CPSC 471 Group Project Proposal

Jorge Leon Gomez, Michael Verwaayen, and David Turnbull

In this class, we were asked to solve an everyday problem by creating a database that could resolve the issue. We decided after doing research that the healthcare system has many flaws in how it determines who can view what information. To address this, we built a system that could control who has access to certain information. We created an ER diagram to show how the aspects of our database would link together, as well as a RM diagram that let us demonstrate how the different entities will communicate with each other and overcome the access control and patient security we attempted to implement. We believe that the main benefits of this database will be for healthcare users as their information will be protected, and they will not have to worry after visiting a doctor that their information will get into the wrong hands. We designed a user friendly system, trying to keep it simple since our main target for this product is health care professionals who are on the front line in communicating with patients.

Patient-doctor confidentiality and the protection of a patient's privacy are considered to be very important ethical components of the healthcare system. Despite this, many healthcare institutions do not employ particularly secure database systems. Many systems suffer from a lack of access control which makes patient information too readily available to database users. We seek to rectify this with a new database system that adds stricter access control and keeps the patient informed about who can access their records. This will lead to enhanced security, and happier patients, who can be comfortable in the knowledge that their information is safe. We have designed a web-based database using PHPmyAdmin and MySQL to form a functional data base, the goal of our system was to remove the threat of loosely stored information by adding restrictions to what professional can view certain patient information.

Our system currently offers functionality for 5 types of user. Any user of the system may sign up for the system by entering their e-mail address and choosing a username and password. What options they have from this point are determined by the type of user they are, and the privileges they have access to as a result.

The first, most basic type of user is the patient. Patients are only allowed to access the database to deal with their own medical information. The patient may view the medical information associated with their ID number. If their personal information, such as their name, has changed, the patient may edit that. They may not edit any other information, or view other patients.

Above the patient level of user, various medical professionals are allowed access to the system to complete their tasks. Pharmacists comprise one type of user, which may view the medical information for patients that have been assigned to them, and fill prescriptions for those patients. The pharmacist can only view prescriptions assigned by doctors before filling them, and cannot write their own prescriptions, nor can they edit patient information.

Physiotherapists are another defined user. Similar to pharmacists, this user level may view patient information and input notes for what procedures they have done for the patient, but may not otherwise change patient information.

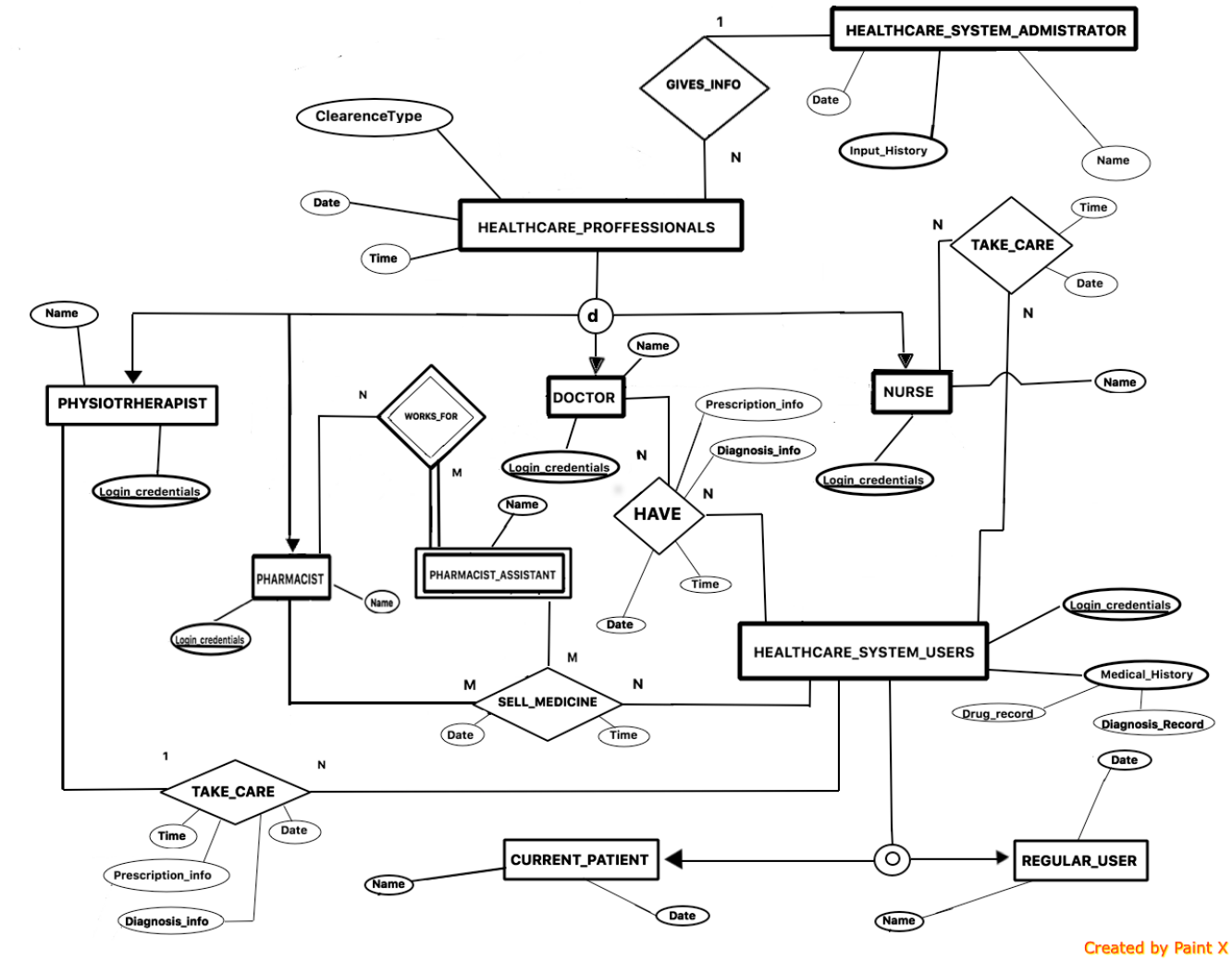
Other medical professionals are not defined in the current system, but could easily be added following the same conventions defined for these two user types.

Doctors have a much greater level of accessibility in the system. Doctors may search the system to view any patients associated with them, and access all of the medical information those patients have.

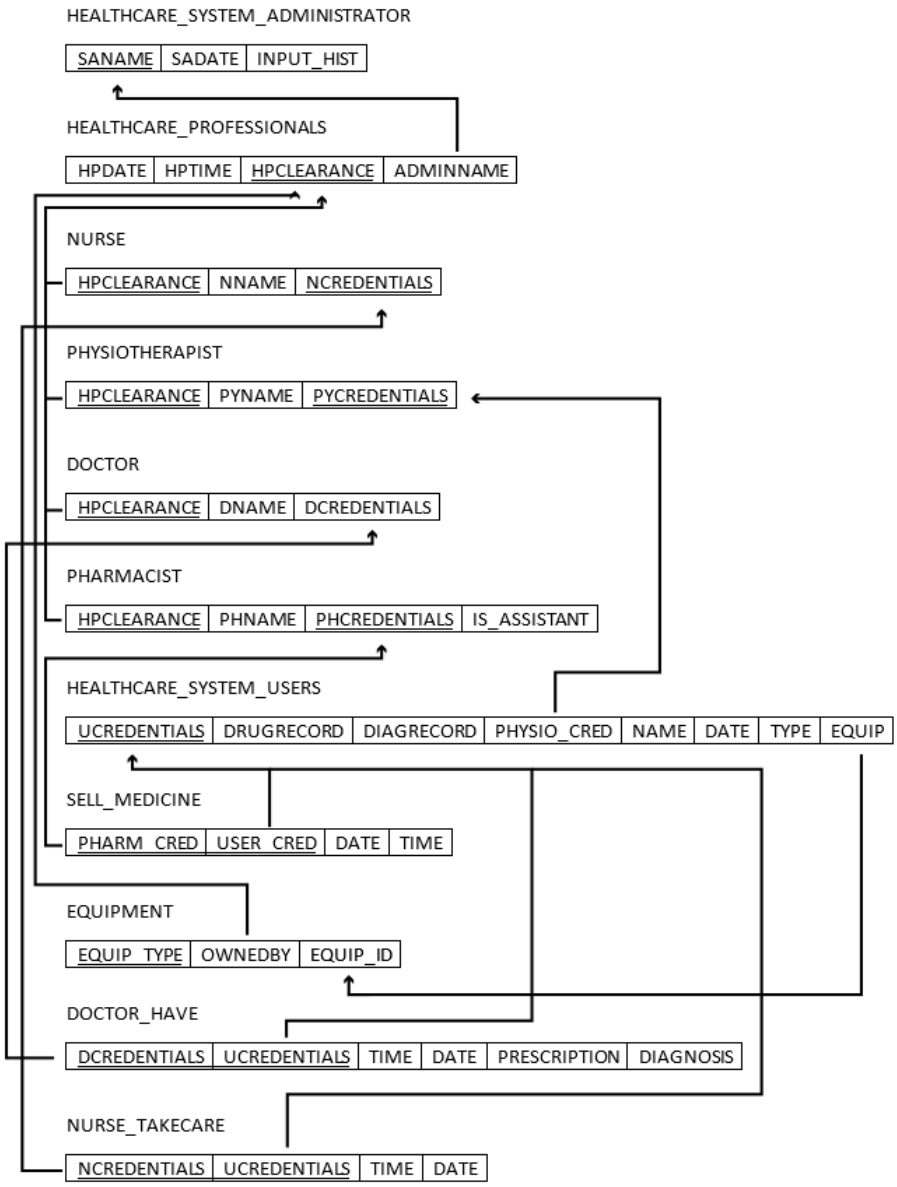
Doctors may also edit this medical information freely. Doctors may assign new treatments and prescriptions, and may grant access to patient information to the medical professionals defined above. If necessary, doctors may add new patients to the system, even if those patients do not yet have their own account.

The system administrator is the highest level user in the system, who can view and edit all data as they see fit. Essentially, the system administrator has access to all of the same commands that a doctor might, plus the ability to modify information pertaining to the doctors themselves, such as viewing and editing their user privileges. This is a rare role that should not be available to many users.

This system is represented by the following ER diagram:



After analyzing our EER diagram we changed the many-many relationship between some entities; for example, pharmacy assistant can no longer have multiple pharmacists. We also removed pharmacy assistant as a weak entity as it does have a primary key as its ID. The sell medicine relationship was changed so pharmacy assistant and pharmacist could both sell medicine, were not required to sign off on the other as it was previously designed to be. Regular user was removed from the EER diagram and Equipment took its place, where doctors could loan out equipment from the hospital to use on patients. The database is represented by this RM diagram:



Our relational model is based on the flow of information for medical professionals, and we made the conscious decision to not include the patients ability to view their records as it would add confusion and not fit with the theme of medical professional security. Since time of submitting we have removed credentials as a primary key as we now see that credentials are required and not unique to the individual. The same goes for HPClearance; there is no unique clearance for each doctor. Although all doctors will have a unique set of patients, they all have the same level of clearance. Once again after

receiving feedback we changed the model to have date and time as a primary key for nurse_takecare and doctor_have because as was mentioned one patient can visit multiple times.

REFERENCES:

http://html5doctor.com/

https://www.youtube.com/watch?v=xb8aad4MRx8&t=4762s