**Software Design Document (SDD) Template**

EL G.O.A.T

**MentCare** Health System For psychological and mental illness

**Name (s):**

1. **Sarah Nabil Kamel .**
2. **Shaima Ahmed .**
3. **Esraa Mohammed Abu Al-Wafa .**
4. **Ebtihal Abdel Moneim .**
5. **Fatima Abdel Samad .**
6. **Hadeer Abel El-Nasser.**

**Date: (05/25/2023)**

**Table of Contents**

1. [Introduction 2](#_bookmark0)
   1. [Purpose 2](#_bookmark1)
   2. [Scope 2](#_bookmark2)
   3. [Overview 2](#_bookmark3)
   4. [Reference Material 2](#_bookmark4)
   5. [Definitions and Acronyms 2](#_bookmark5)
2. [System Overview 2](#_bookmark6)
3. [System Architecture 2](#_bookmark7)
   1. [Architectural Design 2](#_bookmark8)
   2. [Decomposition Description 3](#_bookmark9)
   3. [Design Rationale 3](#_bookmark10)
4. [Data Design 3](#_bookmark11)
   1. [Data Description 3](#_bookmark12)
   2. [Data Dictionary 3](#_bookmark13)
5. [Component Design 3](#_bookmark14)
6. [Human Interface Design 4](#_bookmark15)
   1. [Overview of User Interface 4](#_bookmark16)
   2. [Screen Images 4](#_bookmark17)
   3. [Screen Objects and Actions 4](#_bookmark18)
7. [Requirements Matrix 4](#_bookmark19)
8. [Appendices 4](#_bookmark20)

# Introduction

## Purpose

**My project Hospital Management system includes registration of patients, storing their disease details into the system. My software has the facility to give a unique id for every patient and stores the details of every patient. The Hospital Management System can be used by entering respective username and password. Itis accessible either by an administrator or receptionist. Only the respective person can add data in the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected and data processing is very fast, accurate and relevant.**

**( Mentcare )A patient information system to support mental health care is a medical information system that maintains information about patients suffering from mental health problems and the treatments that they have received.**

**Most mental health patients do not require dedicated hospital treatment but need to attend specialist clinics regularly where they can meet a doctor who has detailed knowledge of their problems.**

**To make it easier for patients to attend, these clinics are not just run in hospitals. Helps predict and warn of dangerous condition,They may also be held in local medical practices or community centres.**

**It is designed to be operated on a hospital scale It makes use of a centralized database of patient information but has also been designed to run on a PC, so that it may be accessed and used from sites that do not have secure network connectivity.**

**It is solely intended to support mental health care (e.g. if a patient is suffering from some other unrelated condition, such as high blood pressure, this would not be formally recorded in the system). The system must therefore interoperate with and shared information with other patient record systems that are in use.**

## Scope

***Daily functions like patient registration, managing admission and***

***overall management of various departments can be easily performed with higher***

***accuracy after the installation of hospital software. The modules of hospital***

***management software are user-friendly and easy to access.***

***Daily functions like patient registration, managing admission and overall management of various departments can be easily performed with higher accuracy after the installation of hospital software. The modules of hospital management software are user-friendly and easy to access.***

**The system will operate on a hospital or clinic scale and patient :**

**To generate management information that allows health service managers to assess performance against local and government targets.**

**To provide medical staff with timely information to support the treatment of patients.**

**In a minority of cases, they may be a danger to themselves or to other people. They may regularly change address or may be homeless on a long-term or short-term basis. Where patients are dangerous, they may need to be “sectioned”—that is, confined to a secure hospital for treatment and observation.**

**To provide an improved records system for clinical staff involved in diagnosis and treatment and follow up on their condition.**

**Individual care management: Clinicians can create records for patients, edit the information in the system, view patient history, etc. The system supports data summaries so that doctors can quickly learn about the key problems and treatments that have been prescribed.**

**Patient monitoring: The system monitors the records of patients involved in treatment and issues warnings if possible problems are detected.**

**Administrative reporting: The system generates monthly management reports showing the number of patients treated at each clinic, the number of patients who have entered and left the care system, the number of patients sectioned, the prescribed drugs and their costs, etc.**

A picture containing text, screenshot, font, diagram

Description automatically generated

## Overview

* **A patient information system to support mental health care is a medical information system that maintains information about patients suffering from mental health problems and the treatments that they have received.**
* **Most mental health patients do not require dedicated hospital treatment but need to attend specialist clinics regularly where they can meet a doctor who has detailed knowledge of their problems.**
* **To make it easier for patients to attend, these clinics are not just run in hospitals. They may also be held in local medical practices or community centres.**

## Reference Material

**I used this file located on the following website in writing this document**

[**https://www.dropbox.com/s/ffj12h421nfqzk1/DependabilityReqEngineering.pdf?dl=0**](https://www.dropbox.com/s/ffj12h421nfqzk1/DependabilityReqEngineering.pdf?dl=0)

[**https://www.dropbox.com/s/8t84unls2ddvi53/Deriving%20dependability%20requirements.pdf?dl=0**](https://www.dropbox.com/s/8t84unls2ddvi53/Deriving%20dependability%20requirements.pdf?dl=0)

## Definitions and Acronyms

## *A picture containing text, receipt, font, screenshot Description automatically generated*

## A picture containing text, receipt, font, number Description automatically generated

1. **SYSTEM OVERVIEW**

* **Mentcare is an information system that is intended for use in clinics.**
* **It makes use of a centralized database of patient information but has also been designed to run on a PC, so that it may be accessed and used from sites that do not have secure network connectivity.**
* **When the local systems have secure network access, they use patient information in the database but they can download and use local copies of patient records when they are disconnected.**
* A picture containing text, screenshot, font, diagram

  Description automatically generated**It is solely intended to support mental health care (e.g. if a patient is suffering from some other unrelated condition, such as high blood pressure, this would not be formally recorded in the system). The system must therefore interoperate with and shared information with other patient record systems that are in use.**

# System Architecture

## Architectural Design

A picture containing text, screenshot, diagram, rectangle

Description automatically generated

Architectural design

1. Patient Management Module: This module would handle all aspects related to patient management, including admission, discharge, transfer, and scheduling of appointments.
2. Electronic Medical Record (EMR) Module: This module would handle the storage and management of patient health records. It would allow healthcare professionals to maintain accurate and up-to-date records of patients' medical histories, diagnoses, medications, and treatment plans.
3. Billing and Payment Module: This module would handle the billing and payment processes related to healthcare services provided to patients. It would handle the generation of invoices, tracking of payments, and management of insurance claims.
4. Pharmacy Management Module: This module would handle the management of medications, including inventory management, dispensing, and tracking of medication orders.
5. Laboratory Management Module: This module would handle the management of laboratory tests and results, including ordering tests, tracking results, and sharing results with healthcare professionals.
6. Radiology Management Module: This module would handle the management of radiology tests and results, including ordering tests, tracking results, and sharing results with healthcare professionals.
7. Inventory Management Module: This module would handle the management of hospital supplies and equipment, including ordering, receiving, tracking, and maintaining inventory levels.
8. Human Resources Management Module: This module would handle the management of hospital staff, including hiring, scheduling, payroll management, and performance evaluation.

modules are interconnected and interdependent. For example, the Patient Management Module would need to access information from the EMR Module to manage patient admissions, discharges, and transfers. The Billing and Payment Module would need to access information from the Patient Management Module and the EMR Module to generate invoices and manage insurance claims. The Pharmacy Management Module would need to access information from the EMR Module to ensure that medications are prescribed correctly, and the correct dosages are dispensed

decomposition description:

In a hospital project, functional decomposition can be used to break down the system into smaller modules based on the functions they perform.

Object-Oriented Decomposition:  
In a hospital project, object-oriented decomposition can be used to break down the system into smaller classes based on the functionalities they perform. Here are some examples of object-oriented classes for a hospital project:

1. Patient Class: This class would encapsulate all the information related to a patient, including their name, age, medical history, and treatment plan.
2. Electronic Medical Record (EMR) Class: This class would encapsulate all the information related to the electronic medical records of patients, including their medical histories, diagnoses, medications, and treatment plans.
3. Billing Class: This class would encapsulate all the information related to billing and payments, including generating invoices, tracking payments, and managing insurance claims.
4. Pharmacy Class: This class would encapsulate all the information related to medication management, including inventory management, dispensing, and tracking of medication orders.
5. Laboratory Class: This class would encapsulate all the information related to laboratory tests and results, including ordering tests, tracking results, and sharing results with healthcare professionals.
6. Radiology Class: This class would encapsulate all the information related to radiology tests and results, including ordering tests, tracking results, and sharing results with healthcare professionals.
7. Inventory Class: This class would encapsulate all the information related to hospital supplies and equipment, including ordering, receiving, tracking, and maintaining inventory levels.
8. Staff Class: This class would encapsulate all the information related to hospital staff, including hiring, scheduling, payroll management, and performance evaluation.

design rationale :

 The rationale for selecting this architectural design is as follows:

1. Scalability: The modular program structure is scalable, which means that it can be expanded to meet the changing needs of the hospital. Each module can be added or removed independently without affecting other modules, making it easier to manage and maintain the system.
2. Flexibility: The modular program structure is flexible, which means that it can adapt to different hospital processes and workflows. Each module can be customized to meet the specific requirements of the hospital, making it easier to integrate with existing systems and processes.
3. Interoperability: The modular program structure is interoperable, which means that it can communicate and exchange data with other systems and devices. This is critical in a hospital setting where different systems and devices need to work together seamlessly.
4. Maintainability: The modular program structure is maintainable, which means that it is easier to identify and fix issues or bugs. Each module can be tested and debugged independently, making it easier to maintain the overall system.
5. Security: The modular program structure is secure, which means that it can protect sensitive patient information and prevent unauthorized access. Each module can be designed and implemented with security in mind, making it easier to ensure the overall system's security.

Trade-offs and Critical Issues:

1. Security: One critical issue in a hospital project is security. Healthcare systems contain sensitive information, such as patient medical records, that must be protected. A trade-off in selecting an architectural design is balancing security measures against usability and accessibility.
2. Interoperability: Interoperability is another critical issue in a hospital project. Different systems and devices need to work together seamlessly to ensure efficient and effective patient care. A trade-off in selecting an architectural design is balancing the need for interoperability with the complexity of integrating different systems.
3. Scalability: Hospitals often grow and expand over time, which means that the architectural design needs to be scalable to accommodate changing needs. A trade-off in selecting an architectural design is balancing the need for scalability with the cost and complexity of expanding the system.
4. Performance: Healthcare systems need to perform quickly and efficiently to ensure that patient care is not delayed. A trade-off in selecting an architectural design is balancing performance with the cost and complexity of implementing faster hardware or optimizing software algorithms.
5. Cost: Hospitals are under constant pressure to manage costs while providing high-quality patient care. A trade-off in selecting an architectural design is balancing the cost of implementation, maintenance, and licensing with the benefits of the system.
6. Usability: Healthcare professionals need to be able to use the system easily and efficiently to provide patient care effectively. A trade-off in selecting an architectural design is balancing usability with the complexity of the system.
7. Compliance: Healthcare systems must comply with various regulations, such as HIPAA, which govern the handling of patient data. A trade-off in selecting an architectural design is balancing compliance with the complexity of the system.
8. Integration: Hospitals often have legacy systems that need to be integrated with new systems. A trade-off in selecting an architectural design is balancing the need for integration with the complexity of integrating different systems.

# Data Design

## Data Description

**In a mental health care system, the transformation of information domain into data structures involves**

**capturing and representing various elements related to patients, their medical history,treatment plans**

**, and clinical outcomes. The system entities typically include patients, healthcare providers,**

**medical records, diagnoses, treatments, appointments, medications**

**The data is organized and stored in a relational database management system (RDBMS) using structured**

**query language (MySQL). The database tables are created based on the defined schema and relationships**

**between entities. The data structures within the database allow for efficient storage, retrieval,**

**and manipulation of the information.**

**The system processes the data by executing SQL queries and commands to perform operations**

**such as creating new patient records, scheduling appointments, recording therapy sessions,**

**and retrieving information based on various criteria.**

**Data structures, such as tables, documents, or key-value pairs, are utilized to represent and organize**

**the data within these databases. Queries and data processing operations can then be performed on this structured data to retrieve, update, or analyze information as required by the mental health care system.**

## Data Dictionary

**Here is a data dictionary for a mental health care system,**

**listing system entities or major data along with their types**

**and descriptions:**

**1-Patients**

**Type: Entity**

**Description: Represents individuals receiving mental health care**

**services. It includes information about the patient's demographic**

**details, medical history, family history, allergies,**

**and contact information.**

**2-Doctor**

**Type: Entity**

**Description: Refers to healthcare providers specialized**

**in mental health care, such as psychiatrists,**

**psychologists, or therapists.**

**It includes information about the doctor's credentials,**

**contact details, areas of specialization,**

**and availability for appointments.**

**3-Receptionist**

**Type: Entity**

**Description: Represents the staff members responsible for**

**managing appointments and administrative tasks in**

**the mental health care system.**

**It includes information about the receptionist's name,**

**contact details, and assigned responsibilities**

**4-Appointments**

**Type: Entity**

**Description: Represents scheduled appointments for patients,**

**including date, time, healthcare provider,**

**and any specific requirements or instructions.**

# Component Design

A diagram of a hospital management system

Description automatically generated

# Human Interface Design

## Overview of User Interface & 6.2 Screen Images :

## The user interface of our hospital is a website. First, they will see a welcome page showing the services we provide + means of communication:

## A picture containing text, screenshot, web page, website Description automatically generated

**Then the user logs in if he has an account, and according to his position, he will enter the control panel. If he does not have an account, he can register an account.**

A screenshot of a login screen

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated

**This is the patient's page or control panel through which he can book an appointment, cancel an appointment, and treatment or consultation online**

A screenshot of a calendar

Description automatically generated with medium confidence

**This is the doctor's page or his control panel, through which he can add, modify, and delete a patient, and see his schedule, treatment, or online consultation**

A screenshot of a calendar

Description automatically generated

**This is the receptionist's page or his control panel, through which he can add, modify, and delete a patient, view his schedule, and book appointments**

A screenshot of a calculator

Description automatically generated

**This is the contact page for submitting any complaints or feedback**

A screenshot of a video game

Description automatically generated with medium confidence

# Requirements Matrix

# form Software Engineering, Tenth Edition Ian Sommerville

# <https://software-engineering-book.com/>

# <https://software-engineering-book.com/case-studies/mentcare/>

[**https://www.dropbox.com/s/ffj12h421nfqzk1/DependabilityReqEngineering.pdf?dl=0**](https://www.dropbox.com/s/ffj12h421nfqzk1/DependabilityReqEngineering.pdf?dl=0)

[**https://www.dropbox.com/s/8t84unls2ddvi53/Deriving%20dependability%20requirements.pdf?dl=0**](https://www.dropbox.com/s/8t84unls2ddvi53/Deriving%20dependability%20requirements.pdf?dl=0)