

DATA MANAGEMENT AND DATABASE DESIGN

PROJECT

Team Name: Resonance

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Introduction:

- **Background**

As per the current COVID-19 pandemic scenario, hospitals and governments are having hard time keeping track of the recovered and active COVID patients and plasma donors. In instances, it also has been observed that the plasma is issued to low-risk patients who do not have immediate necessity instead of high-risk patients. The existing system is based on assessment of biographical information and medical history of the donors and patients which is inefficient and does not incorporate key data like results of COVID tests, real-time health status of donors, current patients admitted and donors nearby hospitals, the demographical and geographical data of the hospitals etc. Considering this, there is a necessity of implementation of database management system in the aforementioned data system.

- **Goal**

The objective of this master's project is to create a database to centrally handle the information of all the Hospitals, Patients, Doctors and Plasma Banks in a region, and to provide access to this information with an easy to use web-based interface that can be accessed by any device with basic html rendering capabilities.

Attributes:

1. User_Credentials
2. Hospital
3. Doctor
4. Patient
5. Plasma Bank
6. PB_inventory
7. Hospital_Request
8. Hospital-Withdrawal
9. Doctor_Request
10. Doctor-Withdrawal

Data Dictionary

1. User_Credentials

Column	Data Type	Description	Example
User_ID(PK)	INT(5)	Unique Key to Identify each user.	11109
Username	VARCHAR(10)	Username generated by end users	mssirsat
PIN	INT(6)	Six-digit PIN generated by user to login	300696

2. Hospital

Column	Data Type	Description	Example
H_ID(PK)	INT(4)	Unique ID associated with hospitals, Starts with 1	1109
User_ID(FK)	INT(5)	Unique Key to Identify each hospital.	11109
H_Name	VARCHAR(40)	Name of the Hospital	Boston Medical Centre
H_Address	VARCHAR(100)	Address of the Hospital	111 Huntington Avenue, Boylston St, Boston, MA 02199
H_Phone	INT(10)	Phone number of the hospital	6176388000

3. Doctor

Column	Data Type	Description	Example
D_ID(PK)	CHAR(5)	Unique 5-character ID assigned for each doctor working at the hospital, starts with D	D0983
H_ID(FK)	INT(4)	Unique ID associated with hospitals, Starts with 1	1109
User_ID(FK)	INT(5)	Unique Key to Identify each doctor.	30983
D_Name	VARCHAR(40)	Name of the Doctor	Bruce Banner
P_Count	INT(2)	No. patients the doctor is currently treating	09

4. Patient

Column	Datatype	Description	Example
P_ID (PK)	INT(8)	Unique ID associated with each Patient, first 4 digits correspond to H_ID	11098324
D_ID (FK1)	CHAR(5)	Unique ID of the doctor treating patient	D0983
User_ID (FK2)	INT(5)	Unique Key to identify each patient.	48324
P_Name	VARCHAR(40)	Name of the patient	Siddhesh Aher
P_Age	INT(2)	Age of the patient	24
P_Blood Type	VARCHAR(3)	Blood type of the patient	B+
P_Status	CHAR(3)	Patient status (Active or recovered)	ACT/REC

5. Plasma Bank

Column	Data Type	Description	Example
PB_ID(PK)	CHAR(6)	Unique 6-character ID assigned for each plasma bank, starts with PB	PB2389
User_ID(FK)	INT(5)	Unique Key to Identify each plasma bank.	22389
PB_Name	VARCHAR(40)	Name of the plasma bank	Boston Red Cross
PB_Address	VARCHAR(100)	Address of the plasma Bank	274 Tremont St, Boston, MA 02116
PB_Phone	INT(10)	Contact number of plasma Bank	8007332767

6. PB_inventory

Column	Data Type	Description	Example
Bloodbag_ID(PK)	CHAR(10)	Unique ID for each blood bag in inventory, first 6 characters correspond to PB_ID	PB23890018
PB_ID(FK)	CHAR(6)	Unique 6-character ID assigned for each plasma bank, starts with PB	PB2389
Blood_Type	VARCHAR(3)	Blood type corresponding to the blood bag	AB+, O-
Blood_Volume	INT(3)	No. of ml of blood stored in the blood bag	750

7. Hospital_Request

Column	Datatype	Description	Example
H_ReqID (PK)	INT(8)	Unique ID generated for each request raised by Hospital, first 4 integers are H_ID	11094689
H_ID (FK)	INT(4)	Unique ID associated with hospitals, Starts with 1	1109
Blood_Type	VARCHAR(3)	Blood type requested	AB+
Request_Amount	INT(3)	Amount of blood in ml requested	750
Request_Date	TIMESTAMP	Timestamp of the request generated	2020:16:11 11:20:15
Request_Status	VARCHAR(8)	Status of the request	APPROVED, PENDING, REJECTED

8. Hospital_Withdrawl

Column	Datatype	Description	Example
H_WDID (PK)	INT(8)	Unique ID generated for each withdrawal done by Hospital	09893620
H_ReqID (FK1)	INT(8)	Unique ID generated for each request raised by Hospital, first 4 integers are H_ID	11094689
Bloodbag_ID (FK2)	CHAR(10)	Unique ID for each blood bag in inventory, first 6 characters correspond to PB_ID	PB23890018
Withdrawal_Date	TIMESTAMP	Timestamp of the withdrawal	2020:17:11 08:15:32
Withdrawal_Status	CHAR(7)	Status of the withdrawal	COMPLETE / PENDING

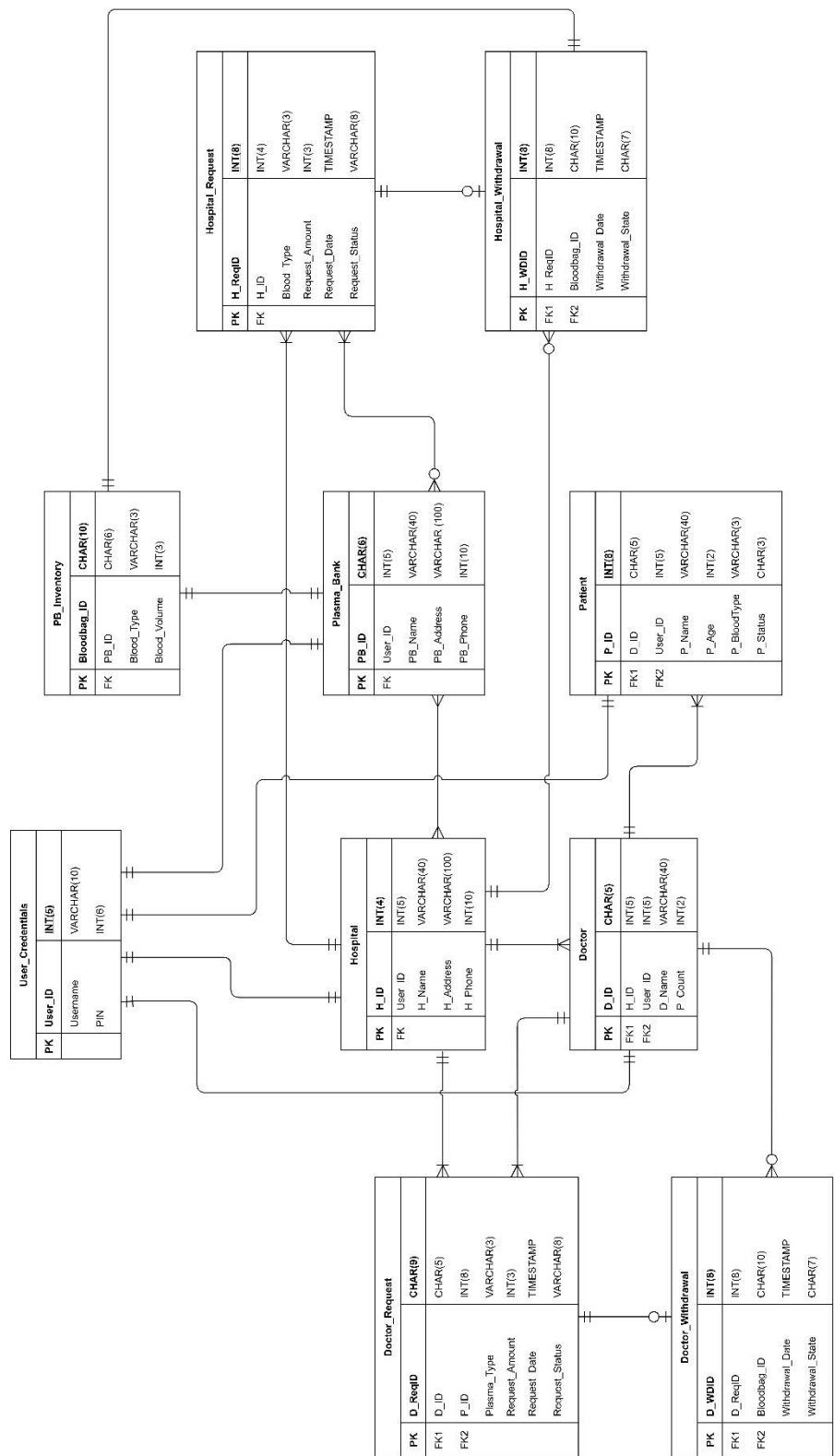
9. Doctor_Request

Column	Datatype	Description	Example
D_ReqID (PK)	CHAR(9)	Unique ID generated for each request raised by Doctor, first 5 characters are D_ID	D09834424
D_ID (FK1)	CHAR(5)	Unique 5-character ID assigned for each doctor working at the hospital, starts with D	D0983
P_ID (FK2)	INT(8)	ID of patient for whom the request is generated	11098324
Plasma_Type	VARCHAR(3)	Blood type requested	AB+
Request_Amount	INT(3)	Amount of Blood in ml requested	750
Request_Date	TIMESTAMP	Timestamp of the request	2020:16:11 09:18:23
Request_Status	VARCHAR(8)	Status of the request	APPROVED, PENDING, REJECTED

10. Doctor-Withdrawal

Column	Datatype	Description	Example
D_WDID (PK)	INT(8)	Unique ID generated for each withdrawal done by Doctor	44240001
D_ReqID (FK1)	CHAR(9)	Corresponding request ID	D09834424
Bloodbag_ID (FK2)	CHAR(10)	Unique ID of blood bag provided to the doctor	PB23890018
Withdrawal_Date	TIMESTAMP	Timestamp of the withdrawal	2020:17:11 16:32:09
Withdrawal_Status	CHAR(7)	Status of the withdrawal	COMPLETE / PENDING

Final Revised ER Diagram



Business Rules

1. Hospital

- Each hospital can have many patients, but patient cannot be admitted to many hospitals at same time
- Each Hospital can have many doctors, but same doctors cannot work at different hospitals.
- Hospital can request plasma to many plasma banks but can withdraw from one bank for same request.
- Hospital can have many doctor requests.

2. Doctor

- Each doctor can have many patients, but patient cannot have many doctors.
- A doctor can work at one hospital only.
- Doctor can send many requests to hospital.
- Doctor can withdraw request from hospital.

3. Patient

- Patient can have only one doctor.

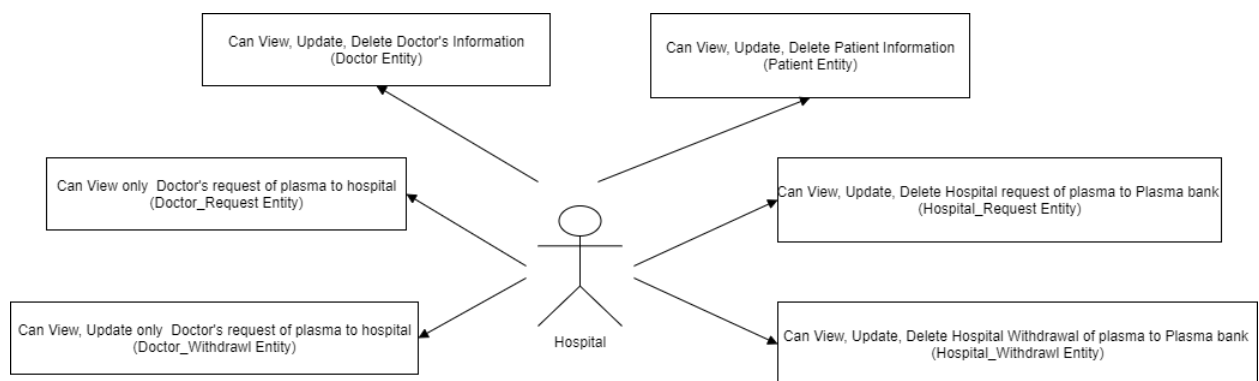
4. Plasma Bank

- Plasma banks can have many requests from many hospitals.

User Level Security

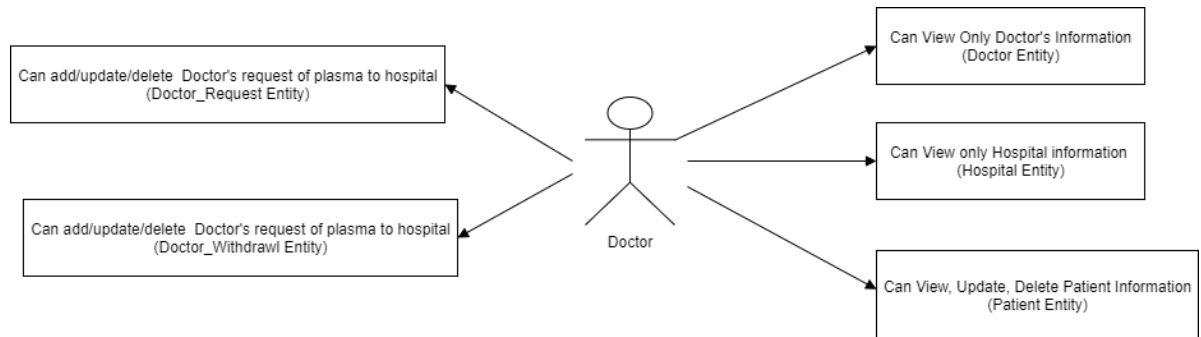
1. Hospital

Hospital will have admin level of security as shown in following diagram.



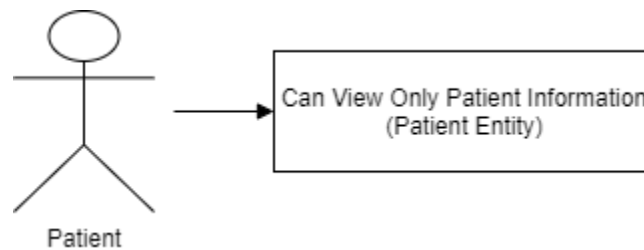
2. Doctor

Doctors can add/update/delete patient information, request and withdrawal of plasma to hospital as well.



3. Patient

Patient can only view patient related information.



4. Plasma Bank

Plasma Banks can add/update/delete plasma bank inventory of own inventory and can view/update hospital request and withdrawal.

