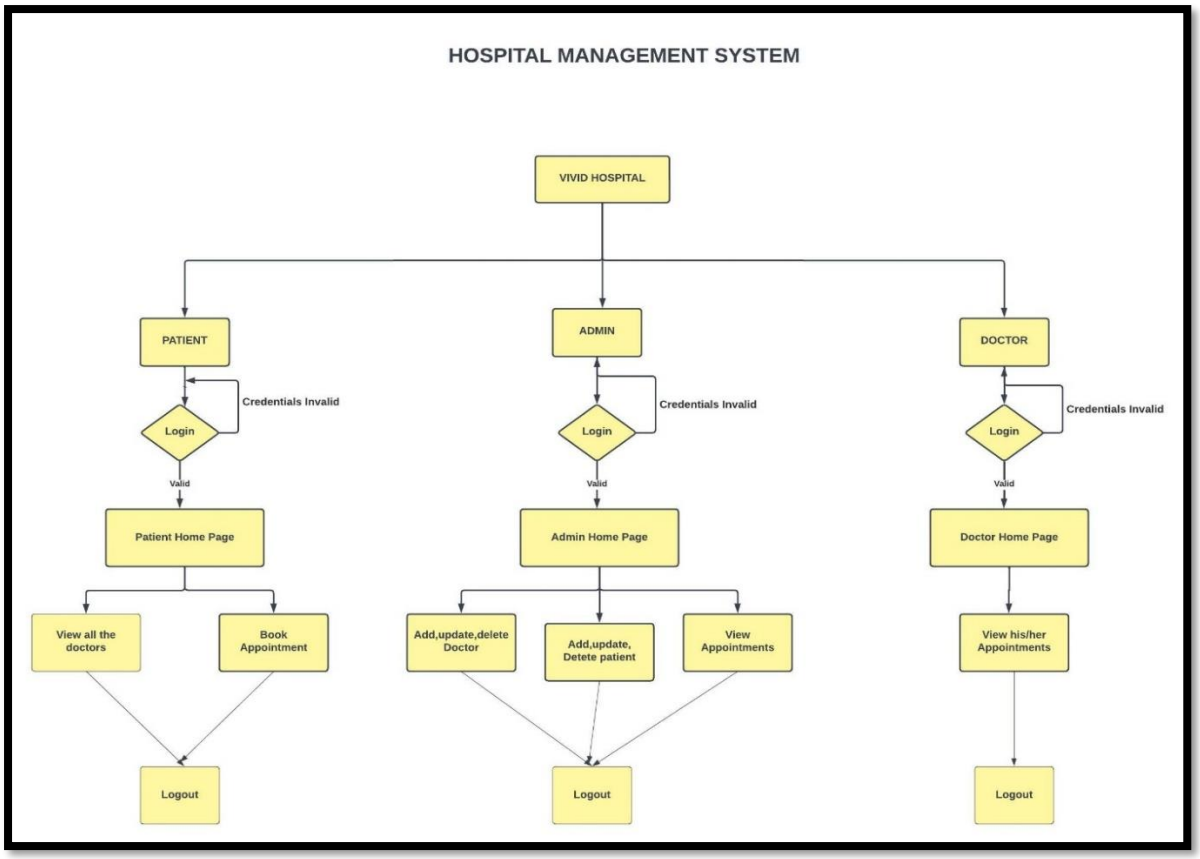
- Register, login
- AdminHomePage,
    - ✓ View, add, update, delete Doctor Records
    - ✓ View, add, update, delete Patient Records
    - ✓ View, add, update, delete Patient Appointments
- Logout.

PATIENT MODULE:

- Register, login.
- PatientHomePage
    - ✓ Patient can book appointments
    - ✓ Patient can view all the Doctors in the VIVID Hospital
- Logout.

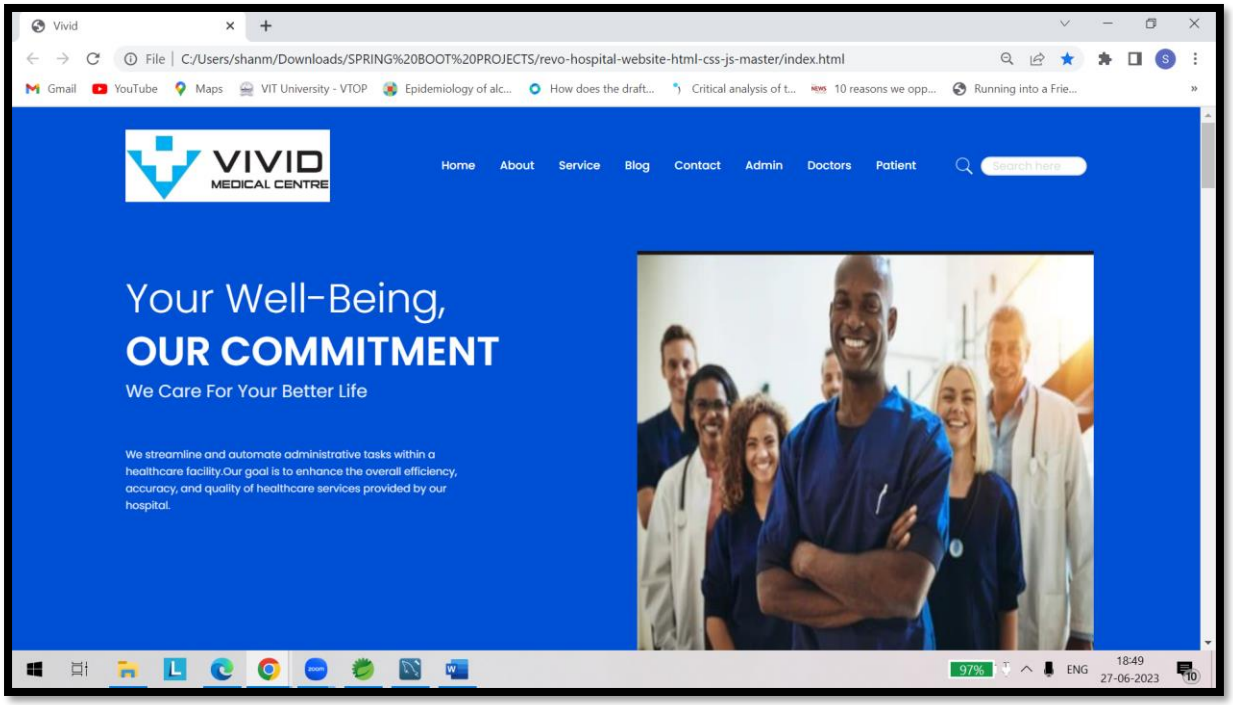
DOCTOR MODULE:

- Register, Login
- DoctorHomePage
    - ✓ Doctor can view his Appointment and he can also update the appointment
- Logout

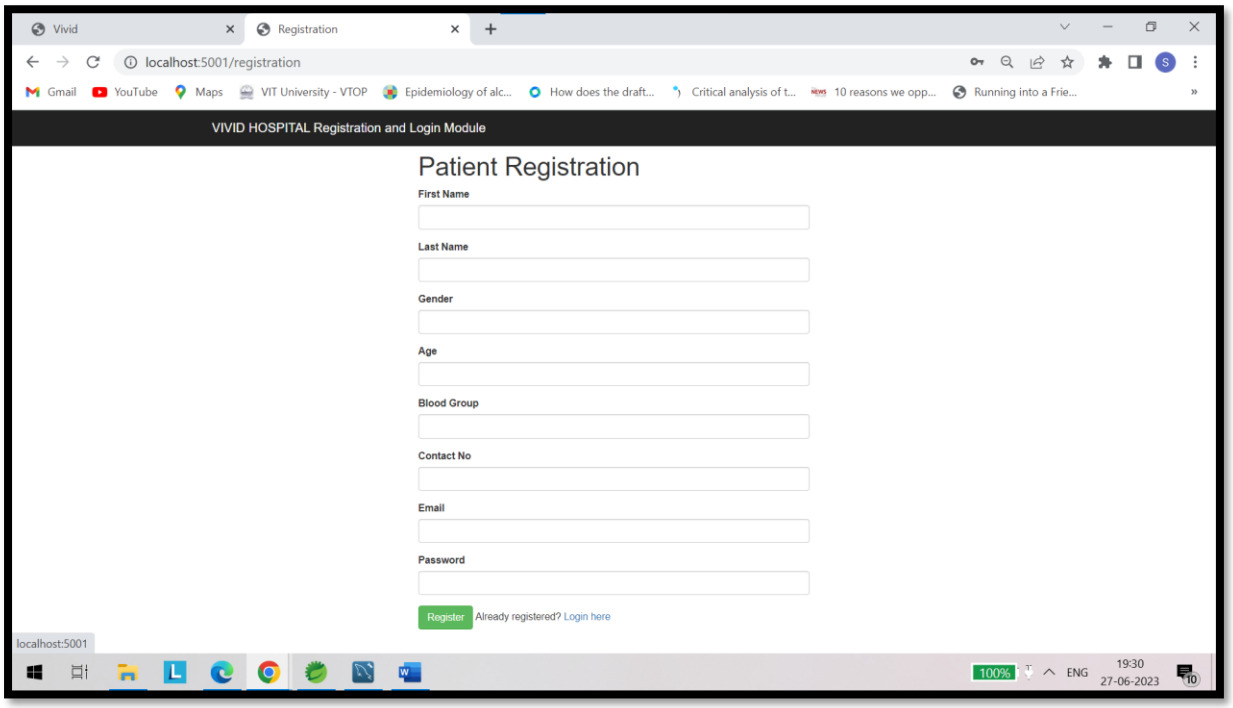


6. RESULT

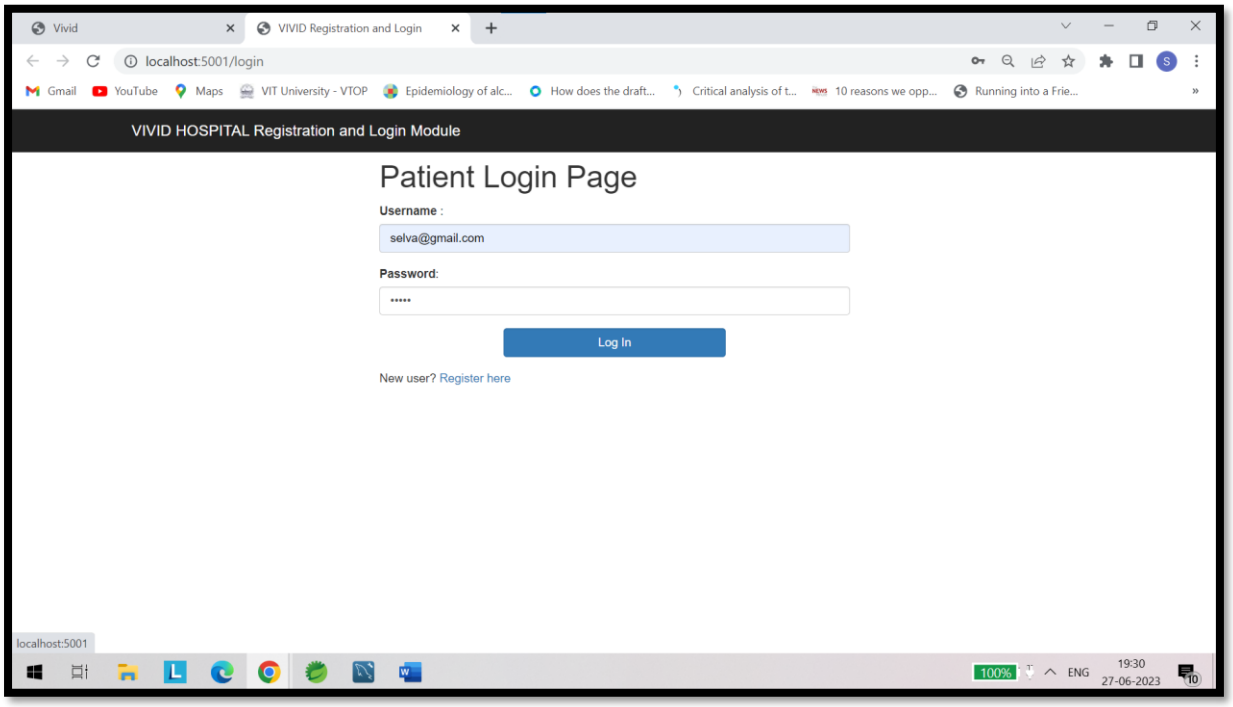
HOME PAGE:



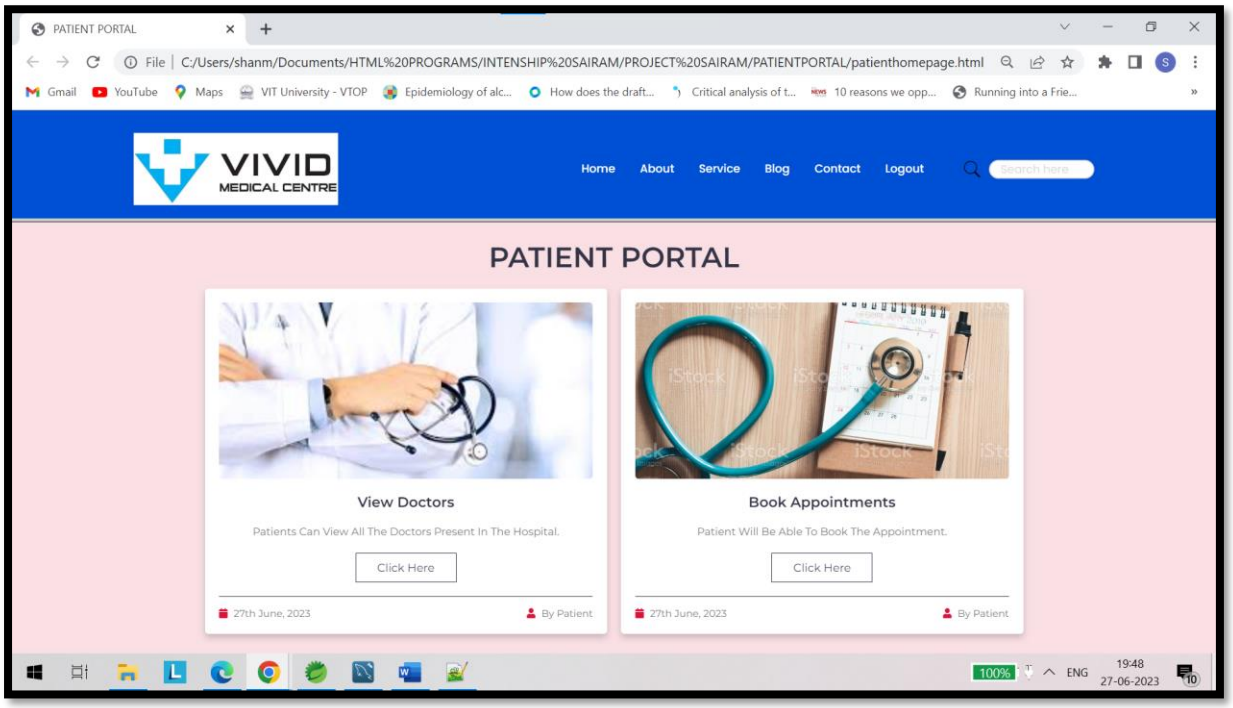
REGISTERATION: (patient)



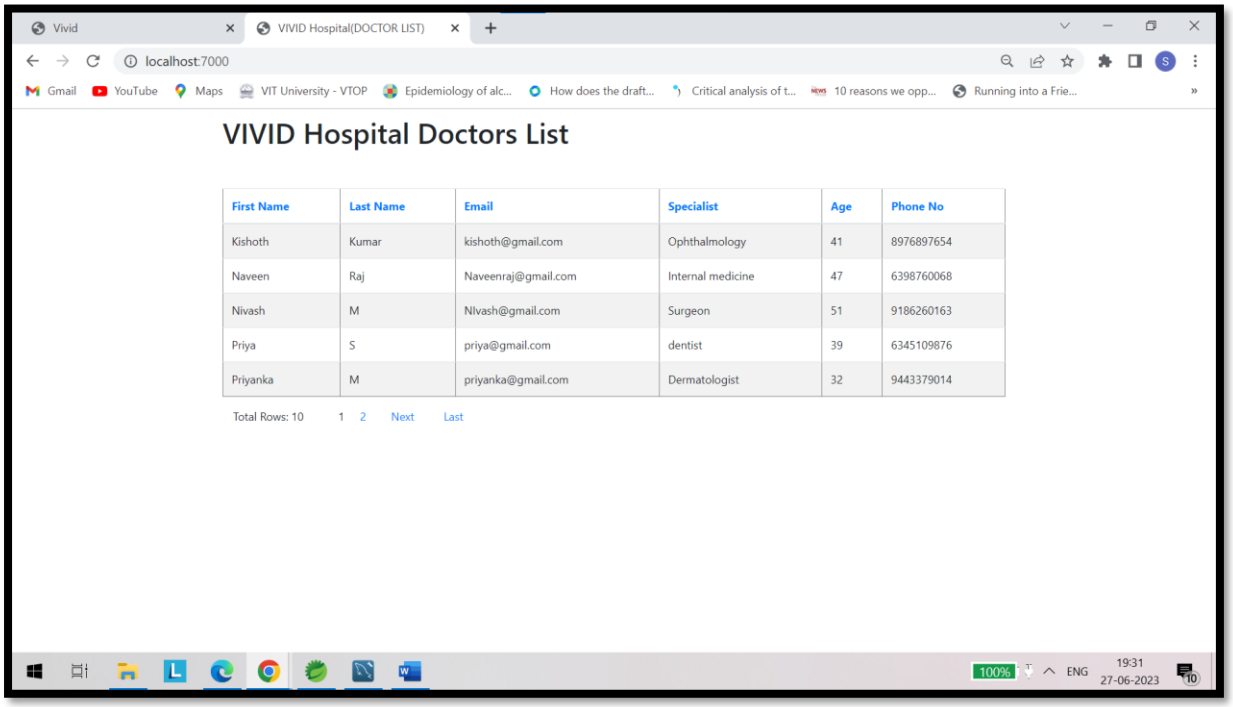
LOGIN: (patient)



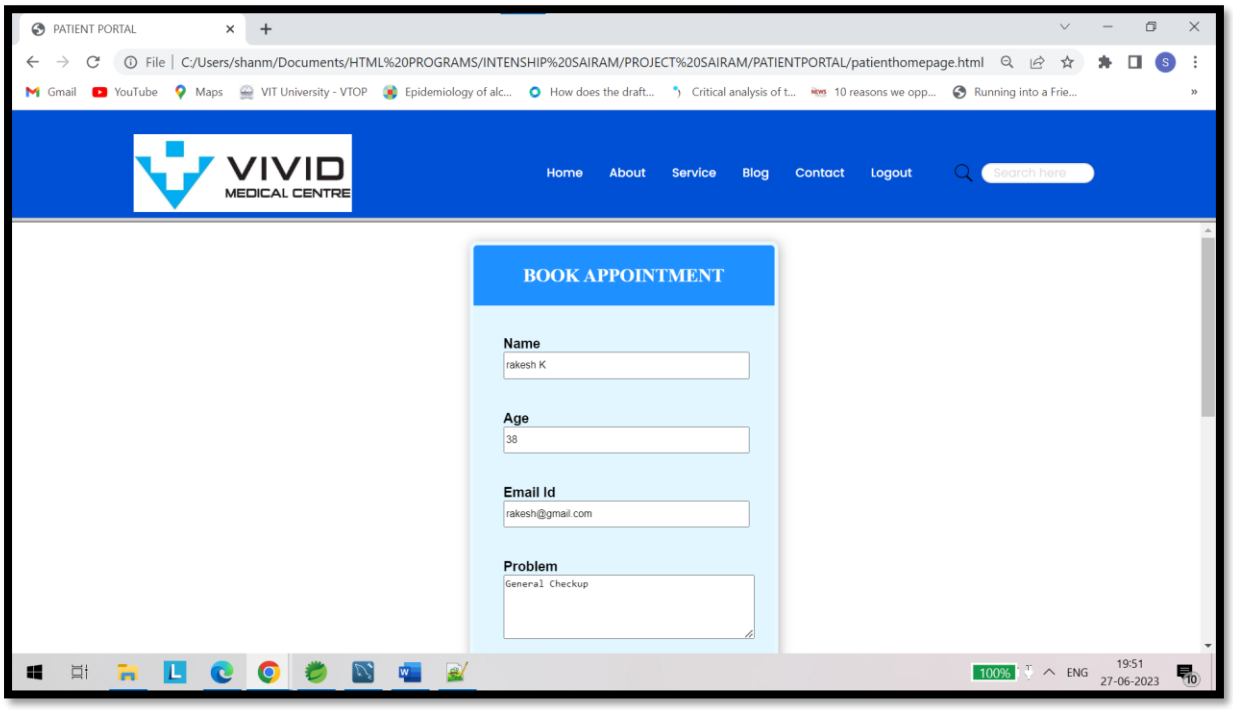
PATIENT HOME PAGE:

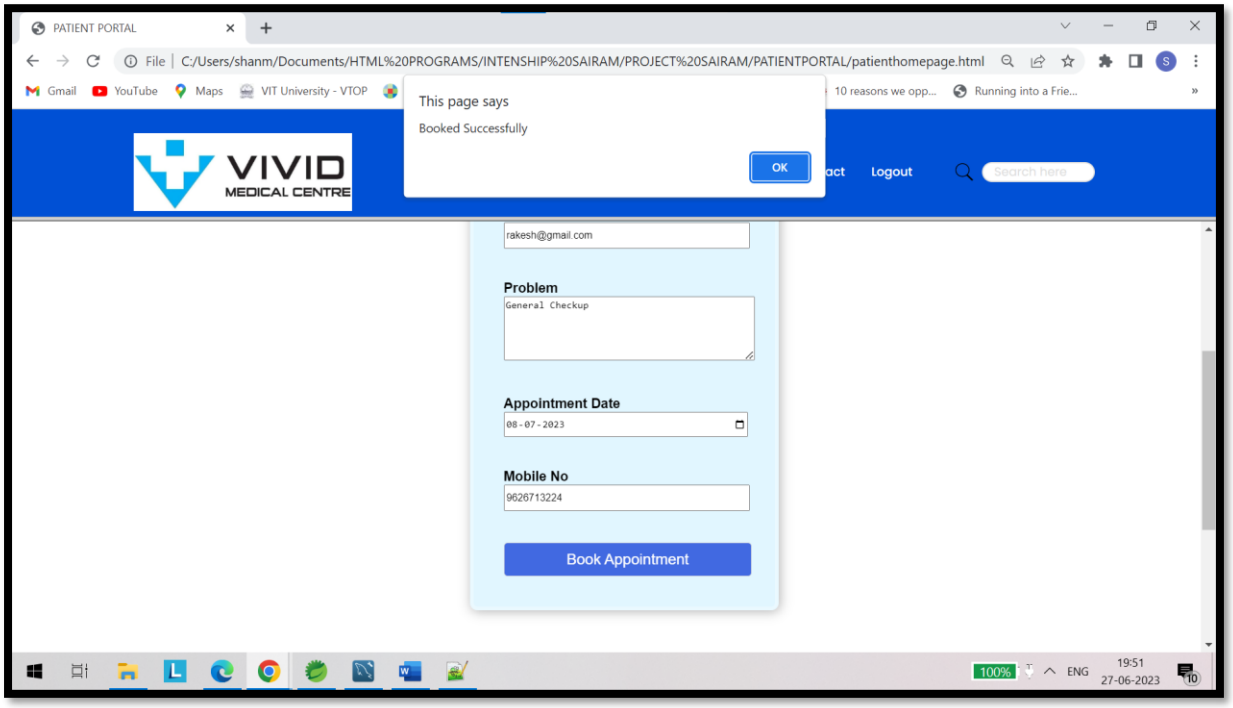


VIEW ALL DOCTORS: (patient)

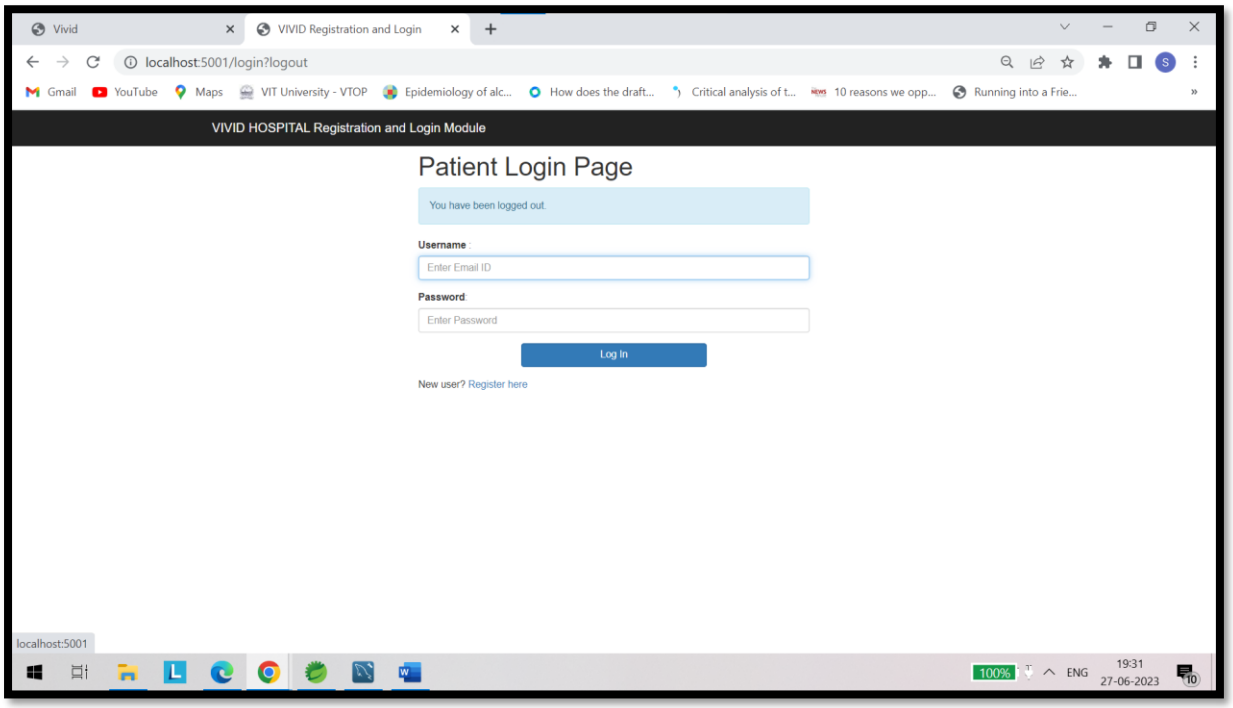


BOOK APPOINTMENT: (patient)

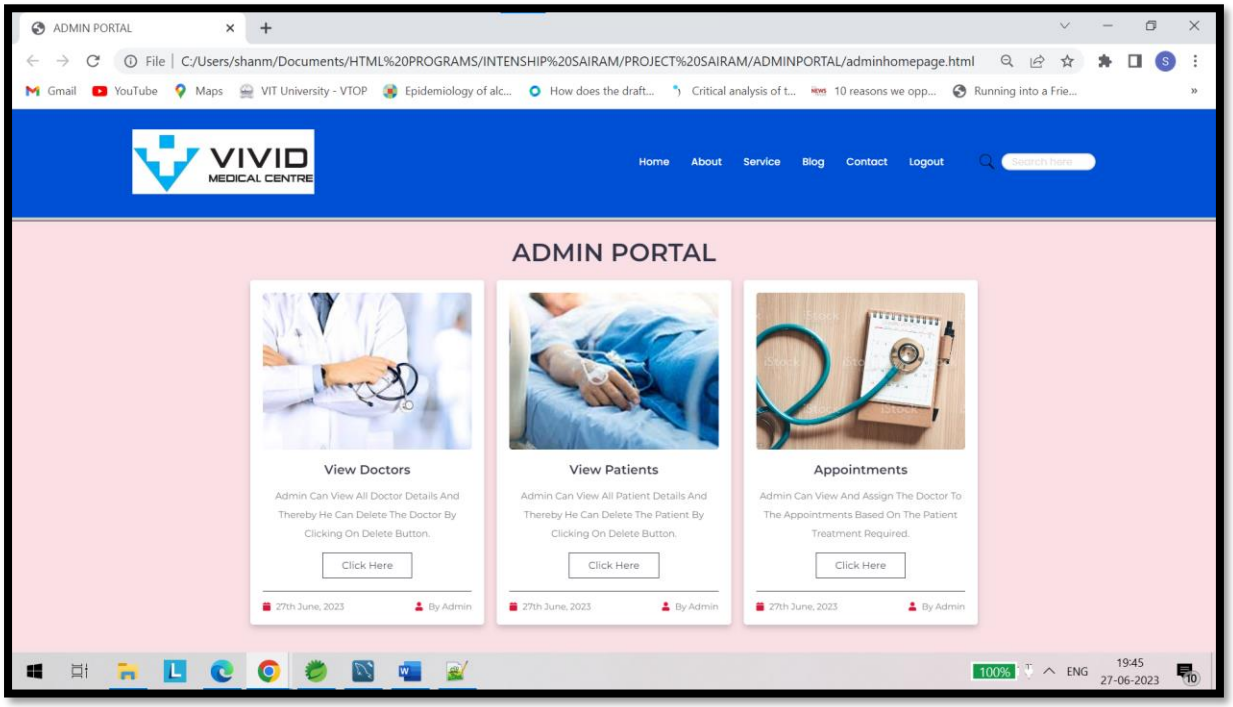




LOGOUT: (patient)

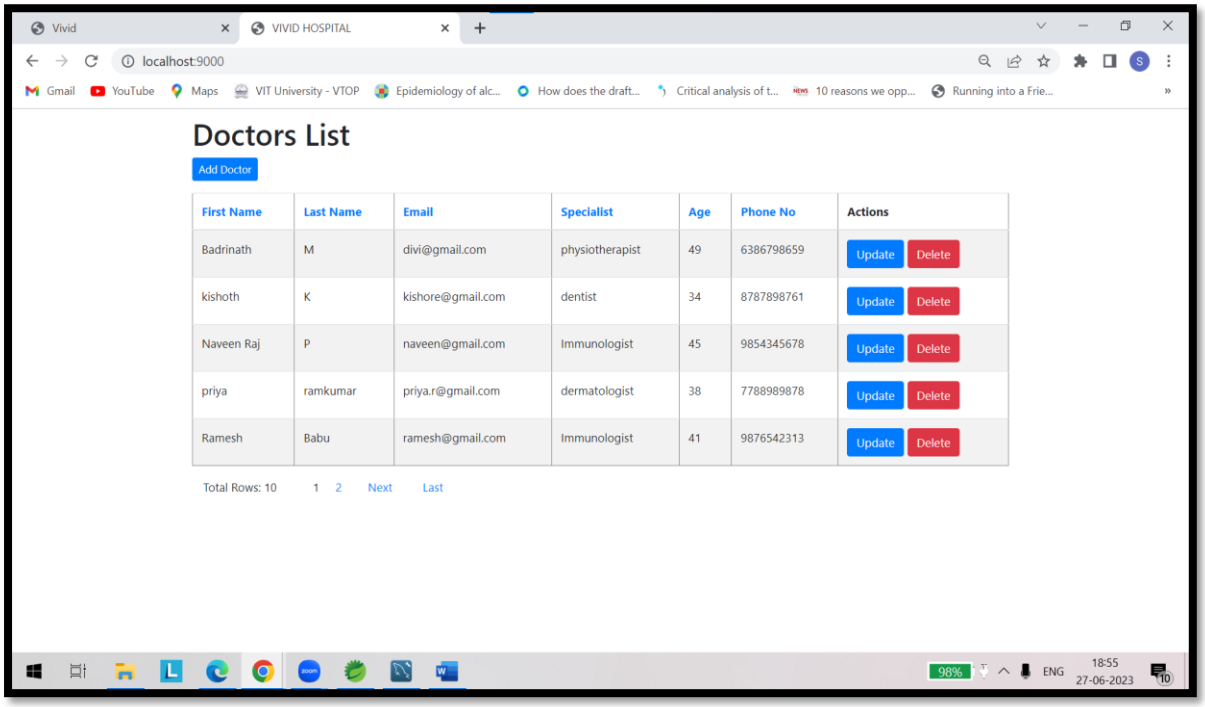


ADMIN HOME PAGE:



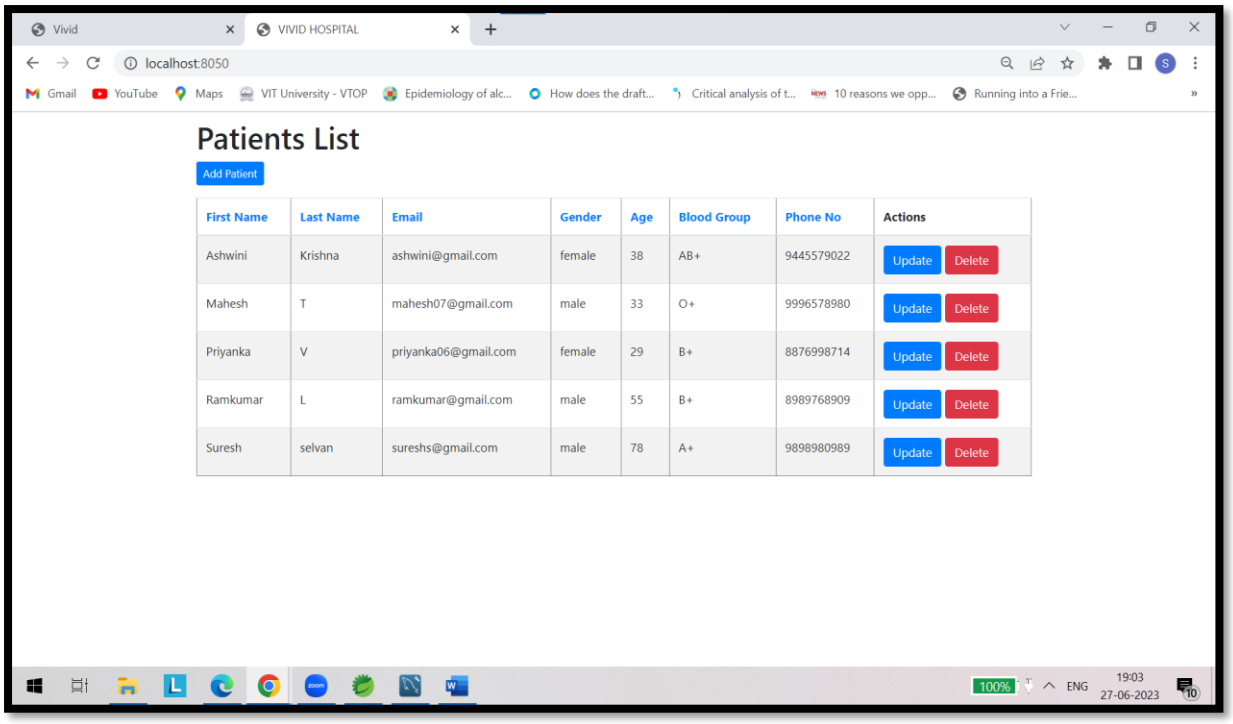
VIEW DOCTOR: (admin)

Admin can also add the doctors, update doctor details, delete the doctor.



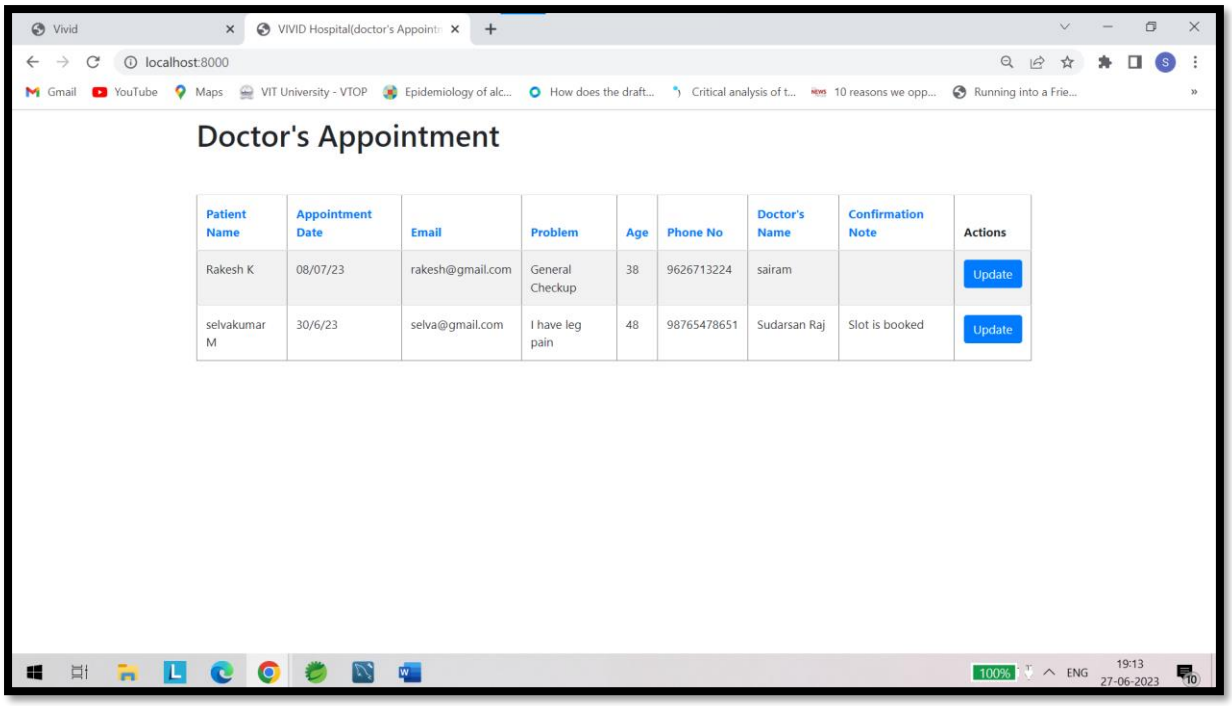
VIEW PATIENT: (admin)

Admin can also add the patient, update patient details, delete the patient.

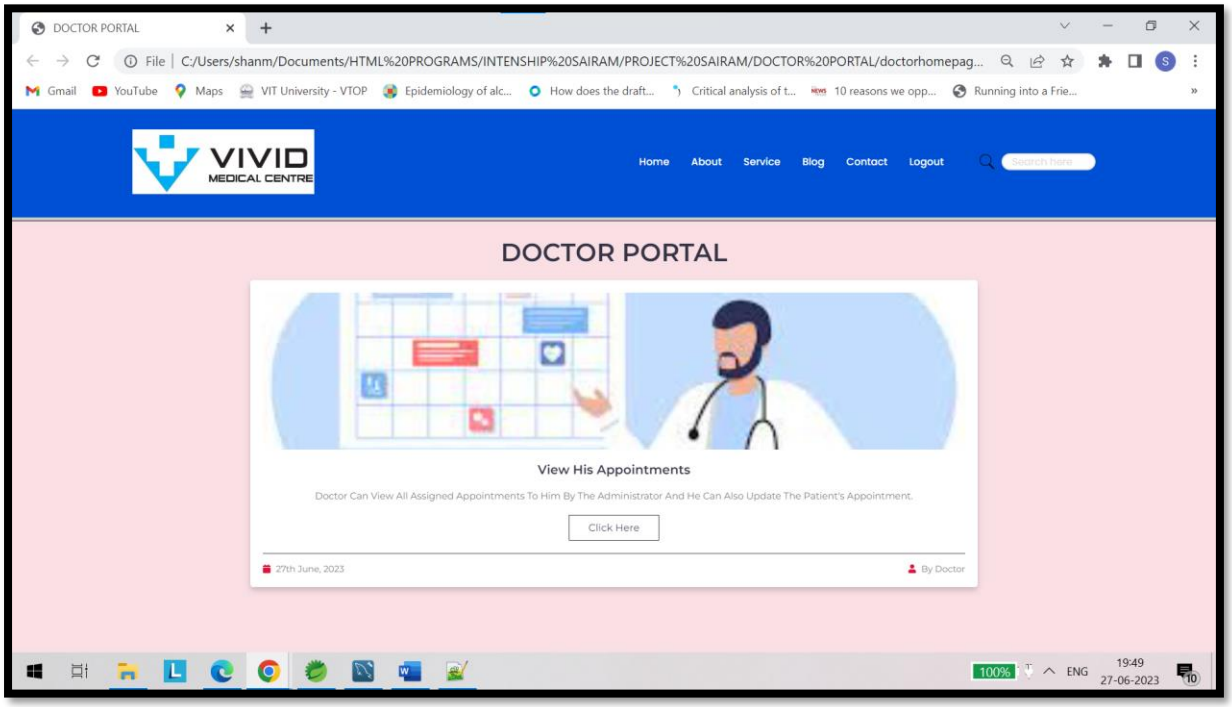


APPOINTMENTS: (admin)

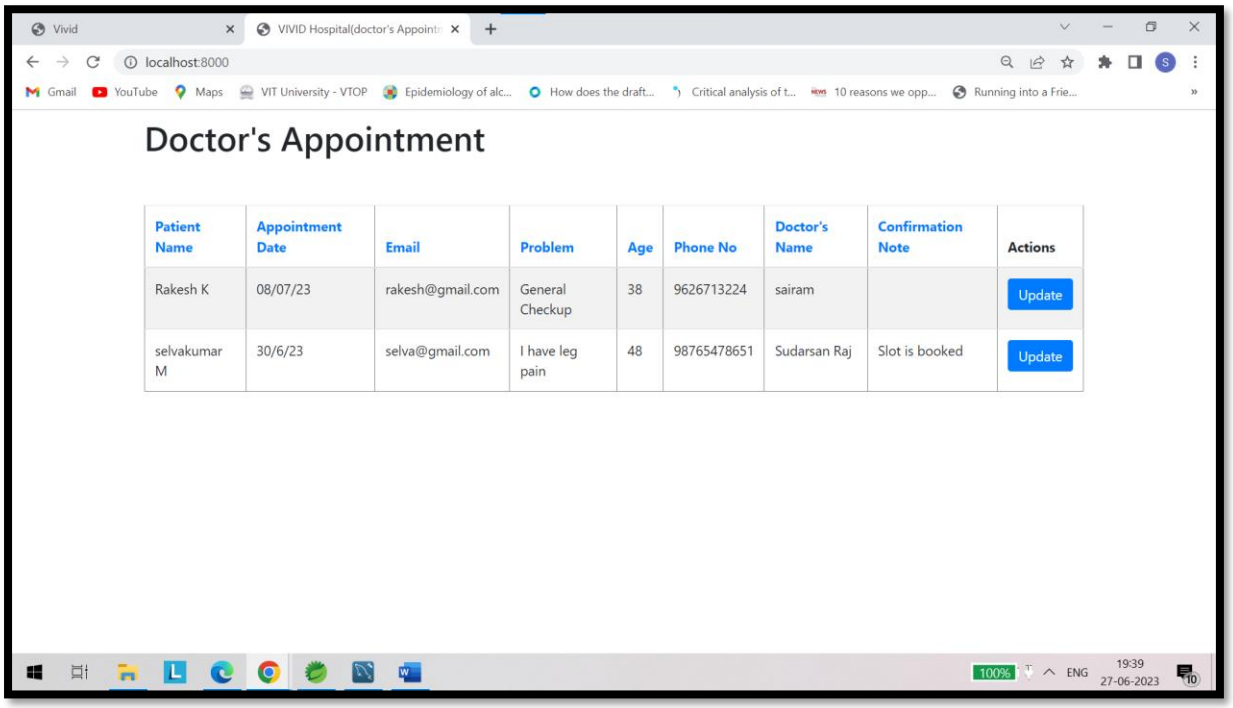
- Once admin gets the appointment details from the patient.
- Admin can use update button to assign doctors to the patient.
- After this, the doctor will confirm the appointment.



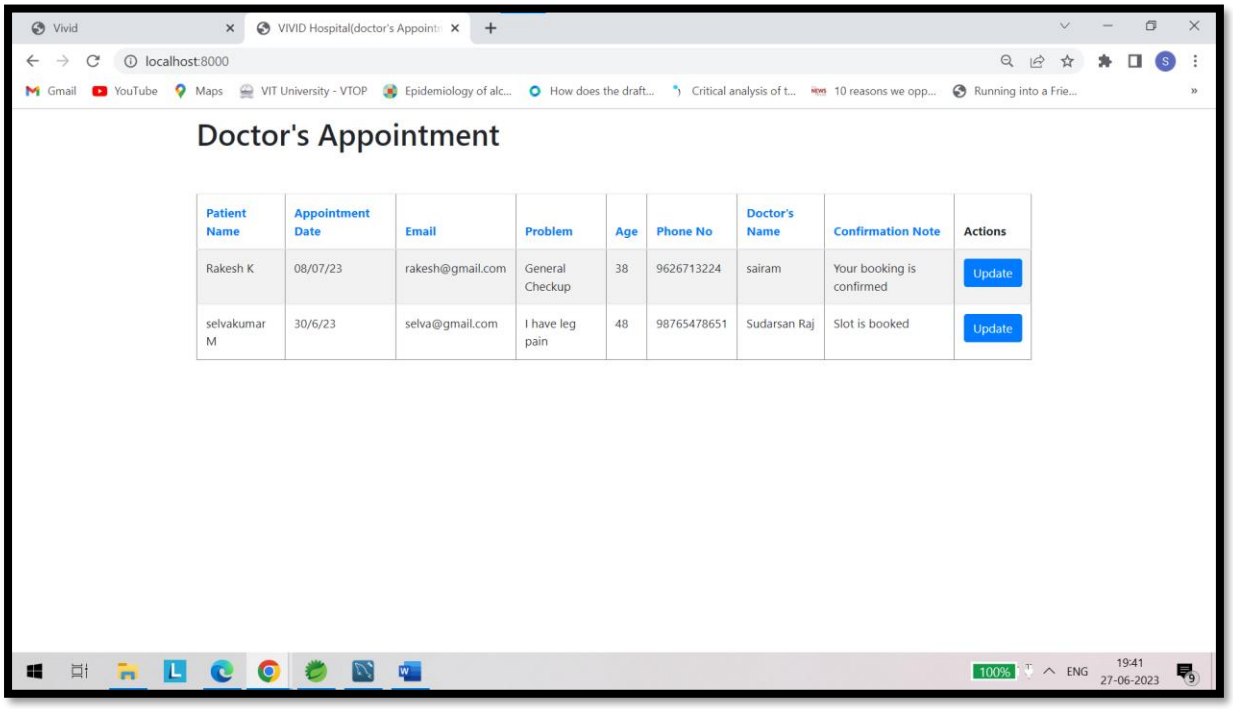
DOCTOR HOME PAGE:



VIEW HIS APPOINTMENT: (doctor)



Update his booking:



7. ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- Improved Efficiency: Online hospital management systems automate various administrative tasks, such as appointment scheduling, billing, and inventory management. This automation helps streamline processes, reduce manual errors, and improve overall operational efficiency.
- Enhanced Patient Care: These systems provide healthcare professionals with instant access to patient records, medical history, and test results. This accessibility enables quicker diagnosis and treatment, reduces waiting times, and ultimately enhances patient care and satisfaction.
- Improved Communication and Collaboration: Online hospital management systems facilitate seamless communication and collaboration among healthcare professionals, departments, and even multiple healthcare facilities. This leads to improved coordination, better exchange of information, and enhanced patient outcomes.
- Secure Data Storage: These systems typically employ robust security measures to protect sensitive patient data. Measures such as encryption, role-based access controls, and regular backups ensure data integrity, confidentiality, and availability, reducing the risk of data breaches and unauthorized access.

DISADVANTAGES

- Technical Challenges: Online systems depend on stable internet connectivity and robust hardware infrastructure. Any technical issues, such as power outages or internet downtime, can affect system availability and hinder regular operations. Moreover, healthcare facilities in remote or underdeveloped areas may face challenges in accessing reliable internet connectivity.

- Data Security and Privacy Concerns: Storing sensitive patient data online raises concerns about data security and privacy. Healthcare facilities must implement stringent security measures to protect patient information from unauthorized access, hacking attempts, or data breaches. Compliance with data protection regulations, such as HIPAA (Health Insurance Portability and Accountability Act), is crucial but can add complexity and cost to the system implementation and maintenance.
- Learning Curve and Staff Training: Transitioning to an online hospital management system requires staff members to learn new software interfaces, processes, and workflows. This learning curve can cause temporary disruptions and productivity decreases. Adequate training and support are essential to help staff members adapt to the new system effectively.
- Limited Personal Interaction: While online systems improve efficiency, they may reduce the opportunities for face-to-face interactions between healthcare professionals and patients. This reduced personal interaction can impact the patient experience and potentially affect patient satisfaction.

8. APPLICATIONS

The application of an online hospital management system is extensive and covers various aspects of hospital operations. Here are some key applications:

- Patient Registration and Appointment Scheduling: The system allows patients to register online, providing their personal information and medical history. It enables them to schedule appointments conveniently, reducing wait times and streamlining the registration process.
- Electronic Medical Records (EMR): The system digitizes and centralizes patient medical records, including diagnoses, treatments, medications, and test

results. It provides healthcare professionals with easy access to patient information, facilitating accurate diagnosis, treatment planning, and continuity of care.

- Billing and Financial Management: The system automates billing processes, generating invoices, and tracking payments. It integrates with insurance systems to verify coverage and streamline reimbursement processes. It helps hospitals manage their financial transactions, revenue cycles, and budgeting effectively.
- Communication and Collaboration: The system enables secure and efficient communication and collaboration among healthcare professionals within the hospital. It provides messaging systems, document sharing, and real-time collaboration tools, promoting effective teamwork and information exchange.

9. CONCLUSION

So we have tried to develop a hospital website where the basic services that are provided in the hospital is transferred into a form of website such as booking appointment and the admin who can add, update, delete the doctor records and the admin can view the appointments given by the patients and assign doctors to them and the doctor has the privilege to accept or reject the appointment with a valid reason through the website we made this project possible by using java spring boot, html, CSS, etc. We hope this website will help patients to make their work simple.

10. FUTURE SCOPE

The future scope of an online hospital management system holds tremendous potential for further advancements and improvements in healthcare delivery. Here are some potential future developments and trends in this field:

Artificial Intelligence (AI) and Machine Learning (ML): Integration of AI and ML technologies can enhance the capabilities of hospital management systems. AI algorithms can help automate tasks like appointment scheduling, resource allocation, and data analysis. ML models can assist in predicting patient outcomes, optimizing treatment plans, and detecting anomalies in patient data.

Mobile Applications: Mobile applications will continue to play a crucial role in the future of healthcare management systems. They allow patients to access their medical records, schedule appointments, receive health reminders, and communicate with healthcare providers. Mobile apps can also facilitate remote monitoring and telehealth services.

Cloud Computing and Big Data Analytics: Cloud-based hospital management systems can offer scalability, flexibility, and cost-effectiveness. They enable storage and analysis of large volumes of patient data, facilitating data-driven decision-making, and enabling research and population health studies.

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APPENDIX

SOURCE CODE

https://github.com/Shanu06github/Hospital-Management-System_Team383