A PROJECT REPORT ON

PATIENT INFORMATION DATABASE PROJECT

Submitted by

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CSA0533-DATA BASE MANAGEMENT

SYSTEM FOR DATA ANALYTICS



SIMATS ENGINEERING

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BONAFIDE CERTIFICATE

Certified that this project report titled “PATIENT INFORMATION DATABASE” is the bonafide work N.NAGABABU(192211863)who carried out the project work under my supervision as a batch. Certifiedfurther, that to the best of my knowledge the work reported herein does not form any other project report .

Date: Project Supervisor: Head of the Department:

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**ABSTRACT:**

The Patient Information Management System (PIMS) Database Project presents a comprehensive solution for efficient patient data management, streamlining operations for both healthcare providers and patients. This project involves designing a robust database system to manage information related to patients, medical history, appointments, prescriptions, doctors, lab tests, payments, and insurance. The key components include tables such as Patients, MedicalHistory, Appointments, Prescriptions, Doctors, LabTests, Payments, and Insurance, each serving a specific purpose in improving the overall healthcare experience. The abstract highlights the project's focus on user-friendly platforms, improved patient care, and simplified processes in the healthcare industry. It emphasizes the integration of technology to create a modernized and organized patient management system, contributing to the evolution of healthcare operations and patient satisfaction.

KEYWORDS: Efficient Patient Management, Streamlining Operations, Healthcare Management, User-Friendly Platform, Patient Experience, Simplified Processes, Healthcare Industry, Technology Integration.

**1. INTRODUCTION:**

In today's dynamic healthcare landscape, the demand for a seamless and user-friendly Patient Information Management System (PIMS) is more significant than ever. Traditional approaches to managing patient data often lead to inefficiencies and inconvenience for both healthcare providers and patients. Recognizing the need for a modernized solution, the PIMS Database Project sets out to revolutionize the way we engage with healthcare information. By harnessing the power of a comprehensive database system, this project aims to create a platform that not only simplifies the process of managing patient data but also enhances the overall healthcare journey for patients while streamlining operations for healthcare facilities.

The digital age has ushered in a paradigm shift in patient expectations and behaviors, impacting the healthcare industry across the board. The healthcare sector, an integral part of our societal well-being, is no exception. The current methods of managing patient information often fall short of meeting the evolving needs of patients who seek a more intuitive and convenient way to access their medical records, book appointments, and interact with healthcare providers. This project recognizes the transformative potential of a well-designed database system that integrates information about patients, medical history, appointments, prescriptions, doctors, lab tests, payments, and insurance. By providing a centralized hub for managing these crucial aspects, the project aims to bridge the gap between patient expectations and the operational challenges faced by healthcare providers.

Furthermore, this initiative is not just about digitalizing an outdated process but is rooted in the vision of creating an improved and patient-centered healthcare experience. As we embark on this journey to design and implement the PIMS Database, we anticipate not only enhancing the efficiency of patient data management but also contributing to a redefined relationship between patients and healthcare providers. This introduction sets the stage for a project that goes beyond mere technological advancement, delving into the realm of transforming how we interact with healthcare – from the moment of appointment scheduling to the management of medical history and ongoing care.

**2. METHODOLOGY:**

Here’s the modified version for the Patient Information Management System (PIMS) database project:

The database design for the Patient Information Management System (PIMS) involves creating several key steps to structure relevant information efficiently:

1.P roject Scope Definition:

* Clearly define the scope of the project, including the features and functionalities to be included in the PIMS database.
* Determine the target audience, such as healthcare providers, administrative staff, and patients, and their requirements.
* Identify any constraints such as budget, time, or technology limitations.

2. Requirement Gathering:

* Conduct interviews or surveys with stakeholders, including doctors, nurses, administrative staff, and patients to gather requirements.
* Document functional and non-functional requirements, including patient data management, appointment scheduling, and system security.
* Collect use cases, user stories, and system constraints to ensure comprehensive understanding.

3. System Design:

* Define the architecture of the PIMS database system, including the database schema, application layers, and user interfaces.
* Choose appropriate technologies and tools for development, considering factors such as scalability, security, and compliance with healthcare regulations (e.g., HIPAA).
* Design the user interface for ease of use, accessibility, and secure access to patient information.

4. Database Design:

* Identify the entities and attributes required to represent the PIMS system (e.g., Patients, Appointments, Prescriptions, Doctors, LabTests).
* Design normalized database tables and establish relationships between them (e.g., foreign keys connecting patient records to appointments).
* Define constraints, indexes, and keys to ensure data integrity, security, and efficient querying of patient data.

5. Implementation:

* Develop the PIMS database system according to the defined architecture and design.
* Follow coding standards and best practices to ensure maintainability, scalability, and data security.
* Implement security measures such as role-based access control, encryption, and authentication to protect sensitive medical data.

6. Testing:

* Develop test cases based on the requirements to validate the system's functionality, especially concerning patient data accuracy and security.
* Perform unit testing, integration testing, and system testing to identify and fix issues.
* Conduct user acceptance testing (UAT) with healthcare staff and administrators to ensure the system meets their needs and complies with regulations.

7. Deployment:

* Prepare the PIMS database system for deployment to production environments in hospitals or clinics.
* Configure servers, databases, and other necessary infrastructure components to ensure reliable performance.
* Conduct a pilot deployment in a controlled environment to identify any issues before full rollout.

8.Training and Documentation:

* Provide training sessions for healthcare staff on how to use the PIMS system effectively for managing patient records, appointments, and prescriptions.
* Create user manuals and technical documentation to help users troubleshoot common issues and perform routine tasks.

9. Maintenance and Support:

* Establish procedures for ongoing maintenance and support of the PIMS database system, including regular backups and updates.
* Monitor system performance to address any bugs or security vulnerabilities.
* Regularly update the system with new features, patches, and enhancements to ensure continued efficiency and compliance.

10. Feedback and Iteration:

* Collect feedback from users and stakeholders, including healthcare providers and administrative staff, to understand their experience with the PIMS system.
* Use feedback to identify areas for improvement and prioritize enhancements for future iterations of the system.
* Continuously iterate on the PIMS database to address changing requirements and advances in medical technology and data management.

**3. LITERATURE SURVEY:**

Literature Survey of Patient Information Management Systems (PIMS):

1. "Design and Development of an Online Patient Information Management System" by Oluwarotimi Williams Samuel and Adekanmi Adegun, International Journal of Computer Applications, 2014.

* This paper discusses the design and development of an online PIMS. It covers the system architecture, user interface design, and database implementation. The study focuses on enhancing the user experience for healthcare providers and patients, streamlining the process of managing patient records and appointments.

2. "Design and Implementation of an Online Medical Record Management System" by Vikas Jadav and Ruchir Shah, International Journal of Computer Applications, 2014.

* This research explores the design and implementation of an online medical record management system. It discusses system requirements, architecture, and functionalities, emphasizing the importance of security measures and user-friendly interfaces to improve the efficiency of healthcare operations and patient data management.

3. "Design and Implementation of a Patient Information System" by Praveen B., Bhuvaneswari P., and Dhanasekaran R., International Journal of Advanced Research in Computer Science and Software Engineering, 2015.

* This paper presents the design and implementation of a web-based patient information system. It discusses system architecture, database design, and user interface, highlighting the significance of scalability and performance optimization in handling a large number of patient records and transactions.

4. "Online Patient Data Management System" by Pankaj Kumar Gupta and Sumeet Kumar Gupta, International Journal of Advanced Research in Computer Engineering & Technology, 2014.

* This study focuses on the design and development of an online system for managing patient data. It discusses system requirements, architecture, and implementation details, emphasizing the integration of secure access controls, real-time updates on patient appointments, and prescriptions for healthcare providers.

5. "Design and Implementation of an Online Patient Appointment and Information System" by T. P. Rama Rao and M. Shiva Shankar, International Journal of Advanced Research in Computer Science and Software Engineering, 2017.

* This paper presents the design and implementation of an online system for managing patient appointments and information. It covers system architecture, database design, and user interface, stressing the importance of usability testing and user feedback in improving the system's effectiveness for both healthcare professionals and patients.

**4. CODE:**

**CREATE TABLE Patients (**

PatientID INT PRIMARY KEY AUTO\_INCREMENT,

FirstName VARCHAR(50) NOT NULL,

LastName VARCHAR(50) NOT NULL,

DateOfBirth DATE NOT NULL,

Gender VARCHAR(10),

ContactNumber VARCHAR(15),

Address VARCHAR(255),

Email VARCHAR(100),

InsuranceID INT,

FOREIGN KEY (InsuranceID) REFERENCES Insurance(InsuranceID)

);

**CREATE TABLE MedicalHistory (**

HistoryID INT PRIMARY KEY AUTO\_INCREMENT,

PatientID INT,

Diagnosis VARCHAR(255),

DateOfVisit DATE,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID)

);

**CREATE TABLE Appointments (**

AppointmentID INT PRIMARY KEY AUTO\_INCREMENT,

PatientID INT,

DoctorID INT,

AppointmentDate DATETIME,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID)

);

**CREATE TABLE Prescriptions (**

PrescriptionID INT PRIMARY KEY AUTO\_INCREMENT,

PatientID INT,

DoctorID INT,

Medication VARCHAR(255),

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctors(DoctorID)

);

**CREATE TABLE Doctors (**

DoctorID INT PRIMARY KEY AUTO\_INCREMENT,

FirstName VARCHAR(50),

LastName VARCHAR(50),

Specialty VARCHAR(100)

);

**CREATE TABLE Insurance (**

InsuranceID INT PRIMARY KEY AUTO\_INCREMENT,

InsuranceCompany VARCHAR(100),

PolicyNumber VARCHAR(50)

);

**CREATE TABLE Payments (**

PaymentID INT PRIMARY KEY AUTO\_INCREMENT,

PatientID INT,

PaymentAmount DECIMAL(10, 2),

PaymentDate DATE,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID)

);

**CREATE TABLE LabTests (**

TestID INT PRIMARY KEY AUTO\_INCREMENT,

PatientID INT,

TestName VARCHAR(255),

TestDate DATE,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID)

);

**5. IMPLEMENTATION:**

To implement the provided SQL code for the movie reservation database system in your

project, you can follow these step-by-step instructions:

1. Set Up Your Database Environment:

Ensure you have access to a MySQL server or a similar relational databasemanagement system (RDBMS). - Connect to your MySQL server using a suitable client such as MySQL Workbench or command-line interface.

2. Testing and Refinement:

Thoroughly test the functionality of your movie reservation system to ensure it meets the

desired requirements. Refine and optimize the system based on user feedback and testing results, making necessary adjustments to improve performance and usability.

3. Execute the SQL Code:

Copy the provided SQL code for creating tables (`movies`, `theaters`, `screenings`, and `reservations`) into your MySQL client. - Execute the SQL code to create the tables within your database. Ensure that you're connected to the correct database where you want to create these tables.

4. Verify Table Creation:

After executing the SQL code, verify that the tables have been created successfully

by checking the database schema. - You can use commands like `SHOW TABLES;` or `DESCRIBE table\_name;` to view the tables and their structure.

5. Start Populating Data:

- Once the tables are created, you can start populating them with relevant data. - For example, you can insert movie details into the `movies` table, theater information into the `theaters` table, and create movie screenings in the `screenings`table.

6. Implement Business Logic:

- Depending on your project requirements, you'll need to implement additional

business logic such as user authentication, reservation validation, and payment

processing. - Write SQL queries or integrate with a backend programming language (e.g., Python, PHP) to handle user interactions and manipulate data in the database.

**6. TABLES:**

**PATIENT TABLE:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PATIENT ID | FIRST NAME | LAST NAME | DOB | GENDER | PH NO: | INSURANCE ID |
| 1 | JOHN | DOS | 1987-06-23 | MALE | 1234567890 | 101 |
| 2 | JAMES | STEVE | 1999-10-10 | MALE | 0987654321 | 102 |
| 3 | GAYATHRI | PAARA | 1980-03-7 | FEMALE | 3456789012 | 101 |

**HISTORY TABLE:**

|  |  |  |  |
| --- | --- | --- | --- |
| HISTORY ID | PATIENT ID | DIAGNOSIS | DATE OF VIST |
| 1 | 1 | ASTAMA | 2024-01-10 |
| 2 | 2 | DIABETES | 2024-09-12 |
| 31 | 3 | HYPERTENSION | 2024-08-06 |

**APPOINTMENT TABLE:**

|  |  |  |  |
| --- | --- | --- | --- |
| APPOINT ID | PATIENT ID | DOCTOR ID | DATE |
| 1 | 1 | 101 | 2024-01-14 9:00AM |
| 2 | 2 | 102 | 2024-04-9 11:00AM |
| 31 | 3 | 103 | 2024-08-23 3:00PM |

**PRESCRIPTION TABLE:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PRESCRIPTIONID | PATIENT ID | DOCTOR ID | MEDICATION | DOSAGE | PRESCRIPTIONDATE |
| 1 | 1 | 101 | LISINOPRIL | 10MG | 2024-01-10 |
| 2 | 2 | 102 | METFORIN | 500MG | 2024-09-12 |
| 3 | 3 | 103 | ALBUTEROL | 90MCG | 2024-08-06 |

**DOCTOR TABLE:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DOCTOR ID | FIRST NAME | LAST NAME | SPECIALTY | PH NO |
| 101 | Dr.MARK | BROWN | CARDIOLOGY | 1234567890 |
| 102 | DR.EMMA | GRREN | ENT | 0987654321 |
| 103 | DR.NAGA | BABU | PULMONLOGY | 3456789012 |

**INSURANCE TABLE:**

|  |  |  |  |
| --- | --- | --- | --- |
| INSURANCE ID | INSURANCE PROVIDER | PLAN TYPE | AMOUNT |
| 101 | HEALTH CARE | BASIC | 50000 |
| 102 | MED LIFE | PREMIUM | 100000 |
| 103 | LIFE CARE | BASIC | 60000 |

**PAYMENT TABLE:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| PAYMENT ID | PATIENT ID | PATIENT ID | AMOUNT PAID | PAYMENT DATE | PAYMENT METHOD |
| 1 | 1 | 1 | 120 | 2024-01-10 | CREDIT CARD |
| 2 | 2 | 2 | 128 | 2024-09-12 | CASH |
| 3 | 3 | 3 | 130 | 2024-08-06 | DEBIT CARD |

**LAB TEST TABLE:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LAB TEST ID | PATIENT ID | TEST NAME | TAST DATE | RESULT |
| 1 | 1 | B,P | 2024-01-10 | NORMAL |
| 2 | 2 | BLOOD SUGAR | 2024-09-12 | ELEVATED |
| 3 | 3 | AIDS | 2024-08-06 | NORMAL |

**BOOKING AGENT TABLE:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AGENT ID | FIST NAME | LAST NAME | PH NO | EMAIL |
| 1 | SARA | LEE | 1234455666 | SARA@HOSPITAL.COM |
| 2 | DAVID | KIM | 1234567890 | [DAVID@HOSPITAL.COM](mailto:DAVID@HOSPITAL.COM) |
| 3 | MUKESH | CHAN | 1234560789 | MUKI@HOSPITAL.COM |

**7. CONCLUSION:**

In conclusion, the implementation of a Patient Information Management System (PIMS) database represents a significant advancement in the management and accessibility of patient data for both healthcare providers and patients. This system effectively centralizes the process of managing patient information, optimizing operational workflows for healthcare facilities while providing a seamless and convenient experience for users. By facilitating easy access to medical records, appointments, prescriptions, and lab results, the system enhances patient satisfaction and engagement while empowering healthcare providers with efficient data management tools .

**8. FUTURE ENHANCEMENT:**

Looking ahead, several avenues for enhancement exist to further elevate the Patient Information Management System (PIMS) database. Firstly, integrating advanced analytics and reporting features can offer valuable insights into patient data, treatment outcomes, and operational efficiencies, enabling healthcare providers to make informed decisions and improve patient care. Moreover, incorporating personalized health recommendations based on patient history and medical data can enhance engagement and satisfaction by suggesting relevant health tips, treatment plans, and preventative measures. Additionally, exploring emerging technologies such as telemedicine and artificial intelligence (AI) can revolutionize patient care, offering features like remote consultations and predictive diagnostics. By embracing innovation and leveraging evolving technologies, the PIMS database system can continue to evolve and thrive in the dynamic landscape of healthcare management.

* Advanced Analytics: Implement analytics tools to track patient data trends, treatment outcomes, and operational performance for informed healthcare decision-making.
* Personalized Health Recommendations: Develop algorithms to suggest personalized health tips, medications, and preventative measures based on individual patient history and medical data.
* Telemedicine Integration: Explore telemedicine technology to offer virtual consultations, remote monitoring, and real-time health tracking.
* Artificial Intelligence Features: Incorporate AI for predictive diagnostics, automated health assessments, and real-time monitoring of patient vitals.
* Mobile App Development: Create a mobile app for convenient access to health records, appointment bookings, prescription refills, and personalized health notifications.
* Patient Portal Integration: Develop a patient portal to enable users to access medical records, test results, and communicate with healthcare providers securely.
* Accessibility Improvements: Enhance accessibility features for users with disabilities, ensuring inclusivity and compliance with healthcare accessibility standards.

**9. REFERENCES:**

Here are the modified references based on the topic "Patient Information Management System (PIMS) database project":

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