



TAKING THE MYSTERY OUT OF YOUR DATABASE

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BY FRED ODE

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As the chief information officer for Lighthouse Electric, Inc., in Canonsburg, PA, Ron Felix had a problem. His accounting and job costing software worked just fine for day-to-day data entry and even produced a fair amount of standard reports. But as the business grew, the tool just couldn't keep up. While the reports showed a clear overview of the company's current status, they didn't allow him to drill down to the level of detail needed to analyze the future of their projects. "So many times I get unique requirements for a report, and I had to get the information quickly. We needed to produce different reports every day," Felix said.

In today's competitive economy, having detailed information at your fingertips is essential to your company's success. You must be able to make decisions and projections based on timely, accurate and detailed information. The good news, as Felix learned, is that the current relational database technology provides a secure environment for storing large amounts of data and offers powerful tools to retrieve just the data you need when you need it. Felix led his company's switch from software based on a flat-file storage to one based on Microsoft SQL Server. Finding the exact data the company needs at any given time is no longer a problem.

A relational database allows Felix quick access to information because of the structure in which the data is stored. Broadly speaking, there are two types of databases—flat-file and relational. To simplify the definitions of each, a flat-file database typically uses text-type files that simply list long strings of text and numbers, often separated by commas or tabs. Think of this as a document typed up in a word processor. In a relational database, different types of data are stored in different tables, and relationships between tables are easily defined. A table is more like a spreadsheet. Each column represents a different category of information, and the values in a row are related.

Consider a system to record the jobs you've done for a customer. In a flat-file database, each job, its customer and related information might be stored as one line in a text file. In a relational database, however, there might be one table listing all jobs and their information. There may be "columns" for job number, job name, job address and customer number. Another table would list the customer information, including the customer number. The customer number, which appears in both tables, provides a link, or "join," between rows in the two tables. While this difference may seem minor on the surface, relational databases offer many advantages.



UNIQUE DATA COMBINATIONS

Storing data in separate tables linked by key information allows you to build reports quickly and with more variety. As data gets more complex, the relationships between the tables can become more complex, something that cannot be easily accomplished in a flat-file system.

Recently, Felix received a request for a list of employees that lived near a particular job site. In his old, flat-file system that would not be possible. There was just no way to get at the data to define the relationship between the employee's address and the job address. With a relational database, however, Felix could easily create a list of employees based on their location.

THIRD-PARTY TOOLS

Relational databases are designed to allow querying of the data for precise information. As a result, a multitude of tools for accessing data have been created. Microsoft SQL Server works particularly well with other Microsoft products such as Excel. Using a wizard, Excel users can easily select data from a SQL Server database and populate a spreadsheet.

Other tools such as Seagate Crystal Reports are more robust, offering even more flexibility but with a higher learning curve. Says Joe Bruno, vice-president of the Ohio Crystal User's Group, "A savvy user can pick up Crystal and understand it in eight hours or so. Once you know how to get at the data in the database and understand SQL queries, building and formatting reports is a snap."

SECURITY

Because flat-file databases often use simple text files, they may be accessible through word processors. If someone can find the file on your network, they have access to your data. High-end relational databases, on the other hand, usually have built-in security that hides the data from those without an ID and password. Furthermore, the security is customizable, so you may allow access only to specific data or give permission to view but not modify it.

DATA INTEGRITY

In addition to security from intruders, relational databases have built-in tools to prevent corruption of data. Because relational databases allow complex relationships between tables, data usually isn't duplicated across multiple tables. However, since those relationships are often not possible in flat-file systems, programmers must duplicate data from one flat file to another—and that inevitably leads to inefficiency and inaccuracies. Felix recalls the maintenance and regular rebuilding of files required on his old flat-file system. "SQL Server, on the other hand," says Felix, "just runs. It's virtually maintenance-free."

Powerful reporting, security and data integrity are fundamental advantages of relational databases, but the real benefit lies in what the information offers your company.

COMMON DATABASE TERMS

If you're looking at relational database technology, these terms are must-knows

Field: A specific category of data In the jobs table, the job number, the job name and the job status might each be a field.

Index: A feature used by database tools to make searching data faster. Basically, it tracks information entered in tables so that individual records can be found more easily.

Join: A connection between tables based on information that is the same in both tables. The ability to define many unique joins between data is an important advantage of relational databases.

Key: (Also known as "primary key") A field in a table that is used to uniquely identify each record in the table. The job number might be the key for the jobs table.

ODBC: Open DataBase Connectivity, a set of standards that allow databases to be accessed by other tools. For example, Microsoft SQL Server is ODBC-compliant and can therefore be accessed by other tools that follow ODBC standards.

Query: A statement, posed in a specific format, which accesses tables in a database and finds specific data. Users build queries to create needed reports.

Record: A collection of data for one specific object in a table. If you think of a table as a spreadsheet, it represents one row in that table. In the jobs table, each job would be a record.

Rollback: A feature of many relational databases that allows users to discard any changes that were made to the data up to a certain point. It provides another level of data integrity because changes that were made incorrectly can be “undone.”

SQL: Structured Query Language, a computer programming language that allows users to work with relational databases. Queries built in SQL will retrieve specific data from a database for reporting, etc. Microsoft uses the SQL language (along with proprietary changes) to create and maintain Microsoft SQL Server databases.

Table: A collection of one type of related data. You may think of a table as a spreadsheet that contains categories of information (fields) for many rows of related objects (records). One or more tables make up a database.



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