HS EMR Business Requirements Document

Business Requirement Specification (V2.0)

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This document documented all the functional and non-functional requirements that should be implemented in HS EMR.

Once signed, this document will provide the basis for negotiation about any changes or modifications, which will be inevitable. Any changes or modifications will be updated in this document and will require a sign off from the client. The development team will use this document as a baseline for the functional requirements.

Full Name	Koh Geok Mui	Client's Sign-off	

Date	19 Sep 14

Document Control

Revision History

Version	Date	Editor	Description/Summary of Changes
V1.0	30 August 2014	Tan Shi Qi	Creation of the document
V2.0	11 September 2014	Tan Shi Qi	Amendments after communication with the client

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1 Project Overview

1.1 Problem Statement

Many hospitals are using an Electronic Medical Records (EMR) system to keep track of the ward and inpatient information. However, the nursing students in Ngee Ann Polytechnic (NP), School of Health Sciences (HS) are still using paper-based documentation and medical records during their practical simulation centre.

If the gap is not fixed, students may face difficulty adapting during their clinical attachments due to the lack of practice in using such system.

In addition, the paper-based process makes it tedious for lecturers to evaluate and track students' performances. Also, it can result in problems such as illegibility; causing some handover issues during the session.

1.2 Key User Requirements

The key business requirements are as follows:

- The system shall be able to handle different simulation of case scenarios to facilitate the students' learning experience
- The relevant reports shall be available in the HS EMR when the students dispatch it in the system
- The elimination of current paper-based system
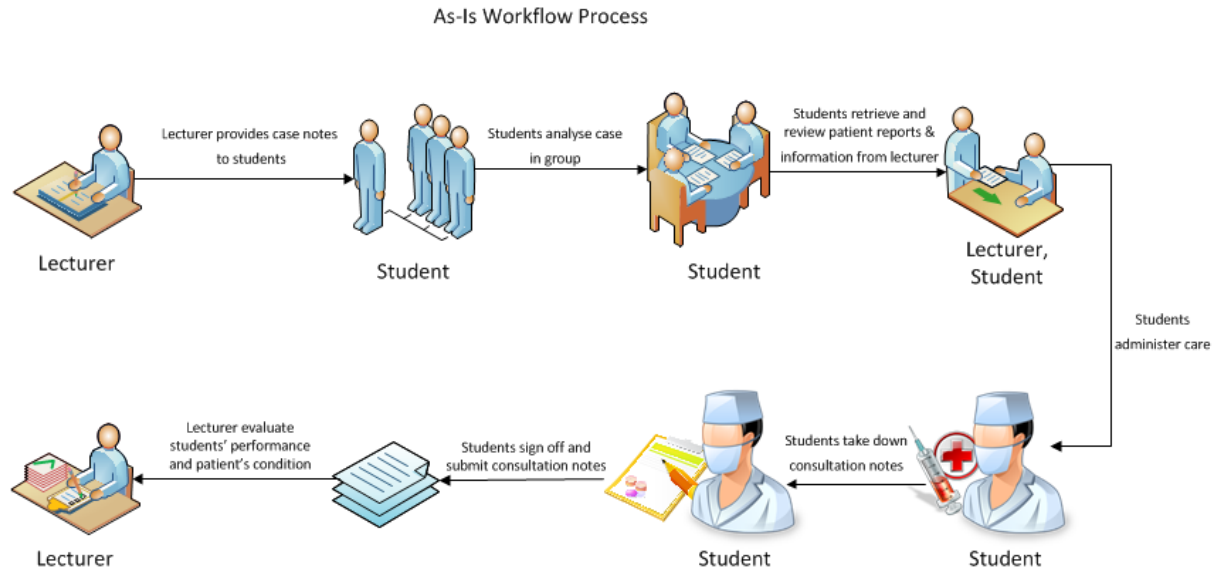- The system shall be released by April 2015

1.3 Current Teaching Process

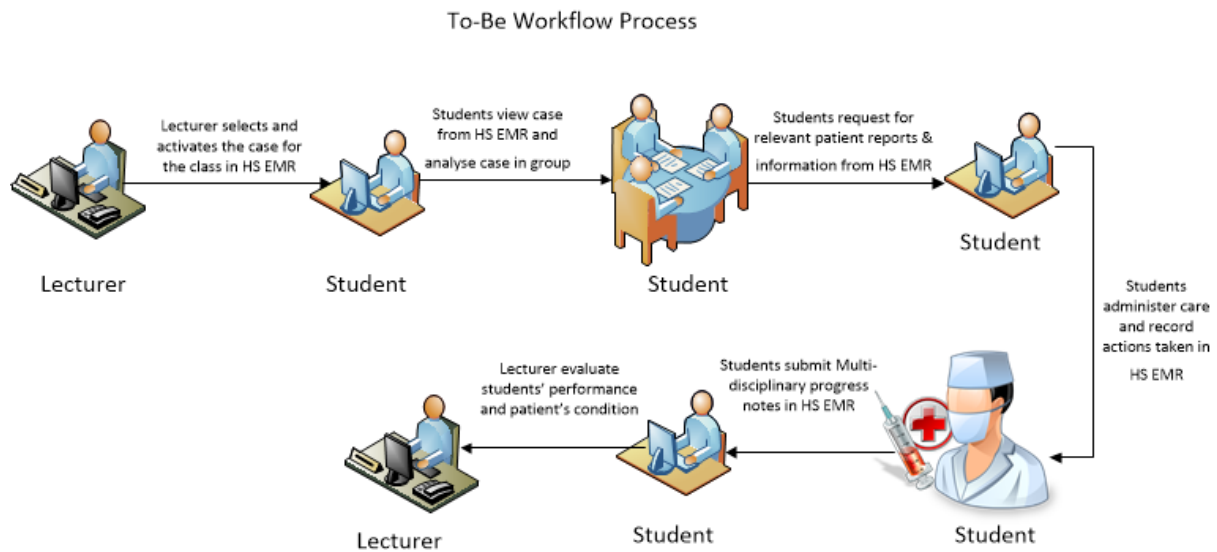Figure 1 - As-Is Workflow Process

1.4   Proposed System Process

Figure 2 – To-Be Workflow Process

1.5   Project Scope Statement

1.5.1   Project Justification

Most clinical institutions in Singapore are moving forward to EMR, eliminating the paper-based documentations and medical records. NP will need to keep their teaching curriculum up to date with the clinical institutions in order to give the students a more holistic and realistic learning experience, to better prepare them for clinical attachments.

1.5.2   Project Requirements

The system shall be released before April 2015.

1.5.3   Project Deliverables

A fully functional website consisting of similar functions to the clinical industry's EMR with customizable features that can simulate various case scenarios for lecturers to facilitate teaching in the simulation centre.

1.5.4   Project Constraints

The team shall use open-source tools whenever possible.

1.5.5   Accuracy and Availability

The website shall be available and compatible for all browsers, tablets and smart phones.

2   System Modules

2.1   Modular Structure
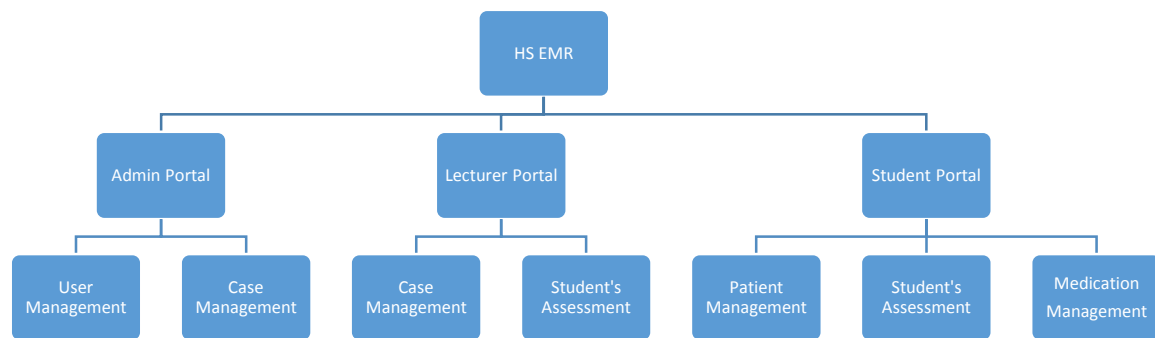
Below is an overview of the structure in the system:

Figure 3 – Modular Structure of HS EMR

2.2   User Role

The following are the roles within the system:

Role	Description
Admin	Refers to the administrator of the HS EMR, one of the nursing lecturers. The admin is responsible to set up the system, manage the cases and user accounts.
Lecturer	Refers to all the lecturers teaching the module Nursing Skills Laboratory 2.1. The lecturers will use the HS EMR to view students' submissions and activate the cases.
Students Note: Nurse and students are used interchangeably	Refers to all Year 2 students who are undergoing the module Nursing Skills Laboratory 2.1. The students will use the HS EMR to view, request for reports and also submit the multidisciplinary notes at the end of the lesson.

2.2.1   User Role Specification

The following are the actions that each user can do for the various functions:

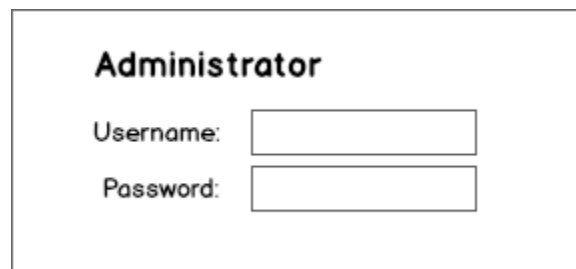| Functions/Module	User	Access Type Needed
User Management	Admin	Create, Read, Update, Delete
Case Management	Admin	Create, Read, Update, Delete
	Lecturer	Update
Student's Assessment	Lecturer	Read, Update, Delete
	Students	Create, Read, Update
Patient Management	Students	Read, Update

Medical Management	Students	Read

3 Functional Requirements

3.1 User Management

This module will allow the admin to create, read, update and delete user accounts. User accounts will be used by the users to log in to the system and it will determine the type of information and functions that a user can access. There will be three types of user accounts – Admin, Lecturer and Nurse.

3.1.1 Feature Description

- The system will allow Admin to create the different type of user accounts: Admin, Lecturer or Nurse.
- The system will allow Admin to view information of user accounts.
- The system will allow Admin to edit the passwords or other information of user accounts.
- The system will allow Admin to remove any Admin, Lecturer or Nurse user accounts.
- The system will allow users to log in to the system using the user accounts created

Figure 4 – Sample Screen of Administrator Login

3.2 Case Management

This module will allow admin to view, add, edit, delete and activate case scenarios. The scenario will be simulated once the students select the case scenario activated by the admin. Information of ward and inpatients are largely dependent on the case scenario selected by the student. The lecturer and students will be involved in this module.

As of August 2014, there are 13 case scenarios to be stored in HS EMR. Every week, the lecturer will activate a case scenario for students to access through the student's portal. These case scenarios will be used by the lecturers to facilitate the students' learning. Students will have to view the basic case information from the portal and conduct analysis on the case before administering care on the patient. The patient's health and state will progress based on the student's actions.

3.2.1 Feature Description

- The system will allow Admin to create case scenarios. The creation of case scenario requires Admin to enter the patient information, define the states and upload the relevant reports into the system.

Figure 5 – Sample screen of Case Setup (Administrator's Portal)

- The system will allow Lecturer to view all cases and select the case scenario(s) to be activated for Students to access in the Lecturer's portal. Once the case is activated, the Students will be able to see it in the Student's Portal
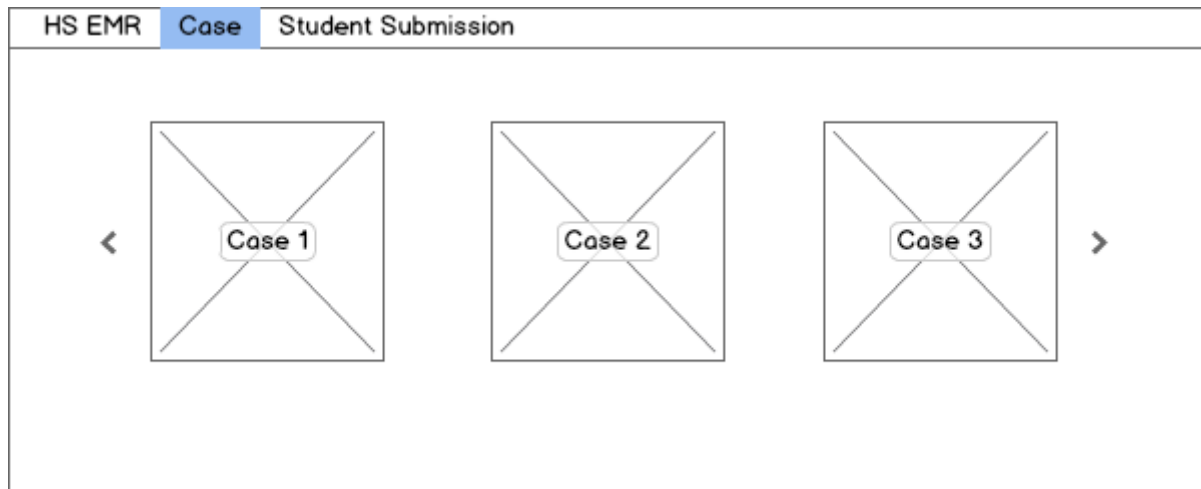
Figure 6 – Sample screen of View all Cases (Lecturer's Portal)

Figure 7 – Sample screen of Case Information after selection of Case (Lecturer's Portal)

- The system will allow Admin to delete any case scenarios.
- The system will allow Student to view the case scenarios available to them. Cases that have not been activated will display a lock icon. After the Students selected a case, they will be directed to view the case scenario and access the patient management module to begin the simulation lab lessons.
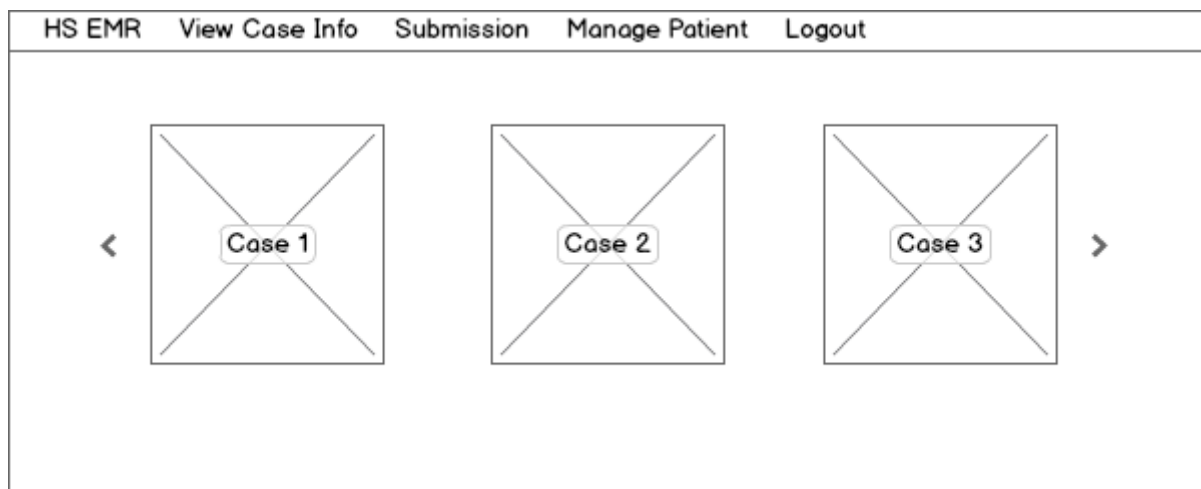

Figure 8 – Sample screen of View Cases (Student's Portal)

- The system will display information of wards and inpatients based on the case scenario selected by Students.
- The system will allow Lecturers to edit the case information.

3.3 Patient Management

This module will allow students to view patient's basic information, admission notes, multidisciplinary notes, investigation, medication and clinical chart.

To provide a holistic system that represents clinical systems, this module will also allow students to have a birds-eye view of the beds through the visualisation of rooms.

Though there is only one bed in the simulation room, the system will still display different wards and beds in the various rooms to have a more realistic look-and-feel of the clinical systems.

The system will randomly generate the bed that the patient will be occupying. Students will have to navigate to the correct ward and bed in order to view the correct patient's information for the case.

3.3.1 Feature Description

- The system will allow Students to view all cases that has been done previously.
- The system will allow Students to view the current week's case once the Lecturer activates the case for the week.
- The system will allow Students to view the various wards.
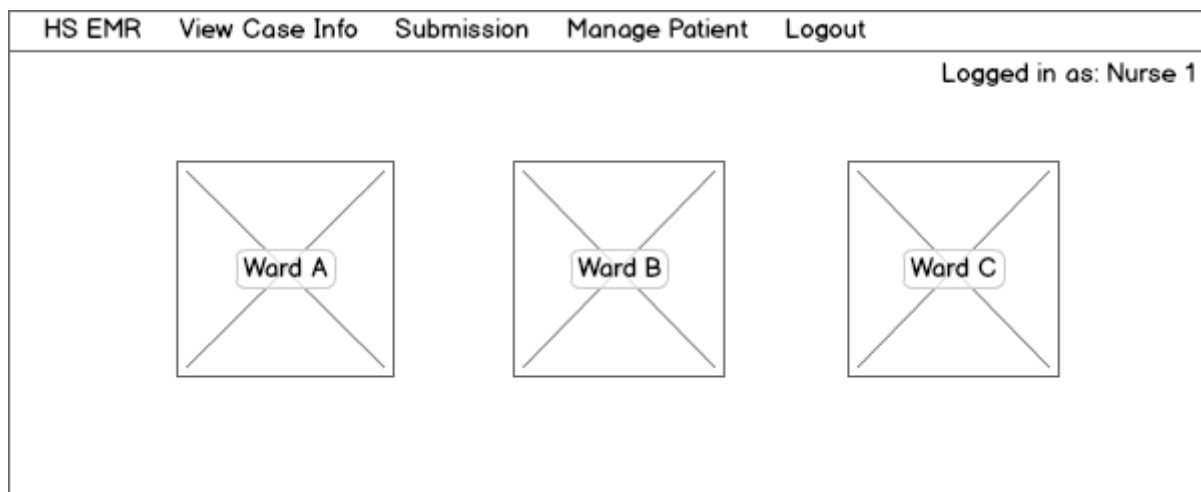

Figure 9 – Sample screen of Ward Information (Student's Portal)

- The system will allow Students to view the availability of the beds in the ward rooms.

Figure 10 – Sample screen of Room Information (Student's Portal)

- The system will allow Students to view the patient's information by clicking on the bed that the patient occupies.
- The system will allow the Students to update the vital signs of the patient
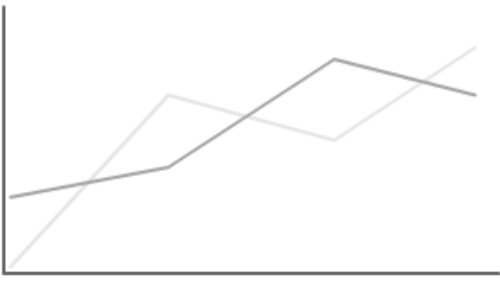

Figure 11 – Sample screen of vital signs (Student's Portal)

- The system will allow Students to view the different kinds of reports belonging to the patient. (E.g. Blood reports, Heart reports, x-ray)
- The system will have a dispatched report button for the students to request for the relevant reports instructed/ordered by the doctor (Lecturer). After requesting, the system will send the report back to the screen for the Student to retrieve.

Figure 12 – Sample screen of Investigation (Student's Portal)

3.4 Student's Assessment

This module will allow the students to type and submit the multidisciplinary notes at the end of their 15 minutes simulation lab.

Students in teams of 4 to 5 members will go through the simulation lab as a team. At the end of the 15 minutes, the group will need to update the multidisciplinary notes and submit it. This will help to facilitate the handing over to the next team of students.

3.4.1 Feature Description

- Student will need to enter the members name in the system and the multidisciplinary notes at the end of the 15 minutes.

Figure 13 – Sample Screen of logging down actions

3.5   Medical Administration

This module will allow students to scan the barcode of the medicine to ensure that the medicine scanned is the correct medicine that the doctor has ordered. Next, the student will have to scan the barcode on the patient's wristband to ensure that the patient is the correct patient displayed on the system. The system will prompt a warning message if the medication and the patient's wristband does not match.

3.5.1   Feature Description
- Students can view the medication that the patient has been ordered.
- Students can scan the medicine's barcode to ensure that the medication stated on the wristband is the same as the medication stated in the system.
- Students can scan the patient's barcode to ensure that the patient is the correct patient that is displayed on the system.

4   Non-Functional Requirements

The non-functional requirements of the system include the following:

- The system shall populate reports in 30 seconds once the students request for it.
- The system shall display appropriate error messages to the user (handle exceptions well).
- The system shall be able to handle extended functionality.
- The system shall be available for the students to use as long as they are in the classroom with no down time.