Project2 Design & Implement

- Patient Management System

Highlight nouns and verbs

1.Introduction

The Patient Management System is a critical healthcare application designed to assist patients in managing patient appointments, medical prescriptions, and the delivery of medications. This system is particularly valuable for streamlining the process of test scheduling, medicine tracking, and ensuring patients receive timely updates and treatments. By integrating patient data, medical test reports, and doctor prescriptions, the system enables efficient tracking of patient health progress and ensures proper medication adherence.

The system is designed to handle various use cases, such as appointment for tests for patients, sending prescribed medications to the patient's home address, and recording the medication cycle. The goal is to improve the overall healthcare management experience for both the patients and medical professionals involved.

2. Rules of the business

1.The Patient Management APP stores each user's most fundamental personal information. This data forms the base layer for managing patient records.

2. Tests are conducted by Labs, and each test is associated with a labId. The Lab Reports are sent back to the system where doctors can review them to prescribe or adjust treatment. Lab Reports are generated based on the test results and contain important information such as illnessName and memo for the doctor's review.

3. Doctors refer Prescriptions to patients after reviewing the Lab reports. Each Prescription contains information such as the date and dosage of Instructions. The system records multiple medications per prescription, each with a unique medicine, medicine name, and dosage frequency.

4. Patients can schedule appointments with doctors through the Patient Management APP. Each appointment records the date and time of the visit, ensuring that the doctor is assigned accordingly. Multiple appointments can be scheduled for the same doctor, and the system prevents double

booking by maintaining unique time slots per doctor.

5. Each medicine issued to a patient is tracked through a Medicine Record. This record logs the date and frequency of medication issuance, ensuring that doctors and the system have an accurate history of the patient's medication timeline. A single medicine can be recorded in multiple medicine issuance records, representing different times it was administered.

6. Doctors have access to all the lab reports for patients under their care. These reports include detailed test results and assist the doctor in making data-driven decisions about adjusting or prescribing treatments. The system ensures that only the assigned doctor has access to each patient's lab reports for privacy and security purposes.

7. After reviewing lab reports and assessing the patient's condition, doctors can adjust prescriptions by changing the dosage instructions or adding/removing medications. This ensures that prescriptions are always up-to-date based on the patient's current health status and the latest lab results.

8. Diseases History only stores records for one month to ensure that patients can have timely follow-up visits.

3. nouns and verbs

Nouns:

Patient Management System

healthcare application

patients

appointments

medical prescriptions

delivery of medications

system

test scheduling

medicine tracking

patient data

medical test reports

doctor prescriptions

progress

medication adherence

appointment

prescribed medications

medication cycle

healthcare management

medical professionals

Patient Management APP

personal information

records

primary functions

Health Surveillance

Medicine Monitor

monitoring

medications

monitor Id (Patient Id)

dosages

Health Surveillance record

symptoms

disease history

Tests

Labs

test

labId

Lab Reports

doctors

Reports

illnessName

memo

doctor’s review

Doctors

Prescriptions

Lab reports

Prescription

information

date

dosage of Instructions

medications per prescription

medicine

medicine name

dosage frequency

Delivery

prescribed medications

address

patient

delivery Id

delivery date

Delivery

Medicine

Verbs

Appointment

Assist

Recording

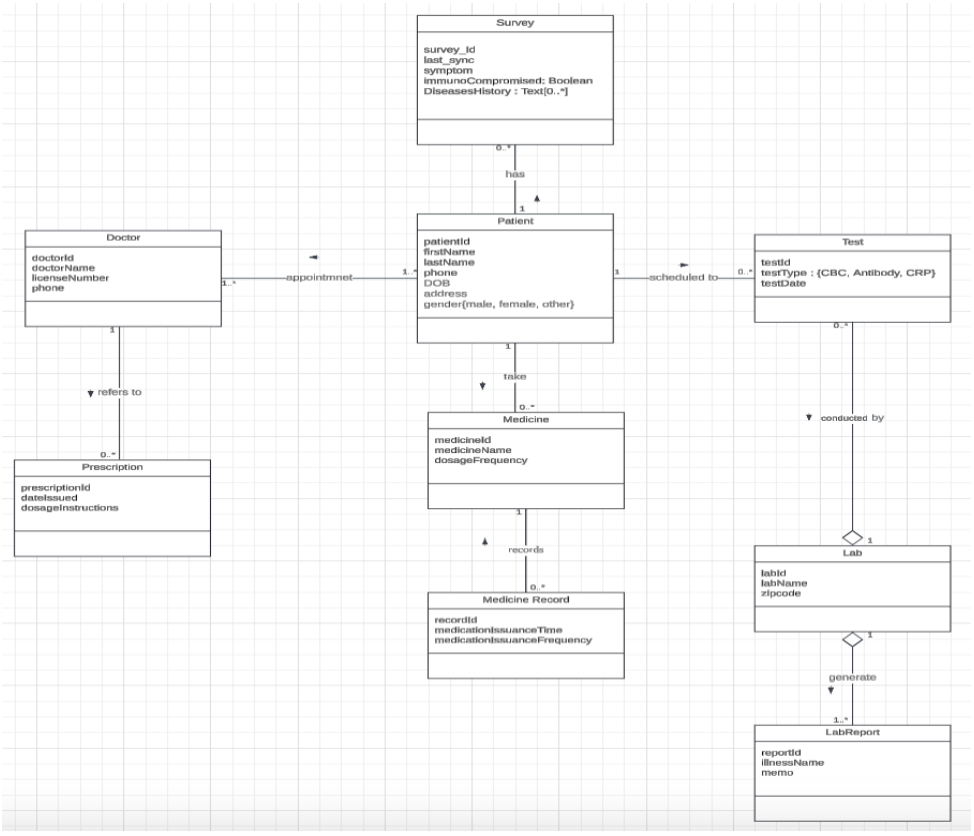
Prescribed

Conducted

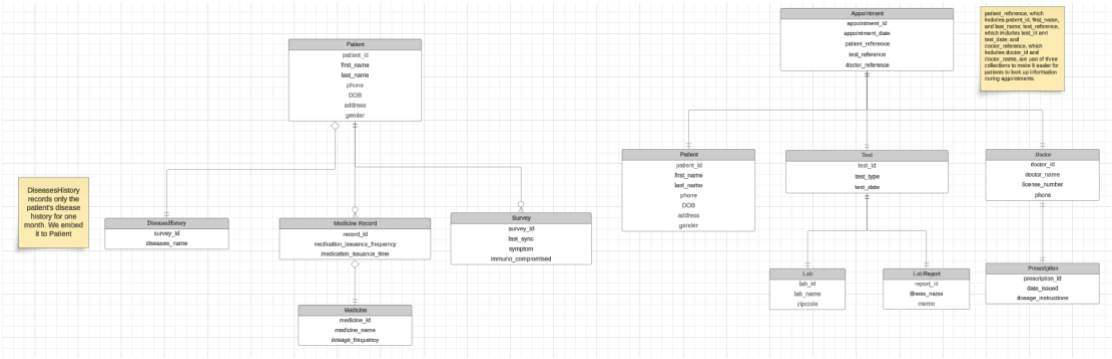
Review

Delivery

4. Conceptual model



5.Hierarchical table



6. JSON examples

```
/*
Comments:
Defining main collections for MongoDB based on logical data model
The "Patient" collection aggregates disease history
Patient Collection
*/
"Patient": {
  "_id": "000001",
  "first_name": "John",
  "last_name": "Doe",
  "phone": "1234567890",
  "DOB": "1990-05-12",
  "address": "123 Main St, City, State, ZIP",
  "gender": "male",
  "disease_history":
    {
     "_id":001",
      "patient_id": "000001",
      "diseases_name": "Diabetes"
    }
}
```

```
Comments:
Medicine Record collection is separated from Patient collection.
This collection maintains detailed information regarding medication records and is linked with Patient collection using "patient_id".
MedicationRecord Collection
*/
"MedicationRecord": {
  "_id": "000001",
  "patient_id": "000001",
  "medication_issuance_frequency": "daily",
  "medication_issuance_time": "08:00 AM",
  "medicine": {
    "medicine_id": "001",
    "medicine_name": "Aspirin",
    "dosage_frequency": "once a day"
  }
}
```

```
/*
Comments:
Test Collection
The "Test" collection aggregates lab and lab report information.
*/
"Test": {
  "_id": "000001",
  "test_type": "Blood Test",
  "test_date": "2024-11-12",
  "lab": {
    "lab_id": "001",
    "lab_name": "City Lab",
    "zipcode": "12345"
  },
  "lab_report": {
    "report_id": "001",
    "illness_name": "High Cholesterol",
    "memo": "Needs diet control"
  }
}
```

```
/*
Comments:
Appointment Collection
The "Appointment" collection references the patient, doctor, and test details for easy lookup.
*/
"Appointment": {
  "_id": "000001",
  "appointment_date": "2024-11-10",
  "patient_reference":
    {
      "patient_id": "000001",
      "first_name": "John",
      "last_name": "Doe"
    }
  ,
  "doctor_reference":
    {
      "doctor_id": "000001",
      "doctor_name": "Dr. Jane Smith"
    }
  ,
  "test_reference":
    {
      "test_id": "000001",
      "test_type": "Blood Test",
      "test_date": "2024-11-12"
    }
}
```

```
/*
Comments:
Survey Collection
Description of symptoms reported by the patient during the survey, such as cough, fever, or other health-related issues.
*/
"Survey": {
    "_id": "000001",
    "last_sync": "2024-11-11",
    "symptom": "Cough and Fever",
    "immuno_compromised": true
  }
```

```
/*
Comments:
Doctor Collection
The "Doctor" collection stores basic doctor information.
*/
"Doctor": {
  "_id": "000001",
  "doctor_name": "Dr. Jane Smith",
  "license_number": "D123456",
  "phone": "9876543210"
}
```

```
/*
Comments:
Prescription Collection
The "Prescription" collection maintains prescription records separately to avoid document bloat.
*/
"Prescription": {
  "_id": "000001",
  "doctor_id": "000001",
  "patient_id": "000001",
  "date_issued": "2024-11-03",
  "dosage_instructions": "Take 1 pill every morning with food"
}
```