

---

# **Software Requirements Specification**

**for**

**<DenSys.me hospital  
management system>**

**Version 1.0 approved**

**<Nazarbayev University>**

**<12.09.2022>**

# Table of Contents

<b>Table of Contents .....</b>	<b>ii</b>
<b>1. Introduction.....</b>	<b>1</b>
1.1 Purpose.....	1
1.2 Intended Audience and Reading Suggestions .....	1
1.3 Product Scope .....	1
<b>2. Overall Description .....</b>	<b>1</b>
2.1 Product Perspective.....	1
2.2 Product Functions .....	1
2.3 User Classes and Characteristics .....	2
2.4 Operating Environment.....	2
2.5 Design and Implementation Constraints .....	2
2.6 User Documentation .....	2
<b>3. External Interface Requirements .....</b>	<b>2</b>
3.1 User Interfaces .....	2
3.2 Hardware Interfaces .....	2
<b>4. System Features .....</b>	<b>3</b>

# **1. Introduction**

## **1.1 Purpose**

The medical hospital in Nur-Sultan provides variety of medical services to population. The hospital needs a web-based system to automate and make an electronic record of patients. For this project you will be asked to develop such a system named “DenSys.Me”. Next, you will be provided a list of different requirements for the software. These requirements provide general guidelines on the core functionality of the system and does not intend to specify fine details of the system. The task is to understand and implement these requirements into a working system.

## **1.2 Intended Audience and Reading Suggestions**

This document is provided as a course project for students of the course CSCI 361 of Nazarbayev University for the purpose of making a software system using the requirements written here.

## **1.3 Product Scope**

The hospital management system has a goal of providing a basic functionality for the patients and the hospital staff (doctors, nurses, managers, administration) to automate the processes of making an appointment, maintaining patient history, and prescribing medications and treatment procedures.

# **2. Overall Description**

## **2.1 Product Perspective**

The system should represent a newly written software. The software must represent a web-based system written with a use of popular web frameworks such as ReactJS, Java Server Pages (JSP), Java Servlets, NodeJS, Django.

## **2.2 Product Functions**

The product functions provided by the hospital system can be summarized as follows:

- 1) Make an online appointment
- 2) Maintain patient history
- 3) Prescribe a medication and treatment for a patient
- 4) Patient/doctor/nurse registration
- 5) Controlling a patient treatment by a doctor
- 6) Messaging app for patient and the doctor

## 2.3 User Classes and Characteristics

The system should contain the following user classes with their own rights and permissions to access the system:

- 1) **Doctor** has access to all patient history information, available treatment options and drugs to prescribe to a patient.
- 2) **Administration staff** has permissions and access to pages for create/update/delete new users into a system.
- 3) **Patient** has a permission to access a personal page and see his own history of treatment.

## 2.4 Operating Environment

The software should be implemented with no specific requirements on operating system, hardware platform.

## 2.5 Design and Implementation Constraints

The system should be implemented using one or a combination of the following backend and frontend tools and frameworks:

- ReactJS
- Java Server Pages (JSP)
- Java Servlets
- NodeJS
- Django
- MSSQL
- MySQL
- PostgreSQL
- Mongo DB

## 2.6 User Documentation

As a product deliverable, a documentation of main features of the system with instructions on how to access and use the system must be provided.

# 3. External Interface Requirements

## 3.1 User Interfaces

- 1) Web pages of the system should include general information for departments of the hospital and their medical staff. The hospital has several departments, including medicine, surgery, gynecology, obstetrics, pediatrics, radiology, eye, ENT, dental, orthopedics, neurology, cardiology, psychiatry, skin.
- 2) The list of services should include at least 4 of the services provided by each hospital department. For example, radiology department have procedures such as MRI, ultrasound, Computer Tomography scanning, X-ray scanning etc.

- 3) For the given services the price, list of contradictions and other related information should be maintained. Administration staff should have access to change service details using the admin page.

Main page should provide the following main information about the hospital:

- Services page
- About us page
- Contacts page
- Make an appointment page
- Search bar
- Login page for doctors/nurses/patients

### 3.2 Hardware Interfaces

The system has no specific requirements on hardware to software interaction interfaces. The only requirement is to deploy a server, which could host a web application with the public access available from the internet or local server environment.

## 4. System Features

### Patient Registration (role Administrator staff)

- 1) *Adding new patient into the system.* This operation must be done by the medical administration staff.
- 2) Patient registration includes the following information: government id, name, surname, middle name, address, phone number, email, contact details of the caregiver or relatives.
- 3) Information for the patient is created during his first visit into a hospital and should be saved for further visits.
- 4) Update patient records (CRUD). The patient data cannot be deleted.

### Patient history (role: Doctor)

- 1) Recording of each appointment with a doctor into a database.
- 2) Recording completed by a patient medical procedure into database.
- 3) Patient lookup page. Doctors could access a page with available search options to find patients and see their history.
- 4) Doctors should be able to print patient details.
- 5) Doctors should be able to send a notification to a patient using the system. System should incorporate a messaging app to send and receive messages between client and a doctor.
- 6) Plan for treatment and the status of treatment can be changed by a doctor.
- 7) Treatment history should include every detail of treatment (drugs prescribed) sorted by the dates (from most recent to the least recent).

### Scheduling a doctor visit (role Administrator staff)

- 1) System should be able to automatically search for the closest dates of the requested services to a patient.
- 2) System should display all active online requests from the clients.

- 3) System should provide and display schedule of the doctors and their workloads.
- 4) System should be able to provide options to assign a doctor, service to a particular patient.

#### **Login page**

- 1) Users should be able to login into the system using their account details
- 2) Account details should be generated by the system or assigned by the admin staff during the procedure of entering a new user into the system.
- 3) System should verify a user and redirect him into a personal page.

#### **Personal pages**

- 1) **Doctor's** personal pages should provide information on patients that was assigned to him.
- 2) **Doctor** should be able access each patient history and current treatment plan and modify the treatment plan according to a guideline.
- 3) Guidelines prohibit to change the treatment history and every modification to the treatment should be recorded into a database as a new entry by a **doctor**.
- 4) **Patient** should be able to see in his personal page his treatment plan.
- 5) **Patient** should be able to send messages to the doctors that currently assigned to him.
- 6) **Patient** should be able to modify his personal information.
- 7) **Patient** can make a direct appointment from his personal page.

#### **Scheduling a doctor visit (Online form)**

- 1) Patient should be able to choose available services from the web pages and make an online appointment.
- 2) The request form should contain mandatory field, such as phone number (or email), name/surname, list of selected medical services and the preferred dates for the visit.
- 3) Patient should be able to choose available doctors for the appointment.

#### **Report generation (role Administrator staff)**

- 1) The system should be able to generate report for the specified starting and ending dates about the total services provided, generated profit, total number of patients.
- 2) Report needs to include charts showing the trends over time of number of provided services, patient distribution over different departments and services. Variety of statistical data should be included into report.