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Set Your Data Free

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If you want your data to be free, a database is the way to emancipate it. Putting your information - whether it's sales contacts, client details or a collection of family birthdays and anniversaries - into a database will make it accessible and easy to use. Freed from the vagaries of inconsistent formatting, missing elements and hard-to-remember file locations, your data will be ready to serve. Tony Stevenson has the story

One of the best ways of organising data, on just about any subject or topic imaginable, is to use a database. Although a lot of people still think of a database as being little more than an electronic filing system, today's sophisticated database systems offer a range of functions and features that allow data to be manipulated, massaged, interrogated and communicated in myriad ways. Microsoft itself offers a range of databases and database-related products, with Microsoft Access and Microsoft SQL Server being the two that are most widely known and used.

Microsoft Access is suitable for solo-operated and small businesses as well as medium-sized companies. It can be used to build sophisticated database systems that can be customised to meet unique business requirements. **Microsoft SQL Server**, which is both a database and a data analysis package, is geared towards enterprises. Its major strength is that it can be used to turn any data that has been collected into business intelligence. And this intelligence, in turn, can then assist an enterprise in determining its strategic direction.

Two powerful features of a modern -day database are its interconnectivity and interactivity. While it is true that a database can exist in isolation, a database's true power really becomes evident when it is used in conjunction with other applications. In a typical Microsoft Office environment, there are many different ways in which the contents of an Access database can be shared and utilized. For example, it's possible to extract data from a database and then publish it in Microsoft Excel so that it is presented as an interactive worksheet. Alternatively, by using Microsoft FrontPage, the extracted data could be turned into a graph that is embedded into a Web page.

Structure of a database

Entire books are written each year about database technology - to cut a big topic down to size, let's take a brief look at the basic components that make up a typical Access database.

Tables

A database consists of one or more tables. Using a bibliographic database as an example, the sorts of tables that could be created include 'authors', 'books', 'libraries' and 'publishers'. Each of these tables then consists of a collection of fields. A field is an item that represents a unique piece of data. For instance, the authors table might contain the following fields: the author's first name; surname; date of birth; nationality; email address and so on. Relationships can then be established that link together the various tables making up a database. It is these relationships that allow the stored data to take on much more meaning than if the data was simply stored in an ordinary file.

Queries

There is little point in storing data if it can't be interrogated. Microsoft Access allows queries to be constructed that can then be run against the data stored in a database. Again using the bibliographic database as an example, a query could be formulated that requests that the following information be returned: give me a list of all the books published in 2002 by authors whose surname begins with the letter 'S' or 'T'. Queries can be run on an ad-hoc basis, that is, formulated and then run just the one time, or they can be stored (so that they are available to be run at any time in the future).

Reports

Often the same information from a database has to be produced on a regular basis. For example, with a database containing financial information, there may be a legal requirement to produce, and then permanently store, reports each month. It's also worth pointing out that Access reports do not necessarily have to be created in hard-copy format on paper. For instance, it is a straightforward procedure to instruct Access to publish a report snapshot to a Web page instead.

Forms



A form is a visual aid that has two purposes. First, it can be used to display data that's stored in a database. Second, it provides a convenient way of entering new data, or of updating data that has been previously stored in a database. The easiest way to think of an Access form is as a series of screen labels, textboxes, drop down combo boxes, checkboxes, buttons and radio buttons.

Macros

Access macros provide the capability to automate tasks that are carried out on a regular basis. For instance, it is possible to set up a macro that automatically emails an Access report to an individual (or to a group of people). Although a lot of people are confused by macros, a macro can be thought of as being a step (or a collection of steps) that is set up once, and which is then used regularly to automatically complete a specified task. Macros can be updated at any time to reflect changes in a business environment.

Modules

When there are more complicated tasks to carry out on the data stored in a database, a macro may not be powerful enough to achieve the desired outcome. The solution in that case is to take advantage of an Access module. A module is a mini-computer program. But unless you have done some programming before, it is likely that you will need some professional help to write modules that tackle anything other than basic tasks.

Getting started with databases

If you have never set up a database before, don't be concerned. Instead of building your first one totally from scratch, you can instead use the special wizard software that's provided in Microsoft Access to automatically complete each of the stages for you. For example, if you've got Microsoft Office XP Professional installed on your machine, the Database Wizard in Access 2002 can be deployed to create all the required tables, forms and reports at the one time.

Another way of getting started with databases is to investigate the Northwind sample database that is supplied with all versions of Access. The advantage of using this approach is that you can experiment with the sample database's forms, reports and other database objects to familiarise yourself with how it has all been put together. A bonus is that you can subsequently use the various sample database components as the basis for your own database projects.

Top five uses of databases

There is almost no limit as to how databases can be deployed, either for business purposes or for leisure. Here is a list of just some of the more common ways in which databases can be successfully used:

1. **Customer/employee/subscribers/(whoever) database** . Databases, and the tables they contain, represent one of the easiest ways to store, manipulate and exchange data. They are ideal in situations where a significant amount of information about a single entity, such as a customer, an employee, a magazine subscriber (or whoever), needs to be maintained.
2. **Database-driven Web sites** . One of the major difficulties with Web sites is keeping their content up to date. An effective way of dealing with that problem is to have the data that's displayed on the Web pages stored in an underlying database. When changes are subsequently made to the information in the database, those changes are automatically reflected on the Web site.
3. **Multiple format storage mechanism** . A significant advantage of a database table is that it can be used to store a diverse range of data types, for instance text (plain or rich text format); numbers; dates; pictures; sounds; clip art; memos; times; currency; hyperlinks etc.
4. **Interaction with other applications** . Once a database has been set up and populated with data, it is then possible for other applications to access it. For instance, data stored in an Access table can be copied to a Word document.
5. **Relationship building** . The world is naturally full of relationships, and relationships can be created using database technology too. For example, a bibliographic database can be set up that consists of two inter-related tables. The first table contains author details, while the second table stores information about the different books that the various authors have written. Having such a tabular relationship means that the details for each author only have to be stored once (and can be updated at a single location), even though an individual author may have written several books.

Things you can do with a database

As the amount of information that you're accumulating about a particular subject grows in size, it makes sense to organize and store that information in a database. By using an electronic medium, you are then in possession of additional powerful functions that make it easier to manage and manipulate the stored data. For instance:

- You can create a series of data entry forms that will allow new data to be added quickly to the database, and for existing data to be either updated or deleted efficiently. You can run queries against the data in the database to answer any questions about the information that you have collected.
- You can print off reports that present different perspectives on the data stored in the database.
- You can sort the data in the database into ascending or descending order.
- You can apply filters to the database data. For example, in a customer database, you can filter out only those

customers who live in a specific suburb or postcode range.

- You can secure your database by creating backup copies (and keeping one of these copies offsite from your business premises in case of a fire or a burglary).
- You can allow different people to access the contents of the database simultaneously.
- You can associate the contents of the database with your company's Web pages so that the data can be accessed from anywhere in the world.
- You can store sensitive data in a database, and then protect it from prying eyes by using a password or by encrypting its contents.

Case Study

Database to the rescue!

Like many other small business people, Adam Verbach only used his computer for word processing and spreadsheet calculations, and occasionally for surfing the Web. In fact, because he only employed a handful of people in his window-cleaning business, he did his company books manually too. He had once tried using a computerised payroll and book-keeping package, but it was far too complex and wasn't particularly easy to use.

The real key to Adam's successful business was simple. It was the exercise book in which he recorded the details of every job that his firm carried out. In addition to the name, address and phone number of each client, plus the details of the work completed, there was another, very significant, snippet of data recorded there. It was a note to himself that indicated whether the windows should be cleaned again at some time in the future.

Men at work

Towards the end of a month (if he had the time or if business was slow), Adam would go through the entries in his exercise book looking for potential jobs for the coming month. However, he usually ignored the smaller domestic jobs because he figured that the return on them was not enough to bother about. And he often missed other jobs because he miscalculated the dates involved, or because it was difficult to decipher his own writing.

Adam's approach to business changed dramatically, however, when he had a chance encounter with an old school friend who was now a computer consultant. The consultant was aghast to find out that Adam had all his crucial business information recorded in a tatty-looking exercise book. Did Adam ever imagine, his friend asked him, what would happen if he lost the book? And why wasn't he making better use of the information that the exercise book contained?

A friend in need

With the help and advice of his friend, the information in the book was transformed into an Access database. After using the new system for a year, Adam's business had grown by 18 percent. It is important to note that no other changes were made to how the business operated.

The increase in business came about because the computerised system now offered Adam functionality that was either simply impossible, or too time-consuming, to achieve using his old manual approach.

In the last week of a month, Adam would run a report that showed which commercial clients had previously requested to be followed up in the coming month. Because the computer carried out the date calculations perfectly each time, he never missed an important job. He also ran a second report (around the same time of the month) that focused specifically on domestic clients. With this report, he could specify a parameter that was used to identify only those household jobs that paid above a certain limit, for example, \$80. He followed up these larger jobs by phoning the clients involved, and saved a substantial amount of time and money by ignoring any lower paid domestic jobs. However, whenever business went quiet, he had the option of lowering the threshold amount fed in via a parameter.

Knowledge is power

Thanks to a series of other reports that he could produce with a click or two of his mouse, Adam could now manage his business and his employees much more efficiently. For example, he had the capability to record more information about each job. This extra data included the number and names of the employees assigned to the job; the time it took to complete the job; whether or not any special equipment was required (for example, extra long ladders or a portable lift operated from the back of a truck); and the use of any unusual cleaning materials. His new scheduling reports allowed him to assign his workers so that similar jobs in the same neighbourhood were completed within days of each other. That also meant that any hiring fees for special equipment were reduced as he no longer needed to rehire the same equipment on different days. Finally, he now possessed figures that accurately showed him which of his workers were the most productive.

A bonus of setting up a computer system for his window cleaning business meant that the fear of losing his invaluable exercise book was now eliminated. He instructed his staff to always run a daily backup of his database, and he also made sure that a weekly backup was stored safely offsite at his home.

Adam then made a commitment to further computerise his business. Because he now had all of his customers' details securely stored in an Access database, the next stage was to build a Visual Basic interface that could process all the associated invoices. Until now, he or one of his staff would physically write out invoices and then reconcile their payments manually.

For more information

The best place to look for more information about databases is undoubtedly the Web. Here's a list of useful resources, sorted into alphabetical order, to get you started. The good news is that many of these sites themselves contain collections of links that, in turn, point you to even more online database resources:

Builder.com builder.com.com

Database Journal databasejournal.com

DataBased Advisor.Zone databasedadvisor.com

Databases (the About Network) databases.about.com/mbody.htm

dbazine.com: the online community for database issues and solutions <http://www.dbazine.com/>

ITtoolbox Knowledge Base for Database database.ittoolbox.com

Microsoft Access home page www.microsoft.com/office/access

Microsoft Access newsgroup news:comp.databases.ms-access

Microsoft Help and Support (The Knowledge Base Search) <http://support.microsoft.com/default.aspx>

Microsoft SQL Server home page www.microsoft.com/sql/default.asp

Microsoft SQL Server newsgroup news:comp.databases.ms-sqlserver

Search Database.com <http://searchdatabase.techtarget.com/>

SQL Server WorldWide Users Group (SSWUG) <http://www.sswug.org/>

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