Database Design Exercise

This case was subdivided into several parts to contain the complexity of the DB Design per design exercise. The narrative in this case represents how requirements are documented by Analysts before it is given to DB Designers and SW Designers to implement their respective component of a DB Application. It is part of the skill of a DB Designer to isolate from the document what are DB Requirements from SW Requirements. DB Requirements simply refer to those that indicates what data needs to be recorded in the database, and one information is related to other information. SW Requirements refers to those part of the document suggesting the features that the intended SW should be providing the users of the DB Application.

1.	Identification of Relations	Assigning appropriate identifiers
2.	Relationships between Relations	Identifying appropriate foreign keys
3.	Required and Unique Values	Determining which fields cannot contain null values; Determining which fields (non-identifiers) should contain unique data
4.	Composite & Multi-Valued Attributes	Dissecting a field into multiple parts; Creating a table for storing multiple values for a single attribute and/or allow special relationships
5.	Controlled-Values	Creating a table to store controlled domain values (i.e. use of ENUM & reference tables)

BACKGROUND OF THE CASE

Tuberculosis (TB) is a highly contagious disease and if not managed can spread throughout the community. TB in Children is among the rising medical cases in the Philippines. Barangay Health Centers (BHC) are the front row in managing the spread of disease through proper records management and early diagnosis. BHC manage patient records using paper records. The ineffectiveness and inefficiencies associated with paper-based patient records has been identified as one of the reasons for difficulties in managing the spread of disease within the barangay.

CASE PART 1

PATIENT RECORD

When patients arrive at the BHC, the barangay health worker (BHW) collect personal information, family information from the patient before a health assessment is performed. Personal Information of patients include the last name, first name, middle name, birthday, sex, age, nationality, permanent and current address, the details for each includes the house no, street, barangay, city/municipality, province, region, and zip code. The picture of the patient is also attached to the record. Other data important to be recorded about the patient includes existing co-morbidities (e.g. diabetes, cancer).

Since the patient is a pediatric patient, information about both parents and emergency contact person is also needed. This information includes the complete name, birthday, contact numbers, email address, and indication if the person has HIV or having/had TB. For emergency contact person, additional details like the complete address and alternative contact number are needed. Each patient record is given a unique patient ID that is being used by the BHW to search for the patient record.

PATIENT CASE

Each patient may have several cases on record. It is possible that in the past, the patient was already being managed by the BHC and his/her TB was cured, thereby closing his/her case. It is also possible that in the past, the patient is already being managed by the BHC and he/she never went for follow-up for more than six months, thereby closing his/her case due to lost to follow-up. It is also possible that the patient has a cured case in the past and went to the BHC since he/she is experiencing symptoms of TB, thereby a new case is created for the patient. At any given time, there is only one active case per patient.

When a case record is created, the following details are needed, a unique Case Number, the status of the Case (Ongoing, Cured, On Treatment, Closed-Died, Closed-Lost to Follow-up), start date of the case, and in case the case was closed, the end date of the case.

CLOSE CONTACTS

For each case, a patient may have several other people in close contact with. Since TB is a highly contagious disease through close contacts with people with TB, close contact information helps the BHC to perform the following:

a. Visit the close contact and make a health assessment of each close contact to determine if they also have TB. And if they exhibit symptoms of TB, they are requested to go to the BHC. They are immediately recorded as patients; information is gathered so that further diagnosis can be performed to determine the type of TB for proper treatment.
b. Check with existing records if any of the close contacts are already recorded as a TB patient.
c. Check with existing records if any of the close contacts are also close contacts of other TB patients.

A record of a close contact includes complete name, birthdate, sex, relationship to patient, contact person, contact number, contact email, and estimated days of contact. If the close contact is an existing TB patient, the patient ID is included in the record. Aside from these, it is possible that the close contact is also a close contact of other patients, the BHW records the patient IDs of the other patients that the person is also a close contact of. This is a requirement of the Department of Health for tracking of spread of TB among the close contacts.

HEALTH ASSESSMENT

Every time a patient with an active case visits the BHC, a health assessment is performed where several information is collected. These include weight, height, blood pressure, body temperature, presence of cardinal symptoms (cough, fever, night sweats, weight loss) and if each of these cardinal symptoms are experienced for more than two weeks already, presence of additional symptoms (fatigue, reduced playfulness, decrease activity and not eating well) and if each of these additional symptoms are experienced for more than two weeks. During the health assessment, any non-TB medications that are being taken or taken by the patient are also being recorded, and how long does each of the medication is being/was taken. Patients exhibiting TB cardinal symptoms of more than two weeks are automatically assigned a presumptive TB modal #. The TB Modal # is like a serial number assigned to a patient from the list of controlled serial numbers provided to the BHC.

DOH REQUIRED INFORMATION

DOH mandates that the BHW (including their position or title) that collected any information from the patient be recorded including when and the time it was collected.