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Computers in psychiatry

An introductory course

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5. The operating system

As we have previously mentioned, the computer itself is simply a collection of chips and circuit boards which are useless without software. Application software is what you do work with, i.e. your word processor or database etc, but the application software itself needs an operating system to run within. The operating system, however, needs something called a basic input/output system (BIOS) to operate. This is software but stored in ROM (Read Only Memory) on chips, and tells the computer what to do when it is first switched on.

Think of the whole thing like layers:

First layer. The computer itself cannot do anything alone.

Second layer. BIOS: controls very basic computer functions, e.g. when there is no disc in a disc drive, the error message that appears has come from BIOS directly.

Third layer. Operating system, usually DOS; allows application programs to interact with the BIOS and the hardware such as monitor, disc drives, printer etc.

Fourth layer. Application software: The level you interact with normally while working, and which uses DOS to do its work.

DOS – some key concepts

DOS is the most commonly used operating system on IBM compatible machines, and hence most of the software on the market runs in DOS. When you first switch on the machine, once the BIOS has set things up it loads DOS and leaves you with a little C:> in the top left of the screen. This is called the DOS prompt and is where you would enter your DOS commands.

The C:> actually refers to your hard disc, which DOS allocates the letter C by default. Similarly, when you change over to using your floppy disc drive, DOS refers to it (or strictly speaking, the disc inside it) as A:>. If you have more than one disc drive, it may be called by another letter e.g. B:>. To change to using a particular disc drive, you simply type its letter, (not forgetting the colon) and press the <enter> key.

Before DOS can use a disc for storing data, including your hard disc, the disc must be formatted. When DOS formats a disc it goes across it marking out tracks (like an LP record), which are divided into numbered sectors, so that when it stores something it can remember where it put it. It keeps tracks of where things are in a special file called the file allocation table (FAT).

We have previously seen that DOS stores all data and programs in the form of files, which are stored on a disc when the computer is switched off. Instead of scattering what can be hundreds of files across a disc willy-nilly, DOS allows you and it to find them more easily by allowing them to be collected together in directories. Think of a directory as a filing cabinet in which, instead of having all your files strewn across your office floor, you collect together all your word processing files in one drawer, all your spreadsheet files in another, and so on. Within the filing cabinet drawers you can have sub-directories dividing, for example, your word processing files further into correspondence, papers, teaching material, etc. The main directory on each disc is called the root directory. This brings us to your first DOS command!

"DIR" displays a list of all the files and sub-directories in the current directory. There may be too many to fit on one screen, so there are two suffixes (or "switches") which can be added to the end. DIR/P stops the screen scrolling one screenful at a time to give you time to read it. DIR/W displays the directory listing in several columns, increasing the chance of it all fitting on one screen.

Many of the other commands rely on you knowing how DOS names files, so let's review that. Files are named with a prefix, a dot, and a suffix. The prefix can be up to eight characters long and there are certain characters which are not allowed to be used in filenames. A prefix alone will suffice for the naming of a file but a suffix, which if present must be separated from the prefix by a dot, can be used to name files in a way which gives clues to their origin (e.g. doc for a word processor file). The suffix can be up to three

characters long. Hence the following are all valid filenames:

FILENAME.DOC
COMP5.DOC
READ.ME
DOUG

Many DOS commands allow you to use wild cards to copy or delete a group of files. A question mark can stand for any character in a file name, and an asterisk can stand for any suffix or any prefix. Hence:

*.DOC stands for "all files ending in.DOC"
*.*stands for "all files"
A??????.* stands for "all files beginning with A"

Besides specifying the name of a file, you can tell DOS what drive and directory in which to find it by specifying its path. For example, a file specified as **C:/AUTOEXEC.BAT** will be found on the root directory of drive C, and a file specified as **A:/WORD/COMP5.DOC** will be found in the "word" Sub-directory of the current floppy disc in drive A.

Some examples of DOS commands

"**MD**" or "make directory" will create a directory or sub-directory on a disc, while "**CD**" takes you into a particular directory. For example: **CD/WORD** changes the current directory and takes you into the directory called "word". **MD/WORD/LETTERS** creates a sub-directory called "letters" within the "word" directory. You could then copy all your correspondence files into it and keep them separate. "**FORMAT**" is the command you must use to prepare a disc for use by DOS by putting onto it the tracks and sector information it needs. If you format a disc which already has data on it all that data will be permanently erased. This may sometimes be desirable, but people have been known to format their hard disc by mistake, which could be disastrous if you have not kept "backup" copies of all your work. FORMAT A: will therefore format a floppy disc in drive A.

"COPY" is used to copy files from one disc or directory to another. The structure of this command is: **copy (name and path of file to be copied) (destination)**, for example: **COPY C:/WORD/COMP5.DOC A:/TEACHING** which copies the file called "comp5.doc" from the "word" directory of the hard disc to a directory called "teaching" on the floppy disc. Remember that wild cards (* and ?) could be used to copy more than one file with a single command.

There are two variations of this command: "**XCOPY**" copies all files and sub-directories from one disc to another. "**Diskcopy**" makes a copy of a disc in a particular drive, formatting the destination disc as it does so.

"**DEL**" deletes a file, so it is better to specify its exact path to avoid errors. **DEL C:/WORD/COMP5.DOC** deletes that particular file. **DEL C:/*.*** deletes all files on the root directory of drive C:. (As a safeguard, DOS asks you if you *really* want to do this before it will continue)

The graphical user interface

From the outset, Apple have set out to make their "Macintosh" computers easier and more intuitive to use. The way this has been done is to do away altogether with the text/command based interface which DOS presents, and replace it instead with a Graphical User Interface in which programs and files and certain functions like copying and deleting are represented on the screen by little pictures (Icons) and commands given by means of a mouse which is used either to manipulate the icons, or to select commands from a pull-down menu. For example, to delete a file you would "grab" the little picture of a disc which represents it and "drop" it into a little picture of a dustbin (or "trashcan"). The computer interprets your wishes from this rather facile little action and deletes the file.

The other advantage of a GUI is that all the applications which run within it have a consistent look about them, and share the same methods of accessing commands, unlike DOS where each application has its own set of rules on how to get it to perform.

DOS now has its own GUI called Windows 3.0 which allows you to give commands with the mouse in much the same way as the Apple Mac does. Applications which run within Windows 3.0 are springing up left, right and centre at present, and share the advantages of consistent command structures and seamless integration between applications. It is not an operating system, however, and underneath its user-friendly face you will find that your mouse-driven commands are being translated by Windows 3.0 into good old DOS instructions.

Multitasking

Multitasking describes the newer processors' ability to run more than one application at the same time, which facilitates procedures such as copying and pasting between applications. Apple Macintoshs do it with ease, as do the newer operating systems being developed for IBM Compatible machines. DOS cannot do it at all, although Windows 3.0 pretends to.