DBAS1007 – Final Project

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# Organization

## Problem

Gotham City Blood Clinic (GCBC) will be conducting its annual Christmas Blood donor drive in the coming weeks. They’ve experienced a much higher than normal volume of interest and appointment bookings. As a result, they will need an efficient, secure and reliable DBMS that can be upscaled as more donors, hospitals and patients take part.

### Departments.

There are several departments that would require access to the database. These include the donors, patients, hospitals and the administrators departments. Allowing all departments access to the same information will allow for a real-time update of critical information such as donor blood type or which blood types are a higher priority for a particular hospital.

#### Operations.

Allowing all departments the ability to access and update information in real-time will also help prevent any potential mistakes. Since everyone will be able to see the information provided by other departments, the need for lengthy email chains, phone calls and meetings will be reduced. This will create a much more efficient system allowing blood donations to get to where they need to go efficiently and effectively.

# Analysis and Design

## Diagram Description automatically generatedConceptual Model

Figure : Conceptual Model outlining tables necessary for efficient information flow.

Initially, the administrator table will list the ID’s and usernames of each of the database administrators who will have access to and be responsible for maintaining the database itself. Within the database, the Blood Type table will list the various blood types that are collected. The hospital table is intended to keep track of which hospitals require which blood types while the patient and donor tables will allow the administrators to track donors and patients who have received blood. The priority table is used to assign and define the priority levels for both patients and hospitals.

## Diagram Description automatically generatedLogical Model

Figure : Logical model outlining what information will be tracked in each table.

Within each table, specific data will be collected and maintained in order to provide clear, concise data storage. This will encourage the efficient management of blood donations in order to send them where they are needed the most. The donor table will list the contact information of all of the donors as well as assigning them a unique ID number. The patient table will not store sensitive personal medical information but instead ID them via patient ID supplied by the hospital treating them. This is to protect their privacy,

## Graphical user interface, application Description automatically generatedPhysical Model

Figure : Physical model showing how the information in the tables are to be stored and relate to each other.

In each table, the data will be stored in very specific manners. For example Patient ID will be limited to ID’s that begin with “P” as that is how the hospitals assign them. This is also true for Donors. They are given ID’s that begin with “D”. Blood type in the patients, hospitals and donors will all be foreign keys that reference the Primary key in the blood type table. The priority table will be much the same for the priority categories in the patients and hospitals tables.

# DBMS

## DBMS Available

There are many DBMS available on the market and it is important to choose one that is not only up scalable but secure and stable while keeping a limited healthcare budget in mind. The following two DBMS have been compared in order to determine which will best suite the needs of the GCBC.

### Oracle.

Oracle is one of the longest established database tools on the market. It is scalable, and portable, can run on various operating systems and it can efficiently manage large-scale data volumes. It has a recovery manager tool as well as being capable of running large ILTB and VLDBs. It is very feature rich and reliable.

#### MySQL.

In contrast, MySQL is an open-source free DBMS which is supported by the Oracle company. It is just as fast and it has a more intuitive and easier to use interface. It follows a client/server architecture that gives excellent performance, high flexibility, and increased productivity. It is scalable, has incredible security and enables crash recovery.

## Analysis

### Oracle.

Due to its ability to comfortably manage massive amounts of data with ease, Oracle is usually the choice for large enterprise corporations. It is feature heavy and packs a punch in performance. This however comes at a cost. A rather steep one at that. Given its cost and capabilities, Oracle excels at large scale operations and is best suited to companies with out budget concerns.

#### MySQL.

Because it is open source, My SQL is free. It gets updates regularly, bugs are fixed quickly and it has a large community of developers who contribute to it worldwide. It is reliable and secure and ideal for the small to medium scale companies.

## Recommendation

For the scale and budget constraints imposed upon the GCBC, MySQL is the better fit. It’s free, open source software means that money saved on the DBMS can be put to use in other areas such as upgrading hardware. It is very scalable and secure, meaning sensitive patient information will be safe from any unwanted access.

# References

*InnoDB - Oracle Wiki*. (n.d.). Retrieved 12 9, 2022, from http://wiki.oracle.com/page/InnoDB

*MySQL Internals Manual*. (n.d.). Retrieved 12 9, 2022, from Dev.mysql.com: http://dev.mysql.com/doc/internals/en/index.html