BLOOD DONATION SYSTEM DATABASE

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Project Description

The aim of this Blood Donations System Database project is to build a system where we have the ability to keep track of blood donations from donors in various blood banks and help these blood banks to manage their blood donations in a better way. One of the core concerns for blood donations is the monitoring process for each blood bank. The monitoring process can consist of monitoring donors who donate their blood, blood banks receiving blood donations, and the quality of the blood coming from donors through various blood banks.

The “Blood Donation System Database " will help better manage the above-stated monitoring process allowing blood banks to record any previous diseases from blood donors, keep track of each individual donor’s information, the recipient’s receiving blood from blood banks, etc. Using this type of monitoring process will allow hospitals to receive high-quality non-contaminated blood to provide for the healthcare system, which then can save different patients' lives.

By creating this type of blood donation system, the search for available high-quality blood will become much easier to find and will become less time-consuming than traditional manual systems. In short, the “Blood Donation System Database” will automate high-quality blood donation to patients, who are in need of blood.

Use Cases

1) **Use Case:** Blood Bank

Actors: Blood bank manager (Tim)

Description: Tim is a manager of a blood bank called “Blood Bank Association”. He’s knowledgeable in technology. While working for the blood bank, he dislikes what the BBA monitoring process is like. One of the main concerns he has is how this blood bank records, searches and looks up donor’s blood samples. They often use an excel sheet to keep track of their donor’s information. Using this type of approach, Tim spends more time than he needs to search or look up each donor’s information to send to hospitals to verify for contamination. He’s now hoping, there’s a system that can log donor’s information in a timely manner, quickly search and send their information out to hospitals without spending more time than he needs to.

With the help of the “Blood Donation System Database”, Tim can now store donor’s information by simply inputting their information onto the database, and when he needs to retrieve their information, he can simply type the donor’s info and send it away to the desired hospital. This approach will help Tim and the BBA create a faster efficient way to monitor their donor’s information, as well as, retrieving this information.

2) **Use Case:** Receiving blood

Actors: Recipient (Wendy), Blood Diseases, Hospital Employee

Description: Due to an accident, Wendy needs a blood transfusion. one day, she needed to go to the hospital, and she overheard someone that some hospitals that test blood for diseases aren't accurate. She is very frightened by this. Arriving at the hospital, the first thing she did was ask the hospital employee if the blood she will be receiving was safe from diseases. The hospital employee checked the hospital records and assured Wendy that the blood she will be receiving will be 100% disease-free. Although the hospital stated that the blood will be disease-free, Wendy has yet to believe the accuracy of the blood results and asked the hospital to verify the blood results received from the blood bank for any diseases before moving forward with the transfusion.

Any type of blood bank using the "Blood Donation System Database" will have the ability to store and log records of donors who have any type of disease and those who don't. So, when the blood bank sends the donor information to the hospitals, they can test for those blood donations that potentially can have diseases showing on the database system record first to make sure it is free from those diseases, before doing any other test

results to make sure it is 100% disease-free. The “Blood Donation System Database” will help assure recipients like Wendy who is afraid of receiving a blood transfusion because diseases can be reviewed by the hospital to make sure the donor’s blood is disease-free or not.

3) **Use Case:** Diseases Testing

Actors: Laboratory workers (Alex), test results, database system

Description: Alex works for California Pacific Medical Center as a blood tester. As a blood tester, he must check the blood that arrives at the laboratory thoroughly. Before he proceeds to test the blood, he first checks for the patient’s records to see if any type of disease exists. If it does exist, he will simply test for those diseases before doing any other tests. If it doesn’t, he will perform a dozen tests to establish the blood type and also test for any infectious diseases. Once Alex finds positive results, the donations will be discarded and will be stored and logged onto the database system. So that, the blood bank can notify the donor of their test results.

Storing and logging donors information onto the “Blood Donation System Database” will help laboratory workers test for results in a faster process. Once the results come back positive, the system will then notify the donor of their donation, and see if any treatment is needed for the donor.

4) **Use Case**: Blood Donation

Actors: Donor (Kevin), blood bank, Blood bank manager (Tim)

Description: Kevin wanted to donate blood for a good cause. However, he's afraid that his blood is contaminated, due to a disease that he has. He went into BBA and spoke to Tim. He told Tim that he had Syphilis, but was cured. Tim asked him to carry on with the donations but will note that he had Syphilis so that the hospital can check for that disease. When Kevin finished with the donation, he asked Tim if he could notify him of the blood results to see if his blood can be used for a good cause.

The "Blood Donation System Database" will help good deeds donors like Kevin to help verify if their blood came back positive or negative. If their blood does come back positive, Kevin will be notified immediately, so that, can they receive proper treatment. Once properly treated, Kevin can then recheck if his blood is still contaminated, so that, if his blood is disease-free, he can keep doing his good deed by donating.

5) **Use Case:** The transfusion process

Actors: Hospital Doctor (Alexa), Recipient (Wendy), Laboratory

Description: Alexa is ready to perform a blood transfusion on Wendy. When Wendy asks if she can provide more evidence on the blood that she

will be receiving is indeed 100% disease-free. Alexa showed her all the blood results from the blood bank, and also the laboratory results that came back negative for diseases. When Wendy finished seeing the results, she was now at ease to get the transfusion that she needed.

The “Blood Donation System Database” can help provide further evidence to show recipients that each donor who donates blood will be thoroughly asked if he/she had any previous diseases, and when they do, it will be logged for the hospital to check for those diseases, so that, the donation will be discarded if it comes back with a positive result.

Database Requirements

1. **Blood Bank**

   1.1. A blood bank shall be managed by at least one manager.

   1.2. A blood bank shall have zero or many donors.

   1.3. A blood bank shall have many donor records.

   1.4. A blood bank shall access many donor records.

   1.5. A blood bank shall have information on many hospitals.

   1.6. A blood bank shall use one monitoring process.

   1.7. A blood bank shall send zero or many notifications.

   1.8. A blood bank shall receive zero or many notifications.

   1.9. A blood bank shall keep only one donor record per donor.

   1.10. A blood bank shall be notified by zero or many laboratories.

   1.11. A blood bank shall have one name.

   1.12. A blood bank shall have at least one address.

2. **Manager**

   2.1. The manager shall manage at least one blood bank.

   2.2. The manager shall send zero or many donor records.

   2.3. The manager shall log zero or many donor records.

2.4. The manager shall retrieve zero or many donor records.

2.5. The manager shall use only one monitoring process.

2.6. The manager shall access many donor records.

2.7. The manager shall have only one full name.

2.8. The manager shall have at least one address.

3. **Donors**

3.1. Donors shall donate to zero or many blood banks.

3.2. Donors shall receive zero or many notifications.

3.3. Donors shall know at least one blood result.

3.4. Donors shall be sent zero or many notifications.

3.5. Donors shall be notified zero or many disease verifications

4. **Blood Recipient**

4.1. Blood recipients shall receive zero or many blood transfusions.

4.2. Blood recipients shall ask for zero or many donor records.

4.3. Blood recipients shall have cooperation from many transfusion doctors.

4.4. Blood recipients shall receive explanations from zero or many transfusion doctors.

4.5. Blood recipients shall be show zero or many blood results from transfusion doctors

5. **Hospital**

5.1. Hospitals shall have information on many blood banks.

5.3. Hospital shall send zero or many notifications.

5.4. Hospital shall have many donor records.

5.5. Hospital shall keep only one donor record per donor.

5.6. Hospitals shall perform zero or many blood transfusions.

5.7. Hospital shall have only one blood recipient record per recipient.

5.8. Hospitals shall have access to many blood recipient records.

5.9. Hospital shall have many laboratories.

5.10. Hospital shall have access to many donor records.

5.11. Hospitals shall receive zero or many donor records.

5.12. Hospital shall receive zero or many notifications.

5.13. Hospital shall have at least one address.

5.14. Hospitals shall have zero or many transfusion doctors .

6. **Hospital Laboratory**

6.1. Laboratory shall perform at least one disease verification.

6.2. Laboratory shall have access to many donor records.

6.3 Laboratory shall log at least one blood result.

6.4. Laboratory shall send zero or many notifications.

6.5. Laboratory shall discard many positive blood results.

6.6. Laboratory shall notify zero or many blood banks.

6.7. Laboratory shall receive zero or many notifications.

6.8. Laboratory shall have at least one address.

6.9. Laboratory shall be in many hospitals.

7. **Transfusion Doctors**

7.1. Transfusion doctors shall access many blood results.

7.2. Transfusion doctors shall perform zero or many blood transfusions.

7.3. Transfusion doctors shall access many donor's records.

7.4. Transfusion doctors shall cooperate with many recipients.

7.5. Transfusion doctors shall show many blood results to recipients.

7.6. Transfusion doctors shall explain to zero or many blood recipients.

7.7. Transfusion doctor shall work in zero or many hospitals.

7.8. Transfusion doctors shall access many blood recipients records.

8. **Donor Records**

8.1. Donor records shall exist one donor's record per blood bank.

8.2. Donor records shall be accessed by many blood banks.

8.3. Donor records shall be accessed by many hospitals.

8.4. Donor records shall be accessed by many managers.

8.5. Donor records shall exist one donor's record per hospital.

8.6. Donor records shall be accessed by many laboratories.

8.7. Donor records shall be given to zero or many blood recipients

8.8. Donor record shall contain one full name.

8.9. Donor record shall contain zero or many addresses.

8.10. Donor record shall contain only one blood type.

8.11. Donor record shall be logged by zero or many managers.

8.12. Donor record shall be retrieved by zero or many managers.

8.13. Donor record shall be sent by zero or many managers.

8.14. Donor record shall be received by zero or many hospitals.

8.15. Donor record shall contain at least one disease verification.

8.16. Donor record shall be accessed by many transfusion doctors.

8.17. Donor record shall be in many blood banks

9. Monitoring Process

9.1. Monitoring process shall be used by many blood banks.

9.2. Monitoring process shall be used by many managers.

9.3. Monitoring process shall contain one description.

10. Notifications

10.1. Notifications shall be sent to zero or many blood banks.

10.2. Notifications shall be received by zero or many blood banks.

10.3. Notifications shall be sent to zero or many donors.

10.4. Notifications shall be received by zero or many donors.

10.5. Notifications shall be sent by zero or many hospitals.

10.6. Notifications shall be received by zero or many hospitals

10.7. Notifications shall be sent by zero or many laboratories.

10.6. Notifications shall be received by zero or many laboratories.

11. Blood Transfusion

11.1. Blood transfusion shall be performed in zero or many hospitals

11.2. Blood transfusion shall be performed by zero or many transfusion doctors.

11.3. Blood transfusion shall be given to zero or many blood recipients.

12. Disease Verifications

12.1. Disease verification shall inform zero or many donors.

12.2. Disease verification shall be performed in at least one laboratory

12.3. Disease verification shall be contained in many donors records

13. Blood Results

13.1. Blood results shall be logged by at least one laboratory.

13.2. Blood results shall be discarded by many laboratories with positive results.

13.3. Blood results shall be accessed by many transfusion doctors.

13.4. Blood results is a positive result, negative result.

13.5. Blood results shall be given to many donors.

13.6. Blood results shall contain only one blood type.

13.7. Blood results shall be shown to zero or many blood recipients by transfusion doctors.

13.8. Blood result shall contain zero or many positive results.

13.9. Blood result shall contain zero or many negative results.

14. Blood Recipient Record

14.1. Blood Recipient Record shall exist only one recipient record per hospital.

14.2. Blood Recipient Record shall be accessed by at least one hospital.

14.3. Blood Recipient Record shall contain one full name.

14.4. Blood Recipient Record shall contain at least one address.

14.5. Blood Recipient Record shall contain only one blood type.

14.6. Blood Recipient Record shall be accessed by many transfusion doctors.

15. Address

15.1. An address shall be used for many blood banks.

15.2. An address shall be located in many donors records.

15.3. An address shall be located in many blood recipient records.

15.4. An address shall be used for many managers.

15.5. An address shall be used for many laboratories.

15.6. An address shall be used for many hospitals.

16. Blood type

16.1. Blood type shall exist in at least one donor record.

16.2. Blood type shall exist in at least one blood recipient record.

16.3. Blood type shall be contained in only one blood result.

17. Positive result

17.1. Positive results shall exist for zero or many blood results.

18. Negative result

18.1. Negative results shall exist for zero or many blood results.

Main Entities, Attributes, and Keys

1) Blood Bank (Strong)

1.1. blood_bank_id: key, numeric

1.2. donor: numeric

1.3. donor_record: key, numeric

1.4. name: composite, alphanumeric

1.5. monitoring_process: numeric

1.8. total_donation: numeric, derived

1.9. manager: weak key, numeric

1.10. address: weak key, alphanumeric

2) Manager (Weak)

2.1. manager_id: key numeric

2.2. blood_bank: key, numeric

2.3. monitoring_process: key, numeric

2.4. donor_record: key, numeric

2.5. full_name: alphanumeric, composite

1. first_name
2. last_name

2.6. address: weak key, alphanumeric

2.7. notification_sent: key, numeric

2.8. notification_received: key, numeric

2.9. laboratory_notifications: key, numeric

2.10. total_notifications_received: numeric, derived

3) Donors (Strong)

3.1. donor_id: key,numeric

3.2. notification_blood_bank: key, numeric

3.3. total_notifications: numeric, derived

3.4. donor_record: key, numeric

3.5. blood_result: key, numeric

4) Donor Record (Strong)

4.1. donor_record_id: key, numeric

4.2. full_name: alphanumeric, composite

1. first_name
2. last_name

4.3. blood_type: key, numeric

4.4. address: weak key, alphanumeric

4.5. blood_bank: key, numeric

4.6. disease_verification: key,numeric

5) Blood Recipient (Strong)

5.1. blood_recipient_id: key, numeric

5.2. blood_recipient_record: key,numeric

5.3. transfusion_doctor: key,numeric

6) Blood Recipient Record (Strong)

6.1. blood_recipient_record_id: key,numeric

6.2. full_name: alphanumeric, composite

1. first_name
2. last_name

6.3. blood_type: key, numeric

6.4. hospital: key,numeric

6.5. address: weak key, numeric

6.6. transfusion_doctor: key,numeric

7) Address (Weak)

7.1. address_id: key, numeric

7.2. address: alphanumeric, multi-value, composite

1. street
2. zipcode

3. state
4. country

8) Monitoring Process (Strong)

8.1. monitoring_process_id: key, numeric

8.2. description: alphanumeric

9) Notifications (Strong)

9.1. notification_blood_bank_id: key, numeric

9.2. notification_hospital_id: key, numeric

9.3. notification_donor_id: key, numeric

9.4. notification_laboratory_id: key, numeric

9.5. sent_description: alphanumeric

9.6. received_description: alphanumeric

9.7. Disease_verification_description: alphanumeric

10) Hospital (Strong)

10.1. hospital_id: key, numeric

10.2. donor_record: key, numeric

10.3. blood_recipient_record: key, numeric

10.4. laboratory: key, numeric

10.5. transfusion_doctor: key, numeric

10.6. address: weak key, alphanumeric

10.7. name: alphanumeric

11) Laboratory (Strong)

11.1. laboratory_id: key, numeric

11.2. donor_record: key, numeric

11.3. blood_bank_notification: key,numeric

11.4. disease_verification: key,numeric

11.5. address: weak key, alphanumeric

11.6. hospital: key, numeric

11.7. notification_sent: key, numeric

11.8. notification_received: key, numeric

11.9. name: alphanumeric

12) Blood Results (Strong)

12.1. blood_result_id: key,numeric

12.2. positive_result: key,numeric

12.3. negative_result: key, numeric

1**2.4.** transfusion_doctor: key, numeric

12.5. laboratory: key, numeric

13) Blood Type (Strong)

13.1. blood_type_id: key, numeric

13.2. blood_type: boolean, composite

1. o_type
2. a_type
3. b_type
4. ab_type

14) Positive Result (Strong)

14.1. positive_result_id: key,numeric

14.2. blood_result: key, numeric

14.3. positive_result: boolean

15) Negative Result (Strong)

15.1. negative_result_id: key,numeric

15.2. blood_result: key, numeric

15.3. negative_result: boolean

16) Disease Verification (Strong)

16.1. disease_verification_id: key,numeric

16.2. disease_result: numeric

16.3. disease_description: alphanumeric

16.4. laboratory: key, numeric

16.5. donor_record: key,numeric

17) Transfusion Doctors (Strong)

17.1. transfusion_doctor_id: key, numeric

17.2. blood_result: key,numeric

17.3. blood_transfusion: key, numeric

17.4. donor_record: key, numeric

17.5. blood_recipient_record: key, numeric

17.6. hospital: key, numeric

17.7. full_name: alphanumeric, composite

1. first_name
2. last_name

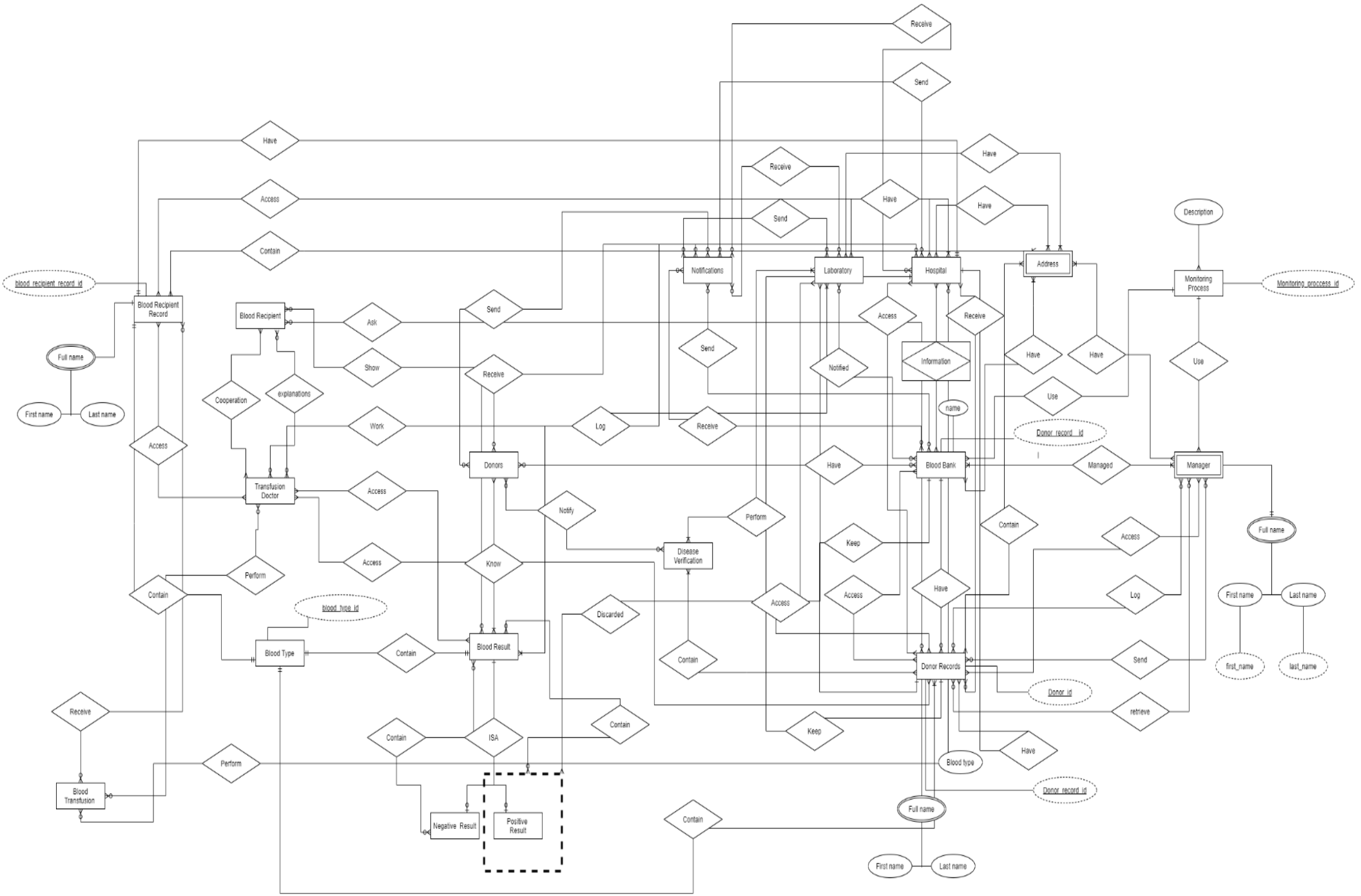
18) Blood Transfusion (Strong)

18.1. hospital_id: key, numeric

18.2. transfusion_doctor: key, numeric

18.3. blood_recipient: key,numeric

Entity Relationship Diagram (ERD)


Receive
Send
Have
Receive
Have
Have
Access
Send
Have
Have
Contain
Description
Notifications
Laboratory
Hospital
Address
Monitoring Process
blood recipient record id
Monitoring proccess id
Blood Recipient Record
Blood Recipient
Ask
Send
Access
Receive
Full name
Show
Receive
Send
Notified
Information
Have
Have
Use
Cooperation
explanations
Use
First name
Last name
name
Work
Log
Receive
Donor record id
Access
Donors
Have
Blood Bank
Managed
Manager
Transfusion Doctor
Access
Notify
Perform
Contain
Full name
Access
Disease Verification
Keep
Access
Perform
Know
Access
Have
Log
Contain
blood type id
Discarded
Access
Blood Type
Contain
Blood Result
Contain
Donor Records
Send
First name
Last name
Donor id
retrieve
Receive
Contain
ISA
Keep
Have
Perform
Blood type
Blood Transfusion
Donor record id
Full name
Negative Result
Positive Result
Contain
First name
Last name

Testing Table

Rule	Entity A	Relation	Entity B	Cardinality	Pass/Fail	Error Description
1	Blood Bank	Managed	Manager	1-to-M	Pass	None
2	Manger	Manage	Blood Bank	1-to-M	Pass	None
3	Blood Bank	Have	Donors	0-to-M	Pass	None
4	Donor	Donate	Blood Bank	0-to-M	Pass	None
5	Blood Bank	Have	Donor Records	M-to-N	Fail	Blood bank only have one donor record
6	Donor Records	Exist	Blood Bank	One	Fail	Donor can have multiple records per blood bank
7	Blood Bank	Access	Donor Records	M-to-N	Pass	None
8	Donor records	Accessed	Blood Bank	M-to-N	Pass	None
9	Blood Bank	Information	Hospitals	M-to-N	Pass	None
10	Hospitals	Information	Blood Banks	M-to-N	Pass	None
11	Blood Bank	Use	Monitoring Process	One	Fail	Blood Bank can use many monitoring process
12	Monitoring Process	Use	Blood Bank	M-to-N	Fail	Monitoring process can be used only once
13	Blood Bank	Send	Notifications	0-to-M	Pass	None
14	Notifications	Sent	Blood Banks	0-to-M	Pass	None
15	Blood Bank	Receive	Notifications	0-to-M	Pass	None
16	Notifications	Received	Blood Bank	0-to-M	Pass	None
17	Blood Bank	Keep	Donor Record	1-to-1	Fail	Blood Bank can have duplicate donor records

18	Donor Record	Be In	Blood Bank	M-to-N	Fail	Donor record can only be in one blood bank
19	Blood Bank	Notified	Laboratories	0-to-M	Pass	None

20	Laboratory	Notify	Blood Banks	0-to-M	Pass	None
21	Blood Bank	Have	Name	One	Pass	None
22	Blood Bank	Have	Address	1-to-M	Fail	Blood Bank can only have one address
23	Address	Use	Blood Bank	M-to-N	Pass	None
24	Manager	Send	Donor Record	0-to-M	Pass	None
25	Manager	Log	Donor Record	0-to-M	Pass	None
26	Manager	Retrieve	Donor Record	0-to-M	Pass	None
27	Manager	Use	Monitoring Process	One	Fail	Manager can use multiple monitoring process
28	Manager	Access	Donor Record	M-to-N	Pass	None
29	Manager	Have	Full Name	1-to-1	Fail	Manager can have many name
30	Manager	Have	Address	1-to-M	Pass	None
31	Donor	Receive	Notifications	0-to-M	Pass	None
32	Donor	Know	Blood Result	1-to-M	Pass	None
33	Donor	Sent	Notifications	1-to-M	Pass	None
34	Donor	Notified	Disease Verifications	0-to-M	Fail	Donor can only be notified once
35	Blood Recipient	Receive	Blood Transfusions	0-to-M	Pass	None
36	Blood Recipient	Ask	Donor Record	0-to-M	Pass	None
37	Blood Recipient	Cooperation	Transfusion Doctors	0-to-M	Pass	None

38	Blood Recipient	Show	Blood Result	0-to-M	Pass	None
39	Hospital	Send	Notifications	0-to-M	Pass	None

40	Hospital	Have	Donor Records	M-to-N	Pass	None
41	Hospital	Keep	Donor Record	1-to-1	Fail	Hospital can have duplicate donor records
42	Hospital	Perform	Blood Transfusion	0-to-M	Pass	None
43	Hospital	Have	Blood Recipient Record	1-to-1	Fail	Hospital can have duplicate recipient records
44	Hospital	Access	Blood Recipient Record	M-to-N	Pass	None
45	Hospital	Have	Laboratories	M-to-N	Pass	None
46	Hospital	Have	Transfusion Doctors	M-to-N	Pass	None
47	Hospital	Access	Donor Records	M-to-N	Pass	None
48	Hospital	Receive	Donor Record	0-to-M	Pass	None
49	Hospital	Receive	Notifications	0-to-M	Pass	None
50	Hospital	Have	Address	1-to-M	Fail	Hospital can only have one address
51	Laboratory	Perform	Disease Verification	1-to-M	Pass	None
52	Laboratory	Access	Donor Records	M-to-N	Pass	None
53	Laboratory	Log	Blood Result	1-to-M	Pass	None

54	Laboratory	Send	Notifications	0-to-M	Pass	None
55	Laboratory	Discard	Positive Blood Result	M-to-N	Pass	None
56	Laboratory	Notify	Blood Bank	0-to-M	Pass	None
57	Laboratory	Have	Address	1-to-M	Pass	None
58	Laboratory	Be In	Hospital	M-to-N	Fail	Laboratory only exist in one hospital
59	Transfusion Doctor	Access	Donor Record	M-to-N	Pass	None

60	Transfusion Doctor	Cooperate	Blood Recipient	M-to-N	Pass	None
61	Transfusion Doctor	Show	Blood Result	M-to-N	Pass	None
62	Transfusion Doctor	Explain	Blood Recipient	0-to-M	Pass	None
63	Transfusion Doctor	Work	Hospital	0-to-M	Fail	Transfusion Doctor can only work in one hospital
64	Transfusion Doctor	Access	Blood Recipient Records	M-to-N	Pass	None
65	Donor Record	Accessed	Blood Bank	M-to-N	Pass	None
66	Donor Record	Accessed	Hospital	M-to-N	Pass	None
67	Donor Record	Accessed	Manager	M-to-N	Pass	None
68	Donor Record	Exist	Donor Record	One	Fail	Donor Record exist multiple time
69	Donor Record	Accessed	Laboratory	M-to-N	Pass	None
70	Donor Record	Given	Blood Recipient	0-to-M	Pass	None
71	Donor Record	Contain	Full name	One	Pass	None

72	Donor Record	Contain	Address	0-to-M	Pass	None
73	Donor Record	Contain	Blood Type	1-to-1	Pass	None
74	Donor Record	Logged	Manager	0-to-M	Pass	None
75	Donor Record	Retrieve	Manager	0-to-M	Pass	None
76	Donor Record	Sent	Manager	0-to-M	Pass	None
77	Donor Record	Received	Hospital	0-to-M	Pass	None
78	Donor Record	Contain	Disease Verification	1-to-M	Pass	None
79	Donor Record	Accessed	Transfusion Doctor	M-to-N	Pass	None

80	Monitoring Process	Used	Manger	M-to-N	Pass	None
81	Monitoring Process	Contain	Description	One	Pass	None
82	Notifications	Received	Blood Banks	0-to-M	Pass	None
83	Notifications	Sent	Donor	0-to-M	Pass	None
84	Notifications	Received	Donor	0-to-M	Pass	None
85	Notifications	Sent	Hospital	0-to-M	Pass	None
86	Notifications	Received	Hospital	0-to-M	Pass	None
87	Notifications	Sent	Laboratories	0-to-M	Pass	None
88	Notifications	Received	Laboratories	0-to-M	Pass	None
89	Blood transfusion	Performed	Hospitals	0-to-M	Pass	None

90	Blood transfusion	Performed	Transfusion Doctors	0-to-M	Fail	Blood transfusion can only be done by one doctor
91	Blood transfusion	Given	Blood Recipient	0-to-M	Pass	None
92	Disease verification	Inform	Donor	0-to-M	Pass	None
93	Disease verification	Performed	Laboratory	1-to-M	Pass	None
94	Disease verification	Contained	Donor Record	M-to-N	Pass	None
95	Blood Results	Logged	Laboratory	1-to-M	Pass	None
96	Blood Results	Discarded	Laboratory	M-to-N	Pass	None
97	Blood Results	Accessed	Transfusion Doctor	M-to-N	Pass	None
98	Blood Results	None	Positive Result	IS-A	Pass	None
99	Blood Results	None	Negative Result	IS-A	Pass	None

100	Blood Results	Given	Donor	M-to-N	Pass	None
101	Blood Results	Contain	Blood Type	1-to-1	Fail	Blood result can have Many blood types
102	Blood Results	Shown	Blood Recipient	0-to-M	Pass	None
103	Blood Results	Contain	Positive Result	O-to-M	Pass	None
104	Blood Results	Contain	Negative Result	0-to-M	Pass	None
105	Blood Recipient	Exist	Blood	1-to-1	Fail	Hospital can have

	Record		Recipient Record			duplicate records
106	Blood Recipient Record	Accessed	Hospital	1-to-M	Pass	None
107	Blood Recipient Record	Contain	Full Name	One	Pass	None
108	Blood Recipient Record	Contain	Address	1-to-M	Pass	None
109	Blood Recipient Record	Contain	Blood Type	1-to-1	Fail	Record can have many blood types
110	Blood Recipient Record	Accessed	Transfusion Doctor	M-to-N	Pass	None
111	Address	Used	Blood Bank	M-to-N	Pass	None
112	Address	Located	Donor Record	M-to-N	Pass	None
113	Address	Located	Blood Recipient Record	M-to-N	Pass	None
114	Address	Used	Managers	M-to-N	Pass	None
115	Address	Used	Laboratories	M-to-N	Pass	None
116	Address	Used	Hospitals	M-to-N	Pass	None
117	Blood Type	Exist	Donor Record	1-to-M	Pass	None
118	Blood Type	Exist	Blood Recipient Record	1-to-M	Pass	None
119	Blood Type	Contained	Blood Result	1-to-1	Fail	many blood types can be in blood results

Database Model/EER

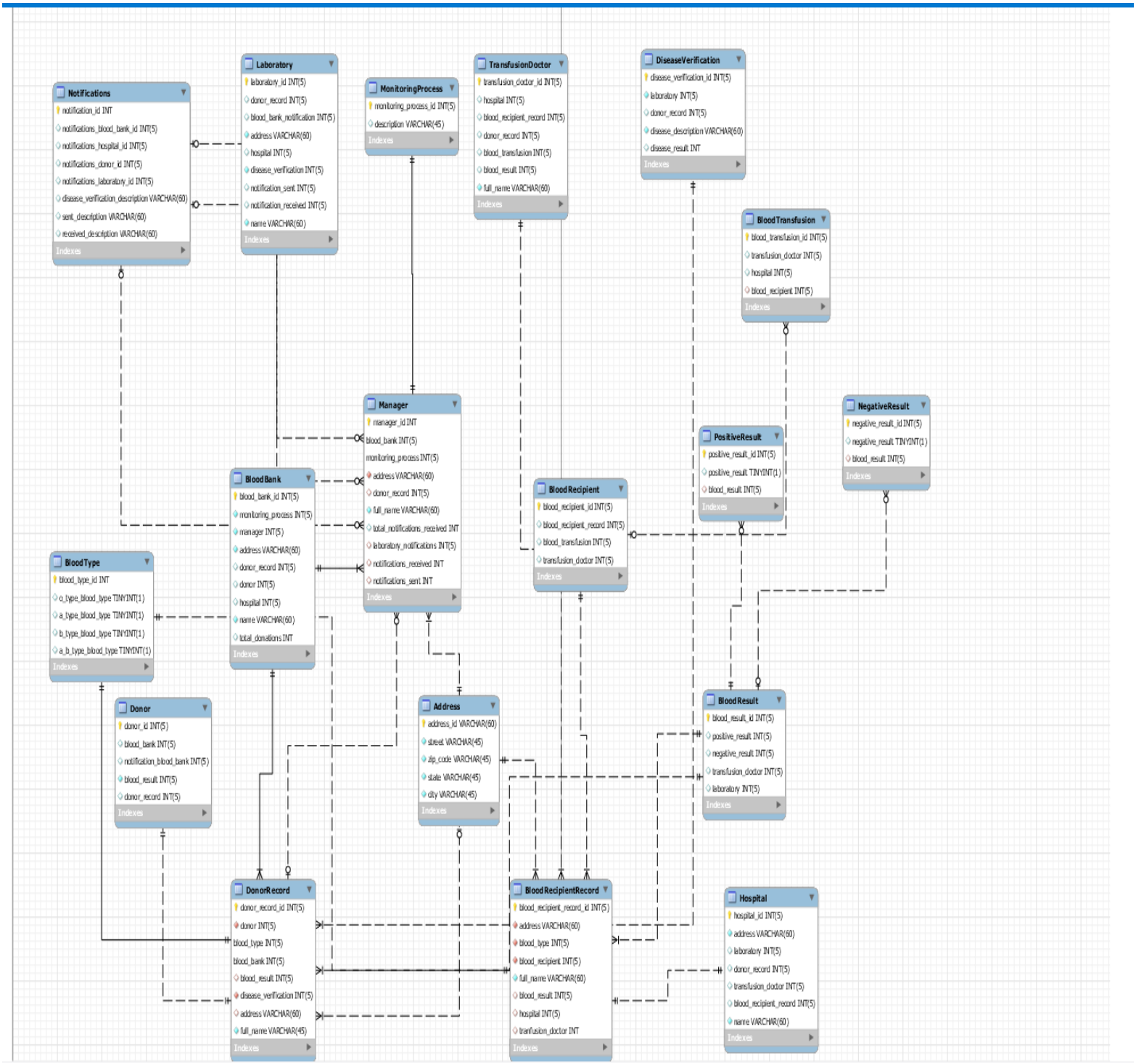


Table	Fk	On Delete	On Update	Comment
Manager	Blood Bank	CASCADE	CASCADE	If the manager gets deleted, the blood bank the manager was working in will also get deleted.
Manager	Donor Record	SET NULL	CASCADE	If donor records gets deleted, the manager should be able to have a record of the donor to access
Manager	Monitoring Process	CASCADE	CASCADE	If monitoring process gets deleted, the manage using this process also gets deleted
Manager	Address	CASCADE	CASCADE	If manager table gets deleted, the address for that current blood bank also gets deleted
Manager	Notifications	SET NULL	CASCADE	If notifications gets deleted, the manager can still see old notifications
Donor Record	Donor	CASCADE	CASCADE	If donor record gets deleted, then the donor of that record also gets deleted
Donor Record	Blood Bank	CASCADE	CASCADE	If donor records gets deleted, blood bank info will also get deleted
Donor Record	Address	SET NULL	CASCADE	If address table gets deleted, it will still have the address inside donor's record
Donor Record	Blood Type	CASCADE	CASCADE	If donor record gets deleted, the blood type inside the record also gets deleted
Donor Record	Disease Verifications	CASCADE	CASCADE	If donor record gets deleted, the verifications inside the record also gets deleted
Donor Record	Blood Result	CASCADE	CASCADE	If donor record gets deleted, the blood result inside the record also gets deleted
Blood Recipient Record	Address	CASCADE	CASCADE	If blood recipient record gets deleted, the address inside the record also gets deleted
Blood Recipient Record	Blood Type	CASCADE	CASCADE	If blood recipient record gets deleted, the blood type inside the record also gets deleted

Blood Recipient Record	Blood Result	CASCADE	CASCADE	If blood recipient record gets deleted, the blood result inside the record also gets deleted
Blood Recipient Record	Hospital	SET NULL	CASCADE	If blood recipient record gets deleted, hospital can still have their record on file
Blood Recipient Record	Transfusion Doctor	SET NULL	CASCADE	If blood recipient record gets deleted, transfusion doctor can still see their record
Positive Result	Blood Result	CASCADE	CASCADE	If blood results gets deleted, the positive results will also get deleted
Negative Result	Blood Result	CASCADE	CASCADE	If blood results gets deleted, the negative results will also get deleted
Blood Transfusion	Blood Recipient	SET NULL	CASCADE	If blood transfusion table gets deleted, blood recipient can still see their blood transfusions

Testing Table

Entity	SQLQuery	Pass/Fail	Error Description	Possible Solution
Address	Delete	Pass	None	None
Address	Update	Pass	None	None
Blood Bank	Delete	Pass	None	None
Blood Bank	Update	Pass	None	None
Monitoring Process	Delete	Pass	None	None
Monitoring Process	Update	Pass	None	None
Blood Recipient	Delete	Pass	None	None
Blood Recipient	Update	Pass	None	None
Blood Recipient Record	Delete	Pass	None	None
Blood Recipient Record	Update	Fail	FK does not exist for blood_type table	Add FK to blood_type table
Blood Type	Delete	Pass	None	None
Blood Type	Update	Pass	None	None
Blood Result	Delete	Pass	None	None
Blood Result	Update	Pass	None	None
Blood Transfusion	Delete	Pass	None	None
Blood Transfusion	Update	Fail	Duplicate entry key	Update blood recipient to not unique
Donor	Delete	Pass	None	None
Donor	Update	Pass	None	None
Donor Record	Delete	Fail	donor id not found	Forgot to insert data to table
Donor Record	Update	Fail	donor record id not found	Forgot to insert data to table

Disease Verification	Delete	Fail	Safe update mode one	Toggle safe update mode off
DIsease Verification	Update	Pass	None	None
Hospital	Delete	Pass	None	None
Hospital	Update	Pass	None	None
Manager	Delete	Pass	None	None
Manager	Update	Fail	Foreign key constraint fail	Add FK to donor record table
Notifications	Delete	Pass	None	None
Notifications	Update	Pass	None	None
Laboratory	Delete	Pass	None	None
Laboratory	Update	Pass	None	None
Transfusion Doctor	Delete	Pass	None	None
Transfusion Doctor	Update	Pass	None	None
Negative Result	Delete	Pass	None	None
Negative Result	Update	Fail	Foreign Key Constraint fail	Blood_result Fk DNE
Positive Result	Delete	Pass	None	None
Positive Result	Update	Pass	None	None