Project 1: Database Design and Data Modelling

Joseph D'Silva COMP-421

1 February 2021

Jonayed Islam (260930902)

Assumptions

1. As soon as the information of a mother is entered into a system, it is assumed that she booked an info session
2. A person only registers once. Even if they come back for another pregnancy with someone else, they retain their original parent key.
3. The system automatically creates a couple entity as soon as a mother is entered into the system
4. There is no midwife assigned when the couple first registers. A midwife is only assigned later on
5. The email for health institutions are unique and can be used a primary key
6. An info session is hosted by only one midwife
7. An appointment is held by only one midwife
8. The pregnancy will have both the menstrual due date and the ultrasound due date, but the final chose due date will also be annotated as an attribute
9. We can have a pregnancy in the system without yet knowing any information about that babies
10. A test can only be prescribed during an appointment

Restrictions

1. A couple must have at least one midwife assigned to them before an appointment can be made and a pregnancy can be assigned.
2. Only one primary midwife and one backup midwife may be assigned to a couple

Artificial Keys

PID is an artificial key for a Parent

CID is an artificial key for a Couple

SID is an artificial key for an InfoSession

AID is an artificial key for an Appointment

TID is an artificial key for a Test

NID is an artificial key for a Note

PID is an artificial key for a Pregnancy

BID is an artificial key for a Baby

Entities & Relations

Parent(PID, Name, Email, DateofBirth, Phone, Profession, Address, BloodType, HealthID)

Mother(PID, TimeFrame)

Father(PID)

malein(PID,CID)

PID is a foreign key referencing to the Father

CID is a foreign key referencing to the Couple

femalein(PID,CID)

PID is a foreign key referencing to the Mother

CID is a foreign key referencing to the Couple

Couple(CID, Interest, PregCount)

InvitedTo(CID, SID, Attended)

CID is a foreign key referencing to the Couple

SID is a foreign key referencing to the InfoSession

InfoSession(SID, Language, Time, Date)

Hostedby(SID, PracID)

SID is a foreign key referencing to the InfoSession

PracID is a foreign key referencing to the Midwife

Midwife(PracID, Name, Email, Phone, isBackup)

AssignedTo(CID, PracID)

CID is a foreign key referencing to the Couple

PracID is a foreign key referencing to the Midwife

Participate(CID, PracID, AID)

CID is a foreign key referencing to the Couple

PracID is a foreign key referencing to the Midwife

AID is a foreign key referencing to the Appointment

Appointment(AID, Date, Time)

Has(AID, NID)

AID is a foreign key referencing to an Appointment

NID is a foreign key referencing to a Note

Note(NID, Time, Observation)

Prescribes(AID, TID, DatePrescribed, Patient)

AID is a foreign key referencing to an Appointment

TID is a foreign key referencing to a Test

Test(TID, Type, DateSample, Result, DateLab, TechName, TechID, TechPhone)

WorksFor(PracID, Email)

PracID is a foreignkey referencing MidWife

Email is a foreignkey referencing HealthInstitution

HealthInstitution(Email, PhoneNum, Name, Address, Website)

BirthingCenter(Email)

CommClinic(Email)

Expects(PID, CID)

PID is a foreignkey referencing a Pregnancy

CID is a foreignkey referencing a Couple

Pregnancy(PID, FinalDueDate, MenstrualDueDate, UsoundDueDate, Birthlocation, NumBabies)

Delivers(PID, BID)

PID is a foreignkey referencing a Pregnancy

BID is a foreignkey referencing a Baby

Baby(BID, DateofBirth, BloodType, Gender, Name, TimeofBirth)

Relational Translation

The mother does not have her healthcare card or email as the primary key and instead uses an artificial key. We can fix this by removing the parent entity and having a Father and Mother entity that are independent. However, we will end up with redundant attributes for the father.

The system does not capture a relation between the birth location and the health institution. It may be possible to create another entity that is the birth location and have an ISA relation with HealthInstitution and Home as subclasses. However, this can overcomplicate the model.

There is no relation between which patient the test is prescribed for and their corresponding file. We would have to add another relationship from baby and another from mother, but this would result in a redundant relation.

There is a redundancy between AssignedTo(CID, PracID) and Participate(CID, PracID, AID). However, this redundancy is kept so that we can quickly identify the associated midwives of a couple. Also, it is possible to have a backup midwife who is assigned to the couple, but does not hold any appointments. Thus, making it impossible to figure out she was linked to the couple with only the Participate relationship.