**4.0 Requirements Analysis Phase**

**4.1** **Identify requirements (for objectives stated in 3.3.1)**

**4.1.1 Functional requirements in terms of inputs, outputs, processes, storage and control.**

*Functional Requirements*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Requirement** | **Inputs** | **Outputs** | **Processes** | **Storage** | **Control** |
| **User-Friendly Program Based Application** | Provider login credentials must be accepted by the system. | Reports will be shown in a graphical style by the system. | A new patient profile will be created by the system. | The system will save the patient's profile in the database. | The system will provide provider access using validated login credentials. |
| **All Input Fields Must be in a Form** | The technology will enable for the creation and modification of new profiles for both referring doctors and patients. | A line graph of each patient's measurements over time will be generated by the system. | A new referring doctor profile will be created by the system. | The technology will save physician profiles in the database of referring doctors. | The technology will give healthcare providers access to a database of patient personal information. |
| **Easy to Read Comprehensive Reports Associated with Each Diagnosis** | Medical measurements are entered as numbers. | On request, the system will generate a graph of all active patients' metrics over time. | Existing patient data will be searched and retrieved by the system. | Updated patient information will be saved in the system. | The technology will give healthcare professionals access to the database of referring doctors' information. |
| **Integrated Referral Management System** | Provider input text notes each visit and summary. | Each visit and narrative are written by the provider. | Existing referral information will be searched for and retrieved by the system. | Updated referring doctor information will be saved in the system. | The system will enable access to the treatment database to healthcare providers. |
| **Integrated Follow-Up Management System** | Provider inputs date of return. | System shall display list of referring doctors’ information, treatment recommendations. | The system will search and retrieve patient information scheduled for follow-up. | System shall save edited date of return. | System shall allow healthcare provider access to follow-up management database. |
| **Application Runs on Different Platforms Accessible with Laptops and Tablets** | System authenticates provider’s login credentials. | System shall display treatment resource information upon request. | The system shall run on multiple operating systems. | System shall maintain functionality across various platforms. | System shall access databases from remote devices off-line. |

**4.1.2 List and Defend Non-Functional Requirements**

*Non-Functional Requirements*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Requirement** | **Performance** | **Ease of use** | **Cost savings** | **Timelines and deadlines** | **Training** | **Quality Management** | **Security and Audits** |
| **Forms to Open** | Response time < 100 milliseconds | Intuitive forms and buttons direct user. | Cost of training users in technical matters. | One month to test and code. | Help menu | Mean system errors < 5 per business day. | User authentication and verification procedures. |
| **Auto-Complete Query** | Response time < 250 milliseconds | Two mouse clicks to get to patient information from drop down box. | 10% - 50% outsource IT services | Two months to test and code. | Help menu | Backup and restore time no more than 30 minutes. | Secure data transmittal and storage. |
| **Populate forms** | Response time <250 milliseconds | One mouse click tab or add/edit button. | 10%- 50% outsource IT services | Two months to test and code. | N/A | Mean system errors < 5 per business day. | Backup and restore and off-site storage. |
| **Report** | Production of report will take less than 2 seconds in 95% of the cases. | Check box to vary graph views, tab to select report. | 10%-50% outsource IT services | Three months to test and code. | Help menu | Mean system errors < 5 per business day. | Secure data transmittal and storage. |
| **Manage Referrals** | Process each new patient profile addition per second at peak load. | One mouse click add/edit patient profile. | 25%-45% compared with outsourced data storage | Three months to test and code. | Help menu | Backup and restore time no more than 30 minutes. | Backup and restore and off-site storage. |
| **Follow-Up Requests** | Process each new follow-up request per second at peak load. | One mouse click add new/select existing. | 25%-45% compared with outsourced data storage | Three months to test and code. | Help menu | Backup and restore time no more than 30 minutes. | Secure data transmittal and storage. |

**4.2 Analyze functional requirements for new system using system modeling approach.**

**4.2.1** **Construct Preliminary Data model – Entity Relationship diagram.**

Diagram

Description automatically generated

**4.2.2 Construct Preliminary process model – Data Flow Diagram**

**Level-0 DFD**

***Figure 1***

Bed Management

Hospital Bed Management System

Doctor Management

Patient Management

Staff Management

**Level-1 DFD**

Bed Management

Generate Bed Report

Generate Patient Report

Patient Management

Doctor Management

Generate Test Report

Check User Login Details

Staff Management

Hospital Bed Management System

Generate Medicine Report

Login Management

Ward Management

Generate Ward Report

***Figure 2***

**Level-2 DFD**

Manage Hospital Details

Admin

Login to System

Modules System

Manage Patient Details

Forgot Password

Check Credentials

Manage Doctor Details

Manage Bed Details

Send email to user

Manage Reports

Manage User’s Role

Manage User’s Permission

Manage System admin

***Figure 3***

**4.2.3 Construct Preliminary interface model – Context Diagram**

allocation

Bed

information

Current System

Patient

**4.2.4 Construct the Event Table – Event Diagram**

A picture containing timeline

Description automatically generated

**4.3** **Master list of all requirements**

**4.3.1 Priority**

*Functional Requirements*

|  |  |
| --- | --- |
| **Requirements** | **Priority** |
| User-Friendly Program Based Application | High |
| All Input Fields Must be in a Form | High |
| Easy to Read Comprehensive Reports Associated with Each Diagnosis | High |
| Integrated Referral Management System | High |
| Integrated Follow-Up Management System | High |
| Application Runs on Different Platforms Accessible with Laptops and Tablets | Medium |

*Non-Functional Requirements*

|  |  |
| --- | --- |
| **Requirements** | **Priority** |
| Forms to Open | High |
| Auto-Complete Query | High |
| Populate forms | High |
| Report | Medium |
| Manage Referrals | Medium |
| Follow-Up Requests | Medium |

**4.3.2 Supporting Requirements**

The modeling framework enables the creation of a hospital by defining the clinical units and wards that are available. Each ward can have different bed capacities by specifying the number of available beds with certain attributes (e.g., single vs. double room bed). The affinity determines whether (and to what extent) it makes sense to assign a patient treated in the clinical unit to a bed in the relevant ward for each pair of ward and clinical unit.

**4.3 Reevaluation and update project scope.**

The scope of the project does not need to be re-evaluated!