

VIEWPOINT

One of the most common terms of praise for an interface is to say that it is "intuitive" (the word should have been "intuitable" but we will bow to convention). Yet the Human Computer Interaction (HCI) literature rarely mentions the word, and for good reason. This viewpoint attempts to clarify the meaning of "intuitive" for non-HCI specialists.

The phrase "this interface feature is intuitive" leaves the impression that the interface works the way the user does, that normal human "intuition" suffices to use it, that neither training nor rational thought is necessary, and that it will be "natural." We are said to "intuit" a concept when we seem to suddenly understand it without any apparent effort or previous exposure to the idea. In common parlance, intuition has the additional flavor of a nearly supernatural ability humans possess in varying degrees. Given these connotations, it is as uncomfortable a term in formal HCI studies as it is a common one in nontechnical publications and in informal conversation about interfaces.

As I learned from a talk given by Martin Marshall in Palo Alto (at the May 1994 BayCHI meeting), a number of commercial magazine-related "usability" labs that rate software qualities give 50% of their weighting to User Satisfaction, 30% to Productivity, and 20% to Intuitiveness. "Intuitiveness" in this context is considered to be a function of percentage of tasks completed and the number of help references made while in the very early stages of using a product.

There are occasional hints of the meaning of "intuitive" in the literature. Stephen Oppenheimer, of the

INTUITIVE EQUALS FAMILIAR



review board of *InfoWorld*, noted in his review of Mathcad 4.0 that "The editing tools become increasingly intuitive over time." This use of the term is uncharacteristic in that immediacy is normally an important aspect of "intuition." In the usual sense of the word, something cannot become intuitive over time, it is either intuitive or it is not. What Oppenheimer is discussing is not intuition, but learning. When the tools had been learned, he is saying, they became intuitive. This is a strong clue as to the meaning of "intuitive."



Jef Raskin

Many claims of intuitiveness, when examined, fail. It has been claimed that the use of a computer's mouse is intuitive. Yet it is far from that. In one of the Star Trek series of science fiction movies, the space ship's engineer has been brought back into our time, where he walks up to a Macintosh. He picks up the mouse, bringing it to his mouth as if it were a microphone, and says: "Computer . . ." The audience laughs at his mistake.

But that is just the whimsy of a screenwriter. Or is it? I performed a deliberate experiment some years ago using one of the early Apple Macintosh computers. I loaded a children's program, *The Manhole*, where user interaction is strictly (and cleverly) limited to "clicking" on various places on an image. Clicking consists of moving the cursor to some location on the screen by moving the mouse on a surface and momentarily pressing the only button on the mouse. Clicking on certain places yields a new screen. This cold description does not express the delight most people find in running the *Manhole* program, but that is not relevant here.

My subject was an intelligent, computer-literate, university-trained teacher visiting from Finland who had not seen a mouse or any advertising or literature about it. With the program running, I pointed to the mouse, said it was "a mouse," and that one used it to operate the program. Her first act was to lift the mouse and move it about in the air. She discovered the ball on the bottom, held the mouse upside down, and proceeded to turn the ball. However, in this position the ball is not riding on the position pick-offs and it does nothing. After shaking it, and

making a number of other attempts at finding a way to use it, she gave up and asked me how it worked. She had never seen anything where you moved the whole object rather than some part of it (like the joysticks she had previously used with computers): it was not intuitive. She also did not intuit that the large raised area on top was a button.

But once I pointed out that the cursor moved when the mouse was moved on the desk's surface and that the raised area on top was a pressable button, she could immediately use the mouse without another word. The directional mapping of the mouse was "intuitive" because in this regard it operated the same as joysticks (to say nothing of pencils) with which she was familiar.

From this and other observations, and a reluctance to accept paranormal claims without repeatable demonstrations thereof, it is clear that a user interface feature is "intuitive" insofar as it resembles or is identical to something the user has already learned. In short, "intuitive" in this context is an almost exact synonym of "familiar."

Given this insight, the measure of intuitiveness used by the magazine usability labs is logical. The percentage of tasks completed increases with increasing intuitiveness since it simply means that the user is already at least partially trained with respect to the feature or set of features under test. Training tends to decrease the time required for task completion, especially at first. Similarly, the number of times the user has to reference help screens increases with decreasing intuitiveness, that is, decreasing familiarity. If the word "intuitive" is replaced by the more readily understood word "familiar" the criterion the magazines have established with respect to intuitiveness seems obvious.

The term "intuitive" is associated with approval when applied to an interface, but this association and magazines' rating systems raise the issue of the tension between improvement and familiarity. As an interface designer I am often asked to design a "better" interface to some product. Usually one can be designed such that, in terms of learning time, even-

tual speed of operation (productivity), decreased error rates, and ease of implementation is superior to competing or the client's own products.

Even where my proposals are seen as significant improvements, they are often rejected nonetheless on the grounds that they are not intuitive. It is a classic catch-22. The client wants something that is significantly superior to the competition. But if superior, it cannot be the same, so it must be different (typically the greater the improvement, the greater the difference). Therefore it cannot be intuitive, that is, familiar.

An extreme and amusing example of erroneously rejecting an interface on the grounds that it was unintuitive occurred when a division of IBM chose to evaluate an interface I helped develop. IBM sent two experienced computer engineers to do the test. They announced their method: they were to work alone with the product for a few hours with no manuals, no instruction, and no other information. We couldn't even attach the one-sentence sticker that was supposed to come on the product. It told people how to reach the help screens (the secret the engineers never discovered: you had to hold down the command activating key and press the key marked "help").

I watched them through a window. Two hours later, they hadn't succeeded at getting it to do much. They reported, for example, that they hadn't been able to "load" the editor. They attempted to find commands to activate the word processor, get a directory, read the help screens, and do other "familiar" operations. The product under test, however, did not have an operating system, there were no directories, and "loading" applications was neither necessary nor possible. They never found out that they were already in the editor (and the spreadsheet, the communications facility, and all other installed applications).

I had run into the same situation the first time I tried to use an IBM PC. I could type at the strange-looking prompt, but couldn't get it to do anything useful. The commands were totally unguessable to me. I suspect the two engineers find MS-DOS intuitive. It is rare that a new paradigm

can be introduced commercially: if Apple had not been a small company with the conviction it could overcome any obstacle, I would never have been able to convince management to support the Macintosh project. Even so, it was canceled more than once before becoming the company's leading product. I was often asked what now seems a very silly question, "Where is the Apple II compatibility?" and was told that the proposed Mac "doesn't work the way computers are supposed to." I hear the same refrains today when I try to introduce new interface ideas.

The present rating systems of the product magazines and the similar thinking of many users, managers, and marketers about products with significant human interface components serves to preserve the status quo, even when it can be shown that a feature that is completely familiar (intuitive) is deficient. This tendency makes it more difficult for major advances in human interfaces to achieve commercial realization. When I am able to present the argument given here that intuitive equals familiar, I find that decision makers are often more open to new interface ideas.

I suggest that we replace the word "intuitive" with the word "familiar" (or sometimes "old hat") in informal HCI discourse. HCI professionals might prefer another phrase: intuitive equals uses readily transferred existing skills.

It would read very differently—and more honestly—if magazine ratings made it clear that they were based, for example, 50% on user satisfaction, 30% on productivity, and 20% on familiarity. Note that user satisfaction and early productivity, (long-term productivity, though of great importance to users, is not tested) are strongly dependent on familiarity, so that the rating system is further flawed in not being built on a set of independent (orthogonal) bases: the three parameters tend to rise and fall together.

That quality of a new interface paradigm that is commonly titled "intuitive" may well turn out to be one of the worst qualities it can have. ■

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