
National COVID Management System

Software Requirements Specification

Version 1.0

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Revision History

Date	Version	Description	Author
18/04/2021	1.0	Initial Draft	Shammi

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Software Requirements Specification

1. Introduction

1.1 Purpose

The Software Requirement Specification of the National COVID Management System of Wakanda is developed to describe the basic details and workings of the proposed system. This document is prepared with two main intentions.

- 1) Describe the features and the workings of the system to the stakeholders (Developers and Customers) so that the stakeholders get a basic idea of the system's working.
- 2) To explain what a user can expect from this system.

This document explicitly includes the following,

- Scope of the project
- Overall Description
- Requirements (Both Functional and Nonfunctional)
- Interfaces
- Design Constraints etc.

Finally, this document can be used as a reference during system testing and maintenance.

1.2 Scope

There are mainly three parties directly associated with this system. The MoH, hospital staff and the citizens.

The MoH can,

- Add new hospital details to the system.
- View patient statistics.
- View hospital and bed statistics.

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A hospital staff is able to

- View statistics about their hospital and beds
- Add the director of the hospital at the beginning.
- Add doctors to the system.
- Assign severity levels to patients based on doctors' assessments.
- Mark patients as discharged once they are discharged by the director.

A citizen is allowed to

- View daily and overall statistics
- Register as a patient

The NCMS is in charge of the following tasks,

- Allocating a bed in the nearest hospital when a citizen registers as a patient.
- Adding patients with no beds to the waiting queue.
- Notify MoH of new hospital requirements when queued patients exceed four.
- Assigned vacant beds to patients in the queue once patients are discharged.

1.3 Definitions, Acronyms, and Abbreviations

Definitions

Term	Definition
COVID-19	An infectious disease caused by the newly discovered coronavirus. [1]
Developer	A person who is involved in the development of the project.
Stakeholder	A person such as an employee, customer, or citizen who is involved with an organization, society, etc. and therefore has responsibilities towards it and an interest in its success.

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Abbreviations

Abbreviation	Full-Form
MoH	Ministry of Health
NCMS	National COVID Management System
HTTP	HyperText Transfer Protocol (Internet Protocol)

1.4 References

[1] [COVID-19](#)(accessed Apr. 18, 2021).

1.5 Overview

Until now we have described the purpose and scope of the system. We have also provided definitions of necessary terms that are used throughout the SRS. The following sections will describe the following,

- Section 2 will provide a high-level abstraction of the system and its features. Also, this section includes all constraints on the project.
- Section 3 will list out all the functional requirements expected from the user and also provide all the non-functional requirements that the system is supposed to fulfil.
- Section 4 includes details on the interfaces of the system and further information such as index, appendices, etc.

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2. Overall Description

2.1 Product Perspective

Figure 2.1 High-level abstraction of the system

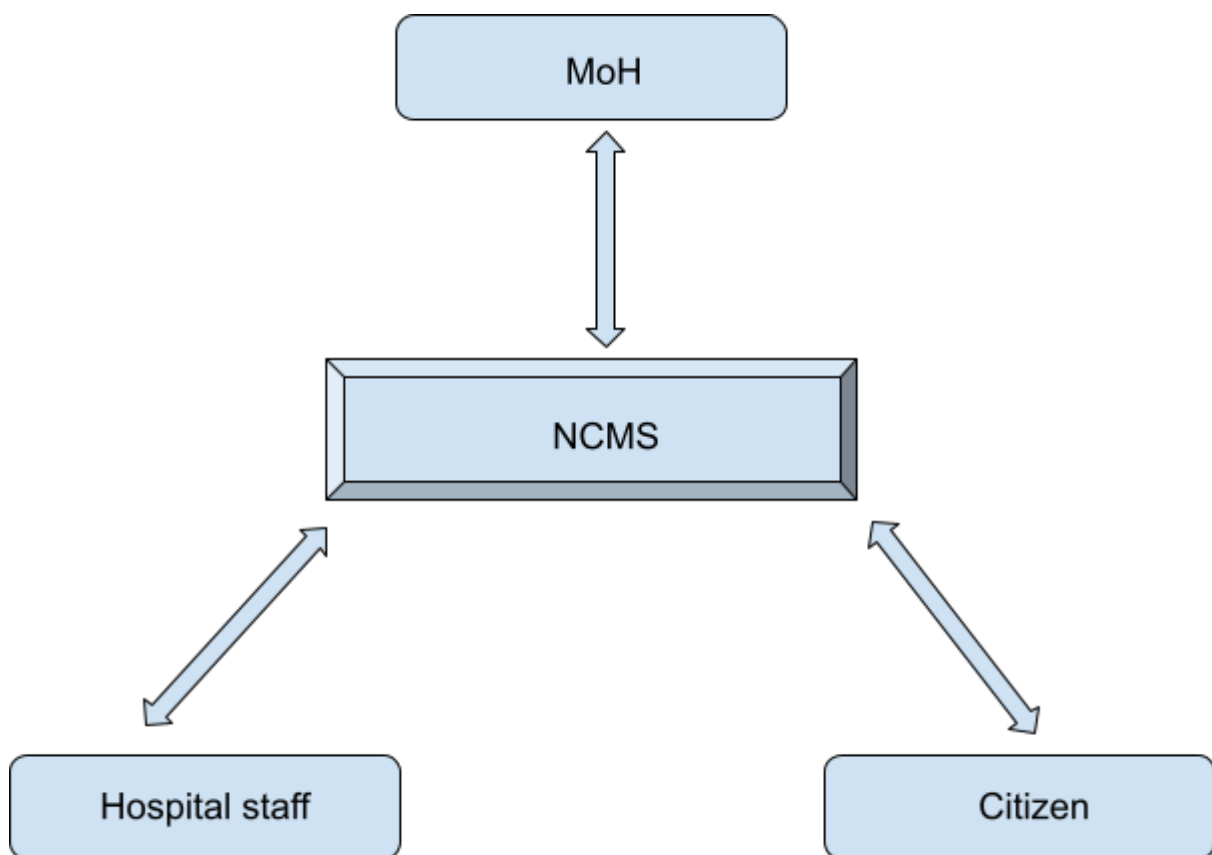


Figure 2.1 shows a high-level abstraction of the system that is proposed. There are three types of users concerned with the system, MoH, hospital staff and citizens. A MoH would interact with the system to make new hospitals and to view statistical data about patients, hospitals and beds. The hospital staff of each hospital in the city interacts with the system to add the director after the hospital is newly added to the system, add doctors, assign severity levels to patients on behalf of the doctors, mark patients discharged on behalf of the director and to view data about the hospital and patients in it.

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2.2 Product Functions

The Product functions would be described in detail in section 3, where we would describe in-depth the functional and nonfunctional requirements of the product.

2.3 User Characteristics

There are three types of users concerned with the system. The MoH is expected to have the following characteristics,

- Login to the system -A must have, as the MoH will not be able to perform any of its functionalities without access to the system.
- Internet access - Since this is an online platform internet access is required to connect to it.

The hospital staff is expected to have the following characteristics,

- Should access the system using credentials provided by the MoH to the hospital - A must have, or else will not be able to access any of their privileges.
- Internet access - same reason as MoH.

The citizens are expected to have some or all of the following characteristics depending on the functionality they need to perform,

- Register to the system - mandatory if the citizen wants to enter a hospital as a patient.
- Internet access - necessary to view statistical data.

2.4 Constraints

- *Time Constraints*

The project is expected to be finished within a few months. This will be the major constraint applied to the project as it limits all of the other resources used in the project.

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- *Human Resource Constraints*

The project is developed by a single person. The project cannot include more people.

The above-mentioned constraints are the main constraints imposed on the project. Although the project incurs many other constraints, all the other constraints are mostly related to the above ones.

2.5 Assumptions and Dependencies

- All the users irrespective of roles are assumed to follow the guidelines set by the developers when using the system.
- Directors or doctors in hospitals will not be directly working with the NCMS. Instead, the hospital staff allocated for interacting with the system will be entering details based on the decisions taken by them.
- All hospitals have an email address to which the credentials to be used by the hospital staff to access the system will be sent when the hospital is newly added to the system.

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3. Specific Requirements

This section focuses on discussing the functional and non-functional requirements of the plugin. Functional requirements will be discussed under two categories, Lecturer related and Student related.

3.1 Functionality

3.1.1 MoH Related functionalities

3.1.1.1 MoH login and logout

Description	MoH authorities with valid credentials will login to the system. They could opt to logout at any moment.
Activity Flow	<ol style="list-style-type: none"> 1. For Login <ol style="list-style-type: none"> a. Enter email and password. b. Email and password are verified and the user is logged in to the system. 2. For Logout <ol style="list-style-type: none"> a. User could logout at any moment.

3.1.1.2 MoH views statistical details

Description	The MoH person logged in can view statistical details about patients, hospitals and beds. A daily update and an overall status update will be provided.
Activity Flow	<ol style="list-style-type: none"> 1. The user will go to a dashboard page which will display all data.

3.1.1.3 MoH add new hospital

Description	MoH can add a new hospital to the system
Activity Flow	<ol style="list-style-type: none"> 1. MoH chooses to add new hospital 2. MoH provides details of the hospital 3. The system adds the new hospital to the database.

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	4. The system sends generated credentials to the hospital email.
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3.1.2 Hospital Staff Related functionalities

3.1.2.1 Hospital staff member login and logout

Description	Hospital staff members with provided credentials will login to the system. They could opt to logout at any moment.
Activity Flow	<ol style="list-style-type: none"> 3. For Login <ol style="list-style-type: none"> a. Enter email and password. b. Email and password are verified and the user is logged in to the system. 4. For Logout <ol style="list-style-type: none"> a. Users could logout at any moment.

3.1.2.2 Hospital staff adds director details.

Description	After a hospital is newly created, the staff can add details of the director of the hospital.
Activity Flow	<ol style="list-style-type: none"> 1. Staff chooses to add director details. 2. Staff enters director details. 3. The system saves the data to the database.

3.1.2.3 Hospital staff adds doctor details.

Description	The hospital staff can add details of the doctors in their hospital.
Activity Flow	<ol style="list-style-type: none"> 1. Chooses to add a new doctor. 2. Enters doctor details. 3. System saves the data to the database.

3.1.2.4 Hospital staff views statistical details of the hospital

Description	The staff logged in can view statistical details about their
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	hospital and patients. A daily update and an overall status update will be provided.
Activity Flow	2. The user will go to a dashboard page which will display all data.

3.1.2.5 Hospital staff adds severity level of patient

Description	A hospital staff member can update a patient's severity level based on the doctor's assessment.
Activity Flow	<ol style="list-style-type: none"> 1. Staff member chooses patient to enter severity level. 2. Staff member enters the severity level and details of the doctor who assessed the patient. 3. System saves the data.

3.1.2.6 Hospital staff marks patient as discharged

Description	Once the director discharges a patient, a staff member will update the patient's status in the system.
Activity Flow	<ol style="list-style-type: none"> 1. Staff member chooses patient to discharge. 2. Staff member changes patient status to discharged. 3. System saves the status. 4. System assigned vacant bed to a patient in the queue.

3.1.3 Citizens Related functionalities

3.1.3.1 Citizen views statistical data

Description	The citizens can view statistical details about patients, hospitals and beds. A daily update and an overall status update will be provided.
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Activity Flow	1. The citizen will go to the homepage of the site to view data.
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3.1.3.2 Citizen registers as a patient

Description	If a citizen suspects that he is infected with COVID, he can register in the system. Then the system will allocate a bed in the nearest hospital.
Activity Flow	<ol style="list-style-type: none"> 1. Citizen chooses to register. 2. Citizen enters data. 3. The system saves the data and allocates a bed in the nearest hospital and assigns a unique serial number. 4. If no beds are available, the patient is added to a queue with the serial number. 5. If the queue length exceeds four, the system notifies the MoH about requirement for a new hospital.

3.2 Usability

3.2.1 Simple and desirable GUI

Since there are mainly three parties involved with the system the GUI should be helpful for all parties to achieve their requirements easily. So the GUI must be,

- ❖ Attractive
- ❖ Simple to use
- ❖ Responsive in short time
- ❖ Clear to understand
- ❖ Consistent on all interface screens

so the controls used should be self-explanatory and must not require training.

3.2.2 Easy for the citizens to use

When we say citizens, people with different backgrounds and varying familiarities with systems such as this will be using this to view statistical data and to register as

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patients. So it is important that the system is developed in such a way that it will be easy to work with even for someone who is not very familiar with such systems.

3.3 Reliability

3.3.1 Should be available 24/7

As patients or MoH may try to get data about the current situation at any time, and since a patient can be reported at any time of the day, the system should continue to be available with minimum downtimes.

3.3.2 System Should be accurate

There are two instances where the accuracy of the system becomes extremely important.

1. Assigning a bed to a patient - the system should take the coordinates of the patient and find the nearest hospital to assign a bed
2. When a new hospital is required, calculating the best location to build the new hospital - the system should choose the city which is where the majority of the patients in the queue resides. If not, the location of the first patient's residence should be chosen. The new hospital should be 10 units away from the base hospital of the selected city.

The accuracy of the system is vital especially during these situations but also required during other situations as well.

3.4 Performance and Security

3.4.1 Process many requests within a short amount of time

It is likely for the system to receive multiple patient registrations from all around the country all at the same time. The system should be capable of handling all these requests quickly and accurately.

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3.4.2 Sensitive data

The system keeps a lot of sensitive information about patients in its database. Hence the security of these data is critical.

3.5 Supportability

3.5.1 The System will run on multiple platforms and functionalities can be separately used later on

As this system is a fully web-based application it has to be accessible through any of the web browsers irrespective of the operating system, including mobile platforms. It is developed based on Object-oriented principles and designed based on the 4+1 architectural model. Certain functionalities of the system can be reused whenever needed.

3.6 On-line User Documentation and Help System Requirements

A user documentation and a quick user guide will be available along with the system.

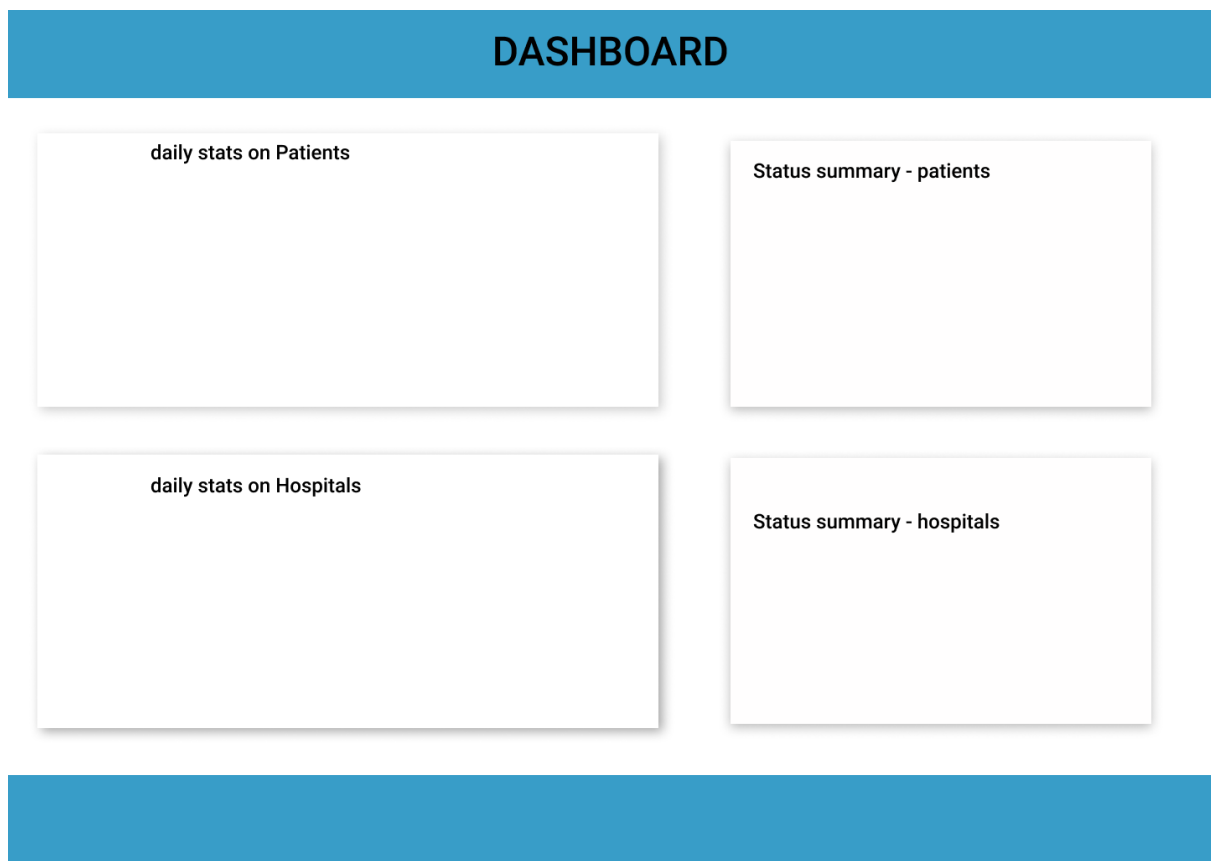
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3.7 Interfaces

3.7.1 User Interfaces

3.7.1.1 Dashboard

- ❖ This page will display the statistical data.
- ❖ Small variations will be made according to the current user.



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3.7.1.2 Add new hospital page for MoH

- ❖ This page will contain a form to enter hospital details and a button to submit the information.

New Hospital

Name

District

Coordinates

X

Y

Create

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3.7.1.3 Register as patient page for citizen

- ❖ A page containing a form to enter details and register as a patient.

Register

Name

District

Coordinates

X

Y

Symptoms

Register

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3.7.1.4 Update severity details of patient for hospital staff

- ❖ The hospital staff can choose a severity level for each person through this page.

Patient Details

Name John Doe
 District District a
 Coordinates X 5 Y 5
 Symptoms Cough, fever
 Severity ☒ Low ☐ Moderate ☐ Critical

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3.7.1.5 Discharge patient for hospital staff

- ❖ This page can be used by the hospital staff to discharge patients.

Patient Details

Name John Doe

District District a

Coordinates X 5 Y 5

Symptoms Cough, fever

Severity Low

Discharge

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3.7.2 Software Interfaces

The system will not be using any external software interfaces.

3.7.3 Hardware Interfaces

This web application does not make use of any hardware devices.

3.7.4 Communication Interfaces

The communication architecture must follow the client-server model. Communication between the client and server should be served over HTTP Secure (HTTPS). So this plugin will support all types of web browsers.

3.8 Database Requirements

The system requires a database to store the patient records and hospital details. The database will have to be a relational database to support the relations between different components in the system.

4. Supporting Information

4.1 Appendices

- Solution Document