SUKKUR IBA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

ASSIGNMENT #2

Marks: 5

Instructor: Engr. Zainab Umair Kamangar **Subject**: Software Engineering

Submission Deadline: 10/08/2025 **[CLO-3]**

Note:

For full credit, show complete work of your assignment.

Q. Design a UML diagram and a Class diagram for the Mental Health Care-Patient Management System elaborated in the case study shown below:

Case Study: A patient information system for mental health care

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 centers.

The MHC-PMS (Mental Health Care-Patient Management System) 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. The system is not a complete medical records system so does not maintain information about other medical conditions. However, it may interact and exchange data with other clinical information systems.

The MHC-PMS has two overall goals:

1. To generate management information that allows health service managers to assess performance against local and government targets.
2. To provide medical staff with timely information to support the treatment of patients.

The nature of mental health problems is such that patients are often disorganized so may miss appointments, deliberately or accidentally lose prescriptions and medication, forget instructions, and make unreasonable demands on medical staff. They may drop in on clinics unexpectedly. 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’—confined to a secure hospital for treatment and observation

Users of the system include clinical staff such as doctors, nurses, and health visitors (nurses who visit people at home to check on their treatment). Nonmedical users include receptionists who make appointments,

medical records staff who maintain the records system, and administrative staff who generate reports.

The system is used to record information about patients (name, address, age, next of kin, etc.), consultations (date, doctor seen, subjective impressions of the patient, etc.), conditions, and treatments. Reports are generated at regular intervals for medical staff and health authority managers. Typically, reports for medical staff focus on information about individual patients whereas management reports are anonymized and are concerned with conditions, costs of treatment, etc.

The key features of the system are:

1. 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 who have not previously met a patient can quickly learn about the key problems and treatments that have been prescribed.
2. Patient monitoring The system regularly monitors the records of patients that are involved in treatment and issues warnings if possible problems are detected. Therefore, if a patient has not seen a doctor for some time, a warning may be issued. One of the most important elements of the monitoring system is to keep track of patients who have been sectioned and to ensure that the legally required checks are carried out at the right time.
3. 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, number of patients sectioned, the drugs prescribed and their costs, etc.

Two different laws affect the system. These are laws on data protection that govern the confidentiality of personal information and mental health laws that govern the compulsory detention of patients deemed to be a danger to themselves or others. Mental health is unique in this respect as it is the only medical speciality that can recommend the detention of patients against their will. This is subject to very strict legislative safeguards. One of the aims of the MHC-PMS is to ensure that staff always act in accordance with the law and that their decisions are recorded for judicial review if necessary

As in all medical systems, privacy is a critical system requirement. It is essential that patient information is confidential and is never disclosed to anyone apart from authorized medical staff and the patient themselves. The MHC-PMS is also a safety-critical system. Some mental illnesses cause patients to become suicidal or a danger to other people. Wherever possible, the system should warn medical staff about potentially suicidal or dangerous patients. The overall design of the system has to take into account privacy and safety requirements. The system must be available when needed otherwise safety may be compromised and it may be impossible to prescribe the correct medication to patients. There is a potential conflict here—privacy is easiest to maintain when there is only a single copy of the system data. However, to ensure availability in the event of server failure or when disconnected from a network, multiple copies of the data should be maintained.