GROUP 2- Healthcare

“Hospital Management System”

Aguila, Mekaila Mae E.

Amoranto, Rafael Luis M.

Cebuano, Jemuel D.

Diolata, Justine Irish R.

Esparto, Erwin Jay O.

Layola, Earth Jeune B.

Oran, Kyle Frankie M.

Mr. Edmundo S. Dela Cruz Jr. MIT

System Integration and Architecture Adviser

INTRODUCTION

In the continuously changing environment of healthcare, the use of modern technologies has become critical to improving efficiency, streamlining processes, and, ultimately, patient care. The Hospital Management System (HMS) is one such game-changing innovation that has transformed the healthcare industry. This comprehensive software system is intended to manage the complexities of hospital operations, such as patient registration and appointment scheduling, as well as billing and inventory administration. HMS represents a paradigm shift in how healthcare facilities approach administration, providing a holistic approach to optimizing workflows, reducing errors, and providing a smoother and patient-centric healthcare experience.

The origins of Hospital Management Systems can be traced back to the increasing complexity of healthcare organizations. As hospitals extend their services and deal with a rising volume of patient data, the requirement for a reliable and integrated system becomes critical. HMS serves as a digital nerve center, integrating diverse departments such as finance and human resources as well as clinical operations and patient care. As a result, these solutions alleviate the issues associated with traditional paper-based procedures, resulting in a more agile and responsive healthcare infrastructure.

One of the most important aspects of Hospital Management Systems is their capacity to improve operational efficiency. Healthcare practitioners can devote more time to patient care by automating common administrative duties such as appointment scheduling, billing, and inventory management. This not only optimizes resource utilization but also reduces the possibility of errors, resulting in a safer and more dependable healthcare environment. Furthermore, real-time access to patient records provides medical practitioners with immediate insights, allowing for faster and more informed decision-making at the point of care.

In addition to operational efficiency, HMS plays a critical role in improving patient care quality. The use of Electronic Health Records (EHR) means that patient data is not only digitized but also freely accessible, allowing for a comprehensive perspective of the patient's medical history. This allows for more precise diagnoses, personalized treatment strategies, and better care coordination among healthcare specialists. Furthermore, implementing decision support tools within HMS helps physicians stay up to date on the most recent medical research and recommendations, supporting evidence-based practice.

As we begin our investigation of Hospital Management Systems, it is critical to consider the broader ramifications of these technology breakthroughs in the healthcare sector. The parts that follow will delve into the essential characteristics, difficulties, and future prospects of HMS, providing a thorough knowledge of how these systems are transforming the face of healthcare delivery. In essence, the adoption and integration of powerful Hospital Management Systems is the first step towards a more efficient, networked, and patient-centric healthcare ecosystem.

PURPOSE

A Hospital Management System (HMS) improves the efficiency and efficacy of healthcare organizations by streamlining different administrative and clinical operations. An HMS's major goal is to integrate and automate the many processes within a hospital or healthcare facility, fostering smooth communication and collaboration among various departments. This system has many features, such as patient registration, appointment scheduling, billing and invoicing, inventory management, and electronic health records (EHR) maintenance. An HMS avoids manual errors, reduces paperwork, and speeds up overall operational workflows by automating these tasks.

Furthermore, an HMS greatly contributes to the enhancement of patient care and safety. Healthcare practitioners can access accurate and up-to-date information about a patient's medical history, medications, and treatment plans because of the centralized administration of patient records. This accessibility allows healthcare practitioners to make well-informed decisions, resulting in better patient outcomes. Furthermore, an HMS supports the deployment of clinical decision support systems, allowing healthcare providers to follow best practices and evidence-based guidelines, ultimately improving the quality of care provided to patients.

From a strategic standpoint, an HMS provides significant insights to hospital executives via data analytics and reporting capabilities. Administrators can make educated judgments about resource allocation, budgeting, and overall organizational strategy by analyzing key performance metrics and trends. This data-driven strategy assists hospitals in streamlining operations, improving financial management, and adapting to changing healthcare trends. In essence, the goal of a Hospital Management System is to develop a more patient-centric, efficient, and sustainable healthcare environment in addition to streamlining day-to-day operations.

AUDIENCE

The Hospital Management System's intended recipients include a wide range of healthcare professionals and administrators involved in patient care and hospital resource management. This includes the following:

Doctors: are in charge of obtaining and updating patient medical records, prescribing drugs, and using the system to make informed decisions.

Nurses: Use the system to schedule appointments, coordinate patient care, and manage essential information at the point of care.

Administrators: Oversee the hospital's general operation, utilizing the system for resource allocation, inventory management, and strategic planning based on generated reports.

Patients: Patients may be able to examine their medical information and plan appointments, increasing their engagement and empowerment.

SCOPE

The Hospital Management System encompasses the complete range of hospital administration, going beyond the urgent necessities of patient care. This includes the following:

- **Accessibility for Multiple Users:** The system supports several user roles and access levels, ensuring that each healthcare professional and administrator has access to important information based on their duties.

- **Scalability:** Designed to support a healthcare institution's growing and changing needs, the system should be scalable to incorporate new features and adapt to increasing technology standards.
- **Security and privacy:** Because healthcare data is so sensitive, the HMS prioritizes comprehensive security measures to secure patient information while also adhering to privacy requirements.
- **Interoperability:** The system should be built to interact smoothly with other healthcare systems and technology, supporting interoperability to improve data interchange and collaboration across the healthcare ecosystem.

PROJECT OVERVIEW

PROJECT OBJECTIVES

The project aims to develop a comprehensive healthcare management system through a website, fostering communication and facilitating appointment bookings with healthcare providers. The system will feature a user registration and authentication process, ensuring secure account creation and data protection. Users will be able to manage their profiles, including personal information, medical history, and insurance details. Additionally, the platform will host detailed profiles for healthcare professionals, showcasing their specializations, credentials, and availability.

A key functionality of the system is the appointment scheduling module, providing users with a user-friendly interface to book appointments with their chosen doctors. A calendar system will display doctor availability, allowing users to select convenient time slots. Real-time communication tools, such as secure messaging and file sharing, will be integrated to facilitate seamless interaction between patients and doctors.

To enhance user experience, the platform will include features like appointment booking, search and filtering options for finding specific doctors, and a feedback system for patients to rate and review healthcare providers. Integration with Electronic Health Records (EHR) will be implemented to ensure easy access to patients' medical history.

Security measures will adhere to industry standards, with a focus on compliance with healthcare regulations and data protection laws. The website will be designed to be mobile-responsive, ensuring accessibility from various devices. Scalability will be a key consideration, accommodating potential growth in both users and data.

The platform will provide educational resources on medical conditions, treatments, and preventive measures. Accessibility will be prioritized, ensuring the website is usable by individuals with disabilities. A customer support system will be in place to address user queries and issues promptly. Continuous improvement will be emphasized, with mechanisms for collecting user feedback and regular updates to meet evolving user needs and technological advancements. In summary, the project aspires to deliver a user-centric, secure, and efficient healthcare management system that enhances the overall patient-doctor experience.

KEY FEATURES

The Hospital Management System (HMS) strives, at its core, to turn the fragmented environment of hospital operations into a unified, digital ecosystem. This digital hub promotes easy communication and coordination among healthcare providers while revolutionizing patient information management. The HMS aspires to achieve the following features by leveraging the power of automation and digitization:

- **Patient Information Management**: The system enables doctors, nurses, and administrators to manage and retrieve patient data such as medical history, prescriptions, and appointments more efficiently. This centralized repository provides easy access to vital information, allowing for more informed decision-making.
- **Appointment Scheduling:** The HMS simplifies the process of scheduling and managing appointments, lowering patient wait times and optimizing healthcare professional productivity. This feature is critical for improving patient happiness and maximizing hospital resource utilization.
- **Prescription Management:** The system supports healthcare practitioners in electronically producing, modifying, and maintaining prescriptions. This function helps reduce errors, ensure prescription correctness, and improve the efficiency of the pharmacy and drug dispensing process.
- **Inventory Tracking:** In addition to patient-centric capabilities, the HMS incorporates inventory tracking functionality. Administrators and procurement staff can use this to monitor stock levels, streamline supply chain management, and reduce the danger of shortages or excess situations.
- **Reporting:** The system creates detailed reports on numerous elements of hospital operations, providing insights that may be used to influence strategic decisions. Patient demographics and operational efficiency measures are included.
- **Medical Records**: Within the HMS, a complete electronic medical record (EMR) system assures the safe preservation and retrieval of patient medical records. This not only enhances care quality by providing a comprehensive picture of a patient's health, but it also aids in fast and correct diagnosis.
- **Medical Billing:** Allows hospitals to improve financial performance, improve patient experience, and manage the complexity of healthcare reimbursement more efficiently and accurately.

TECHNOLOGIES USED

The healthcare management system will be developed using a robust set of technologies to ensure its functionality, security, and scalability. Visual Studio Code (VSCode) will serve as the integrated development environment (IDE) for efficient coding and collaboration. The front end of the website will be built using HTML for structure, CSS for styling, and JavaScript for interactive features, ensuring a responsive and user-friendly interface.

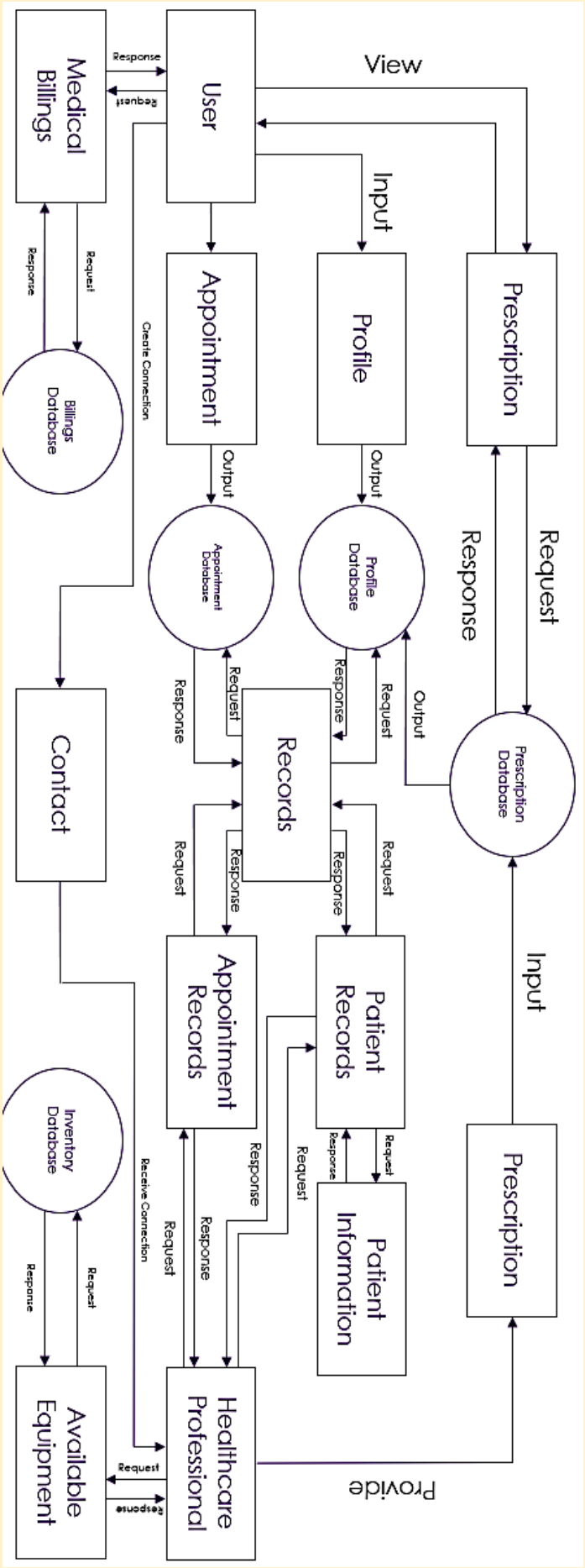
The back end of the system will be powered by PHP, a server-side scripting language well-suited for web development. PHP will handle dynamic content generation, user authentication, and data processing. MySQL will be employed as the relational database management system (RDBMS) to store and manage user profiles, appointment details, and other relevant data securely.

APIs (Application Programming Interfaces) will play a crucial role in connecting different components of the system, facilitating seamless communication between the front-end and back-end, as well as integration with external services or data sources. XAMPP, a free and open-source cross-platform web server solution, will be used for local development and testing purposes, providing an environment that includes Apache, MySQL, PHP, and other components.

The chosen technology stack leverages well-established tools and languages to create a robust, secure, and scalable healthcare management system. This combination of VSCode, HTML, CSS, JS, PHP, MySQL, APIs, and XAMPP provides a solid foundation for developing a feature-rich platform that meets the diverse needs of both patients and healthcare providers.

SYSTEM ARCHITECTURE

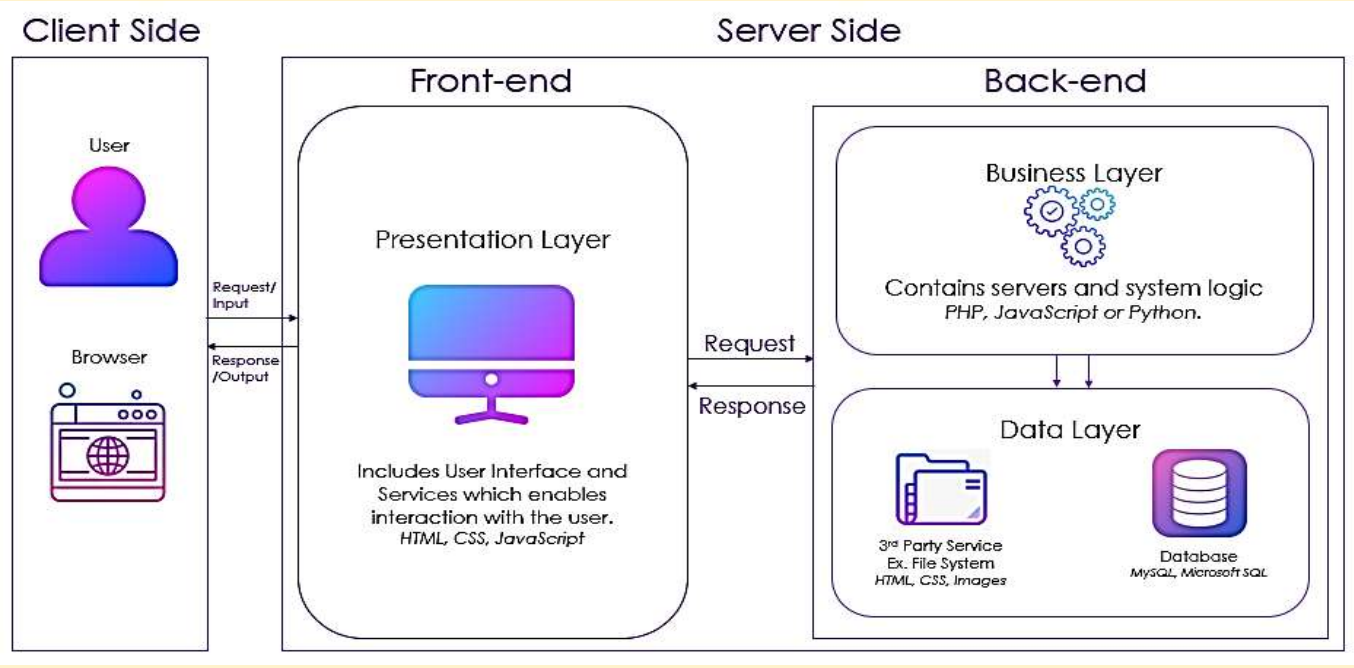
ARCHITECTURE OVERVIEW



COMPONENTS AND MODULES

1. **User Account Creation (Registration):** New users can create an account and choose between two account types (Healthcare Professional and Patient). The website has different functionality between these two account types.
2. **Prescription of Medicines:** Patients can easily view the prescriptions provided by their doctor. The prescription provided shows the patient's name, date, medicine name, amount, and frequency.
3. **View Prescriptions:** This module allows authorized users, typically doctors and nurses, to access and review patient prescriptions. It provides details of prescribed medications, dosages, frequencies, and any special instructions provided by the prescribing physician.
4. **Add Appointments:** This enables patients to quickly create appointments with their own chosen doctor, date and time, and concern. The website will check if the chosen doctor is free during the chosen period.
5. **View Appointments:** This module enables users, such as receptionists and healthcare providers, to view the schedule of appointments for patients.
6. **Add items in inventory:** This module allows authorized personnel, such as inventory managers or administrators, to add new items to the hospital's inventory. Users can input details such as item name, and quantity, ensuring accurate inventory tracking and management.
7. **View Inventory:** This module provides a comprehensive overview of the hospital's inventory to authorized users. It displays details such as available medical supplies. Users can quickly assess inventory status and make informed decisions regarding procurement and utilization.
8. **Edit Inventory:** This module enables authorized users to modify existing inventory records as needed. Users can update item quantities, edit item details, and make other necessary changes to ensure inventory accuracy and integrity.
9. **View Profiles:** Each user has a profile information page that can be edited. Patients profile information can be viewed by healthcare professionals on their patient record page. Patients can only edit their demographic profile so medical records, medications, doctor's recommendations, and recent appointments are excluded.
10. **Upload Profile Picture:** This module allows users to upload or change their profile pictures within the HMS. It provides a simple interface for users to personalize their profiles and helps in easy identification and communication among hospital staff members.

DATA FLOW DIAGRAM

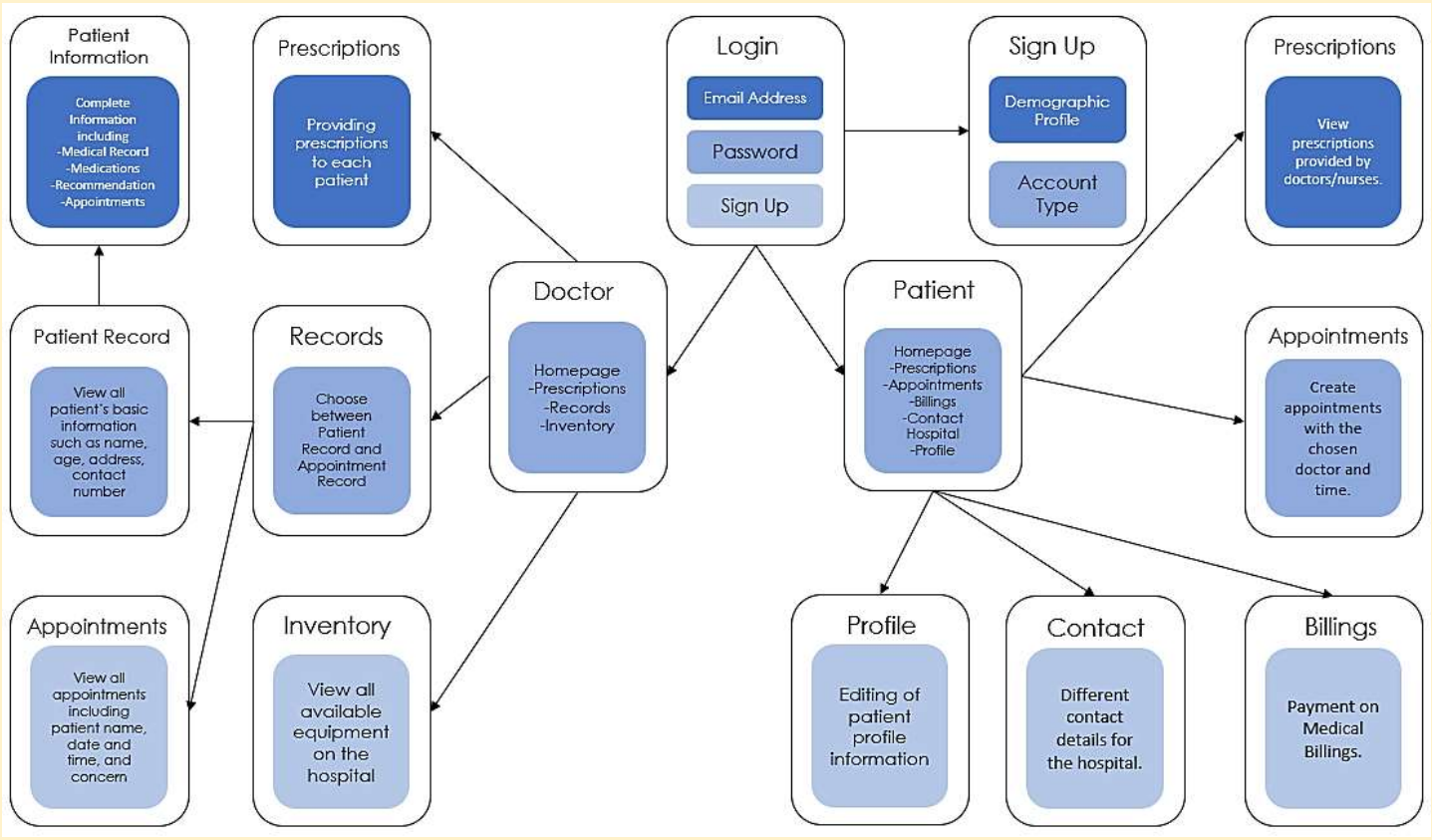


SITE STRUCTURE

NAVIGATION MENU

- Home (contains name of website, shortcut for navigations).
- Appointments (make appointments with chosen doctor, date, and time).
- Records (choose between patient record and appointments record).
- Inventory (view all available equipment on the hospital).
- About Us (provide all contact information for the hospital).

SITEMAP



DESIGN AND LAYOUT

Our website used a monochromatic color scheme. We focused on blue-green and their different tones from the color wheel. A hospital typically correlates to the blue or green color which is the reason why we chose this color scheme. By using a monochromatic color scheme, the website gives a feeling of simplicity and avoids the clashing of different color values which affects the readability of the contents of the website.

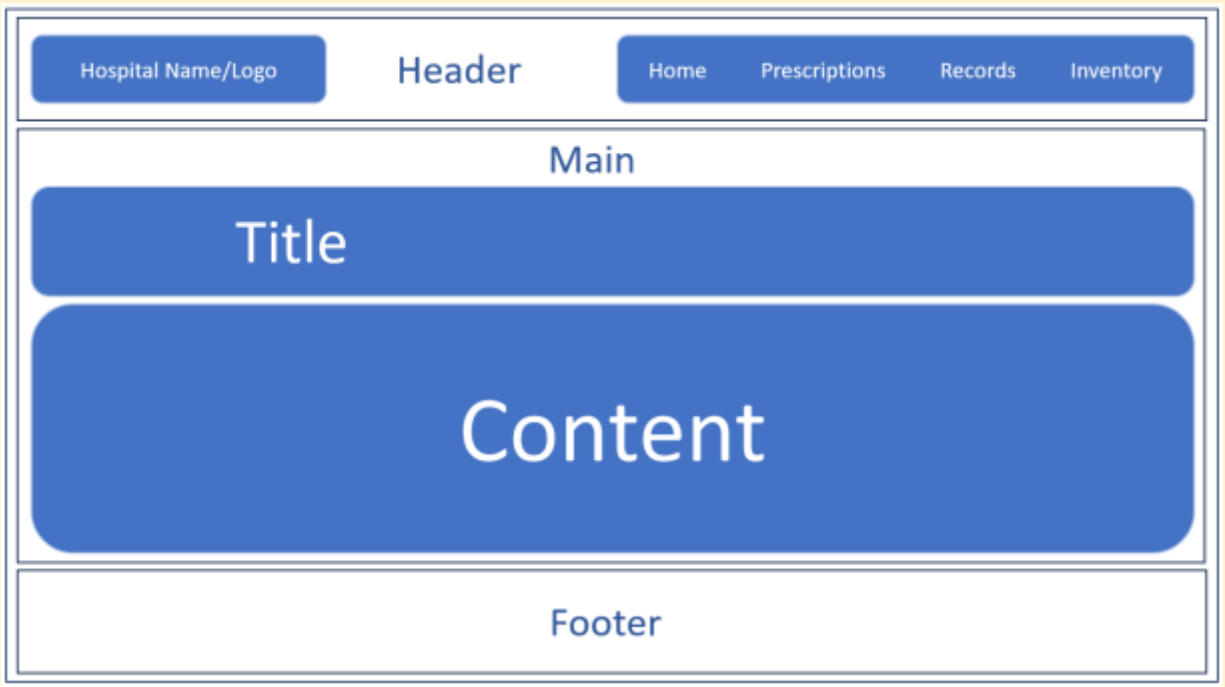
The website follows a minimalistic design which prevents objects from being clustered resulting in the avoidance of confusion for the users and follows the simplicity of color scheme design. The design enables the website to display the essential information only to the user. Titles use a larger font size and uses a strong font style to attract attention from the user. Easy-to-read fonts were used and the font color used contradicts the background to provide readability for users.

The header of the website contains the hospital name, and navigation menu which changes depending on the type of account logged in from the website. The patient account type navigation menu contains the prescriptions, appointments, billings, contacts, and profile while the Doctor and Nurse account type navigation menu contains prescriptions, records, and inventory. There are similar objects in the navigation menu between the two account types such as prescriptions but they have different functions.

The website prevents users with different account types from accessing the sections for specific account types. This prevents patients from gaining access to the section specifically for doctors and nurses such as their records for patients and appointments. Doctors and nurses also cannot access the sections provided for patients such as viewing billings and making appointments etc.

The website provides convenience to doctors and nurses since they can access all of the patient's information and appointments through the records section, easily provide prescriptions to each patient, and quickly check the available equipment in the hospital. Also, the patient to quickly check the provided prescriptions, create appointments without falling in line in the hospital, be able to contact the hospital quickly, and be able to pay billings online or face-to-face.

Layout for Homepage



CONTENT

Text Content

Welcome to the Healthcare Management System for PUP Biñan Doctors, a dedicated platform designed to streamline interactions between doctors and patients, ensuring efficient prescription management and appointment scheduling. Our homepage invites hospital staff to explore further, highlighting the system's objectives focused on enhancing the doctor-patient experience. Regular updates on the latest healthcare practices, in-depth evaluations of prescription management technologies, and expert insights from medical professionals can be found on our Medical Insights Blog. Guides and tutorials cater to both doctors and patients, offering step-by-step instructions for seamless interaction within the system. This all-inclusive platform provides dynamic material for investigating different aspects of doctor-patient interactions.

Images and Media

The Prescription Showcase section captivates doctors, showcasing the latest in prescription management technologies and tools. It goes beyond the surface, providing insights into the functionality of cutting-edge prescription systems and highlighting their significance in modern healthcare.

In the realm of Video Content, our platform offers engaging materials, including instructional videos on efficient prescription management, insightful interviews with medical professionals, and the latest updates on medical advancements presented in video format. This multimedia approach ensures a dynamic and informative experience for doctors seeking diverse perspectives on the ever-evolving healthcare landscape.

Content Management System (CMS)

At the core of the Healthcare Management System for PUP Biñan Doctors is a user-friendly Content Management System (CMS) designed to prioritize seamless functionality. The intuitive dashboard simplifies prescription management and appointment scheduling, providing a cohesive experience for doctors. Our CMS relies on multimedia integration to enhance the prescription management experience. Doctors can easily prescribe medicines, and the system allows for the integration of other media, resulting in visually appealing and diversified material.

The CMS features powerful organizing elements such as Categorization and Tagging, with well-organized categories for various prescription types and a tagging system that improves information retrieval efficiency. Collaboration is eased using doctor accounts that provide various access levels and collaboration features, allowing multiple doctors to contribute seamlessly to patient care. In conclusion, the CMS acts as a solid foundation, enabling effective prescription management and collaborative activities within the Healthcare Management System for PUP Biñan Doctors.

FUNCTIONAL COMPONENTS

This is a comprehensive healthcare management system designed to streamline patient-doctor interactions and optimize healthcare processes. Serving as a centralized hub, this healthcare management system encompasses various functional components aimed at enhancing the overall healthcare experience for both patients and healthcare providers.

The Patient’s Module includes features to facilitate seamless communication and appointment management. The Appointment Scheduling component allows patients to schedule appointments with

healthcare professionals conveniently through a user-friendly interface. Patient Profiles store and organize individual health information, medical history, and insurance details securely. Real-time Communication tools enable secure messaging and file sharing between patients and doctors, fostering effective virtual consultations. A Search and Filters function assists users in finding specific doctors based on specialization, location, and availability. Appointment Reminders and Feedback and Ratings mechanisms enhance user engagement, reducing no-shows and providing valuable insights for continuous improvement.

The Healthcare Provider's Module focuses on empowering doctors and healthcare administrators with efficient tools. Doctor Profiles provide detailed information on healthcare professionals, including specializations, credentials, and availability. The Appointment Management component allows doctors to view and manage their schedules, facilitating a well-organized workflow. Integration with Electronic Health Records (EHR) ensures seamless access to patients' medical history, improving diagnostic accuracy. Security and Compliance features adhere to industry standards, safeguarding patient information and ensuring regulatory compliance. Analytics and Reporting tools offer insights into appointment trends, user interactions, and system performance.

The Administrative Module serves as the central hub for overseeing and managing the healthcare system. User Management allows administrators to handle user accounts, ensuring security and privacy. The System Configuration component enables adjustments to system settings and routine maintenance tasks for optimal performance. The Database Management feature oversees the secure handling of patient data, including additions, edits, and removals. Continuous Improvement mechanisms involve collecting user feedback, implementing updates, and staying abreast of technological advancements. Overall, these functional components collectively create a robust healthcare management system that prioritizes patient well-being and enhances the efficiency of healthcare delivery.

DATA MANAGEMENT

Database Structure

The database structure for a healthcare system requires consideration of various aspects such as patient information, medical records, appointments, prescriptions, and billing.

Patients Database- This stores information about patients who are registered in the healthcare system. It includes details such as patient IDs, names, dates of birth, gender, contact information, and addresses.

Medical Records Database- contains information related to each patient's medical history and visits to healthcare providers. It includes details such as the date of the visit, the doctor who attended the patient, diagnosis, treatment provided, and any additional notes relevant to the visit.

Appointments Database- records appointments made by patients to see healthcare providers. It includes details such as the patient ID, doctor ID, date and time of the appointment, and the reason for the appointment.

Prescriptions Database - contains details about medications prescribed to patients during their visits. It includes information such as the patient ID, doctor ID, date of the prescription, medication name, dosage, frequency, and duration of the prescription.

Billing Database- stores information related to the financial aspects of patient visits and treatments. It includes details such as the patient ID, date of billing, total amount charged for services rendered, and the payment status (whether the bill has been paid or is pending).

DATA FLOW

User Interface

- This is the interface through which users interact with the healthcare system, such as patients, doctors, and administrative staff.

Application Layer

- This layer consists of the application logic that processes user requests, manages data, and communicates with the database layer.

Patient Registration & Doctor Interface

- These modules handle the registration of new patients and provide an interface for doctors to manage their appointments, prescriptions, and medical records.

Patient Management & Doctor Management

- These modules handle the management of patient information and doctor information respectively. They handle tasks such as scheduling appointments, managing medical records, and updating patient information.

Database Layer

- This layer manages the storage and retrieval of data. It includes the database itself and any external systems that the healthcare system interacts with, such as billing systems or laboratory systems.

Data Storage: This is where the actual data is stored, typically in a relational database management system (e.g., SQL Server, Oracle, MySQL, etc.).

Data Backup and Recovery procedures

Data backup procedures

a. Backup Frequency

- Determine the frequency of backups based on the criticality of the data and regulatory requirements. For example, critical patient data may require daily backups, while less critical data can be backed up less frequently.

b. Full and Incremental Backups

- Perform regular full backups of the entire database to capture all data. Additionally, implement incremental backups to capture changes made since the last full backup, reducing backup time and storage requirements.

c. Encryption

- Encrypt backup data to protect sensitive patient information during transmission and storage. Encryption helps prevent unauthorized access to data in case backup media are lost or stolen.

d. Backup Documentation

- Maintain detailed documentation of backup procedures, schedules, and configurations. Documentation facilitates troubleshooting, auditing, and compliance with regulatory requirements.

e. Regular Review and Updates

- Regularly review and update backup procedures to incorporate changes in technology, regulations, and organizational requirements. Periodic reviews ensure that backup procedures remain effective and aligned with business objectives.

Recovery procedures

Backup Strategy - Implement a comprehensive backup strategy that includes regular backups of all critical data, including patient records, medical images, billing information, and administrative data.

Data Encryption - Encrypt sensitive patient data both during transit and at rest to prevent unauthorized access in case of data loss or theft.

Offsite Backup Storage - Store backup copies of data in offsite locations to protect against physical disasters, such as fires, floods, or other events that could impact the primary data storage facility

Testing and Validation - Regularly test the backup and recovery processes to ensure that data can be successfully restored in the event of a data loss incident. Conduct validation tests to verify the integrity and completeness of backup data and ensure that it meets regulatory compliance requirements.

SYSTEM INTEGRATION

Third-Party API's

The YouTube API serves as a third-party tool integrated into Hospital Management Systems to fetch health-related videos, offering patients educational content on various medical topics. These videos are curated to provide valuable insights into wellness practices, treatment options, and medical procedures, enhancing patient understanding and engagement with their healthcare journey. By leveraging the YouTube API, Hospital Management Systems can offer a diverse range of educational resources conveniently within the system, empowering patients to make informed decisions about their health while facilitating effective communication between healthcare providers and patients.

Data Exchange and Integration

Seamless data exchange and integration are fundamental aspects of a Hospital Management System, enabling efficient communication and collaboration among various healthcare components. Through robust integration mechanisms and standardized data formats, disparate systems such as electronic health records (EHR), laboratory information systems (LIS), and radiology systems can seamlessly exchange information, ensuring a comprehensive view of patient data across the healthcare ecosystem. Third-party APIs play a pivotal role in this process by facilitating interoperability between different systems, allowing for real-time data exchange, and enabling healthcare professionals to make well-informed decisions promptly. By fostering interoperability and integration, hospitals can enhance operational efficiency, improve patient care coordination, and ultimately achieve better healthcare outcomes for their patients.

USER EXPERIENCE

Responsiveness

- The system's responsiveness is critical, ensuring that users can access and interact with the Hospital Management system seamlessly across various devices, including desktop computers, tablets, and smartphones. A responsive design ensures that all functionalities are accessible and optimized for different screen sizes, enhancing user productivity and satisfaction.

Cross-Browser Compatibility

- Cross-browser compatibility is essential to ensure that the Hospital Management System performs consistently across different web browsers. By adhering to web standards and conducting thorough testing, the system can deliver a consistent user experience regardless of the browser used, improving accessibility and user satisfaction.

Performance Optimization

- Performance optimization plays a vital role in delivering a smooth and efficient user experience within the Hospital Management System. By optimizing code, minimizing loading times, and efficiently managing data, the system can deliver fast response times and smooth interactions, enhancing user productivity and satisfaction. Performance monitoring and regular optimizations ensure that the HMS maintains optimal performance levels, providing healthcare professionals with a reliable and efficient tool for managing hospital operations and patient care.

SECURITY

- It is to safeguard sensitive patient data, ensuring the confidentiality and privacy of medical records. Robust security measures, such as user authentication and data encryption, prevent unauthorized access and protect against potential breaches. In a healthcare setting, where patient confidentiality is paramount, a secure system not only upholds ethical standards but also fosters trust among patients and healthcare professionals.

User Authentication - ensures that only authorized personnel, such as healthcare providers and administrative staff, can access patient information, maintaining confidentiality and privacy.

Data Encryption - is implemented to secure patient records, ensuring that sensitive data remains confidential and protected from unauthorized access.

Protection Against Common Web Vulnerabilities - The system also incorporates robust measures to guard against common web vulnerabilities, such as implementing firewalls and input validation checks, enhancing the overall security posture of the hospital's digital infrastructure.

THIRD-PARTY INTEGRATIONS

- It plays a vital role by enhancing its functionality and expanding its capabilities. Integration with payment gateways facilitates seamless and secure financial transactions for medical services, streamlining the billing process.

Payment Gateways - Seamless integration with payment gateways streamlines financial transactions for medical services, providing a secure and efficient payment process for patients

Social Media Sharing - Social media Sharing features enable the hospital to engage with the community, disseminate important health information, and enhance its online presence

Analytics Tools - Tools that empower healthcare providers to gain valuable insights into patient trends, resource allocation, and overall operational efficiency, contributing to informed decision-making and improved patient care.

ADMINISTRATION

- It is to ensure efficient oversight and control of various system aspects.

User Roles and Permissions

- User roles and permissions are meticulously configured, ensuring that different staff members have appropriate access levels based on their responsibilities within the hospital. In a Hospital Management System (HMS), typical user roles include:

Administrator: Responsible for overall system management, user access control, configuration, and maintenance of the HMS. They ensure the smooth functioning of the system and handle any technical issues that arise.

Doctors: Primary healthcare providers who use the HMS for patient diagnosis, treatment planning, prescription management, and medical record documentation. They rely on the system to access patient information and communicate with other healthcare providers.

Nurses: Provide direct patient care and use the HMS for tasks such as updating patient records, administering medications, scheduling appointments, and communicating with doctors and other healthcare staff.

Billing and Finance Staff: Responsible for managing billing, insurance claims, and financial transactions within the hospital. They use the HMS to generate invoices, process payments, and maintain financial records accurately.

Maintenance and Updates

- Regular maintenance and updates are conducted to keep the system optimized, secure, and aligned with evolving healthcare industry standards, guaranteeing a reliable and up-to-date platform.

TESTING AND QUALITY ASSURANCE

- This involves testing individual components and functionalities of the hospital management system to ensure they perform as expected. It includes verifying tasks such as patient registration, appointment scheduling, billing, and inventory management.

Testing methods - This involves testing separate system modules or components to make sure they operate properly when used alone. This might involve evaluating particular features of hospital management systems, such as inventory control, billing computations, and room reservations.

Bug Tracking - involves identifying, documenting, prioritizing, and resolving issues or "bugs" within the software. These bugs can range from minor glitches to critical errors that affect the system's functionality or security.

User Acceptance Testing- This testing ensures that the system meets the needs of hospital industry professionals, such as doctors, nurses, etc. During UAT, real-world scenarios are simulated to verify that the system functions correctly, is user-friendly, and aligns with business requirements.

DEPLOYMENT - refers to the process of making the system available and operational within a healthcare facility. It involves several key steps:

1. **Requirements Gathering and Analysis**: Start by understanding the specific needs and requirements of the hospital or healthcare facility. This involves gathering information from

stakeholders, identifying pain points, and determining key features and functionalities required in the hospital management system (HMS).

2. **System Design and Development**: Once the requirements are clear, design the HMS architecture and develop the system accordingly. This stage involves creating wireframes, database design, module development, and ensuring interoperability with existing hospital systems (e.g., electronic health records, and billing systems).
3. **Testing and Quality Assurance:** Thoroughly test the HMS to ensure it meets the specified requirements and functions correctly. This includes unit testing, integration testing, system testing, and user acceptance testing (UAT). Address any bugs or issues identified during testing before proceeding to deployment.
4. **Deployment Planning:** Plan the deployment process meticulously, considering factors such as system downtime, data migration, user training, and contingency measures. Coordinate with hospital staff, IT personnel, and stakeholders to minimize disruption to hospital operations during deployment.
5. **Post-Deployment Support:** Gradually roll out the HMS across different departments of the hospital. Monitor the system closely during the initial period to address any issues or challenges that arise. Provide ongoing support and maintenance to ensure the smooth functioning of the HMS and address any additional requirements or enhancements identified by users.

Hosting Information: The hosting information for a Hospital Management System (HMS) typically involves deploying the system on secure and reliable servers, either on-premises within the hospital's IT infrastructure or in a cloud environment. Additionally, the hosting infrastructure should be scalable to accommodate the growing needs of the hospital and capable of handling high volumes of data and user traffic to ensure optimal performance and reliability of the HMS.

Domain Configuration: Domain configuration involves leveraging the localhost via XAMPP to access the website, which is usually done through XAMPP's localhost. This approach is favored due to the associated costs of registering a DNS.

Support and Maintenance: We continue to provide support and maintenance services to ensure the smooth functioning of the HMS. This involves addressing user queries, resolving technical issues, implementing updates or enhancements, and conducting periodic system audits to ensure compliance with regulatory standards and evolving healthcare requirements.

TROUBLESHOOTING - involves identifying and resolving issues that may arise within the system.

Common Issues and Solutions:

Maintenance Schedule – Conducting routine database maintenance may enhance efficiency, guarantee data accuracy, and avert data loss. This might entail activities like database cleansing, indexing, and data backups.

Contact Information - A hospital management system's contact information system usually consists of a centralized database or directory that contains all pertinent contact information for anyone connected to the hospital. For any troubleshooting or support-related inquiries, please contact:

- **Facebook Page**: PUP Biñan Doctors
- **Mobile Number**: +639128803234