Not only computing – also art

JOHN LANSDOWN

What's in a word?

When we design interactive systems, it's surprising how often we assume that the command words we incorporate will be as readily comprehensible to others as they are to ourselves. Unfortunately, though, things don't happen that way and new users frequently have considerable difficulty in relating our command words to the tasks in hand. They complain about the 'unnaturalness' of the terms we use. Little published work, however, seems to have been done to determine how much this factor interferes with the use of the system or makes it harder to use or to learn when compared with a system which tries to employ more 'natural' commands.

An extremely interesting study on this topic was detailed in the July 1983 issue of the *Communications of the ACM* by T. K. Landauer, K. M. Galotti and S. Hartwell of Bell Laboratories. They carried out a series of tests on novice users of a text-editing system, namely, Bell Lab's UNIX editing utility called, ED.

There are basically five text-editing tasks:

- putting in text (inserting);
- removing text (deleting);
- putting new text in place of old (replacing);
- changing location of text (moving);
- interchanging locations of text (transposing).

In ED, common computing terms such as substitute, append, change, delete and insert are used to perform these tasks. Slight differences in the use occur depending on what type of text element (character, word, line or paragraph) is being dealt with. Thus, in ED, we 'substitute' a character, word or combination of words, but we 'append' or 'insert' a line or paragraph.

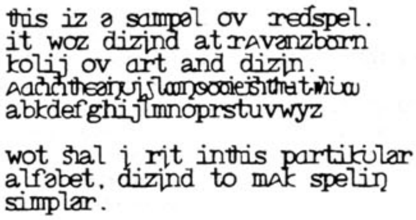

Figure 2

Skilled and trainee typists, who were the participants in the tests, were asked to provide their own names for these editing tasks. Not surprisingly, a large variety of different words were suggested (indeed, in no case, did more than about a third of the participants choose the same word!). In only one case was an ED word their first choice. This was the use of 'insert' to mean putting in a word. In virtually all the other cases, there were at least two more words used more frequently than the equivalent ED word.

When all the figures are boiled down, however, the average probability that any two new users would use the same descriptive word for a particular text correction task is only 0.08. Furthermore, individuals are not self-consistent either. On the basis of this study, there is only a 34 per cent probability that a person would use the same word to describe what we in computing would regard as essentially the same editing task - like inserting blanks, characters, words or lines into text. It is to be noted that people unfamiliar with computing treat blanks and spaces differently to other characters - indeed, they don't see them as characters at all - a fact that I had noticed in empirical observation. Thus, if nothing else, it is essential that attention of new users is drawn to the point that computers treat blanks and spaces as characters. Insofar as there was any agreement in the naming, it appears that the preferred words for editing are:

Add for insert
Omit for delete
Change for replace
Put for move
Switch for transpose

The second part of the study was to see whether the use of unfamiliar or 'unnatural' words actually affects the performance of interaction by new users. In this case, a simplified editor was created which performed only the insert, delete and replace tasks. For these, three commands needed to be learned together with three others to assist in running the system. Again secretaries and trainee typists were the participants in the tests.

The surprising outcome of this part of the study is that the actual words used seem not to have a very significant effect on performance even when the meaningful words 'omit', 'add' and 'change' are replaced by words which, in the context, are nonsensical, such as 'allege', 'cipher' and 'deliberate'. Of course, these tests were carried out using a very small set of commands: different results might arise if a full set were used.

The authors comment that, when choosing command names, it is probably more important that they be precise than they be familiar and that it might be better to choose words which are relatively infrequently used but are recognised as having appropriate meanings. They conclude by saying that rational design of commands needs a deeper understanding than is captured in the slogan 'make the language natural'.

The fount of all knowledge

An advantage of having computers in Graphics Arts departments of art

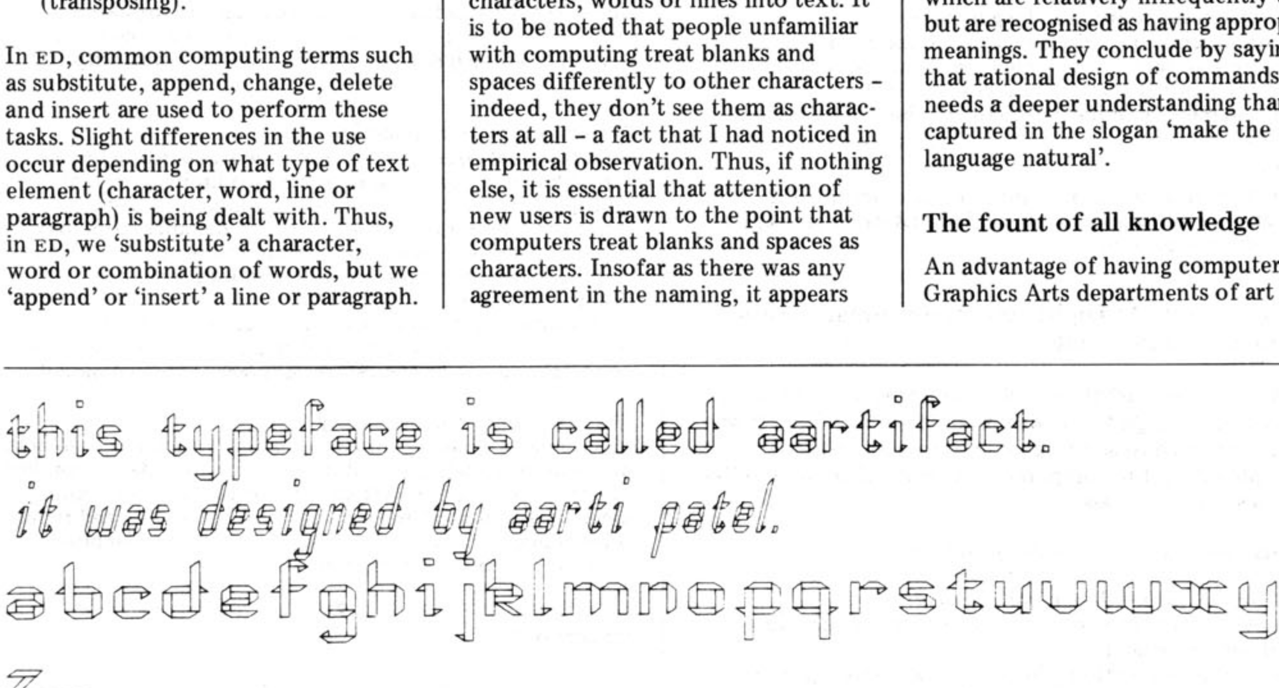

Figure 1

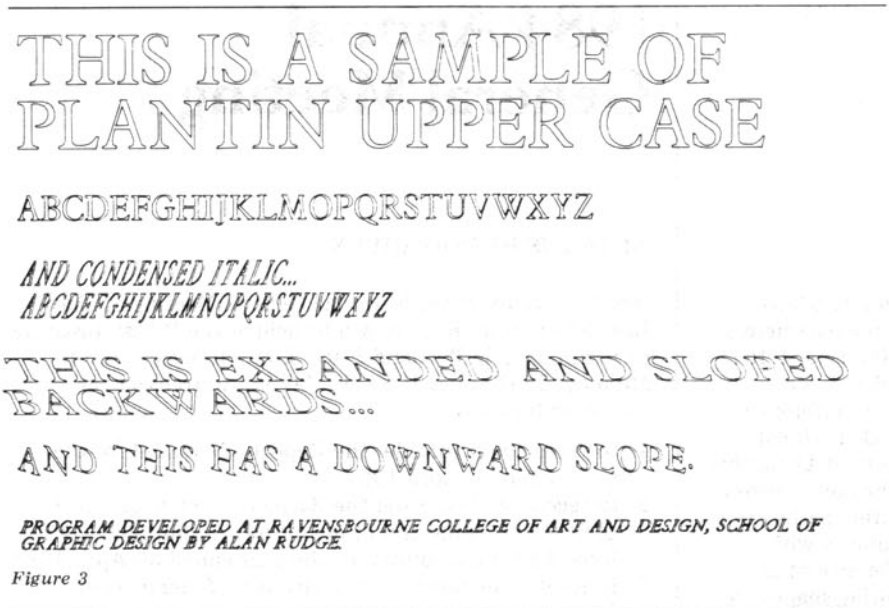

Figure 3

schools is that they help students and staff experiment with such things as letter forms and alphabets in ways which might be too tedious and time-consuming to do by manual means. My colleague, Alan Rudge, for example teaches part-time at the Ravensbourne College of Art and Design, and has developed a program to ease the design and manipulation of character fonts. (Figures 1 and 2).

His program was originally written for an Apple II computer using a joystick for input and a pen-plotter for output. In order to overcome some of the limitations of using a joystick, any characters created by that version had to be related to a grid. The current version of the program runs on a BBC model B micro and uses a digitising tablet to allow the freehand tracing of characters.

Once designed, the characters are stored in a compressed format so that the whole set can be held in RAM. This enables programs using the fonts both to run faster and to be available to cassette-based machines.

At the output stage, it is possible to alter the size and general appearance of the characters (Figure 3). This is done by setting parameters to control such things as:

- height (with a negative value producing upside-down characters)
- width/height ratio (with a negative value producing characters reversed left to right)
- spacing of characters and lines
- offset at top of character (for producing italic or backward slopes)
- drop at left of character.

Alan is planning future enhancements to include kerning (where the spacing of letters is determined dynamically so as to allow the overlapping of letters in combinations such as 'AW' or 'To') and perspective distortion of the letters.

Like many departments in art colleges, Ravensbourne School of Graphic Design tries to give its students a background education in relevant computer applications but has limited hardware resources. Until recently, the hardware comprised three BBC model B computers each with Calcomp 2000 digitising tablets and dual floppy disc drives, together with two Sirius I computers used for word processing and photo-typesetting. Lately, delivery has been taken of a Sirius II with 10MB fixed disc and a 15-inch Calcomp digitising tablet, all to be connected to an IO Research Pluto board with Pallette. This, together with Alan's new software, should allow students to make further strides in the application of computers to their areas of interest.

I didn't know you cared

Many thanks to all who let me know that they are 'out there'. I have not yet had chance to deal with all your letters but will do so as soon as I can.

Increasing the Society's visibility

It has been announced that the British Computer Society has been granted a Royal Charter which will serve to emphasise the Society's role in promoting the science and technology of computing for the benefit of the public - by which is meant for the benefit of those engaged in other professions as well as the proverbial man (or woman) in the street. Unfortunately, too many people working outside the immediate environs of the computing industry know little or nothing about The British Computer Society and, with this in mind, the Society has increased the extent of its representation at both trade and public exhibitions in an attempt to broaden its visibility and, to support this activity, the Headquarters organisation desperately needs more voluntary help from members.

Two contrasting examples of events at which the Society has recently had a presence for the first time are the London DEXPO '84 exhibition (in conjunction with the Expert Systems group), which was associated with a conference aimed at the users of a particular manufacturer's products, and the Dorset Business Computer Fair in Poole which provided an opportunity for businessmen to view the equipment currently available in an area not generally well served by this type of event. Both these shows proved successful from the Society's point of view, albeit in different ways, and undoubtedly brought the activities of the British Computer Society to the attention of thousands of people.

The Society will maintain its high profile by exhibiting at the Personal Computer World Show to be held in London on 19-23 September 1984. This show is the largest of its type in the UK and, aimed exclusively at the microcomputer market, is of interest to all users in business and the home. The show is now in its seventh year and has been moved to Olympia 2 since it has outgrown the Barbican Centre. Any member prepared to assist on the BCS stand (at the PCW show or at any similar event) is urged to contact Neil Truby, Information Officer, The British Computer Society, 13 Mansfield Street, London W1M OBP (01-637 0471).

Thank you.

D. W. HARDING
Secretary-General