Analysis of the Central District Clinic

Project 4 will require the creation of a database system to support the operation of a fictitious health clinic in downtown Seattle ... by studying how an organization functions it is possible to understand how it can be most effectively supported with IT.
The Central District Clinic (CDC) is a fictitious walk-in health clinic offering lab tests for drugs, HIV, AIDS, and other STDs.

- It is staffed by volunteer health professionals and a volunteer receptionist … no need to be concerned with the database issues of billing or payroll.
- The lab testing is not performed on-site, but is contracted with Seattle labs and hospitals.
- The goal of our effort is to provide all the database facilities needed to support all aspects of the client processing and testing.

Databases and business systems are best developed by considering how an organization operates.
Consider The Operation Of The CDC

- Starting with a client entering …
  - The receptionist gathers contact information from the client and enters on the client record; if a client has visited before the data is verified
  - The receptionist queues the client to see one of the health professionals working that day
  - (After waiting long enough to read last year’s *STD Weekly*) the client sees the health professional who fills out a chart with a brief medical history and orders the tests to be run
  - The client’s specimens are labeled
  - At the end of the day the specimens for each test are grouped and compared against a manifest listing all of the tests of that type ordered that day and sent out
The results are returned and recorded in each client’s record. The outcomes are: positive, negative, failed or inconclusive, and exceptional. A letter is composed to be sent to the client reporting the result of the test(s). A mailing label is affixed to the envelope, the letter is verified and it is mailed to the client. Quarterly, summary statistics are compiled reporting on the clinic’s activities including the number of clients and statistics on the number of positive cases of different diseases. The past quarter’s records are archived.
Needs Analysis

- Review the operation of the clinic to determine what tasks need to be supported by the database system
  ... use the verbs as short hand
  - Enter client data
  - Queue client for health professional
  - Fill out chart
  - Order tests
  - Label Specimens
  - Specimens compared to manifest
  - Results recorded in client record
  - Reply letter composed
  - Quarterly statistics compiled
  - Records archived
Enter Client Data
- Need a table and form for capturing client data

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Prefix</th>
<th>First Name</th>
<th>Middle Name</th>
<th>Last Name</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mr</td>
<td>Thomas</td>
<td>Wright</td>
<td>Jones</td>
<td>Jr.</td>
</tr>
<tr>
<td>2</td>
<td>Ms</td>
<td>Emily</td>
<td>Bronte</td>
<td>Smith</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>ZIP</th>
<th>Home Phone</th>
<th>Work Phone</th>
<th>Birthdate</th>
</tr>
</thead>
<tbody>
<tr>
<td>123 1st Avenue</td>
<td>Seattle</td>
<td>WA</td>
<td>98100</td>
<td>(206) 555-1212</td>
<td></td>
<td>11/22/33</td>
</tr>
<tr>
<td>333 Columbia S</td>
<td>Seattle</td>
<td>WA</td>
<td>98000</td>
<td>(425) 543-1000</td>
<td>(   ) 543-3333</td>
<td>12/12/50</td>
</tr>
</tbody>
</table>

Client ID: [ ] 1
Prefix: Mr
First Name: [ ] Thomas
Middle Name: [ ] Wright
Last Name: [ ] Jones
Suffix: Jr.

Date: 11/20/99
Birthdate: 11/22/33
Address: 123 1st Avenue
City: Seattle
State: WA
Zip Code: 98100
Home Phone: (206) 555-1212
Work Phone: [ ] [ ]
Queue Client With Med Professional

- The reference to medical professional implies that the volunteers at the clinic should be recorded ... what data should be saved?
  - Contact Information
  - Medical license information
  - Home office or hospital

- Define a table and a form for capturing the data
Further Attention To Queuing

- What does queuing really mean?
  - Associating a client with the medical professional that will see him or her
  - Such associations are phenomena that can and should be recorded in a database ... the phenomenon is a client “seeing” a medical professional, which is called a Visit

- What is the relevant Visit data?
  - Client, but only the key is needed
  - Medical Professional, key only
  - Date of visit

<table>
<thead>
<tr>
<th>Visits: Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Name</td>
</tr>
<tr>
<td>VisitID</td>
</tr>
<tr>
<td>MedProID</td>
</tr>
<tr>
<td>ClientID</td>
</tr>
<tr>
<td>Date</td>
</tr>
</tbody>
</table>

© Copyright, Larry Snyder, 1999
A Fundamental Idea

- Notice that the database design contains tables for “things” such as the Clients table and the table for the medical professional’s information.
- These tables represent information about entities.
- The Visits table is different in an important way …
- It represents information about a relationship between entities, namely that the Client and the MedPro are connected or associated by a visit.
  - Pairing the keys of the related entities is the mechanism.
- The relational database model (that’s the set of concepts on which modern databases like Access are built) represents information about entities and relationships.
Fill Out Chart

- During the visit the medical professional will ask the client questions and discover information ... where will this information be recorded?
- Visits -- it represents the event of the client seeing the medical professional, making it a logical location
- What information will be gathered ... 
  - History -- what is the relevant past medical data?
  - Symptoms -- what’s wrong now?
  - Notes -- observations about the patient, comments
  - Tests requested
Order Tests

- Ordering tests can be thought of as the final action of a visit by a client to a medical professional.

- What activities are created by ordering a test:
  - Collecting specimens … not an IT task
  - Labeling specimens

- The label must …
  - Uniquely identify the patient, but respect privacy
  - Must specify the test to be run
  - Must identify the CDC

Creating the tracking number is a task initiated by Ordering

Central District Clinic
123 Yesler Way
Seattle WA 98100
Hep B: CDC09A00BD0
Test Tracking Number
A manifest is a list of things that are supposed to be in a package.

When the specimens are sent to the lab at the end of the day, there must be a separate list of all the specimens collected for each test …

- What information is on the list?
- How is this information created?

A manifest for a given day for a given test can be created by selecting all those records that have the proper date and have that test checked … derive a new table.
The three primary tables have been formulated: Clients, MedPros and Visits

The concept of representing entities and relationships in tables has been introduced

To be continued ...