

THE BLIT AND THE USER'S PERCEPTION OF THE COMPUTER

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ABSTRACT

The Blit terminal (a research ancestor of the Teletype DMD 5620) is fairly typical of current bitmap graphics displays in its use of graphical input and output to provide a more convenient computing environment. But the Blit has one important distinction: it permits convenient control of asynchronous processes. Also, the user interface on the Blit is unusually spare: it provides a few powerful, expressive operators rather than a large number of features. Nonetheless, the Blit is as comfortable to a beginner as it is helpful to an experienced programmer and Blit user. This anecdotal talk will show how asynchronous processes can be used to comfortably extract more "user bandwidth" from the machine, how a simple user interface is preferable to a more feature-ridden one, and how the underlying structure of its user interface is more important than its superficial features such as menus and icons.

EXTENDED ABSTRACT

The Blit user interface is Spartan. The basic windowing system uses one finger (that is, one of three mouse buttons) for pointing, and the other two to present small menus for text manipulation and window operations. Surprisingly, the terminal is popular for novices and experts alike, although it was designed with expert programmers in mind. This success is attributed to a few basic principles: the entire system is built around the idea of multiplexed independent virtual terminals (in contradistinction to windows); the operations require little user activity (e.g. the number of button hits to perform some action is kept to a minimum); and the operations have been selected and designed to provide as featureless an interface as possible.

The user interface is made of several layers. The innermost is structural: the software is based on the idea of multiplexed virtual terminals, each of which is, to both program and user, identical to a physical terminal.

This multiplexing is fundamental. Perhaps the single most important thing we have learned from the Blit is that it is possible, even natural, to have several ongoing

active processes running on a computer, provided the user interface makes it easy to control them. In other words, it's easy to think about several things at once, with a little help. But it's worth emphasizing that this multiplexing is provided not so much by any explicit commands as by what those commands make possible: convenient control of asynchronous activity.

The next layer is psychological: one mouse button, that under the index finger, is always used for pointing. This action is so natural that it rapidly becomes unconscious behaviour. There are many anecdotes of early users naturally pointing at things on the screen (such as text), unconsciously expecting something to happen. Indeed, much of the recent work on the Blit has capitalized on this natural tendency.

The outer layer is what is more traditionally thought of as the 'user interface.' Defined by menus, icons, and other faddish constructs, this level provides the command set -- the verbs and objects -- of the user interface. But it is relatively uninteresting; there is little psychological difference between typing a short command and selecting it from the menu, at

least compared with the difference between giving a program directions to some word on the screen and simply pointing to it. There are certainly principles of efficiency and simplicity in choosing the actions to place in a menu, but common sense is adequate guidance. It is therefore interesting that the excitement about bitmap terminals these days focuses on the appeal of menus and icons, while the important advances that such devices provide are more elementary and natural, to novices and experts alike.