Software Requirements Specification

For

Diagnostic Center Client Coordination System

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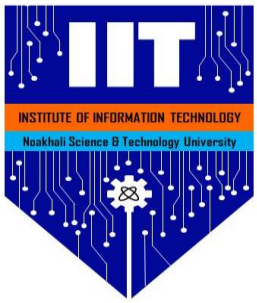

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1. Introduction

Software Requirement Specifications also known as SRS picturizes the full depth, requirements, scope and many other criteria. Through this document, we will provide you a detail and specific requirements of our project **"Mediquick"**.

1.1 Purpose

The main purpose of this project is to provide the automation service of reservation of doctor schedule, Prescription of the doctor, lab management and various other features. Mainly we want to build a diagnosis management system.

1.2 Project Scope

We want to build an app which will connect three parties including patient, clinic controllers and doctors. They all will be connected through a large database which will help them to store their data and get the necessary information without any hazard. We also visualize their connection through different diagrams. This project will reduce time and cost of both parties and it will be effective for our health sector also.

1.3 Glossary

This subsection contains definitions of all the terms, acronyms, and abbreviations used in the document. Terms and concepts from the application domain are defined.

- GUI – Graphical User Interface
- API – Application Programming Interface
- SRS – Software Requirement Specifications
- UI – User Interface

- SDLC – Software Development Life Cycle
- DBMS – Database Management System

1.4 References

1.5 Overview

In the current situation of our country, it is very hard for our patients to get the appointment of the doctors or getting treatments from clinics. Also, clinic cannot manage the data of their doctors or patients in a collective way. It causes havoc for all parties.

We live in the era where we can get data through access and also store our information in the secured database. But getting treatment from doctors and other treatment related issues are not handled in a disciplined manner in our country. It wastes time and create various other problems.

As no such system exists, patients find it difficult to deal with the doctors and clinics. Even clinic cannot manage the doctor and patient schedule properly. The ultimate result costs the patients mainly who must get the proper treatment. doctors also cannot get the information how many patients they have to deal with or cannot see the history of the patient.

By analyzing such circumstances, we want to build an automation system of proper diagnostic management system through our project ***"Mediquick"***. All information of doctors, clinic and patients will be stored and they can easily access their data very easily. We also ensure the necessary security of information and other processes.

2. User Classes and characteristics

There are six types of stakeholders in our "Diagnostic Center Module". Such as:

Patient: Patient can get the appointment of the doctors and also can view the prescription. They also can get the lab suggestion through their own account. But first of all, they need to create an account to access this feature. They can view the clinic list very easily.

Doctor: Doctor will have their own account and they can view the patient history and can prescribed them.

Clinic: Clinic will manage the doctor appointment schedule according to the permission of the doctor and can also their own lab schedule.

Lab manager: Lab manger will have a separate account. He can view the suggested lab of the patients and can also view and submit the new lab report.

3. Design and implementation constraints

Design and implementation constraints are those that we have used to implement this project make successful. It also describes tool that enables developers and testers to view and interact with the user interface (UI) elements of this application.

3.1.1 Programming Language

We will use Java as programming language to develop our application. Mainly Java Swing and Java FX will be used to develop this project.

3.1.2 Web Server

A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their

computers' HTTP clients. Dedicated computers and appliances may be referred to as Web servers as well. We will use the Apache HTTP server to implement this project.

3.2.2 Database Server

We will use MySQL database server to store all of the information of this system. The reason behind to choose the database server are given below:

- Security
- Reporting and Data Mining
- Replication
- Fault tolerance
- Performance diagnostics

5. Requirement Specification

Before a system is designed and implemented, the requirements have to be specified in enough detail to make analysis and design possible. This is a big part of software engineering, especially for larger systems. The complete requirement specification based on the elicitation process is described in this section.

5.1 Functional Requirements

Every system must have some functional requirements. Functional requirement defines a system or its component. It describes the functions a software must perform. A function is nothing but inputs, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional software requirements help to capture the intended

behavior of the system. Now, we are going to mention functional requirements associating with our project.

5.1.1 Patient search for hospitals

Requirements 1	**Patient search for hospitals**
Description	Patient finds the hospital and come to search his needed doctors for doctor's appointment. But in our apps find hospital can be done by using a search option. Patient need to search hospitals by Find Hospital's module, which is unique. Now, no need to check manually.
Stakeholders	Patient

5.1.2 Patient search for Doctors

Requirements 2	**Patient search for Doctors**
Description	After searching through the hospital and come to search his needed doctors for doctor's appointment. But in our apps find doctors can be done by using a search option. Patient need to search doctors by Find doctor's module, which is unique. Now, no need to check manually.
Stakeholders	Patient

5.1.3 Patient see Doctors details

Requirements 3	**Patient see Doctors details**
Description	When patient search for a doctor, then they will be able to see the doctor profile assigned to that hospital. And then patient will see the doctor's qualification, about doctor etc.
Stakeholders	Patient

5.1.4 Patient set appointment

Requirements 4	**Patient set appointment**

Description	After searching doctors, patient come to the hospital for set appointment. But in our apps doctor's appointment can be done by using a set appointment button, which is unique. Now, no need to set appointment manually.
Stakeholders	Patient

5.1.5 Patient cancel appointments

Requirements 5	**Patient cancel appointments**
Description	After set the appointment, patient need to cancel the appointment for various reason. Patient come to the hospital and talk with management for cancel the appointment. But in our app's appointment can be cancel by using a Cancel appointment button. Now, no need to cancel appointment manually.
Stakeholders	Patient

5.1.6 Patient update appointments

Requirements 6	**Patient update appointments**
Description	After set the appointment, patient need to update the appointment for various reason. Patient come to the hospital and talk with management for update the appointment. But in our app's appointment can be update by using an Update appointment button. Now, no need to update appointment manually.
Stakeholders	Patient

5.1.7 Patient update own profile

Requirements 7	**Patient update own profile**
Description	Patient need to update their profile. For updating own profile, they need to log in to the system.
Stakeholders	Patient

5.1.8 Patient change account and password

Requirements 8	**Patient change account and password**
Description	Patient need to change account and password. For change account and password own profile, they need to log in to the system.
Stakeholders	Patient

5.1.9 Doctor check appointment

Requirements 9	**Doctor check appointment**
Description	Manually, doctor don't know about the number today's appointment, about patient info, diseases description. But in our apps, after entering the app by doctor email and password, doctor see the number today's appointment, about patient info, diseases short description.
Stakeholders	Doctor

5.1.10 Doctor prescribe test and medicine

Requirements 10	**Doctor prescribe test and medicine**
Description	Manually, doctor gives the prescription. But in our apps doctor log in the app with patient ID and Password and add the prescribe test and medicine added in the document. No need to write on prescription. Patient also print out the prescription.
Stakeholders	Doctor

5.1.11 Doctor update own profile

Requirements 11	**Doctor update own profile**
Description	Doctor need to update their profile. For updating own profile, they need to log in to the system.
Stakeholders	Doctor

5.1.12 Doctor change account and password

Requirements 12	**Doctor change account and password**

Description	Doctor need to change account and password. For change account and password own profile, they need to log in to the system.
Stakeholders	Doctor

5.1.13 Lab Reporter check necessary test

Requirements 13	**Lab Reporter check necessary test**
Description	Patient come to the lab reporter for do the necessary test and patient come with prescription. Lab reporter check the prescription. But in our apps patient no need to come with prescription but also with his ID and password. Lap reporter see the necessary test with patient ID and Password. Now, no need to check manually.
Stakeholders	Lab Reporter

5.1.14 Lab Reporter create report

Requirements 14	**Lab Reporter create report**
Description	Manually, patient wait for test report result. Patient collect the report result and go to the doctor. But in our apps lab reporter add the report result in the patient document by using patient ID and Password. Now, no need to wait manually.
Stakeholders	Lab Reporter

5.1.15 Lab Reporter update own profile

Requirements 15	**Lab Reporter update own profile**
Description	Lab Reporter need to update their profile. For updating own profile, they need to log in to the system.
Stakeholders	Lab Reporter

5.1.16 Lab Reporter change account and password

Requirements 16	**Lab Reporter change account and password**
Description	Lab Reporter need to change account and password. For change account and password own profile, they need to log in to the system.
Stakeholders	Lab Reporter

5.1.17 Clinic manager add clinic

Requirements 17	**Clinic manager add clinic**
Description	In our app's clinic manager add clinic with following some rules. Patient also search clinic which also includes this system.
Stakeholders	Clinic manager

5.1.18 Clinic manager manage doctors

Requirements 18	**Clinic manager manage doctors**
Description	Manually clinic management add doctors which type of doctor are necessary in their clinic. In our app's clinic manager add doctor with their necessary information. Clinic manager also add, delete, update their information. Patient also see the doctor details.
Stakeholders	Clinic manager

5.1.19 Clinic manager manage employees

Requirements 19	**Clinic manager manage employees**
Description	In our app's clinic manager add employees with their necessary information. Clinic manager also add, delete, update their information.
Stakeholders	Clinic manager

5.1.20 Clinic Manager update own profile

Requirements 20	**Clinic Manager update own profile**

Description	Doctor need to update their profile. For updating own profile, they need to log in to the system.
Stakeholders	Clinic Manager

5.1.21 Clinic Manager change account and password

Requirements 21	**Clinic Manager change account and password**
Description	Lab Reporter need to change account and password. For change account and password own profile, they need to log in to the system.
Stakeholders	Clinic Manager

5.1.22 Data retrieve from cloud server

Requirements 22	**Data retrieve from cloud server**
Description	Data must be retrieved from server as the whole system will be dynamic. It is also to be said that, all operational functionality will be occurred on server also.
Stakeholders	Clinic Manager

5.2 Data Requirements

For defining data requirements, we need to build the model. For our application maximum data would be loaded from remote user. And for that purpose, we need to focus on some major points. Such as:

- Types of entity of the system
- Route data locations
- Capacity and resources of the data requirements
- Data source sequence
- Data availability schedules
- Quantity of data
- Availability of data

5.3 Performance Requirements

It is very important to maintain performance of any software system. To ensure performance, we need to maintain some steps. Now, I will explain some perspective by which we are going to enhance the performance of our project.

5.3.1 Speed & Latency Requirements

Speed and latency requirements must be ensured while retrieving data from the cloud server.

SLR-1	**Search result must be faster**
Description	When patient search for hospitals or doctors, then the search result must show within seconds.
Stakeholders	Patient

5.3.2 Precision & Accuracy Requirements

Result that is to be shown to the end user is need to be accurate. Because, wrong information might be ruined the whole business process.

PAR-1	**Search result must be accurate**
Description	When patient search for hospitals or doctors, then the search result must be according to the input value given by patient.
Stakeholders	Patient

5.3.3 Capacity Requirements

The developed system by us must be capable to handle user data, provide accurate information, handling database, manage http request etc.

CR-1	**The system will handle thousands of data**
Description	The system needs to handle data thousands of data every moment.
Stakeholders	Patient, Clinic manager

5.4 Dependability Requirements

The term dependability is measured based on four dimensions. Such as:

- Availability
- Reliability
- Safety
- Security

If we want to say that our application system is dependable then it must fulfil the four dimensions. But there are other tasks. Like there is no way to make mistakes or our system should have the ability to detect and then remove errors. Besides that, it is also very important to limit the damage which might be caused by system failure.

5.4.1 Reliability & Availability Requirements

Now, I will mention requirements which is related to reliability and availability.

RAR-1	**The system must be available on 24 X 7**
Description	Our system must be available all day long, every day in a week • The system must be updated regularly • System must be malware free
Stakeholders	Patient, Doctor, Clinic Manager

5.4.2 Robustness or Fault-Tolerance Requirements

To ensure robustness and fault-tolerance facilities to the end users, it is urgent to ensure 0% crush. Moreover, it must show accurate results.

RFT-1	**The system handles all user access without system errors**
Description	Thousands of users might hit our application system at a time. All their requests must be handled without any fault.
Stakeholders	N/A

5.4.3 Safety-Critical Requirements

There are no safety-critical requirements in our project.

5.5 Maintainability & Supportability Requirements

It is very important to provide after service or support to the end users.

5.5.1 Maintainability Requirements

MR-1	**System helps to update user profile**
Description	It is very important to update user profile.
Stakeholders	Patient

5.5.2 Supportability Requirements

Supportability requirements may have related to some extends. Like:

- Testability
- Extensibility
- Adaptability
- Maintainability
- Compatibility
- Configurability
- Serviceability
- Install ability

Our application meets all of the above requirements related to supportability.

5.5.3 Adaptability Requirements

There are no adaptability requirements in our system software.

5.6 Security Requirements

Making software security as a requirement is very important. Software security requirements should be its functional requirement. Software security enforces security of an application system.

Functionality related to software security can either be directly tested or observed. Some security related requirements are given below:

- Signing in a patient
- Get access according to logged in user

- Signing out as a patient
- Handling encrypted passwords

While accessing to the system, each and every module must provide a central authentication mechanism. There is also a process to prevent entering into the system by ensuring hashed password for the unauthenticated users.

5.6.1 Access Requirements

For accessing to our application system, there remains some authentication and authorization techniques. And every module of our system will provide it. Now I will provide an explanation below.

AR-1	**Application provides security mechanism**
Description	Every module is designed in such a way that it only gives access to the authorized and authenticated users.
Stakeholders	Patient, Doctor, Clinic Manager, Lab Reporter, Super Admin

5.6.2 Integrity Requirements

Integrity requirements refers to a security system which ensures an expectation of data quality. It also ensures that all data of the system would never be exposed to the malicious modification or accidental destruction. For that reason, we will store our user passwords as encrypted format which is impossible to decrypt. It is also called hashed password.

5.6.3 Privacy Requirements

It is very important to ensure privacy of the system users. Privacy requirements enhances to protect stakeholder's privacy. In this way, all data or a partial part of data are going to be disclosed according to system's privacy policy. To ensure privacy, the central database should be protected by the anonymous. Users are permitted to get access to those data which are being associated by them which can be ensured by the user log in system.

5.7 Usability and Human-Interaction Requirements

The main target of developing any system is to make the system user friendly and easy to usable for the end users.

5.7.1 Ease of Use Requirements

Our application is easy to use and also easily understandable.

EUR-1	**Application must be usable for the end users**
Description	This app is enough usable to the patient or doctor or lab reporter or clinic manager by which they can operate this system easily.
Stakeholders	Patient, Doctor, Lab reporter, Clinic manager

5.7.2 Personalization and Internationalization Requirements

There are not any personalization and internationalization requirements to our system. This maiden version of our application is only be operated by Bangladesh.

5.7.3 Understand ability and Politeness Requirements

It is already said that the application which we are going to develop, is understandable enough. The system provides hints to users whether any error occurred or wrong. By reading those errors users can be able to operate the system easily.

5.7.4 Accessibility Requirements

There are no specific accessibility requirements associated to our system yet.

5.7.5 User Documentation Requirements

Documentation are mainly two types. One is internal documentation which is generally written by the application engineers. It is prepared to make development life cycle easier for the system engineers or system analysts.

UDR-1	**The system engineer documentation**
Description	To develop our application named smart citizen, safe journey, firstly we have made a system analysis team as well as documentation team.
Stakeholders	System analysts or software developers

5.7.6 Training Requirements

Training requirements involved in after service of any application. It is very necessary to properly train up end users to the system so that they would be capable to operate easily. After launching the full package to the market, firstly we provide training to the different end users like traffic police, drivers, vehicle owners, insurance company, Bangladesh Road & Transport Authority, one stop service centers.

5.8 Look and Feel Requirements

Look and feel requirements mainly refers how the system will look like and how the user interface or graphical user interface of our system will display to the user.

5.8.1 Appearance Requirements

Traffic police and all other user must know which input fields are required and which are not. For that reason, we will use labels for all input fields. Input fields might be text type, radio, checkbox, spinner etc.

AR-1	**Labels of mandatory fields must be bold**
Description	The mandatory field's label must be bold and all input fields must have placeholder to make it easier for the users.
Stakeholders	Patient, Doctor, Lab reporter, Clinic manager

5.8.2 Style Requirements

After keeping all contents, it is very essential to load stylesheet to the application. For mobile application like android system, extensive mark-up language or xml is used. It is to be said that we are going to develop our system at android platform. Style makes the system lucrative.

SR-1	**The appearance must be controllable using stylesheet file**
Description	For android application stylesheet files are xml. So, all stylesheet must be controllable by the xml file.
Stakeholders	Software developer

5.9 Operational and Environmental Requirements

Operational and environmental requirement refers to the capabilities, performance measurements, process, measurements of effectiveness, measurements of performance, measures of sustainability, measurements of technical performances etc.

5.9.1 Expected Physical Requirements

There are no expected physical requirements in our system.

5.9.2 Requirements for Interfacing with Adjacent Systems

There are no requirements for interfacing with adjacent system for our project.

5.9.3 Release Requirements

There are no specific release requirements in our system.

5.10 Legal Requirements

Legal requirements normally refer to the terms and conditions or privacy policy of any organizations. The terms and condition of our application is that, no third-party software or person are allowed to engage to use our data for their business purpose.

5.10.1 Compliance Requirements

There are no specific compliance requirements for our system.

5.10.2 Standards Requirements

There are no specific standards requirements for our system.

6. Requirement Engineering Process

Requirement engineering refers to the process of defining, documenting and maintaining requirements in the engineering design process. It is a common role in systems engineering and software engineering.

6.1 Requirement Elicitation Techniques

Requirement elicitation is the process of collecting and refining stakeholder's requirements. It is perhaps the most difficult, most error-prone and most communication intensive software development. It can be successful only through an effective customer-developer partnership. It is needed to know what the users really need.

6.1.1 Hold Elicitation Interviews

We hold interviews that can be performed one-on-one or with a small group of stakeholders. They are an effective way to elicit requirements without taking too much stakeholder time because we meet with people to discuss only the specific requirements that are important to this system. Interviews are helpful to separately elicit requirements from members in preparation for workshops where those members of this system come together to resolve any conflicts.

6.1.2 Distribute Questionnaires

We conduct a survey to collect requirements for this system. Questionnaires are a way to survey large groups of users to determine what they need. Questionnaires are useful with any large user population but are particularly helpful with distributed groups.

6.1.3 Perform Observation

We observe the diagnostic center management system. We observe how they manage the client and client information, how they manage doctor information and how they manage their system. Every observation must be guided by clearly stated objectives. The analyst should know what data is to be collected, how observation will be done, when and where to observe, how the data will be collected and what the data will be used for after analysis.

6.1.4 System Interface Analysis

Interface analysis can also help in determining requirements for interoperability and exposing interfacing stakeholders early on in the project. It helps to clarify the boundaries of the interacting application, identify the functionality, input and output of the each interface. We saw the system interface in a diagnostic center.

6.1.5 Perform Document Analysis

Existing documentation can help reveal how systems currently work or what they are supposed to do. Documentation includes any written information about current systems, business processes, requirements specifications, competitor research. Reviewing and analysing the documents can help identify functionality that needs to remain, functionality that isn’t used.