BusinessWeek

See full size image on last page.

VIEWPOINT October 21, 2009, 11:39AM EST

The Mad Dash Toward Touch Technology

True innovators need to know as much about when, why, and how not to use trendy technology as when to use it

By Bill Buxton

Buried within the current mad scramble towards touch and multitouch technologies lies an important lesson in innovation: "God is in the details" (Ludwig Mies van der Rohe).

So while executives and marketers all seem to be saying, "It has to have touch," I am more inclined to say that anyone who describes a product as having a "touch interface" is likely unqualified to comment on the topic. The granularity of the description is just too coarse. Everything—including touch—is best for something and worst for something else. True innovators needs to know as much about when, why, and how not to use an otherwise trendy technology, as they do about when to use it. Let me explain.

The photo above shows four watches in my collection. On three of them (a, b, and c), the entire crystal is a touchscreen. Three of them (a, b, and d) have built-in calculators.

WHEN FAT FINGERS MEET SMALL TARGETS

Watch (a) is the Casio AT-550. Despite its conservative styling, it has some pretty amazing software. To put it into calculator mode, you push a button on the lower left side. To enter numbers or operators into the calculator, you just draw them on the crystal with your finger. So, for example, a downward stroke from 12 to 6 o'clock enters the digit one (1), whereas the same stroke followed by a horizontal stroke from 9 to 3 o'clock enters a plus (+) sign. The numbers appear in the main part of the LCD window, and the current operator as a kind of superscript, above them.

The whole screen is used for entering each character, thereby bringing the scale of the action well within the bounds of normal human finger motor control. Less obvious but just as important, the technique enables "heads up" data entry—the equivalent of touch typing. In other words, I can input numbers without diverting my gaze from you or the document from which I am copying a number.

Watch (b) is the Casio TC-50. To put it into calculator mode, you also push a button on the lower left side of the watch. In this case, however, a graphical representation of the familiar calculator numerical keypad appears on the watch face. To enter a number, you touch the desired digit on the virtual keypad. To enter an operator, you touch the appropriate icon
(÷, x, -, +) permanently marked just below the LCD at the bottom of the watch crystal. The design is intended to take advantage of your previous experience with calculators. However, while this all seems clear, it does little to make the calculator usable. The watch is a victim of what happens when fat fingers meet small targets—even when accompanied by high concentration. As for touch typing, forget it.

IMPORTANT PRODUCT LESSONS

Watch (c) is a Tissot Touch. While the crystal is touch-sensitive, this watch does not have a calculator. To activate the touchscreen you push and hold the watch stem for a couple of seconds. Different functions are

enabled by touching the crystal at particular places. For example, if you touch at the 6 o'clock digit, the hands of the watch align and point north, converting the watch into a compass.

Watch (d) is a third calculator watch, a Casio Data Bank 150. This one has a physical, mechanical keypad rather than a touchscreen. While the physical keys are small, they can be accurately used, but not without looking.

What I like about these watches is their power to teach us, using relatively simple existing products, important lessons about products that we might be dreaming about. Take watches (a), (b), and (c). Even though they are all just watches, and all use a touchscreen to gain access to their functionality, knowing how to use any one of them buys you pretty much nothing in terms of knowing how to use the other two. Even if you know how to use two of them, you still don't know how to use the third.

In fact, isn't it interesting to note that there is a closer affinity between the touch interface of (b) and the non-touch interface of (d) than between the two touch ones? In light of this, what in terms of user experience is conveyed by specifying that a product requires a touch interface? Very little. Yet how many of those insisting on a touch interface know about products such as these, much less the lessons that they have to teach?

TOUCH ISN'T NEW

As with almost any suddenly hot technology, touch and multitouch are decidedly not new. They are a textbook example of my notion of the "Long Nose of Innovation. " For example, multitouch was first discovered by researchers in the very early 1980s, before the first generally available PC using a mouse was commercially released. It has been gradually mined and refined ever since. The companies whose products have initiated the current buzz just happened to recognize the latent value of touch, and believe in it enough to take on the risk and investment required to effectively exploit its potential.

Significantly, these companies neither invented the underlying technology, nor were they the first companies to exploit it commercially. This is not a criticism, by the way, but rather a respectful commentary on the nature of design and innovation—one that counters the myth of the genius inventor, and gives appropriate recognition to those who laid the foundation that enabled this to happen.

UNDERSTAND THE LONG NOSE

Finally, consider the following: Casio released the AT-550 in 1984 for under $100. That's the same year that the first Macintosh was released. Working Moore's Law backward, that means that wonderful "heads up" character recognition was created using only one 131,072th of the computer power that would be found on an equivalently sized chip today. [Note: Now that it is 2013, another Moore's law has past, so double this number!]

There is a serious lesson here for those would-be innovators who, on seeing the great success of one company's use of some technology or another, scramble to adopt it in the hope that it will bring them a share of that wealth as well. Such behavior is more appropriate for lemmings than innovators.

Rather than marveling at what someone else is delivering today, and then trying to copy it, the true innovators are the ones who understand the long nose, and who know how to prospect below the surface for the insights and understanding that will enable them to leap ahead of the competition, rather than follow them. God is in the details, and the details are sitting there, waiting to be picked up by anyone who has the wit to look for them.

Bill Buxton is Principal Scientist at Microsoft Research and the author of Sketching User Experiences: Getting the Design Right and the Right Design. Previously, he was a researcher at Xerox PARC, a professor at the University of Toronto, and Chief Scientist of Alias Research and SGI Inc.