**CSCE 5350.002 (Fundamentals of Database Systems)**

**Assignment- Project ER Model**

**Group Number** - **8**

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**Project Title** - **Electronic Hospital Management System**

Revision History

|  |  |  |  |  |
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| 1.0 | 12th March 2022 | Initial Draft | Group 8 | Deliverable 1 – Requirement Document with ER Diagram |

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3. **Introduction**
   1. **Purpose**

The purpose is to develop Electronic Hospital Management System to allow patients to schedule appointments with doctors in specifically available slots for routine checkups or treatment opinions. Only permitted users can be part of this system.

* 1. **Scope**

The system will contain different users ranging from doctors, patients grouped into (out-patient and in-patient), nurses, lab technicians, accountants. The system captured various sub-units like (appointment, treatment, medicine, payment, employees’ salary, insurance, laboratory tests

**Entities**

1. Admin
2. User
3. Out-patient
4. In-patient
5. Doctor
6. Driver
7. Ambulance
8. Medicine
9. Medicine Category
10. Treatment
11. Nurse
12. Ward
13. Room
14. Block
15. Test
16. Timeslot
17. Salary
18. Laboratory
19. Lab technician
20. Specialty
21. Accountant
22. Payment
23. Payment method
24. Receipt
25. Department
26. Bed
27. Floor
28. Stay
29. Cleaner
30. Insurance

**Relationships**

Below is the list of a few relationships that will be part of the proposed system

* Specialize
* Schedule For
* Locate
* Incharge
* Belong
* Cover
* Earn
* Pay For

1. **Project Overview**
2. The admin entity is a super-type user (having complete access to the overall system), this entity stores admin email.
3. The user entity is a super-type entity that stores broad information for the admin, doctor, and patient with the **user\_id** attribute as the primary key. Users can be of type (Admin, Doctor, Patient).
4. The patient entity has 3 attributes which are patient location, yob(year of birth) it has general information about patients regardless of their type whether in-patient or out-patient.
5. The in-patient entity is a sub-type type entity that stores records for a patient admitted in the hospital, this brings into the birth of stay entity that stores information about admission date and discharge date for a patient. The patient is admitted into a ward therefore, the ward entity stores information about the ward the patient has been admitted into. In each ward there are beds and the bed entity has information about a specific bed in the ward. A nurse entity stores information about a nurse who is in charge of a certain ward.
6. Each nurse is grouped into a certain department, therefore, the birth of the department entity.
7. Generally, patients receive treatment where the treatment entity has general information about the patient treatment and the sickness details. Undertreatment there is a relationship between treatment and medicine entity which is a many to many relationships hence creating a bridge table called consist which has the prescription attribute for any medicine administered to a patient.
8. Every patient must be insured under an insurance cover therefore, insurance entities store information about insurance coverage.
9. The doctor entity has a relationship with a specialty entity where a specific doctor has to be specialized in one area only, the specialty entity stores information about a specific specialty depending on **sp\_id** which is a primary key.  
   The medicine has been grouped into medicine category hence the medicine-category entity that stores information about medicine categories with **category\_id** as the primary key.
10. For any treatment a payment must be done, the payment entity stores information about the amount paid and date, there are various payment methods where there is a relationship between payment and payment method. There is a relationship between payment and receipt, the receipt entity stores receipt date and **receipt\_id** as the primary key.
11. An outpatient can schedule an appointment, where each doctor has been allocated a timeslot when booking of appointment can be made. The appointments are done in the room where this entity stores general information about the room. The rooms are entities with details about those rooms, the rooms are on floors hence the birth of floor entity.  
    On each floor, there is a cleaner who is responsible for the cleaning of the rooms, the entity stores basic information about cleaners.
12. Every employee gets a salary therefore there is a salary table storing basic information about the salary.

**2.1 Assumptions**

The following assumption has been made

* A patient is under one insurance or medical cover.
* All payment is done fully.
* User is a supertype entity consisting of admin, patient, and doctor.
* A doctor should only have one specialty.
* A cleaner may be in charge of one or many floors but not a single floor with more than one cleaner
* All doctors have a common timeslot for all.

**2.2 ER** Diagram - The image below is the ER diagram for an electronic hospital management system.

* Rectangle Shape represents Entities
* Oval Shapes represents Attributes
* Diamond Shapes symbolize the relationship between an entity to another one.
* Primary keys are represented by underlined attributes.

**Diagram

Description automatically generated**