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**1. Project Idea and Plan of Action:**

**- *Problem:*** A hospital without a management system, healthcare facilities numerous challenges. It can be related to disorganization, missing documents, error in delivery, chaotic schedules,and reduce staff productivity.

- ***Plan of Action:*** Upgrade the HMS to a modern and flexible software solution to address these limitations. This can help with almost fullproof management to mitigate all errors as best as possible and help with productivity and efficiently organizing all necessary tasks, while helping with easier access to patient files.

**2. SDLC model employed:**

**Agile Methodology:**

- Iterative and flexible approach to software development.

- Emphasizes adaptive planning and continuous improvement, allowing for evolving requirements in the healthcare industry.

- Delivers working software in small, incremental releases (sprints), enabling quick feedback and iteration.

- Prioritizes collaboration between stakeholders, including hospital staff and patients, ensuring the system meets their needs effectively.

- Supports the integration of new technologies and services, such as AI, through incremental development and iterative enhancements.

- Rapid adaptation to changing healthcare needs, and continuous improvement of patient care processes.

**3.Task Organization**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Task*** | ***Jana*** | ***Rani*** | ***Mhmd*** | ***Abdallah*** |
| ***Task1*** | Gather requirements from hospital stakeholders. | Define system functionalities and features based on requirements. | Design database schema to store patient, staff, and facility data. | Research existing hospital management systems and gather insights |
| ***Task2*** | Create project plan and timeline. | Design system architecture considering scalability and security. | Plan data migration strategy if necessary. | Collaborate on designing user interface mockups |
| ***Task3*** | Assign roles and responsibilities to team members. | Develop user authentication and authorization mechanisms. | Set up and configure database management system (DBMS). | Implement core functionalities such as patient registration. |
| ***Task4*** | Coordinate communication between team members and stakeholders. | Implement core functionalities such as appointment scheduling. | Perform database optimization and indexing for efficient queries. | Conduct unit testing for individual system components |
| ***Task5*** | Monitor progress and ensure tasks are completed on schedule. | Conduct unit testing for individual system components. | Back up and restore database regularly to prevent data loss. | Address identified bugs and issues |
| ***Task6*** | Document project milestones, decisions, and changes. | Perform integration testing to ensure different modules work together seamlessly. | Create database documentation including entity-relationship diagrams (ERD) and data dictionary. | Document debugging process and solutions. |
| ***Task7*** | Evaluate project risks and implement mitigation strategies. | Gather feedback from hospital staff and patients for system improvement. | Monitor database performance and troubleshoot any issues. | Optimize code for performance and efficiency. |
| ***Task8*** | Prepare project documentation for final submission. | Finalize system deployment plan and execute deployment. | Implement database security measures to protect sensitive patient information. | Create user manual and documentation. |

**4. Feasibility Study:**

***-*** ***Internal Feasibility***: An internal feasibility study highlights the importance of implementing a hospital management system (HMS) to enhance patient care and operational efficiency. With a focus on improving patient engagement, appointment scheduling, and billing processes, the HMS promises significant cost savings and revenue enhancement opportunities. However, careful consideration must be given to resource availability, including skilled personnel and adequate infrastructure. While an HMS can improve healthcare service quality, privacy and accessibility concerns must be addressed to prevent potential disparities in healthcare delivery. Overall, successful implementation requires understanding the process and engaging a reliable software development partner.

***-*** ***External Feasibility***:An external feasibility study for a hospital management system (HMS) involves various key aspects. Market feasibility entails surveying healthcare professionals and patients to identify desired features. Legal and regulatory compliance ensures adherence to data protection laws and patient privacy regulations. Competitive feasibility assesses the system's unique value proposition and its alignment with industry standards. Marketing sustainability involves analyzing market demand and competition, while considering environmental impact and legal considerations. Economic feasibility evaluates development and maintenance costs, potential benefits, and patient requirements, encompassing factors like software, hardware, staff training, and operating expenses.

**5.Functional Requirements:**

* **Database Management:**
* ***Required Patient Information****:*

Each patient has essential information, such as their phone number, first and last name, personal health number, postal code, nation, city, address, and patient ID number. (High)

* ***Updating patient's information:***

Users of the hospital management system can update patient information as defined in the included mandatory data. (Medium)

* **Generating Reports:**
* ***Patient Information:***

Every patient is given a report by the Hospital Management System that contains various information, including name, phone number, bed number, name of the assigned physician, and more. (High)

* ***Bed Availability:***

The Hospital Management System also assists by generating reports regarding the number of beds that are available, offering details about which beds are occupied or vacant, and more. (High)

* **Patient Checks:**
* ***Appointment Scheduling****:*

To ensure effective resource use and shorten patient wait times, the system should enable patients to make appointments with different departments and doctors. (High)

* ***Medical History Management:***

The system should maintain a comprehensive record of each patient's medical history, including past illnesses, surgeries, medications, and allergies, to provide healthcare providers with relevant information for diagnosis and treatment. (High)

* **Staff Management:**
* ***Scheduling and Shift Management:***

To guarantee proper coverage and effective use of human resources, the HMS should make it possible to schedule staff shifts, assign responsibilities, and management of work hours. (High)

* ***Training and Development:***

To guarantee that healthcare workers retain the necessary skills and qualifications, the system should make it easier to track staff training, certifications, and professional development. (Medium)

* **Order processing:**
* Customers shall be able to browse the online catalog, book appointments to their shopping cart, and proceed to checkout. (High)
* The system shall generate order confirmations and notify customers via email upon successful order placement. (Low)
* **User Interface:**
* The system shall feature an intuitive web-based interface accessible across multiple devices and browsers. (High)
* A HMS branding elements shall be incorporated into the user interface design to maintain consistency with their brand identity. (Medium)

**6. Non-Functional Requirements:**

* **Security:**
* ***Patient Identification***: The system requires patients to verify their identity using their phone.
* ***Logon ID***: Users accessing the system must possess a unique Logon ID and password.
* ***Database Modifications***: Database modifications such as insertion, deletion, and updates are swiftly synchronized and can only be executed by the ward administrator.
* ***Front Desk Staff Access***: Front desk staff have access to view data within the HMS and add new patient records, but they lack authority to modify existing data.
* ***Administrator privileges***: The administrator holds rights to both view and modify any information stored within the Hospital Management Software.
* **Performance:**
* ***Response Time:*** The system promptly acknowledges patient information checks within one second of initiation.
* ***Capacity:*** With a capacity to support at least 1000 concurrent users, the system ensures seamless operations even during peak usage.
* ***User-Interface:*** The user interface acknowledges user interactions within a maximum of five seconds, promoting swift navigation and usability.
* **Maintainability:**
* ***Back-Up:*** The system provides efficient data backup capabilities, ensuring the integrity and security of hospital records and information.
* ***Error Tracking:*** Comprehensive error tracking functionality enables the system to monitor and log every mistake, facilitating prompt identification and resolution of issues for seamless operation and maintenance.
* **Reliability:**
* ***Availability***: The system maintains constant availability, ensuring uninterrupted access and operation for users.
* ***Resilience***: As a software as a service (SaaS) solution, HMS demonstrates high resilience against technology disruptions, downtime, or crashes common in other systems. It possesses offline capabilities to ensure the continued functionality even in the absence of internet connectivity.