



DATABASE MANAGEMENT SYSTEM INNOVATIVE ASSIGNMENT

HEALTHCARE MANAGEMENT SYSTEM

SUBMITTED BY:

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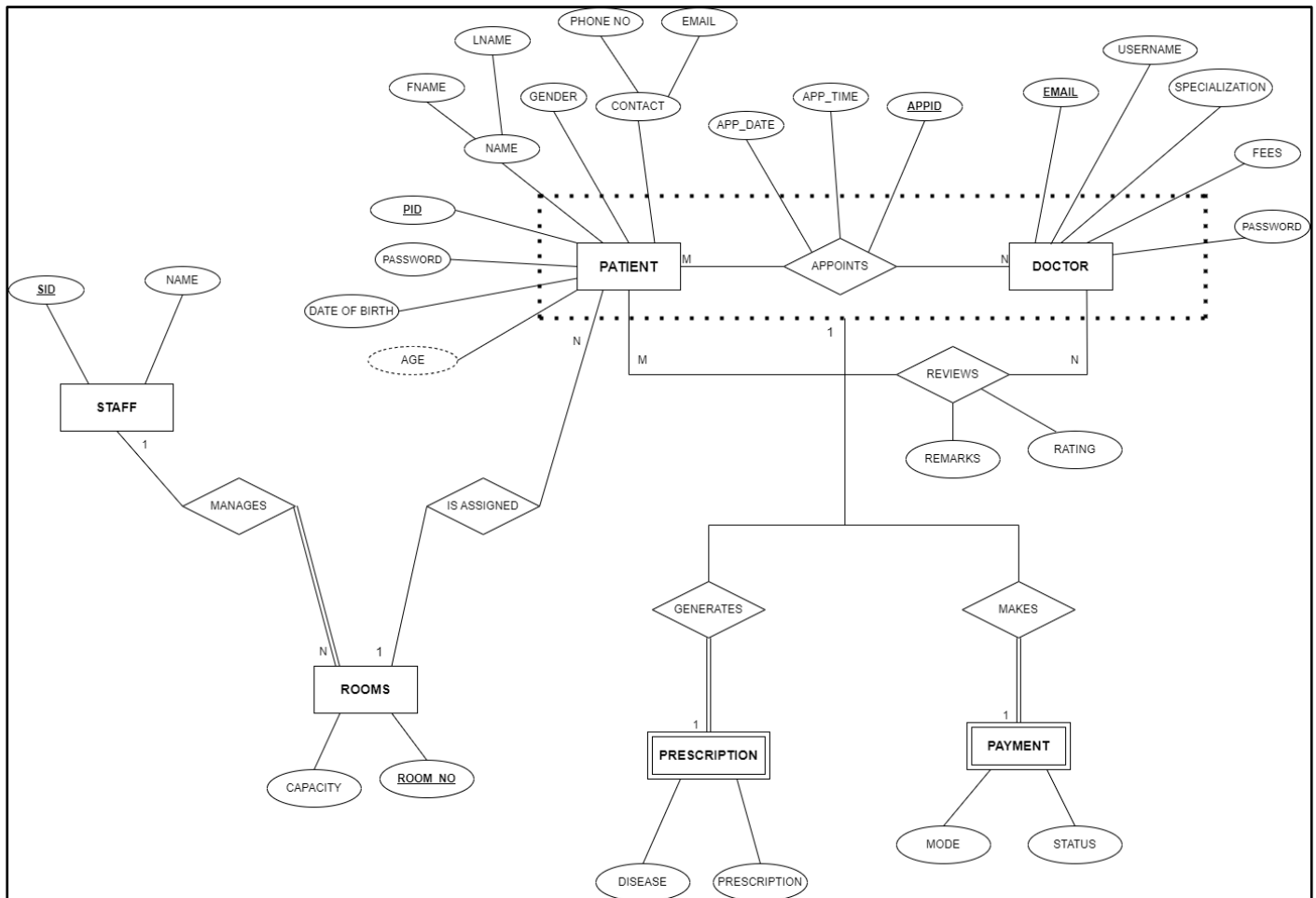
Objective:

Our objective is to develop a Healthcare Management System, that enables patients to book an appointment with a doctor of their choice at a convenient date and time. We will utilize the concepts of Entity-Relationship Diagram, ER to Relational Database conversion, and Normalisation for the database design of our system to make it optimal and consistent.

Features of Our Healthcare Management System:

- The patients can register and login (using email and password).
- Doctors can login using their email and password.
- A patient can book an appointment with any doctor of his/her choice.
- The patient can select the mode of payment (online or cash) and the available appointment date and time.
- The doctor needs to approve an appointment requested by a patient.
- The doctor provides a prescription after each appointment.
- Patient and doctor can view the appointments and prescriptions.
- The patients are allotted rooms in the hospital if necessary.
- The hospital staff manages and maintains the hospital rooms.

ER – DIAGRAM



ER TO RELATIONAL DATABASE:

Patient:

Pid(PK)	Room_no (FK)	Fname	Lname	Gender	Email	Contact	Password
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Doctor:

Username	Password	Email(PK)	Specialisation	Fees
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Appointment:

Pid (FK)	AppID (PK)	Email (FK)	Appdate	Apptime	Disease	Prescription	Mode	Status
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Review:

Pid(PK)	Email(PK)	Ratings	Remarks
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Rooms:

Room_no (PK)	Capacity
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Staff:

Sid (PK)	Name	Room_no (FK)
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NORMALIZATION:

Denoting all the attributes of Relation R,

- Phone no = PN
- Gender = G,
- Password (Patient) = PPW,
- Date of Birth = DOB,
- Email (Patient) = PE,
- Fname = FN,
- Lname = LN,
- AppDate = AD,
- AppTime = AT,
- Email (Doctor) = DE,
- Username = U,
- Specialization = SP,
- Fees = F,
- Password (Doctor) = DPW,
- Remarks = RE,
- Rating = RA,
- Disease = D,
- Prescription = P,
- Mode = M,
- Status = S,
- Capacity = C,
- Room_no = RN,
- Name (Staff) = SN,

Table Patient:

Functional Dependencies: (FDs)

1. {PID} -> {FN, LN, PN, PE, G, PPW, DOB}
2. {PN, FN, LN} -> {PID}
3. {PE, PPW} -> {PID}
4. {DE} -> {U, SP, F, DPW}
5. {U, DPW} -> {DE}
6. {PID, DE} -> {RE, RA}
7. {APPID} -> {AD, AT, D, P, M, S}
8. {RN} -> {C}
9. {SID} -> {SN}

A possible **Key** : {PID, DE, APPID, RN, SID}

Other possible keys : {PN, FN, LN, DE, APPID, RN, SID}, {PE, PPW, DE, APPID, RN, SID}, {PID, U, DPW, APPID, RN, SID}

Prime Attributes: PID, DE, APPID, RN, SID

Non – Prime Attributes: G, DOB, SP, F, RE, RA, D, P, M, S, C, SN

1NF:

The relation R is in 1st Normal Form (1NF) since it is atomic.

2NF:

For 2NF, offending FDs are the ones with {prime attributes} -> {non-prime attributes}:

Hence all the above listed FDs are offending, so they are separated in to different relations as follows:

R1: {PID, FN, LN, PN, PE, G, PPW, DOB}	F1 : {PID} -> {FN, LN, PN, PE, G, PPW, DOB}, {PN, FN, LN} -> {PID}, {PE, PPW} -> {PID}	K1 : {PID}, {PN, FN, LN}, {PE, PPW}
R2: {DE, U, SP, F, DPW}	F2 : {DE} -> {U, SP, F, DPW}, {U, DPW} -> {DE}	K2 : {DE} , {U, DPW}
R3: {PID, DE, RE, RA}	F3 : {PID, DE} -> {RE, RA}	K3 : {PID, DE}
R4: {APPID, AD, AT, D, P, M, S}	F4 : {APPID} -> {AD, AT, D, P, M, S}	K4 : {APPID}
R5: {RN, C}	F5 : {RN} -> {C}	K5 : {RN}
R6: {SID, SN}	F6 : {SID} -> {SN}	K6 : {SID}

The above relations are dependency preserving and lossless. Now all the relations are in 2NF.

3NF:

For 3NF, there are no offending FDs. Hence all the relations are in the 3rd Normal Form.

BCNF:

For BCNF, there are no offending FDs in any relation from R1 to R6, as the LHS is a superkey in all the FDs. Hence, all the relations are in BCNF.