# System Requirement Specification

For

# Hospital Management

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# Introduction

## 1.1 Purpose

This document aims to build a management system that helps hospitals control their Data. Also, help them to find and use the data easily and fast. Additionally, the goal of this system is to automate some of the hospital's existing processes in order to allow more efficient service call management.

## 1.2 Intended Audience and Reading Suggestions

**This document is intended for use by the following rules:**

⭕ `Hospitals Managers:`
- They can manage People for example doctors, nurses, etc. Also control resources, for example, drug stock, and tools, and buy or change something that needs to pay attention to.

⭕ `Government Health department:`
- They can analyze the data collected from hospitals and control them and study them. This process can help them to improve the health system and let them know which hospital needs more money, resources, tools, etc.

⭕ `Software Developers:`
- To allow them to clearly understand the process flow, functional and non-functional requirements, and system capabilities that are required to be deployed.

## 1.3 Project Scope

⭕ `Improve Efficiency:`
- The system must be able to improve the response time of serving the Hospital's customers.

⭕ `Improve Disciplines:`

- The system must be able to improve disciplines with organized connections between patients and Personnel.

⭕ `Reduce Idle Time:`
- The system must be able to reduce the idle time of service Personnel to identify and check patients.

⭕ `Increase Patient Satisfaction Rate:`
- Hospitals can study and know about the patients' situations and services. So they can find the problems and solve them.

# 1.4 References

- SRS sample
- How to Write SRS-20220623
- Java 2 Final Project

# Overall Descriptions

## 2.1 Product Perspective

⭕ `Personnel Management:`
- This system shall include functionalities to manage personnel duty, personal information, salary, insurance, etc.

⭕ `Patient Management:`
- This system shall include functionalities to manage patients' personal information, diseases, drugs, their doctors, etc.

⭕ `Drug Management:`
- This system shall include functionalities to manage available drugs, needed drugs, distributor company, etc.

⭕ `Tools Management and services:`
- This System shall include functionalities to manage tools and machines that hospitals use and check their services, etc.

In terms of external interfaces, the system shall be compliant with the following:

⭕ `User Interface:`
- The system shall use the hospital logo, and be user-friendly, usable, and easy to access.

⭕ `Hardware Interfaces:`
- This system shall run on PCs, Android devices, and IOS devices. Additionally, the system database shall be hosted locally on students' personal devices. Finally, the system shall also support connections with printing devices.

⭕ `Software Interfaces:`
- The system shall be compatible with Microsoft Windows XP and Windows 8 and Windows 10 and Windows 11 and Android and IOS operating systems. It shall use Microsoft SQL as the database repository.

# 2.2 Product Features

- Personnel login
- Buying drugs
- Assign patients to doctors
- Recruitment Personnel
- Manage inventory
- Hospitalization Patient
- Dismiss Patient
- Recieve Patient Costs
- Pay Personnel Salary
- Machine and tools annual service

# 2.3 User Classes and Characteristics

⭕ `Patient:`

- This user has no direct access to the system and it has access to the system by doctor panel, personnel panel, nurse panel.

⭕ `Doctor:`
- This user has direct access to the system and has the responsibility to change things in the system database.

⭕ `Nurse`
- This user has direct access to the system and has the responsibility to do what doctors specify.

⭕ `Employee`
- This user has direct access to the system and has the responsibility to receive patient costs, pay personnel salary, etc.

⭕ `Workers`
- This user has direct access to the system and the responsibility to manage inventory and drugs.

⭕ `Manager`
- This user has direct access to the system and the responsibility to manage all parts of the hospitals and systems.

# 2.4 Operating Environment

This system operates on Microsoft Windows XP and Windows 8 and Windows 10 and Windows 11 as the main OS. Additionally, It has to operate on all smartphones including Android devices and IOS devices. Furthermore, the system shall operate on all Linux and Mac OS devices.

# System features

## 3.1 Personnel login

### 3.1.1 Description and Priority

Personnel need to log in or sign up to use the system features and facilities and can access the system.

Priority: high

### 3.1.2 Stimulus/Response Sequences

| Use case name | Personnel Login |
|---|---|
| summary | User login in the hospital management system. |
| preconditions | The Personnel should have a valid username and password |
| Success End Condition | Personnel logged into the system. |
| Failed End Condition | Personnel cannot log into the system. |
| Primary | All personnel and management. |
| Trigger | The personnel needs to access the system |
| Description | Step) Actions |
| | 1) System should ask for a username |
| | 2) System should ask for a password |
| | 3) User can log in to the system. |
| Extensions | Step) Branching Action |
| | 1a) User has an invalid username. Show an error that the username is wrong and enter it again. |
| | 2a) User has an invalid password. Show an error that the password is wrong and enter it again. |

# 3.2 Buying drugs
## 3.2.1 Description and Priority

Managers need to buy drugs from the distributor company and import the details into the system.

Priority: high

## 3.2.2 Stimulus/Response Sequences

| Use case name | Buying drugs |
|---|---|
| summary | Manager needs to buy drugs for the hospital. |

| preconditions | Manager login to the system, Hospital should have enough money in the bank account and the distributor company distributes the drug |
|---|---|
| Success End Condition | Drug delivery succeeded and was added to the storeroom. |
| Failed End Condition | Drugs do not arrive at the hospital |
| Primary | Manager |
| Trigger | Not enough medicine is available in the storeroom and Inventory is low. |
| Description | Step) Actions |
| | 1) Manager order the drugs |
| | 2) distributor company has drugs available |
| | 3) distributor company send drugs |
| | 4) Drugs deliver and pay the cost. |
| | 5) Drugs add to the storeroom. |
| Extensions | Step) Branching Action |
| | 2a) Drugs are not available. Send a message to the manager to buy drugs from another company. |
| | 3a) The drug delivery process is encountered. |
| | 5a) Forgot to add drugs to the storeroom. Show an error that we buy some drugs and add them to the storeroom. |

# 3.3 Assign patients to doctors
## 3.3.1 Description and Priority

Every patient according to the need and disease needs to assign to a specific doctor

Priority: high

## 3.3.2 Stimulus/Response Sequences

| Use case name | Assign Patients to Doctors |
|---|---|

| summary | All patients need a specific doctor to examine or cure them. |
|---|---|
| preconditions | Patient information available in the system, doctor information available in the system, and doctor specialty are the same with the patient disease. |
| Success End Condition | Patients are assigned to a specific doctor. |
| Failed End Condition | No doctor is available for a specific disease of a patient. |
| Primary | Doctors, manager |
| Trigger | Patients need a doctor. |
| Description | Step) Actions |
| | 1) Patients ask for a doctor for a specific disease |
| | 2) A doctor is available to accept a patient's request |
| | 3) A patient assign to a doctor successfully |
| Extensions | Step) Branching Action |
| | 1a) No doctor available for specific diseases. Send the information of the patient to another hospital that has a suitable doctor. |
| | 1b) doctors are available for that disease but do not accept the patient. Try to find another doctor. |
| | 2a) No patient available for a doctor's specialty. |

# 3.4 Recruitment Personnel

## 3.4.1 Description and Priority

Manager needs to recruit new doctors, nurses, and other personnel and add them to the hospital team.

Priority: high

## 3.4.2 Stimulus/Response Sequences

| Use case name | Recruitment Personnel |
|---|---|
| summary | Hospital Personnel team needs to be updated |
| preconditions | to Meet the needs of the hospital during the interview. |

| Success End Condition | New personnel join the hospital team |
|---|---|
| Failed End Condition | No one joins the hospital |
| Primary | manager |
| Trigger | When the hospital needs a new doctor, worker, nurse, employee |
| Description | Step) Actions |
| | 1) Hospital needs a new personnel |
| | 2) manager find a proper personnel |
| | 3) Add a new person to the system. |
| Extensions | Step) Branching Action |
| | Come on, it has no extensions :)) |

# 3.5 Manage inventory
## 3.5.1 Description and Priority

Inventory of the hospital shall be managed by this system and workers can manage it.

Priority: high

## 3.5.2 Stimulus/Response Sequences

| Use case name | Manage inventory |
|---|---|
| summary | Inventory needs to be managed and we should buy drugs etc and keep it full. |
| preconditions | Workers have valid information details in the system, inventory detail available in the system |
| Success End Condition | Drugs are enough for at least a month |
| Failed End Condition | No more drugs available |
| Primary | Worker, manager |
| Trigger | When Inventory is low or empty. |

| Description | Step) Actions |
|---|---|
| | 1) Worker log in to the system successfully |
| | 2) Check Inventory |
| | 3) report manager if need attention. |
| Extensions | Step) Branching Action |
| | 3a) Manager doesn't pay attention. Show a message to pay attention. |

# 3.6 Hospitalization Patient

## 3.6.1 Description and Priority

Every patient that is hospitalized needs to enter information such as disease and personal information into the system by details

Priority: high

## 3.6.2 Stimulus/Response Sequences

| Use case name | Hospitalization Patient |
|---|---|
| summary | Keep the information of the Hospitalization Patient for services and attention. |
| preconditions | Patients' information details register in the system as a valid user |
| Success End Condition | Patient hospitalized |
| Failed End Condition | Patients information details be invalid |
| Primary | Employee, manager |
| Trigger | When a patient needs to be hospitalized |
| Description | Step) Actions |
| | 1) Register a new patient in the system |
| | 2) A room and a doctor available for the patient |
| | 3) Patient hospitalized in a hospital successfully |
| Extensions | Step) Branching Action |

| | |
|---|---|
| | 1a) Patient information is invalid |
| | 1b) Patient ID is available in the system |
| | 2a) A room doesn't exist for a patient |
| | 2b) Proper doctor does not exist |

# 3.7 Dismiss Patient

## 3.7.1 Description and Priority

When a patient is cured and wants to exit the hospital, set the time they cured and left the hospital.

Priority: high

## 3.7.2 Stimulus/Response Sequences

| Use case name | Dismiss  Patient |
|---|---|
| summary | Patients need to exit the hospital after being examined or cured. |
| preconditions | Doctor allows the patient to dismiss |
| Success End Condition | Patient dismiss |
| Failed End Condition | Patient not allowed to dismiss |
| Primary | Employees, Doctors, Manager |
| Trigger | Patient examined or cured. |
| Description | Step) Actions |
| | 1) Doctor allow patients to dismiss |
| | 2) Patient pay their costs |
| | 3) Employee allow the patient to dismiss |
| Extensions | Step) Branching Action |
| | 1a) Cure time of the patient is not finished |
| | 2a) Patient has no valid bank account |

# 3.8 Receive Patient Costs
## 3.8.1 Description and Priority

The system should calculate patient costs by the time of their staying in the hospital, services that they get, and drugs that they use.

Priority: high

## 3.8.2 Stimulus/Response Sequences

| Use case name | Receive Patient Costs |
|---|---|
| summary | Calculate patient costs and receive them from patients. |
| preconditions | Patient Cure time finished |
| Success End Condition | Patient refinement successfully |
| Failed End Condition | Patient cannot pay their costs, |
| Primary | Employee, Manager |
| Trigger | Patients want to pay the cost or exit the hospital. |
| Description | Step) Actions |
| | 1) Patient information detail be valid |
| | 2) Patient has allowed dismissing |
| | 3) Pay the costs |
| Extensions | Step) Branching Action |
| | 2a) Patient's doctor does not allow them to dismiss |
| | 2a) Patient doesn't have enough money. |

# 3.9 Pay Personnel Salary
## 3.9.1 Description and Priority

This service is for paying the salaries and its details like how much money is paid or when that money is paid.

Priority: high

## 3.9.2 Stimulus/Response Sequences

| Use case name | Pay Personnel Salary |
|---|---|
| summary | Pay the salary of each personnel. |
| preconditions | Hospital has enough bank account balance |
| Success End Condition | All personnel salary pay successfully |
| Failed End Condition | Not enough money for all personnel |
| Primary | Employee, Manager |
| Trigger | When the hospital should pay the salaries. |
| Description | Step) Actions |
| | 1)Time to pay personnel salaries |
| | 2) Accountants tells the manager money that is enough for all personnel |
| | 3) Manager allows Employee to withdraw from bank account |
| | 4) All salary paid successfully |
| Extensions | Step) Branching Action |
| | 1a)Time to pay personnel salaries has not arrived. |
| | 2a) Accountant tell wrong number |

# 3.10 Machine and tools annual service
## 3.10.1 Description and Priority

Every tool needs Annual service and checkup. Information like last check-up and time of next one. Also if a machine or tool is broken keep the information about information and replacement.

Priority: high

## 3.10.2 Stimulus/Response Sequences

| Use case name | Machine and tools annual service |
|---|---|
| summary | Every tool and machine needs checkup and replacement. |
| preconditions | Machine and tools registered in the system |
| Success End Condition | Annual service repeated |
| Failed End Condition | Annual service do not do when it needs |
| Primary | Worker, Manager |
| Trigger | When checkup time arrives or needs replacement. |
| Description | Step) Actions |
| | 1) Worker tells manager machines and tools need annual service |
| | 2) Manager allows the worker to do annual service |
| Extensions | Step) Branching Action |

# 3.11 Detailed Non-Functional Requirements

## Manager

| Data Item | Type | Description | Comment |
|---|---|---|---|
| ID | Integer | ID number of manager in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID | Unique |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code her or his house | |
| Birthday | Date | When they born | |

# Patient

| Data Item | Type | Description | Comment |
|---|---|---|---|
| ID | Integer | ID number of member in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID | Unique |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code her or his house | |
| Birthday | Date | When they born | |

# Nurse

| Data Item | Type | Description | Comment |
|---|---|---|---|
| ID | Integer | ID number of member in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID of manager | Unique |
| Supervisor | Integer | ID of Supervisor | Foreign key from Doctor - ID |
| Tasks | Text | What they should do | |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code they house | |
| Birthday | Date | When they born | |

# Doctor

| Data Item | Type | Description | Comment |
|---|---|---|---|
| ID | Integer | ID number of member in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID of manager | Unique |
| Supervisor | Integer | ID of Supervisor | Foreign key from Doctor - ID |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code her or his house | |
| Birthday | Date | When they born | |

# Employee

| Data Item | Type | Description | Comment |
|---|---|---|---|
| ID | Integer | ID number of member in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID of manager | Unique |
| Rule | Text | ID of Supervisor | |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code her or his house | |
| Birthday | Date | When they born | |
| Task | Text | Their Duties | |

# Worker

| Data Item | Type | Description | Comment |
|-----------|------|-------------|---------|
| ID | Integer | ID number of member in hospital | Primary Key |
| First Name | Text | First Name | |
| Last Name | Text | Last Name | |
| Phone Number | Integer | Phone Number | |
| National ID | Integer | National ID of manager | Unique |
| Rule | Text | ID of Supervisor | |
| Address | Text | Where they live | |
| City | Text | Which city they live | |
| Postal Code | Float | Postal code her or his house | |
| Birthday | Date | When they born | |
| Task | Text | Their Duties | |

# Company

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Code | Integer | Company Code | Primary Key |
| Name | Text | Company Name | |
| CEO Name | Text | Name of CEO | |
| Phone Number | Integer | Phone Number of company | |
| Country | Text | Which country company is | |
| City | Text | Which city company is | |
| Region | Text | Which region company is | |
| Address | Text | Adress od compnay | |
| Postal Code | Text | Postal code of company | |

# Drug

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Code | String | Drug Code | Primary Key |
| Name | Text | Name of medicine | |
| Producer | integer | Code of company that produces it | Foreign key from Company - Code |
| Price Per Box | float | Price of the drug for each box | |

# Machine

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Code | Integer | Machine Code | Primary Key |
| Name | Text | Name od machine | |
| Annual Service Per Year | Integer | How many times should we service a machine in a year | |
| Service Provider | Integer | ID of someone who services this machine | Foreign key from Worker - ID |
| Company | Integer | Code od company which produce this machine | Foreign key from Company - Code |

# WareHouse

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Drug | Integer | Drugs Code | Foreign key from Drug - Code |
| Tool | Integer | Tools Code | Foreign key from Tool- Code |
| Available | Boolean | Is drugs available or not? | |
| Box | Integer | How many boxes are availably | Nullable for tools |

# Tool

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Code | Integer | Tool Code | Primary Key |
| Name | Text | Name of Tool | |
| Company | Integer | Code od company which produces this product | Foreign key from Company- Code |

# Patient & Doctor

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Patient ID | Integer | ID number of patient in hospital | Foreign key from Patient - ID |
| Doctor ID | Integer | ID number of doctor in hospital | Foreign key from Doctor - ID |

# Patient & Nurse

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Patient ID | Integer | ID number of the patient in hospital | Foreign key from Patient - ID |
| Nurse ID | Integer | ID number of the nurse in hospital | Foreign key from Nurse - ID |

# Patient's Drugs

| Data Item | Type | Description | Comment |
|---|---|---|---|
| Patient ID | Integer | ID number of the patient in hospital | Foreign key from Patient - ID |
| Drug | Integer | ID number of member in hospital | Foreign key from Drug - Code |

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**Manager**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Address | text |
| City | text |
| Postal Code | float |
| Birth Day | date |

**Patients & Doctors**

| Patient ID | integer |
|---|---|
| Doctor ID | integer |

**Doctor**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Supervisor | integer |
| City | text |
| Address | text |
| Postal Code | float |
| Birth Date | date |

**Employee**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Rule | text |
| Address | text |
| City | text |
| Postal code | float |
| Birth Day | date |
| Task | text |

**Patients & Nurse**

| Patient ID | integer |
|---|---|
| Nurse ID | integer |

**Patient**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Address | text |
| City | text |
| Postal Code | float |
| Birth Date | date |

**Patients' Drugs**

| Patient ID | integer |
|---|---|
| Drug Code | integer |

**Nurse**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Supervisor | integer |
| Tasks | text |
| City | text |
| Address | text |
| Postal Code | float |
| Birth Date | date |

**tool**

| Name | text |
|---|---|
| Code | integer |
| Company | integer |
| Price | float |

**WareHouse**

| Drug | integer |
|---|---|
| Tool | binary |
| Available | boolean |
| Box | integer |

**Drug**

| Name | text |
|---|---|
| Code | string |
| Producer | integer |
| Price Per Box | float |

**Company**

| Name | text |
|---|---|
| Code | integer |
| CEO Name | text |
| Phone Number | integer(11) |
| Country | text |
| City | text |
| Region | text |
| Address | text |
| Postal Code | text |

**Machine**

Machine that doctors and nurses allow to use

| Name | text |
|---|---|
| Code | integer |
| Annual Service Per Year | integer |
| Service Provider | integer |
| Company | integer |

**Worker**

| ID | integer |
|---|---|
| First Name | text(20) |
| Last Name | text(20) |
| Phone Number | integer(11) |
| National ID | integer(10) |
| Rule | text |
| Address | text |
| City | text |
| Postal code | float |
| Birth Day | date |
| Task | text |

# External interface requirements

## 4.1 User Interface

Back-end software: Java & Swift

Android front-end: Java

IOS front-end: Swift

EIREQ-1: It should be user-friendly and easy to use on all devices.

EIREQ-2: All error messages shall be explicitly referred to as an error.

## 4.2 Hardware Interface

EIREQ-3: The system shall be supported by PCs and Smartphones.

## 4.3 Software Interface

EIREQ-4: The system shall run on PCs on Microsoft Windows 7, 8, and 10 OS.

EIREQ-5: The system shall run on android 4.4 or upper for android devices.

EIREQ-6:The system shall run on IOS  for Apple devices.

EIREQ-7: The system shall use My SQL as the central database.

# 4.4 Communications Interface

EIREQ-8: The system shall use email, SMS, or push to send automatic notifications.