**NextGen Care: Transforming Healthcare Management**

**Team Members:**

**Chirag Dodia**

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**Project Summary**

NextGen Care is a healthcare management platform engineered to optimize clinical workflows by integrating core functionalities such as patient information systems, electronic health record (EHR) processing, and administrative automation. The system leverages a structured healthcare dataset sourced from Kaggle, encompassing variables like patient demographics, medical history, and admission metadata. This dataset enables the platform to support advanced data analytics, facilitating predictive insights, resource optimization, and enhanced clinical decision-making. Through modular design and scalable architecture, NextGen Care aims to serve diverse healthcare environments by streamlining data handling, reducing manual overhead, and improving interoperability across healthcare services.

**Project Objectives and Usefulness:**

**Enhancement of Healthcare Management Processes:**

NextGen Care seeks to improve healthcare operational efficiency by consolidating patient information into a centralized system and automating critical administrative functions such as appointment scheduling, record maintenance, and workflow coordination.

**Advancement of Patient Care Quality:**

By facilitating seamless access to comprehensive electronic health records (EHRs), the platform aims to support healthcare providers in delivering continuous, coordinated, and error-minimized care. The system’s design emphasizes the reduction of administrative burden, thereby allowing practitioners to allocate greater focus to clinical tasks.

**Promotion of Data-Driven Decision-Making:**

Through the integration of advanced data analytics, NextGen Care enables healthcare institutions to extract actionable insights from patient and operational datasets. This empowers organizations to detect emerging trends, optimize resource allocation, and make evidence-based clinical and administrative decisions.

Furthermore, the project framework is intentionally designed to be iterative and adaptive. Throughout the development lifecycle, additional objectives and system enhancements will be identified and incorporated, ensuring that the platform evolves in response to the dynamic and complex needs of healthcare providers and patient communities.

**Usefulness of NextGen Care:**

NextGen Care offers significant utility across multiple domains within the healthcare ecosystem:

**For Healthcare Providers:**

The platform streamlines administrative operations by reducing manual paperwork, facilitating rapid access to patient records, and integrating scheduling functionalities. These enhancements enable providers to devote greater attention to clinical care and improve the overall quality of service delivery.

**For Patients:**

NextGen Care enhances patient engagement by offering functionalities such as online appointment scheduling and seamless access to personal health records, thereby improving convenience, transparency, and the overall patient experience.

**For Healthcare Administrators:**

The system supports facility management through integrated resource management tools and performance analytics dashboards, contributing to more effective allocation of resources, improved operational oversight, and enhanced institutional performance.

**For Researchers:**

By aggregating and anonymizing large-scale healthcare datasets, NextGen Care creates valuable opportunities for medical research. This facilitates data-driven advancements in healthcare delivery, informs evidence-based policymaking, and supports innovations aimed at improving public health outcomes.

Moreover, the platform is powered by a comprehensive dataset comprising 10,000 records, encompassing variables such as patient demographics, clinical status, and admission details. This dataset is critical for enabling functionalities such as predictive modeling for healthcare outcomes and optimization of resource utilization. Through the integration of high-quality, real-world data, NextGen Care ensures that clinical and administrative decisions are both data-driven and aligned with contemporary healthcare needs, ultimately leading to improved patient outcomes and more efficient healthcare management.

**Technical Description:**

**Data:**

**Dataset Utilization:**

NextGen Care leverages a healthcare dataset obtained from Kaggle, encompassing extensive patient information, including demographics, clinical status, and admission details. This dataset underpins the platform’s functionality by enabling data-driven insights and facilitating the efficient management of healthcare operations.

**Preprocessing Steps:**

To maximize the dataset’s effectiveness within the application, several preprocessing procedures are applied:

* 1. **Duplicate Removal:** Duplicate entries are systematically eliminated to maintain data consistency and integrity.
  2. **Data Type Conversion:** Data fields are converted into appropriate formats to ensure compatibility with processing and analytical functions.
  3. **Segmentation:** The dataset is organized into structured components, such as individual patient profiles and medical histories, promoting easier management, retrieval, and usability of information.

**Tools and Technologies:**

**Architecture:**

The system architecture follows the Model-View-Controller (MVC) design pattern, which enforces a modular separation between the data model, user interface, and application control logic, thereby enhancing scalability and maintainability.

**Backend:**

The server-side infrastructure is developed using Python, enabling robust backend operations, complex data processing, and seamless API integrations.

**Database:**

MySQL is employed for data storage due to its proven reliability, scalability, and efficiency in executing complex queries on large healthcare datasets.

**Frontend:**

The user interface is implemented using React, delivering a dynamic and responsive experience that supports interactive features and real-time data visualization.

**Deployment:**

Netlify is a cloud platform that provides seamless continuous deployment and hosting for modern web projects where we simply connect your GitHub repo, or we write the command “npm run build” where a build folder is built and we can manually drag and drop the folder and Netlify automatically deploys your project.

**Architectural Diagram:**

A diagram of a data processing process

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**User Functionalities:**

NextGen Care offers a comprehensive set of functionalities designed to support the diverse needs of healthcare stakeholders:

**Patient Information Management:**

Authorized users can create, view, update, and delete patient records, ensuring accurate and consistent documentation of patient data throughout the care lifecycle.

**Appointment Scheduling System:**

The platform enables patients to book, modify, or cancel appointments online, improving scheduling flexibility and reducing administrative overhead.

**Interactive Dashboards and Reporting:**

NextGen Care provides intuitive dashboards and generates detailed reports, allowing healthcare professionals to monitor trends, assess performance, and support data-informed clinical and administrative decision-making.

**Secure Data Handling and Regulatory Compliance:**

All patient data is managed in accordance with healthcare data protection standards, ensuring confidentiality, integrity, and compliance with regulatory requirements.

Through its integration of modern technologies and structured healthcare datasets, NextGen Care delivers an efficient, scalable platform that improves operational workflows and enhances the overall healthcare experience for providers and patients alike.

**Appendix:**

**A screen shot of a computer program

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**Schema Diagram: Made on mermaid.live**

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**Sql file code:**

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**Team Contribution:**

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| **Name** | **Tasks** | **Average Time Spent**  **(per week)** |
| **Ayan Shaikh** | **Data Collection, Project Summary, provided ideas for the Conceptual schema, designed database constraints, created database tables and inserted values.**  **Worked on Frontend, collaboratively worked on the report as well.** | **4 - 6 hours per week**  **(Approximately)** |
| **Chirag Dodia** | **Data Collection, Objectives, Schema Design, designed database constraints, normalized the database by removing rows with null  values and further added unique constraints.**  **Worked on Backend, deployment of the system and collaboratively worked on the report as well.** | **5 - 8 hours per week**  **(Approximately)** |

**Project demo link:** [**https://youtu.be/OsqCTFlgC6Q**](https://youtu.be/OsqCTFlgC6Q)

**Project github repo link:** [**https://github.com/ADTOnline/Final\_Project.git**](https://github.com/ADTOnline/Final_Project.git)

**Presentation link:** [**https://docs.google.com/presentation/d/1IXJ3UKhJcn53Zjky339rg7fBMpjsOw9S/edit?usp=sharing&ouid=102760413128025972646&rtpof=true&sd=true**](https://docs.google.com/presentation/d/1IXJ3UKhJcn53Zjky339rg7fBMpjsOw9S/edit?usp=sharing&ouid=102760413128025972646&rtpof=true&sd=true)