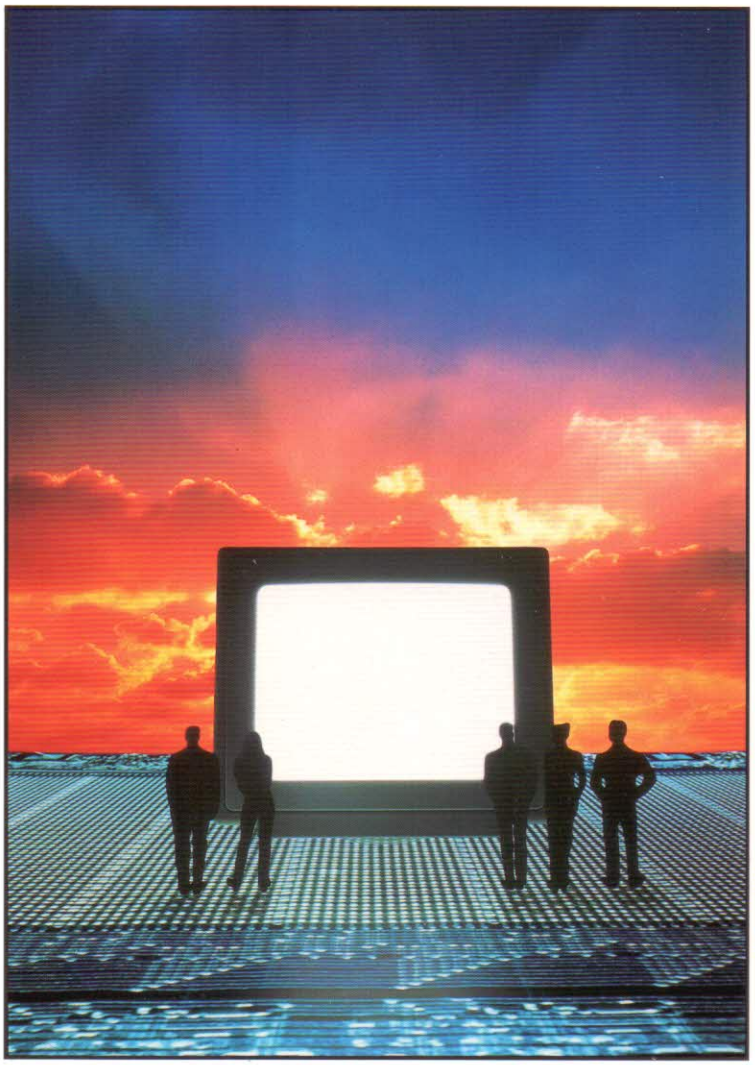
EUROPEAN PROJECT ON

ACCESS TO GRAPHICAL USER INTERFACES BY BLIND PEOPLE



By **John Gill**

TIDE (*Technology Initiative for Disabled and Elderly people)* is a European Community R&D initiative in the field of rehabilitation technology. Rehabilitation is defined according to the United Nations Assembly as "a goal oriented and time limited process aimed at enabling an impaired person to reach optimum mental, physical and/or social functional level, thus providing her or him with the tools to change her or his life. It can involve measures intended to compensate for a loss of functional limitation (for example by technical aids) and other measures intended to facilitate social adjustment or readjustment".

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INTRODUCTION

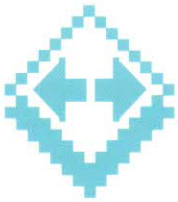
The increasing use of graphical user interfaces (GUIs) by designers of computer software poses problems for blind persons. The crux of the problem is that until the advent of GUIs computer interfaces were based on text, which can be presented to users as speech, as refreshable braille or in an enlarged visual format. GUIs are based not on text, but on a graphical screen display which can have text embedded in it, although such text may not be stored in text form. This results in a number of problems for visually disabled users, both for input to the computer and output from the computer.

The Commission of the European Communities has funded a project to examine these problems. The project "Textual and Graphical User Interfaces for Blind People (GUIB)" is described in this booklet.

A blind employee needs to perform at a speed not too dissimilar to equivalent sighted employees. Therefore it is necessary to develop solutions which are not only at an affordable price but can be used by a blind person at a reasonable speed with a modest level of extra training. It is important that blind persons can access the same computer systems and applications as their sighted colleagues, so that they can be fully integrated in a professional environment.

Evidence of the growing popularity and importance of GUIs can be gauged from the sales of MicroSoft's Windows, currently one of the most widely used GUIs. MicroSoft has sold over 10 million copies and expects sales to continue at over 10 million copies per year. It is also notable that a number of large employers, including government departments and private companies, are adopting Windows as their software standard. The Apple Macintosh interface and X-Windows which runs under Unix are other examples of GUIs which have been influential in changing the face of computing.

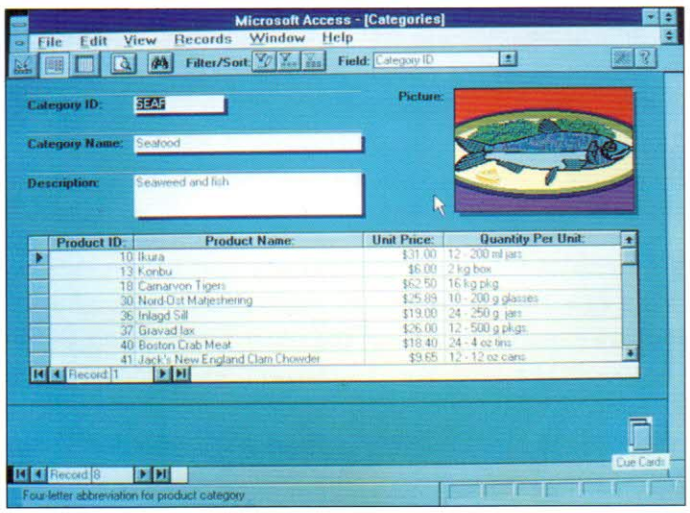
Viable solutions for a blind user are likely to include a mixture of audio and tactual output. Text can be represented by speech or braille, but there is also a need for non-visual pointing systems.



ADVANTAGES AND DISADVANTAGES OF GUI'S

On the input side, one of the great advantages of GUIs for sighted users is that interaction with the computer is based on what is known as direct manipulation. Instead of typing in lengthy and difficult to remember commands, users manipulate graphical objects on the screen; for example they click on menu items or buttons, or drag graphical objects around the screen. These actions indicate commands to the computer. Clicking and dragging are usually performed with a mouse. This style of interaction is very visual and requires good hand and eye co-ordination. Alternate methods of interaction need to be developed for blind users.

On the output side, there is the problem of how to present graphical information to blind users. To be able to use an application such as a word processor with a GUI, users must have access to both the interface and the contents of the application. The interface will consist of graphical objects such as buttons and menus and text associated with these graphical objects, for example titles on menus and labels on buttons. Within the application there may be text, but also graphics such as diagrams which may have a structure which could be converted to text, and pictures which do not have a clear non-visual structure.



An example of a GUI

Of these different graphical elements, what can or should be converted into text form so it can be presented as speech or braille, and what can or should be presented to the user directly in a graphical form and how can that be achieved? Another problem on the output side is that a GUI can present much more information simultaneously than a text-based interface, displaying many small icons, buttons and pull-down menus on the screen at the same time.

Users are expected to scan all this information visually and concentrate on the aspects which are currently relevant to them. In addition, users can have several applications running simultaneously in different areas of the screen which are indicated by different windows. How can visually disabled users deal with these large amounts of simultaneous information when the current access technology (speech or braille) presents information in a highly serial form?