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Computers in psychiatry

An introductory course

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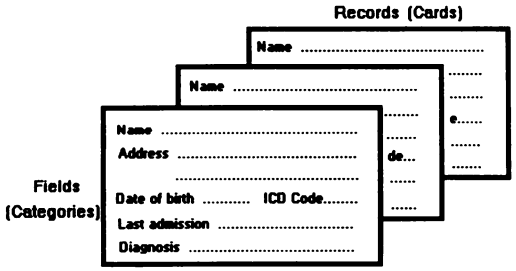
3. Databases, graphics and modems

Database

You have all used a database at some time or other, although perhaps not on a computer. For example, every time you look up someone's phone number in your address book, or look up a patient's registration number in the card index file in medical records, you are using a database. Information of any type is easier to sort and find if it is organised into categories.

A Simple Database



By convention, each complete entry in a database is called a **record** and each category within the records is called a **field**. Things become difficult, however, if you have several hundred, or even several hundred thousand records, each with several fields. And what if you are doing a study and want to keep track of a couple of hundred items of information (fields) about each patient? Unless your database is on computer you may find yourself needing a small room to store all your record cards.

Alleviating storage space, however, is only one of the advantages of a database application.

Searching. Instead of looking through the records one by one to find the record you are looking for, it is possible to search for a specific "key field" e.g. a patient's name, and have the whole record located and extracted. There may be more than one patient with that name, in which case more than one record will be extracted. You can therefore combine the searches for different fields to narrow the search criteria and reduce further the number of records extracted. (This is how Medline on CD ROM works).

Querying. A more specific form of searching which allows you to look through the database at the content of fields and find, for example, ages less than 65, or names beginning with 'A', or more than three admissions, or combinations of such criteria. Once established you can apply your **query** to the database and extract the records that you're looking for – either the whole records or just certain field data from each record located in the search e.g. you might only want to know the *names* of all the schizophrenics over age 25 in a certain area, not their entire records.

Your query can then be stored, and applied again in the future, either to the same database or to another one, without having to reconstruct it.

Sorting. The cards in a card index file are usually sorted using one of the fields e.g. surname, in order to make it easier to find records. You can re-sort the database records on your computer according to any of the fields (e.g. name, age, PANSS score, date of discharge) as easily as pressing a few buttons.

Mailmerge. This facility allows you to link your database and word processor to produce **form documents**. The most well known example of this is the form letter, which comprises a standard letter which is to go out to a large number of recipients, with only the name and address changed. A standard letter is drawn up which refers to fields in the database e.g.:

Happy Holidays Ltd
Resort Avenue
Touriston

To: <Title> <Firstname> <Lastname>
<Address1>
<Address2>
<Town>
<Postcode>

Dear <Firstname>

Haven't you ever sat at the window of your home in <Town> and wished you were somewhere hotter? (etc)

The word processor can then churn out a copy of the letter for each entry in the database, customising each letter as it goes. Conditions can also be added, for example different versions of the letter can go out to different towns.

Relational databases. The type of database we've looked at so far, which resembles a simple card index filing system, is often referred to as a **flat-file** database. This is to distinguish it from a relational database which is a more sophisticated tool, capable of juggling and manipulating several databases at once, facilitating cross referencing of information and the setting up of queries across more than one database.

Programmable databases. A common term for database packages which are flexible enough to incorporate their own programming language allowing you to completely customise the way the commands are presented and data entered. Useful if, for example, you want a specific database for a single unique purpose, e.g. medical records, and want the program to make it easy to enter the data by prompting the user for each bit of data it requires to complete a record.

Graphics and presentation packages

These are broadly similar packages, all able to create, manipulate and print out pictures.

Graphics packages are for creating computer-based art which may be used in posters, books or scientific papers etc. Images can be created using a range of drawing tools. Producing art in this way is more difficult than on paper, but altering and manipulating the image afterwards is obviously much easier. Images can also be pasted in from collections of **Clip Art**, or copied from books etc using a **page scanner** which resembles a small photocopier but copies the image to a software package rather than onto another sheet of paper.

Presentation packages are used to prepare images mainly for slide presentations and can therefore be used to combine, for example, a graph from your spreadsheet, some explanatory text and labels, and perhaps diagrams or pictures.

Modems

A modem attached to your PC, in conjunction with the requisite **communications software**, allows you to connect it to a standard telephone line and exchange data, programs or even just small talk with anyone else in the world who has a telephone, a PC and a modem. A modem simply converts the data the computer produces into a format suitable for transmission down a phone line, and vice versa at the other end.

Some modems are housed in a box which sits beside your PC on the desktop, others fit inside your system unit box, fitting into an empty **expansion slot**.

Once the modem is set up, using it is as easy as making a phone call, except that you use your PC to exchange data instead of talking. Essentially, this means that you can link up with someone else's PC and operate it from your keyboard, either to download data or request information from the growing number of **online** services.

Modems come in many different types which transfer data at varying speeds (**baud rates**), and the modem to which you are trying to communicate must be compatible with yours *and* be transmitting at the same baud rate.