Northeastern University - DAMG 6210

Team Members: Srihitha Kilari (002138766), Kavya Mannem (002194057), Vaishnavi Sai Challagula (002959612).

Database Topic: Blood Availability Management System

Mission Statement: The purpose of this project is to develop a blood donation system for the city of Boston. It will be used by all the hospitals, blood banks and people who register for blood donation to facilitate functionalities like blood donating, checking blood availability, and analysis of blood requirements in hospitals.

Mission Objectives:

- To maintain data (enter, update, and delete) on donors.
- To maintain data (enter, update, and delete) on patients.
- To maintain data (enter, update, and delete) on hospitals.
- To maintain data (enter, update, and delete) on blood banks.
- To maintain data (enter, update, and delete) on blood_management_sysinventory.
- To maintain data (enter, update, and delete) on sample_details.
- To maintain data (enter, update, and delete) on samplecheckdetails.
- To maintain data (enter, update, and delete) on medical history.
- To maintain data (enter, update, and delete) on blood request.
- To maintain data (enter, update, and delete) on doctors.
- To maintain data (enter, update, and delete) on blood bank employees.
- To maintain data (enter, update, and delete) on Location.
- To maintain data (enter, update, and delete) on request status type.

- To perform a search on required blood groups.
- To perform a search on available donors.
- To perform a search on donation frequency.
- To perform a search on donation eligibility.
- To perform a search on patient's medical history.

- To track the expiry dates of blood samples.
- To track the donor’s health records.
- To track the date of the donor's last donation.
- To track the patient’s health records.
- To track availability of blood.
- To track distribution of blood.

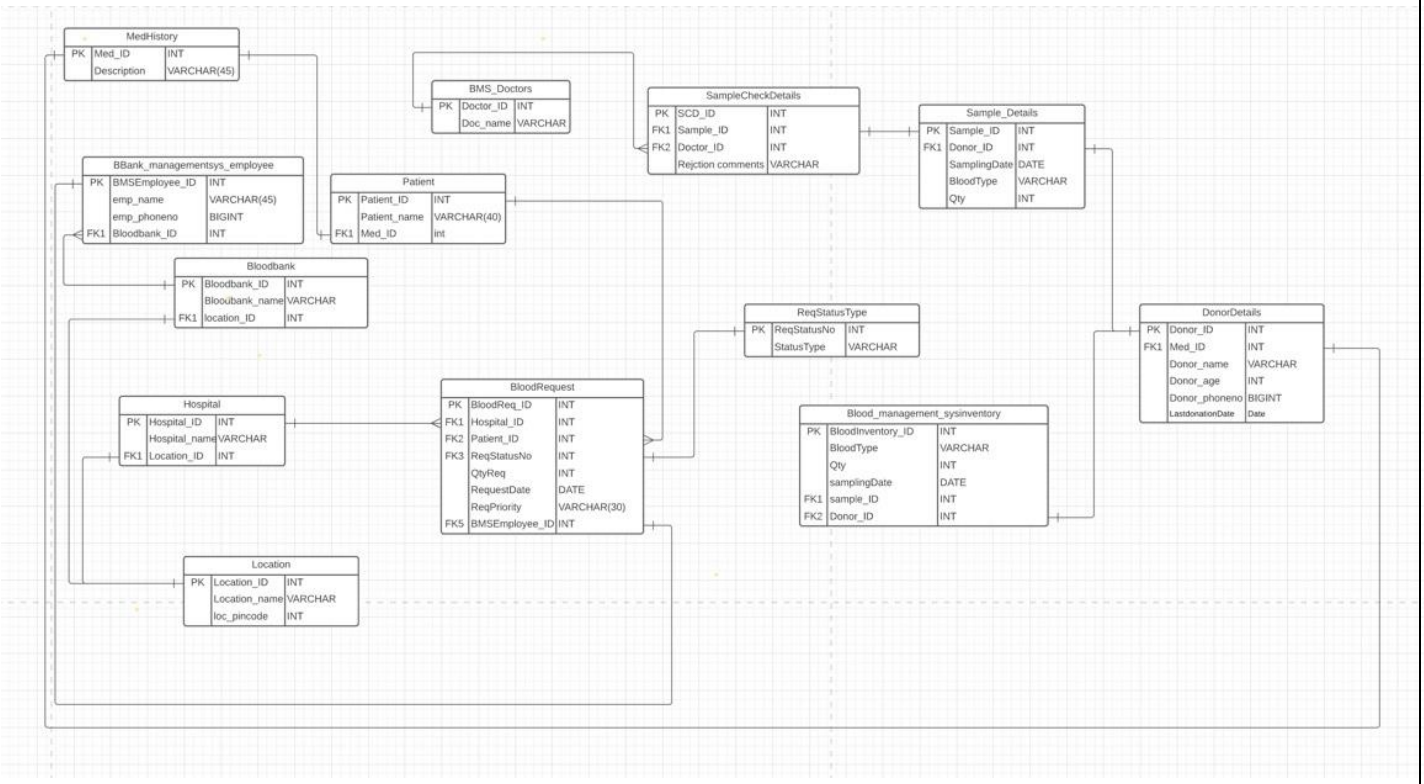
- To report on availability of blood.
- To report on patient.
- To report on donor.
- To report on hospitals.
- To report on blood bank.

Database Design document

Problems Addressed:

- Blood banks gather, store, and distribute donated blood to patients in need. The blood is divided into groups based on the blood types received, and also checked to see if the blood has been contaminated.
- The fundamental purpose is to keep track of the quality of the blood as well as the people who donate it. This, however, is a challenging process. The existing system will not be able to handle the demands of retaining high-quality blood while also keeping track of donors. The system we are working on called the 'Blood Donation Management System' will be able to handle all of these difficulties.
- The 'Blood Bank Management System' helps to maintain track of blood quality as well as available blood when an acceptor requests it. Manual systems are now in use, which are time consuming and ineffective, whereas our system automates the process of blood delivery.
- It will store, run, recover, and analyze data related to a blood bank's administrative and inventory management. This system is created in such a way that it is controllable, time-efficient, cost-effective, and versatile, and it does not require a large amount of manpower.

Entity Relationship Diagram



Entity-Attributes Datatypes

MedHistory

Attributes	Datatypes	Comments	Description
Med_ID	Int	PK	The Medical ID assigned to each patient's health record
Description	varchar		Description of the health record is given

BBank_managementsys_employee

Attributes	Datatypes	Keys	Description
BMSEmployee_ID	int	PK	Blood Bank Management system employee unique ID
Emp_name	varchar		The name of the employee
Emp_phoneNo	BigInt		The contact number of employee
Bloodbank_ID	int	FK1	The unique number assigned to each blood bank

Hospital

Attributes	Datatypes	Keys	Description
Hospital_ID	Int	PK	The unique identification number assigned to each hospital
Hospital_name	Varchar		The name of the hospital
Location_ID	int	FK1	Unique Location identification number of each hospital

BMS_Doctors

Attributes	Datatypes	Keys	Description
Doctor_ID	Int	PK	The unique identification number of each doctor in the bloodbank management system
Doc_Name	varchar		Name of the doctor

BloodRequest

Attributes	Datatypes	Keys	Description
BloodReq_ID	Int	PK	Unique identification number describing a particular blood requirement request
Hospital_ID	Int	FK1	The unique identification number assigned to each hospital
Patient_ID	Int	FK2	The unique identification number assigned to each patient
ReqStatusNo	Int	FK3	The unique number describing status of a particular request
RequestDate	DateTime		It is the date when the request for blood is made
ReqPriority	Varchar		This gives the priority of the requests made
QtyReq	varchar		This gives information about the quantity of the blood required
BMSEmployee_ID	int	FK5	Blood Bank Management system employee unique ID

SampleCheckDetails

Attributes	Datatypes	Keys	Description
SCD_ID (PK)	Int	PK	The unique identifying number describing the details of sample being checked
Sample_ID	Int	FK1	The unique number of the sample collected
Doctor_ID	Int	FK2	The unique identification number of each doctor in the blood bank management system
RejectionComments	varchar		The reasons why the sample cannot be donated is given here.

Patient

Attributes	Datatypes	Keys	Description
Patient_ID	Int	PK	The unique identification number assigned to each patient
Patient_name	Varchar		This is the name of the patoent
Med_ID	int		The Medical ID assigned to each patient's health record

Location

Attributes	Datatypes	Keys	Description
Location_ID	Int	PK	Unique Location identification number for each hospital
Location_name	Varchar		The name of the location
Loc_pincode	int		Pin code of the location is given

Sample_Details

Attributes	Datatypes	Keys	Description
Sample_ID	Int	PK	The unique number of the sample collected
Donor_ID	Int	FK1	This is the unique identification number for the donor
SamplingDate	DateTime		It is the date when the sample is collected from the donor
BloodType	Varchar		The group of the blood collected
Qty	int		The quantity of blood collected

ReqStatusType

Attributes	Datatypes	Keys	Description
ReqStatusNo	int	PK	The unique id number defining the required blood availability status
StatusType	varchar		Describes whether the blood is available or not

Blood_management_sysinventory

Attributes	Datatypes	Keys	Description
Bloodinventory_ID	Int	PK	The unique identification number for the blood inventories
BloodType	Varchar		The group of the blood collected
Qty	int		The quantity of blood collected
SamplingDate	DateTime		It is the date when the sample is collected from the donor
Sample_ID	Int	FK1	The unique number of the sample collected
Donor_ID	int	FK2	This is the unique identification number for the donor

BloodBank

Attributes	Datatypes	Keys	Description
Bloodbank_ID	Int	PK	Gives the unique identification number for each blood bank.
Bloodbank_name	Varchar		Name of the blood bank is given
Location_ID	int	FK1	Unique Location identification number for each hospital

DonorDetails

Attributes	Datatypes	Keys	Description
Donor_ID	Int	PK	This is the unique identification number for the donor
Med_ID	Int	FK1	The Medical ID assigned to each patient's health record
Donor_name	Varchar		Name of the donor is given
Donor_age	Int		The age of the donor
Donor_phoneNo	BigInt		The contact number of the donor
LastDonationDate	Date		The Date when donor Last donated

Relationships between Entities

MedHistory and Donor details

relationship=”relates”
Relation type is “one to one”
one donor will be having one particular medical history and based on this, it is decided whether the sample can be used or not.

Bbank_Managementsys_Employee and Blood Bank

relationship=” deals”
Relation type is “many to one”
One blood bank consists of multiple blood bank management employees dealing with various tasks.

Bloodbank and Location

Relationship=” is located”
Type of relation “many to many”
One location, say a location having same pincode may have multiple blood banks in the same area which are distinguished by location ID and blood bank ID.

Hospital and Location

Relationship is “located”
Type of relation here is “many to many”
One location, say a location having same pincode may have multiple hospitals in the same area which are distinguished by location ID and hospital Id.

Hospital and Blood Request

Relationship is “requests”
Type of relation here is “one to many”
One hospital can request any number of blood banks for blood required, so this is a one-to-many relationship.

BloodRequest and RequestStatusType

Relationship is “associated”
Type of relation here is “one to one”
One blood request can have only one request state, as this is where the decision of availability of blood is given.

DonorDetails and SampleDetails

Relationship is “associated”
Type of relation here is “one to one”
A donor can be giving one sample at a time and sothe relationship is one to one.

SampleDetails and BBankManagement SysInventory

Relationship is “deals”
Type of relation is “many to one”
A bbank_management system inventory deals with n number of samples and hence it is a many to one relationship.

Patient and MedHistory

Relationship is “checks”
Type of relation is “one to one”
A patient has only one medical history that consists of a description about the details. So this is a one to one relationship.

Hospital and BloodRequest

Relationship is “requests”
Type of relation is “many to many”
N number of hospitals can be making N number of blood requests as per the requirement. So, it is a many to many relationships.

SampleDetails and SampleCheckDetails

Relationship is “checks”
Type of relation is “one to one”
Each sample collected is checked by the doctor and reports are made and if anything is wrong with the sample collected, it will be rejected and the reasons for that are described in the rejection comments.

BloodRequest and Patient

Relationship is “requests”
Type of relation is one to one
A particular request according to the requirement is made by the patient. So, this is a one-to-one relationship.

SampleCheckDetails and BMS_Doctors

Relationship is “verifies”
Type of relation is “many to many”
A sample is checked by multiple blood bank management doctors and one doctor can also check multiple

BBankManagement SysInventory and Donor Details

Relationship is “handles”
Type of relation is “one to many”
A blood bank management inventory has multiple donor samples and the details of those samples. So, this is a one-to-many relationship.

BUSINESS RULES

1. A donor has one description of medical history.
2. A patient has one description of medical history.
3. Each blood bank consists of multiple blood bank management employees dealing with various tasks.
4. A blood bank has a single location. A location can have one or more blood banks.
5. A hospital has a single location. A location can have one or more hospitals.
6. A hospital can request any number of blood banks.
7. A blood request has only one request state if it's available or not available.
8. A donor details can have only one sample details.
9. A blood bank management system inventory can have many number of samples.
10. Many hospitals can make many blood requests according to the blood requirement.
11. Each sample is checked or verified by a single doctor.
12. A patient initiates a single blood request.
13. Sample check can be done by one or more doctors and one doctor check one or more number of samples.
14. A blood bank management inventory can have many donor samples and they also have details of the donor's samples.

SECURITY RULES (User level access, permissions)

Bbank_Managementsys_Employee

1.Has ALL LEVEL of ACCESS to **all the entities** in the database.