Health and Education for All (HAEFA)

Software Requirement Specification

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Revision History

Doc. Ver.	Date	Author	Description of Revision
0.1	20-March-2023	AHM Mashiuzzaman	Initial Version of Demo Release
0.2	20-March-2023	Md Rubel	Revised

Contents

1. Introduction

The introduction of the Software Requirements Specification (SRS) provides an overview of the entire SRS with purpose, scope, definitions, acronyms, abbreviations, references and overview of the SRS. The aim of this document is to gather, analyze, and give an in-depth insight of the complete **NIROG-Plus Electronic Medical Record System Application** by defining the problem and workflow statement in detail.

This SRS describes the software functional and nonfunctional requirements for demo release of the **NIROG-Plus Electronic Medical Record System Application**. The members of the project team that will implement and verify the correct functioning of the **NIROG-Plus Electronic Medical Record System Application** will use this document. Unless otherwise noted, all requirements specified here are high priorities and committed for demo release.

The SRS is designed to document and describe the agreement between the client and the vendor company regarding the specification of the software solution requested. This document is broken into a number of sections used to logically separate the software requirements into easily referenced parts. Throughout the description of the software, the language and terminology used should unambiguous and consistent throughout the document.

1.1 Purpose

The purpose of the document is to collect and analyze all assorted ideas that have come up to define the **NIROG-Plus Electronic Medical Record System Application**, its requirements with respect to the users and client's need. Also, it will predict and sort out how this Website will be used in order to gain a better understanding of the project, outline concepts that may be developed later, and document ideas that are being considered, but may be discarded as the **NIROG-Plus Electronic Medical Record System Application**.

In short, the purpose of this SRS document is to provide a detailed overview of the **NIROG-Plus Electronic Medical Record System Application**, its parameters and goals. This document describes the project's target audience and its user interface, hardware and software requirements. It defines how the client, team and audience see the application and its functionality. Nonetheless, it helps any manager, designer and developer to assist in software delivery lifecycle (SDLC) processes.

1.2 Scope

NIROG-Plus Electronic Medical Record System is health service based application which will have Mobile app, Desktop app for the front line and an admin panel and a reporting app for the administrators. We will follow a Hybrid system architecture using MIcroservice Architecture with MVC based backend application.

1.3 Document Audience Description

This document is intended for any individual user, developer, tester, project manager or documentation writer that needs to understand the basic **NIROG-Plus Electronic Medical Record System Application** architecture and its specifications. Here are the potential uses for each one of the reader types:

Developer: The developer who wants to read, change, modify or add new requirements into the existing program, must firstly consult this document and update the requirements with appropriate manner so as to not destroy the actual meaning of them and pass the information correctly to the next phases of the development process.

User: The user of this program reviews the diagrams and the specifications presented in this document and determines if the software has all the suitable requirements and if the software developer has implemented all of them.

Tester: The tester needs this document to validate that the initial requirements of this programs actually corresponds to the executable program correctly.

This document contains the necessary requirement and some aspects of the analysis of the requirements and is organized based on the Standard for Software Requirements Specification.

1.4 Definitions, Acronyms, and Abbreviations

Term/Acronym	**Definition**
SRS	Software Requirement Specification
SDLC	Software Development Life Cycle

TBD	To be Defined
OS	Operating Website
Visitor	Someone who will visit the Application
Admin/Administrator	Software administrator who is given specific permission for managing and controlling the NIROG-Plus Electronic Medical Record System Application.
Front-end	Publicly accessible pages
Back-end	Administrative panel

2. Overall Description

2.1 Overview

The remaining sections of this document provide overall description including characteristics of the users of this project, the functional and nonfunctional requirements with other Requirements.

2.2 Target platform

NIROG-Plus Electronic Medical Record System Application will operate in the following operating environment for the client and server:

Modern Browsers (Google Chrome, Mozilla Firefox, Internet Explorer)

Webserver or Local Server, cPanel-Apache Linux (Server)

3. Functional Requirements

3.1 Overview

NIROG-Plus Electronic Medical Record System Application will consist of two parts: Publicly accessible pages (Front-end) And admin Portal (Back-end). Front-end will be available for any

visitor no access identity required to read or see the content. The Admin Web Portal will be used to manage all the administrative task including content update.

Serial No	Main Feature/Functions	Description
1	Mobile App	
2	Desktop Application	
3	Admin Application	

3.2 Feature/Function 1 (Mobile App)

This section includes the functional requirements that specify all the fundamental actions of Android Mobile App Front-End

Requirements

Req ID	Requirement Text / DATA	Notes
MA 1.1	Patient Registration a. Enter Name, mobile Number, and other demographic information b. Take photo of patient	
MA 1.2	Ask Patient history of illness	
MA 1.3	Ask patient family history of illness	

MA 1.4	If Existing Patient: a) Search for patient in database using mobile number, NID, given ID (FDMN) or other relevant information b) Upon successful search, confirm patient demographic data c) Confirm/update patient history of illness d) Confirm/update patient family history of illness e) If referred from another clinic, review referral notes	
MA.1.5	Enter Patient Vital Data a) Enter the patient's Height, Weight, Temperature, BP, RBG/FBG, Pulse/Ox b) If BP is beyond normal range, repeat BP reading c) Alert on hypo/hyper-glycemic condition, if applicable d) 4. Alert on hypo/hyper-tensive condition, if applicable e) Upload/Enter any diagnostic test and/or TB test results (if previously ordered and available)	
MA. 1.6	Doctor/Healthcare Worker Reviews Patient Historical Data (if any) and enters new data	
MA 1.6.1	a) Review referral notes from other clinic if applicable	
MA 1.6.2	b) Review past diagnoses/chief complaints/medication/vital data/diagnostic results/etc.	
MA 1.6.3	C) Enter Chief Complaints	
MA 1.6.4	d) Go through mental health screening questions	
MA 1.6.5	e) If patient is female, enter women's health module data	
MA 1.6.6	f) If patient is female and at risk for Cervical Cancer, perform screening and enter results	

MA 1.6.7	g) Ask patient TB related questions to screen for TB	
MA 1.6.8	h) Enter provisional Diagnosis (ICD10 Code enabled)	
MA 1.6.9	i) Prescribe Rx Printable version	
MA 1.6.10	j) Prescribe diagnostic tests and/or TB test	
MA 1.6.11	k) Enter Doctor's notes	
MA 1.6.12	l) If required, refer patient to other clinic (refer up/down)	

3.3 Feature/Function 2 (Desktop Application)

This section includes the functional requirements that specify all the fundamental actions of Desktop Application.

Requirements

Req ID	Requirement Text / DATA	Notes
DA 1.1	Patient Registration a. Enter Name, mobile Number, and other demographic information b. Take photo of patient	
DA 1.2	Ask Patient history of illness	
DA 1.3	Ask patient family history of illness	

DA 1.4	If Existing Patient: f) Search for patient in database using mobile number, NID, given ID (FDMN) or other relevant information g) Upon successful search, confirm patient demographic data h) Confirm/update patient history of illness i) Confirm/update patient family history of illness j) If referred from another clinic, review referral notes	
DA.1.5	Enter Patient Vital Data f) Enter the patient's Height, Weight, Temperature, BP, RBG/FBG, Pulse/Ox g) If BP is beyond normal range, repeat BP reading h) Alert on hypo/hyper-glycemic condition, if applicable i) 4. Alert on hypo/hyper-tensive condition, if applicable j) Upload/Enter any diagnostic test and/or TB test results (if previously ordered and available)	
DA. 1.6	Doctor/Healthcare Worker Reviews Patient Historical Data (if any) and enters new data	
MA 1.6.1	c) Review referral notes from other clinic if applicable	
DA 1.6.2	d) Review past diagnoses/chief complaints/medication/vital data/diagnostic results/etc.	
DA 1.6.3	D) Enter Chief Complaints	
DA 1.6.4	m) Go through mental health screening questions	
DA 1.6.5	n) If patient is female, enter women's health module data	
DA 1.6.6	o) If patient is female and at risk for Cervical Cancer, perform screening and enter results	

DA 1.6.7	p) Ask patient TB related questions to screen for TB	
DA 1.6.8	q) Enter provisional Diagnosis (ICD10 Code enabled)	
DA 1.6.9	r) Prescribe Rx	
DA 1.6.10	s) Prescribe diagnostic tests and/or TB test	
DA 1.6.11	t) Enter Doctor's notes	
DA 1.6.12	u) If required, refer patient to other clinic (refer up/down)	

3.4 Feature/Function 3 (Admin Application)

Req ID	Requirement Text / DATA	Notes
AA 3.1	**APP USER**	
AA 3.2	Patient	
AA 3.3	**HEALTH CENTER**	
AA 3.4	HC Analysis	
AA 3.5	Station	
AA 3.6	Referral Patient	
AA 3.7	Reference Data	
AA 3.8	System Configuration	
AA 3.9	File Upload	
AA 3.10	Schedule	
AA 3.11	Data Synchronization	
AA 3.12	DB Backup	
AA 3.13	Email	

AA 3.14	SMS	
AA 3.15	**NIROG Reporting Graph Requirements** Only Rohingya is included in the company portion of the backend portal. Including options for other projects was proposed as HAEFA's operations are expanding, and the same goes for branch potion	
AA 3.16	The linear graph should be included in the analysis portion so that the fluctuation rate of the disease can be analyzed for an individual patient for an individual disease. For example, A patient came to visit with a Systolic Blood Pressure of 150 mmHg and Diastolic Blood Pressure 0f 100 mmHg. On the next visit, the blood pressure was obtained 130/90 mmHg. Two graphs are attached for convenience.	
AA 3.17	Including another graph, chart, or diagram was planned to analyze the incident rate of disease at a specific time for specific population. A bar chart is included for example.	
AA 3.18		
AA 3.19	**REPORT BY** 1. SL NO 2. EMPLOYEEID 3. GIVENNAME 4. FAMILYNAME 5. GENDER 6. BIRTHDATE 7. AGE 8. MOBILENO **9.** FOLLOWUPDATE	

AA 3.20	**Report Filter by:** 1. Patient Illness History 2. Family Illness History 3. Vaccination 4. Social Behavior History 5. Gravida Still Birth ETC.	
AA 3.22	**Filter by Types of Patient:** 1. BP 2. E118 | Type 2 diabetes mellitus with unspecified complications 3. E119 | Type 2 diabetes mellitus without complications 4. I10 | Essential (primary) hypertension 5. Miscarriage Or Abortion 6. Pregnant 7. RBG 8. Suspected Pulmonary TB case 9. Anemia 10. Skin disease	
AA 3.23	**Filter by Paints History**	
AA 3.24	**Report Type: Provisional Diagnosis** 1. No 2. Employee ID 3. Given Name 4. Family Name 5. Gender 6. Birth Date 7. Age 8. Mobile No 9. Provisional Diagnosis	

AA 3.25	**Report Type: Provisional Diagnosis Age Wise** 1. No 2. Provisional Dx 3. Male 0 to 5 years 4. Male Above 5 years 5. Total Male 6. Female 0 to 5 years 7. Female Above 5 years 8. Total Female 9. Total	
AA 3.26	**Report Type: Provisional Diagnosis Date Wise** 1. No 2. Provisional Dx 3. 01-Sep-2022 4. Total	
AA 3.27	**Report Type: Patient Count Age Wise** 1. No 2. Provisional Dx 3. Male 0 to 5 years 4. Male Above 5 years 5. Total Male 6. Female 0 to 5 years 7. Female Above 5 years 8. Total Female 9. Total	

AA 3.28	**Report Type: Treatment Suggestion** 1. No 2. Employee ID 3. Given Name 4. Family Name 5. Gender 6. Birth Date 7. Age 8. Mobile No 9. Treatment Suggestion	

3.5 Non Functional Features

Req ID	Requirement Text / DATA	Notes
NF 3.5.1	Mobile App should run in offline mode once connected with receiver pc it will be able to sync data with the central server	
NF 3.5.2	Desktop application should be work like the mobile app functionality and can be sync with server if connected with internet	
NF 3.5.3	Design need to be up-to-date and user friendly	
NF 3.5.4	All devices data will be connected with the main server	
NF 3.5.5	Server data should be able to sync with DGHS server	

3.6 Specific and Recommended Features

Req. ID	Requirement Text / DATA	Notes

SF 3.6.1	The redevelopment will ensure the upgrade and expand of the present software to a newer version, which will enable longitudinal tracking of NCD patients' health records including diagnosis, treatment, follow up, referral, and back-referral care in all over the Bangladesh beginning from a remote place (hard-to-reach area)/village than gradually Upazilla to district with an offline capability feature.	
NF 3.6.2	The planned EHR system, NIROG-Plus, will record real-time medical data including biometric finger printing system with barcode scan able features, clinical and laboratory findings with uploading Path Lab scanned images at the point of care.	
NF 3.6.3	This should be encrypted, HIPAA-compliant, password-protected medical records, which will be accessible and retrievable from any health facility within the network at the community, sub-district, district, and national levels.	
NF 3.6.4	Will have NCD screening, and an algorithm for ICD10 code-based diagnosis and PEN national protocol-based management including the Clinical Decision Support System (CDSS) as well as an NCD CVD risk calculator that will define 10 years of cardiovascular disease (CVD) risk and provide options to mitigate them.	
NF 3.6.5	Initially, the platform is going to focus on major NCDs like cardiovascular diseases and their risk factors, diabetes (DM), hypertension (HTN), gestational DM & HTN, chronic respiratory diseases like asthma & COPD, cancers (e.g., breast and cervical cancers) along with a major focus on tuberculosis, and additionally pregnancy (ANC/PNC), and mental health with all present modules with a red-flagging system.	

NF 3.6.6	The TB Module in the application should have additional sputum test results - initially 2, after 2 months 1 more, and after 5 months 1 last test results in addition the Gene X-pert results, and X-Ray image and short Report.	
NF 3.6.7	• The necessary functionality for the risk assessment tool for cervical and breast cancer will be introduced.	
NF 3.6.8	• There should be options for artificial intelligence-based information system which can guide the respective health care providers to better decision making and also help in evaluation and monitoring of the data through CDSS including prevention mechanism for drug-interaction, and medicine drop-down list.	
NF 3.6.9	• The patient's lab results also should be synchronized and updated with individual patient's medical record.	
NF 3.6.10	• Will have two-way text alert system with reminder for follow up-appointment and medicine/immunization alert and patient-generated BP and Blood glucose from a Pharmacy to be sent to the planned EHR system, NIROG-Plus backend database via patient's registered phone – Note: this feature will be added in the next version of the application, not included for this scope of work.	

NF 3.6.11	• A dashboard utilizing business intelligence technology, which will display graphs of patients' individual and aggregated data categorized according to ➢ Individual patient's Dashboard - showing graph of - Y axis values, X-axis with dates (Both weekly and monthly options), and Z-axis with medicine name and doses every time there are changed or adjusted. This should be seen on the hand-held Tab each time a patient visits the health center – showing both weekly and monthly graphical presentation. ➢ This follow-up patient data should be depicted presenting an auto generated graph which will reflect each patient gradual improvement or deterioration (patient status), which should help assist healthcare provider to take necessary decision. ➢ Aggregated Dashboard for each health centers, each subdistrict and each district * showing the following for each diseases tested: (A) total screened number with male, female and age breakdown (B) total diagnosed number with male, female and age breakdown (C) total diagnosed versus total treated /managed/controlled (NCD)/cured (TB and other) number with male, female and age breakdown	