**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

|  |  |
| --- | --- |
| Date | 06 May 2023 |
| Team ID | NM2023TMID11307 |
| Project Name | Estimation and Prediction of Hospitalization and Medical Care Costs |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | **User Registration and Authentication** | Users should be able to register and create accounts to access the estimation and prediction system.  The system should provide secure authentication mechanisms to ensure user privacy and data security |
| FR-2 | **Data Input and Management** | The system should allow healthcare providers to input patient information, including demographics, medical history, diagnoses, treatments, and medications.  Users should be able to update and manage patient data efficiently. |
| FR-3 | **Cost Estimation** | The system should employ algorithms and models to estimate hospitalization and medical care costs based on patient data and treatment information.  It should consider factors such as treatment procedures, length of stay, medication usage, and associated healthcare services. |
| FR-4 | **Predictive Analytics** | The system should incorporate predictive analytics techniques to forecast future hospitalization and medical care costs.  It should analyze historical data and identify patterns or trends that can help predict future costs. |
| FR-5 | **Insurance Integration** | The system should integrate with insurance providers' systems to obtain real-time insurance coverage information for patients.  It should consider insurance policies, deductibles, copayments, and other relevant factors when estimating costs. |
| FR-6 | **Reporting and Visualization** | The system should generate comprehensive reports and visualizations to present estimated costs and predictions to healthcare providers, patients, and administrators.  Reports should be customizable and provide insights into cost breakdowns, trends, and comparisons. |
| FR-7 | **Integration with Electronic Health Records (EHR)** | The system should integrate with EHR systems to retrieve patient data and ensure data consistency and accuracy.  It should also update EHR systems with estimated costs and predictions for future reference. |
| FR-8 | **Security and Privacy** | The system should implement appropriate security measures to protect patient data, including encryption, access controls, and audit logs.  It should comply with relevant data privacy regulations, such as HIPAA (Health Insurance Portability and Accountability Act) or GDPR (General Data Protection Regulation). |
| FR-9 | **Scalability and Performance** | The system should be able to handle a large volume of patient data and perform computations efficiently.  It should be scalable to accommodate increasing user demands and future growth. |
| FR-10 | **User Roles and Permissions** | The system should have role-based access control, allowing different users (healthcare providers, administrators, insurers, etc.) to have appropriate access rights and permissions. |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | The system should have an intuitive and user-friendly interface, making it easy for healthcare providers and administrators to input and manage patient data.  It should provide clear and understandable cost estimates and predictions to users, avoiding complex technical jargon. |
| NFR-2 | **Security** | The system should have robust security measures in place to protect patient data from unauthorized access, tampering, or breaches.  It should comply with relevant data security standards and regulations, ensuring the confidentiality and integrity of patient information. |
| NFR-3 | **Reliability** | The system should be reliable and available, minimizing downtime and ensuring continuous access to the estimation and prediction functionalities.  It should have backup and disaster recovery mechanisms to protect against data loss or system failures. |
| NFR-4 | **Performance** | The system should provide fast and responsive performance, with minimal latency in estimating and predicting costs.  It should handle concurrent user requests efficiently and maintain acceptable response times even under peak loads. |
| NFR-5 | **Accuracy** | The estimation and prediction algorithms should be accurate and reliable, providing precise cost estimates and predictions.  The system should undergo thorough testing and validation to ensure accuracy in different scenarios and with diverse patient data. |
| NFR-6 | **Scalability** | The system should be scalable to accommodate increasing data volumes and user demands.  It should be capable of handling a growing number of patients, healthcare providers, and healthcare facilities without significant degradation in performance. |