Chapter 1 Instructor’s Guide

# Outcomes

* Define relational databases
* Understand the position of relational databases in the history of databases
* Identify major relational database management systems
* Identify main characteristics of relational databases
* Understand SQL’s role in relational database
* Recognize some indications of where a database could be useful
* Define a statement of work for a given database scenario

# Outline

I. Database Overview

A. What is a Database?

B. Flat File Databases

1. Delimited

2. Fixed width

3. Spreadsheets

C. Hierarchical Databases

II. Relational Databases

A. All data is stored in tables

B. Each row has a primary key

C. Foreign Keys

D. SQL

III. Relational Management Systems

A. Definition

B. Functions

C. Some Popular RDMSs

IV. Opportunities for Database Development

V. Initial Interview

A. Being Prepared

B. Listening to the Client

C. Focusing on the Broad Topics

VI. Identifying the Big Topics

A. Identify nouns

B. Group by themes

C. Entities and Attributes

VII. Statement of Work

A. History

B. Scope

C. Objectives

D. Tasks and Timeline

VIII. Documentation

A. Importance

B. Documenting the Structure

C. Documenting the Process

D. Project Notebook

IX. Things We Have Done

X. Things to Look Up

XI. Vocabulary

XII. Practices

XIII. Scenarios

# Vocabulary

|  |  |
| --- | --- |
| 1. Attribute | l. Things that define aspects of entities |
| 2. Foreign Key | i. This key is the primary key repeated in another table to create a link between the tables. |
| 3. Statement of Work | n. A document including the scope, objectives, and timelines for a given project |
| 4. Primary Key | h. This key uniquely identifies each row in the table. |
| 5. Data Integrity | f. Refers to the accuracy and the correctness of the data in the database |
| 6. Redundancy | g. Refers to storing the same data in more than one place in the database |
| 7. Delimited Files | d. These files have some sort of character separating columns of data. The delimiter is often a comma or tab, but can be any non-alphanumeric character. |
| 8. Relational Database | a. A type of database that uses “relations,” tables, to store and relate tables |
| 9. Entity | k. Something that the database is concerned with, about which data can be stored |
| 10.Relational Design | b. The process of organizing data into tables or entities and then determining the relations among them |
| 11. SQL | c. The language relational databases use to create their objects and to modify and retrieve data |
| 12. Constraints | m. Limits on what the database will do |
| 13. Fixed Width Files  14. Statement of Scope | e. Files where the length in characters of each column is the same  j. A short statement of one or more paragraphs that says in clear, but general, terms what the project will do |

# Things to Look Up

The Things to Look Up section is meant to spur discussion. Many of the questions do not have precise answers. All links provided can change or go away.

1. Look up Codd’s twelve rules. Choose one of the rules to explain to your fellow students.

Codd’s 12(13) rules are available in many places but perhaps the easiest place to access them is at <http://en.wikipedia.org/wiki/Codd's_12_rules>. The student can choose any one of them and discuss it briefly. For example, Rule 1, the information rule, requires that all data, even data about data such as column names and data types must be stored in tables. A student might note that this makes all the data in a database, even the metadata, accessible to the same query techniques. Related to this, Rule 5 requires a comprehensive data sublanguage that can handle all data and RDMS needs.

2. Look up the history of SQL. How many revisions of the standard have there been? What was added in the most recent one?

Wikipedia is also not a bad source for this question <http://en.wikipedia.org/wiki/SQL>. According to it there have been six revisions since the first formalization in 1986. The last one in 2008 allowed ORDER BY outside of Cursor definitions, added INSTEAD OF triggers and TRUNCATE.

3. Use the Internet to look up database-related jobs. Make a brief report summarizing what you find.

This is also highly variable and depends on the time and the region. Monster.com <http://www.monster.com/> is a good place to start. For Keywords a student can select SQL and Databases and find both local and national jobs. A student can also choose titles such as “Database Administrator” or “Database Developer.” Further they can choose specific RDMSs such as SQL Server or Oracle.

4. A recent trend for major commercial database developers is to offer free “Express” versions of their databases. Microsoft has SQL Express, Oracle has Oracle Express, and DB2 has DB2 Express. Go to the company web sites and look up these Express editions. What features does each one have? What limits do they have? How do they compare to each other?

Microsoft SQL Express can be found at <http://www.microsoft.com/express/database/>. It is available for free for development and deployment. It has a graphical interface, and supports up to 10 gigabytes per database, though it can have many databases. It is compatible with other versions of SQL Server. It only supports 1 gigabyte of RAM, 1 CPU, and lacks most enterprise features. A comparison of features among versions of SQL Server can be found at <http://www.microsoft.com/sqlserver/2008/en/us/editions-compare.aspx>. SQL Express will run only on Windows platforms.

Oracle Express can be found at <http://www.oracle.com/technetwork/database/express-edition/overview/index.html>. Oracle Express will store up to 4 gigabytes of data, will use 1 CPU and no more than 1 gigabyte of RAM. It comes with a web interface for creating and managing data. Oracle Express will run on Windows, Linux, Unix, or Mac platforms.

DB2 Express can be found at <http://www-01.ibm.com/software/data/db2/express/about.html?S_TACT=&S_CMP=>. DB2 will use up to 2 CPUs and 2 gigabytes of memory. I did not see a limit on its database size. DB2 Express will run on Windows, Linux, Unix, or Mac platforms.

SQL Server has a surprising number of features available in its Express version. Perhaps its most severe limitation is that it is limited to the Windows Operating System. The Oracle Express is the most limited with its 4 gigabyte data limitation, but it is available across most operating systems. DB2 may be the most full featured and robust of all the Express editions, since it addresses up to 2 gigabytes in RAM and 2 CPUs.

5. For some time there have been attempts to move beyond relational databases, to find some new data model. One direction has been to move toward object-oriented databases. Another area of research is into XML-based databases. Choose one of these to look up and write a brief summary of what the model entails and what is the current status of the model.

Wikipedia has an article on object-oriented database at <http://en.wikipedia.org/wiki/Object_database>. Another site with several articles is <http://www.service-architecture.com/object-oriented-databases/>. One of the issues with the object-oriented database is that definitions are still in flux, though the main thrust is to create a database based on object-oriented concepts rather than relational ones. Theoretically this would make them more compatible with the object-oriented structure of the applications that access them. The status can vary with time. But currently the trend is to add object-oriented aspects to existing relational databases.

A search for XML databases will reveal a few white papers and product pages, but like object-oriented databases, the thrust is to increasingly include XML functionality in the relational database, including storing XML as a native type, validating XML against XML schema and including X-query to enable the querying of XML data directly.

6. Look up Statements of Work. What are some additional elements that can be included?

There are several examples and templates for statements of work online including at Wikipedia <http://en.wikipedia.org/wiki/Statement_of_work>. Some of the additional elements are Location, Application Requirements, Special Requirements, Payment Schedule, etc.

# Practices

*1*.*Think about keeping a home budget. Would it be better to keep the budget in spreadsheets or to create a budget database? Write a couple of paragraphs that describe your choice and at least three reasons to justify it*.

Either answer is acceptable as long as they justify it with good reasons.

The spreadsheet would be best because the home budget is simple and does not involve thousands of rows. Creating a database would involve development time and added complexity. The spreadsheet also offers excellent tools for the calculations and summaries necessary for a budget.

The database would be best if they want to track many budgets over time. It would make it easier to compare values from different time periods. It would also make it easier to look at longer term trends and explore patterns by querying the database.

It is quite probable students will come up with additional valid reasons for both solutions.

**Suggested Rubric**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| No justifications for the choice or poor ones. | At least two good reasons for making the choice they did. Written out in paragraph form. | Two or three good reasons for their choice, well described with some detail. |

*2.Think of a small business or non-profit that you know that could use a database. Explain why you think a database would help the business. List the benefits the business or non-profit would gain from a database.*

The business or non-profit is, of course, a wildcard. It could be anything. The benefits, however, should fall into the following general areas:

* improved data collection and storage
* better data integrity and consistency
* better business information
* better security

**Suggested Rubric**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| A poor answer would only include one of the general categories listed above. Little discussion. | Covers at least two of the areas. Some discussion. | Covers two or more of the areas, with a thoughtful discussion of each of the benefits. |

*3.An* ***Entity*** *is something the database is concerned with. For instance, a movie rental business would probably have an entity called DVD. Attributes are things that describe the entity. Make a list of possible attributes for a DVD entity*.

Here are some possible attributes of a DVD:

* title
* artists
* studio
* features
* media
* rating
* genre
* producer
* director
* release date

**Suggested Rubric:**

Don’t worry about multi-valued attributes versus single-valued attributes at this point.

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Less than 5 attributes | At least 5 | 5 or more attributes |

*4.You are going to interview a small business owner about creating a database for his sandwich shop and bakery. Make a list of questions for this initial interview. Remember at this point you just want the big picture and major requirements. Don’t get too deep into the details.*

The questions should focus on topics relevant to the database, but not go into specific details about data or implementations. Questions that should be avoided are things like:

* What do you charge for donuts?
* What database software do you want to use?
* How old are your customers?
* What time do you open?
* What kind of coffee do you serve?

Valid questions are things like:

* What do you want to track with your database?
* What kinds of information do you want to get out the database?
* Why do you want a database?
* How many people will be using the database?
* How do you track things now?

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Only one or two questions. Irrelevant questions that do not pertain to the database project. | Several questions, but many too specific or focused on only marginally relevant topics. | Several questions focused on the overall purpose and function of the database. |

*5. Think about the sandwich shop and bakery in question 4. List what you think the major topics would be.*

Major topics should include:

* Customers
* Bakery goods (but not specific goods such as donuts, sandwiches, coffee)
* Sales (or orders)
* Inventory (I mean by this raw goods, flour, sugar, etc.)
* Employees

(Students may come up with other relevant topics, such as suppliers.)

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Irrelevant topics, or lists of particular products. | At least Bakery goods, Customers, and Sales. May include a few particulars and irrelevant topics. | Focuses just on the main topics. At least three or four of the topics included. |

*6. A dentist office wants a database to track its appointments. The specifics they want to track:*

* 1. *All customers of the dental office*
  2. *Customer appointments*
  3. *Which dentist serves each customer at the appointment*
  4. *Which assistants assist each dentist*
  5. *In brief, what services were provided at the appointment*
  6. *The database will not track bills and payments (they have separate software to do that)*

*Write a statement of scope for the dental office database****.***

The statement of scope basically consists of the bulleted points. Below is a simple version. The name of the dentistry clinic is not in the practice and could be anything or nothing in the student response

The Miracle Dentistry clinic database will track all customers and their appointments. It will track which Dentists and assistants were involved with each appointment and what services were provided. The database will not track bills and payments.

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Just bulleted points, perhaps not all the points present. | The bulleted points in a paragraph, minus the last constraint, excluding billing. | Contains all the points in a good paragraph form. |

*7.List the major themes for the dentist office database in practice 6.*

Major themes should include:

* Dentists
* Assistants (or both under Dental Staff)
* Customers
* Appointments
* Services

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Irrelevant topics; only one or two of the listed topics. | At least three of the topics. Only one or two irrelevant topics. | Four or five topics. |

*8***.***How long do you think it would take to gather the information needed to make the dentist office database in practice 6? Discuss what steps you think would be involved and how long it might take you.*

This is mostly an exercise in guesswork. Ideally students will list most of the steps Sharon listed when preparing her statement of work:

* Gathering information
* Evaluating the information
* Developing business rules and requirements
* Logical modeling
* Normalization
* Making the database
* Reviewing and testing the database

**Suggested Rubric**:

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Irrelevant topics; only one or two of the listed topics. The times allotted showing little thought. | At least four of the topics. Only one or two irrelevant topics. The time lines showing some thought about what might be involved. | Five or more of the topics. Time lines show thoughtful estimates. |

*9.Look around the school or think of some businesses or non-profits with which you are familiar. Identify at least one situation in which a database could be a help.*

* 1. *Describe why a database would improve the situation.*
  2. *Describe what the major topics of this database would be.*
  3. *Write a statement of work for this database.*

Again this is quite variable depending on the business or non-profit chosen.

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| The situation is not particularly relevant for a database. Only one or irrelevant reasons why a database would improve the situation. Incomplete or irrelevant list of topics. Statement of work sketchy and incomplete. | The situation is one that could be improved by a database. A least two good reasons why a database would improve the situation. Most database topics covered. The statement of work includes, history, scope, projected timeline, even if not fully developed. | The situation is one that could be improved by a database. Two or three good reasons why a database would improve the situation. Good list of major topics. No irrelevant topics. Statement of work contains history, scope and timeline, all fully developed. |

*10.An instructor has been keeping all his grade books in Excel for years. He has a separate spreadsheet for every course. In the spreadsheet he tracks the scores for every assignment and test and then assigns term grades based on the overall averages. Whenever a former student contacts him requesting a letter of recommendation or whenever the administration requests information concerning a student in a previous term, he has to open and search several spreadsheets to get the student’s information.*

* 1. *What are some of the advantages a database would have over the current system for this instructor?*
  2. *What would be some of the major topics for the database?*
  3. *Write a statement of work for the database above.*

The chief advantage would be the ability to easily search a student’s complete record. Other, implied advantages, could be to have all the data stored together in one place and the ability to compare data over time.

Major topics would include Student, Course, Assignment, Grade; possibly Test and Section.

Here is a sample of what the history and scope of a Statement of Work might look like. The timeline should resemble Sharon’s example near the end of the chapter.

HISTORY

Professor M\_ has been keeping all his grade books in Excel for years. This works well enough to record the scores for each student and the grades for a given quarter. The problem comes when trying to find or compare information over multiple quarters. To do this Professor M\_ must search through several different spreadsheets to gather the information. This requires a great deal of time and can be prone to mistakes. Professor M\_ has decided that a database would help solve these problems.

SCOPE

The database will track all the elements necessary to record student assignments and grades through multiple sections and quarters. It will track a minimal amount of information about each student. It will track courses and the quarter sections of those courses. The database will track assignments and the grades given to students for each assignment. It will also track quarterly grades. The instructor should be able to retrieve the entire history of a student or a class with a simple query.

OBJECTIVES

* Improve tracking of students and grades across quarters
* Improve comparing data across quarters and classes

**Suggested Rubric:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Only one or two topics. Topics not relevant. Incomplete or sketchy statement of work, no objectives, no or sketchy timeline, no deliverables. | At least three relevant topics;  decent history and scope. One or two objectives. Some attempt at a timeline with some deliverables. | At least three relevant topics. Good statement of work and scope. Good objectives. Timeline with deliverables. |

# Scenarios

Each scenario has the following tasks:

1. *List the major topics for this database.*
2. *Write a draft statement of work. Include a brief history, a statement of scope, objectives, and a preliminary timeline.*
3. ***Documentation:*** *Start a notebook, either electronically or physically, to record your progress with the scenario database. Add the statement of work and any notes to the notebook.*

## Wild Wood Apartments

Topics should include: managers, tenants or renters, building, apartment, lease, rent payment, and maintenance request. It is possible that students will identify other relevant topics.

Most of the materials needed for the statement of work are in the scenario description. The history, in fact, is just the scenario repeated or stated in other words. The timeline is also copied from the example in the chapter. Student timelines should reflect basically the same tasks though they can vary in times allotted and deliverables. Below is a possible statement of work:

HISTORY

Wild Wood Apartments owns 20 different apartment complexes in Washington, Oregon, California, and Idaho. Each apartment complex contains anywhere from 10 to 60 separate apartments of varying sizes. All apartments are leased with a six-month or year-long lease.

It is the company’s practice to hire one of the tenants to manage each apartment complex. As managers they need to admit new tenants to the building, collect rents from existing tenants, and close out leases. The manager also needs to maintain the apartments conducting any repairs, replacements, or renovations. These can be billed back to the parent company. For acting as manager, the tenant gets free rent and a stipend. The stipend varies depending on the size of the apartment building.

Each manager is expected to send a report to the Wild Wood Apartments company headquarters in San Francisco every quarter. This report summarizes the occupancy rate, the total revenues in rent, the total expenses in maintenance and repairs, etc. Currently managers fill out a paper form and mail it back to headquarters. Many apartment managers have complained that preparing this report is a very difficult and time-consuming process. Also, the managers at corporate headquarters have expressed concerns about the accuracy and verifiability of the reports.

To allay these concerns and to improve the ease and efficiency with which the apartment managers conduct their daily business, the company is proposing to develop a centralized database that can be used by the managers to track the daily business of their apartment building and to prepare their reports.

SCOPE

The Wild Wood Apartments database will provide a centralized repository for all the apartment management data from the company’s 20 apartment buildings. The database will track each of its buildings, the state (occupied or unoccupied) for each apartment, leases, tenants, and rental payments. It will also track maintenance requests and expenses. In addition the database will produce quarterly and annual reports summarizing occupancy rates, revenues in rent, and repair and maintenance costs.

OBJECTIVES

* Centralize management of apartments and rents
* Gather apartment, tenant, lease, and rental payment information
* Better recording of maintenance expenses and costs
* Improve the accuracy and ease of creating quarterly reports

TASKS AND TIMELINE

1. **Gathering Data:** This task will consist of a number of interviews, questionnaires, and observations. Time allotted: 3 weeks.

**Deliverable:** A list of scheduled interviews and observations, text of the questionnaires.

1. **Analyzing Data:** The data gathered will be analyzed to determine business rules and preliminary data modeling. Time allotted: 2 weeks.

**Deliverable:** List of business rules to be reviewed, basic entities, and attributes.

1. **Normalization:** The data model will be completed with entities and relationships normalized. Time allotted: 1 week.

**Deliverables**: Entity Relation Diagram for Review.

1. **Building the Physical Database:** The data model will be translated to the relational database management system. Tables, columns with specific data types, and relational and other constraints created. Time allotted: 3 days.

**Deliverables:** The schema of the database for review.

1. **Testing and Security:** Sample data will be entered and each of the business rules and requirements will be tested. General database security and security related to business rules will also be tested. Time allotted: 3 weeks.

**Deliverables**: Documented test results.

1. **Database Completion and Installation:** Final changes and corrections are made. Sample data will be removed and the database installed on a server. Final testing for server access and connections. Time allotted: 2 weeks.

**Deliverables:** The working database.

## Vince’s Vinyl

Topics should include Album, Customer, Seller, Sale, and Purchase. It is possible students will identify other relevant topics.

Most of the materials needed for the statement of work are in the scenario description. The timeline is also copied from the example in the chapter. Student timelines should reflect basically the same tasks though they can vary in times allotted and deliverables. Below is a possible statement of work.

HISTORY

Vince Roberts runs a vintage record shop in the University district. His shop sells 45’s, LPs, and old 76 RPM records. Most of his stock is used. He buys used vinyl from customers or finds them at yard sales and discount stores. He does sell some new albums that are released on vinyl. He has kept most of his inventory either in his head or in a spiral notebook he keeps behind the sale counter. But his inventory and his business have grown to where that is far from sufficient.

SCOPE

Vince’s Vinyl database will track his album inventory. It will track all purchases of albums and their sales. It will also track customer requests. The database will provide reports on total purchases and total costs for various periods of time. It will also generate an email list for notifying customers of new sales, new albums of interest, and other promotions.

OBJECTIVES

* Improve inventory and pricing control
* Better tracking of purchases and sales
* Better tracking of customer requests
* Improve advertising and customer contact

TASKS AND TIMELINE

1. **Gathering Data:** This task will consist of a number of interviews, questionnaires, and observations. Time allotted: 3 weeks.

**Deliverable:** A list of scheduled interviews and observations, text of the questionnaires.

1. **Analyzing Data:** The data gathered will be analyzed to determine business rules and preliminary data modeling. Time allotted: 2 weeks.

**Deliverable:** List of business rules to be reviewed, basic entities, and attributes.

1. **Normalization:** The data model will be completed with entities and relationships normalized. Time allotted: 1 week.

**Deliverables**: Entity relation diagram for review.

1. **Building the Physical Database:** The data model will be translated to the relational database management system. Tables, columns with specific data types, and relational and other constraints created. Time allotted: 3 days.

**Deliverables:** The schema of the database for review.

1. **Testing and Security:** Sample data will be entered and each of the business rules and requirements will be tested. General database security and security related to business rules will also be tested. Time allotted: 3 weeks.

**Deliverables**: Documented test results.

1. **Database Completion and Installation:** Final changes and corrections are made. Sample data will be removed and the database installed on a server. Final testing for server access and connections. Time allotted: 2 weeks.

**Deliverables:** The working database.

## Grandfield College

Topics should include: software, user, computer, location, and license.

Most of the materials needed for the statement of work are in the scenario description. The timeline is also copied from the example in the chapter. Student timelines should reflect basically the same tasks, though they can vary in times allotted and deliverables. Below is a possible statement of work:

HISTORY

The law requires that any business, including a school, track its software. It is important to know what software the school owns, in what versions, and what the license agreement for that software is. There are several different licensing schemes.

Whatever the license agreement for particular software, it is essential for the institution to know which software is installed on which machine, where that machine is located, and what users have access to that machine. It is also important to track when the software is uninstalled from a machine, and when a machine is retired.

Grandfield’s current process for tracking these issues is inadequate. They need a new database to ensure that they are compliant with all the regulations and laws governing software use.

SCOPE

The Grandfield College software tracking database will track all software and the associated license agreements. It will track which software is installed on which computer and what user or users have access to that machine. In addition it will track requests for new software installations. The database should provide reports that show conformance to software licensing and copyright laws.

OBJECTIVES

* Improve record of installation and removal of software
* Improve conformity to license agreements
* Improve management of software requests
* Improve accuracy and ease of reporting

TASKS AND TIMELINE

1. **Gathering Data:** This task will consist of a number of interviews, questionnaires, and observations. Time allotted: 3 weeks.

**Deliverable:** A list of scheduled interviews and observations, text of the questionnaires.

1. **Analyzing Data:** The data gathered will be analyzed to determine business rules and preliminary data modeling. Time allotted: 2 weeks.

**Deliverable:** List of business rules to be reviewed, basic entities and attributes.

1. **Normalization:** The data model will be completed with entities and relationships normalized. Time allotted: 1 week.

**Deliverables**: Entity relation diagram for review.

1. **Building the Physical Database:** The data model will be translated to the relational database management system. Tables, columns with specific data types, and relational and other constraints created. Time allotted: 3 days.

**Deliverables:** The schema of the database for review.

1. **Testing and Security:** Sample data will be entered and each of the business rules and requirements will be tested. General database security and security related to business rules will also be tested. Time allotted: 3 weeks.

**Deliverables**: Documented test results.

1. **Database Completion and Installation:** Final changes and corrections are made. Sample data will be removed and the database installed on a server. Final testing for server access and connections. Time allotted: 2 weeks.

**Deliverables:** The working database.

## Westlake Research Hospital

Topics should include: patient, doctor, drug, appointment, possibly medical history, and researchers.

Most of the materials needed for the statement of work are in the scenario description. The timeline is also copied from the example in the chapter. Student timelines should reflect basically the same tasks, though they can vary in times allotted and deliverables. Below is a possible statement of work:

HISTORY

Westlake Hospital is conducting a double-blind test of a new depression drug. It will involve about 20 doctors and about 400 patients. Half of the patients will get the new drug and half will get traditional Prozac. Neither the doctors nor the patients will know who is getting which drug. Only two test supervisors will know who is getting what. The test will last about 18 months. Each doctor will see 20 patients initially, though it is expected some patients will drop out over time. Each patient will be coming in twice a month for a checkup and interviews with their doctor. The drugs will be dispersed in a generic bottle by the two supervisors, one of whom is a pharmacist.

To track this study, the hospital will need a database.

SCOPE

The database will need to track patient information from their first screening through each of their interviews. It will track the symptoms of their depression and any specific physical side effects. Doctors will need to be able to see their own patients’ information, but not other doctors’ patients. Patients should be able to see their own medical profile, the doctor’s notes, and nothing else.Only the two researchers should be able to see everything. Reports should be generated comparing the results of the two groups over time.

There is always some danger of spying by other companies interested in similar drugs, so in addition to the security of the blind test, the database needs to be secured against outside intrusion as well.

OBJECTIVES

* Track patients in a double-blind drug study
* Track symptoms and side effects
* Maintain the double blind on the part of doctors and patients
* Generate reports that compare the results of the test groups

TASKS AND TIMELINE

1. **Gathering Data:** This task will consist of a number of interviews, questionnaires, and observations. Time allotted: 3 weeks.

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**Deliverables:** The working database.

## Show Times: Local Shows and Acts

Topics should include: acts, venues, shows, customers, or fans.

Most of the details needed for the history and scope are in the scenario description. The timeline is just copied from the chapter. Below is a sample statement of work.

HISTORY

Many people like to follow local bands and attend their shows, but because these small bands rarely advertise in the usual media, it can be hard to know when and where they are playing. A database of acts, venues, and shows with a Web front end would help the situation immensely. It would benefit the acts, the venues, and the fans.

SCOPE

The database will track acts and the venues where they play. It will list the dates, times, and restrictions for shows. It will list where tickets can be purchased for each show. Customers can sign up to follow acts and receive notification when those acts have a show. Venues will be allowed to update their show schedule. All other database updates will be done by the database administrator.

**Constraints**

1. Though the database will make ticket information available, it will not be used to sell or trade tickets.
2. The database will not serve as a place for acts to advertise and sell their music, though it can contain a link to an act’s Web page.
3. The database will only track local venues and shows. It will not list all the shows an act schedules outside the local area.

OBJECTIVES

* To make it easier to locate local shows and venues
* To allow a user to follow an act’s shows in the local area

TASKS AND TIMELINE

1. **Gathering Data:** This task will consist of a number of interviews, questionnaires, and observations. Time allotted: 3 weeks.

**Deliverable:** A list of scheduled interviews and observations, text of the questionnaires.

1. **Analyzing Data:** The data gathered will be analyzed to determine business rules and preliminary data modeling. Time allotted: 2 weeks.

**Deliverable:** List of business rules to be reviewed, basic entities and attributes.

1. **Normalization:** The data model will be completed with entities and relationships normalized. Time allotted: 1 week.

**Deliverables**: Entity relation diagram for review.

1. **Building the Physical Database:** The data model will be translated to the relational database management system. Tables, columns with specific data types, and relational and other constraints created. Time allotted: 3 days.

**Deliverables:** The schema of the database for review.

1. **Testing and Security:** Sample data will be entered and each of the business rules and requirements will be tested. General database security and security related to business rules will also be tested. Time allotted: 3 weeks.

**Deliverables**: Documented test results.

1. **Database Completion and Installation:** Final changes and corrections are made. Sample data will be removed and the database installed on a server. Final testing for server access and connections. Time allotted: 2 weeks.

**Deliverables:** The working database.

**Suggested Rubric for the Scenarios:**

|  |  |  |
| --- | --- | --- |
| **Poor** | **OK** | **Good** |
| Only one or two topics. Topics not relevant. Incomplete or sketchy statement of work, no objectives, no or sketchy timeline, no deliverables. | At least three relevant topics;  decent history and scope. One or two objectives. Some attempt at a timeline with some deliverables. | At least three relevant topics. Good statement of work and scope. Good objectives. Timeline with deliverables. |