

My life with tablet PCs

Eric Blair

12 February 2009

[D]o you know why books such as this are so important? Texture. The book has *pores*. It has features. This book can go under the microscope. You'd find life under the glass, streaming past in infinite profusion. The more pores, the more truthfully recorded details of life per square inch you can get on a sheet of paper. . . .

Bradbury [1953]

I'd say that the interest in tablet PCs re-emerged with the rollout of the Amazon Kindle (motto: "Starting the fire to burn all the books!"). For most media—i.e. music and movies—we've had cute devices that play back at your convenience for quite some time now. But text is remarkable, because reading is remarkable.

If you take a speed-reading class, they'll tell you that the way we read involves fixing at a point along the line, comprehending the neighborhood of text around that point, then stepping to the next fixation, and so on to the end of the line, until you drop back to the next line. And you're not just looking at pictures of faces, but distinguishing between I, i, l, and 1. So text is so much simpler than a movie, and yet displaying a novel in a manner that doesn't leave the reader cross-eyed was something of an issue.

Anyway, thanks to eInk, better-resolution screens, and cultural acceptance, it seems we've overcome that hurdle, and there are several devices out there that will display text in a manner that does not cause the viewer personal injury.

I don't use any of the latest crop, and this is my rationale, based on my experience using tablet PCs in various forms for a few years now.

The output side Like most of us in modern America, I use my computer to read things and listen to music—more-or-less hands-free consumption. I don't even have an MP3 player anymore, but just hook my ears to my laptop most of the day (with my telephone for MP3-playing backup). So having a gadget that lets me easily read text also makes a lot of sense.

¿What am I reading? I still think of myself as an academic, which means that my life is about PDFs. I've occasionally made the point to colleagues that we are in the full-time job of producing PDF documents, and there's a strong sideline within that of reading other people's PDFs as an input to production. If you have decent access to jstor.org, then you have several lifetimes' worth of PDFs to read.

The problem with the Kindle and family is that the screen is the size of a paperback, not a standard A4 or 8.5x11 piece of paper, and that means sheet-of-paper layout PDFs

are going to be impossible to read: you either have to view a minuscule portion of the page at a time, or zoom out until all the subscripts are entirely illegible. Screens have expanded somewhat, and the iPad boasts (!) a screen that is about 25cm diagonal, which is still a long way from the 35cm diagonal of the standard US piece of paper (for the Imperialists, that's 9.5 inches versus 13.9 inches).

Here's another fun fact: paper is taller than it is wide. In fact, every type of text is. As above, the miracle that is reading involves moving the eye in a series of left-to-right fixations. Not only do you read faster with fewer fixations per line, but you fatigue less. Designers have evidently known this for centuries, because text is always taller than it is wide. Newspapers are good speed-reading exercise because the narrow columns can be read by a novice in maybe two fixations, and by an expert in one. I am told that the ballpark of 75 characters across is best, but I'm not sure the extent to which this is a design rule and the extent to which this is Science.

Now check out your laptop screen: it's wider than it is tall, isn't it. It's the shape of paper, sideways. Great for watching movies, bad for writing or reading, unless you're OK with huge swaths of empty space on either side of the text. The reason for this, of course, is that the keyboard is wider than it is tall, because that's the physiology of our hands. Given the standard design of the laptop, where the screen and keyboard are married, the screen has to be suboptimal form. I guess the screen shape is great for watching movies.

The marriage of screen and keyboard creates other problems as well—check out the diagrams in entry #082.

We thus establish the conflict. In my entry #259, I talked about how miraculous the keyboard is, and how it allows us to do things with our hands that we can do with no other device. It is wider than it is tall, and it has lots of moving parts with enough heft to give you some physical feedback.

The ideal device for passive consumption of text is taller than it is wide, and is as light as possible.

It's a simple conflict, that has existed for as long as there's been a hinge holding keyboards and screens together. The news is that vendors are increasingly OK with jettisoning the keyboard entirely. That is, we used to have only gadgets that let us both produce and consume text efficiently—laptops—but are now able to buy more devices built solely around passive consumption.

Page and Janice My first tablet was from Motion Computing, a company that seems primarily oriented at selling specialized PCs to hospitals and the like, whose stuff sells in the secondary market (i.e. eBay) for maybe twenty percent of new retail. It is a true tablet: no keyboard. The screen is great, and is exactly the form I wanted. Once I worked out how to install Linux without a CD drive, that ran OK too. So reading PDFs was a total victory. I named it Page.

Now for the input problem. Input number one is the Wacom tablet that is the screen, i.e. the pen. The Wacom pen is is much smarter than you'd guess it to be: it's a transmitter. Behind the screen is a grid throwing out a magnetic field. When the pen enters the field, a current is induced in the pen, and the transmitter turns on and starts broadcasting its position. This is how your touch-to-the-pad ID cards work as well,

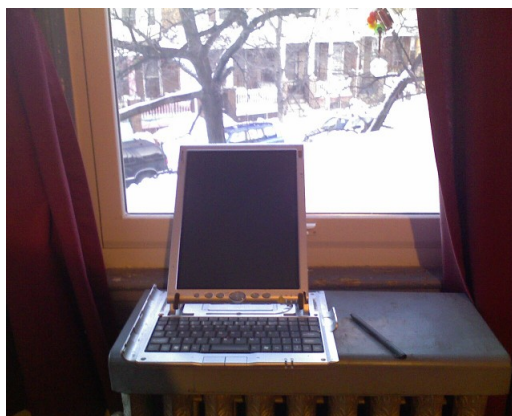


Figure 1: The cover is a keyboard and mount for the tablet, which is all very clever. This also demonstrates that I wrote this after being snowed in for days.

and even though you probably think the thing on the wall is reading your ID card, it's more like your ID card has just turned on and is sending to the wall.

When the tip is bent (which happens when you tap the screen), a resistor bends to produce a slightly stronger current, and the transmitter passes on that information. Visual artists like the pen because the tip is not just on or off, but senses a theoretically continuous range of pressures (I saw a manual that said the system only sends 255 pressures, which is more than enough for me).

And while I'm talking about visual artists, I could perhaps be throwing out a little paean to the plain old pen. It has different goals from the text-only keyboard, but for its intent it is still the only game in town. If I want to seriously produce non-text on a tablet PC, I'll need a pen of some sort.

The important part to Wacom's system for reading is that there doesn't need to be a grid of sensors on the screen. The current-generating net is behind the screen, the receivers are on a corner or two, and you aren't looking through a touch-sensitive layer to get to your pixels. A victory for reading PDFs.

So what can we text people do with the pen? I use Xournal for annotating PDFs and filling out bureaucratic forms. Handwriting recognition, via cellwriter is pretty good, and there's always the on-screen keyboard if you're drunk. But as above, none of these are a keyboard, and you're going two or three characters per second at your best.

The Motion Computing people put an external keyboard on the lid, which you can see in use in the diagram. It seemed like a design afterthought, though, and I plugged in a USB keyboard every chance I got. You can see that the lid is also a stand, which I learned is essential when I got a tablet that didn't have one.

I took a slip on the ice one day, and Page went with me, and she was never the same. So I got Janice, named for the Roman god who sees in both directions at once. Janice is what I take to be the standard configuration for tablets: a typical keyboard-over-screen setup, with a swivel screen that lets the screen face out on top of the keyboard. No

photo, because Janice looks so much like a standard laptop. She's from HP, and I paid circa \$250 for her on ebay.

Again, in face-up mode, we can rotate the screen to the correct taller-than-wide proportions. PDF reading can be a little less convenient with Janice, because she doesn't have a stand, and extended reading from a screen sitting flat on a table is annoying (and Motion Computing's screens are still much better for this than you'll get in most laptops or telephones). These things weigh several kilos and have to be held at the right angle, and that's fatigue after fifteen or twenty minutes. [I often work in the kitchen, so I've found that bags of flour work well as props.]

The built-in keyboard is not an option when in reading mode, though you can maybe plug in a USB keyboard if you have one on hand.

But this brings me to the key point of the essay: the machine is built for an easy-input mode, with the keyboard and touchpad where they should be; and an easy-reading mode, where input devices are hidden and the screen is correctly configured. There is no truly comfortable middle ground.

So ¿what do designers do? Janice's compromise is to have both modes available, and you pick the one you're in the mood for. The recent trend, characterized by e-book readers like the iPad, is toward giving you one and only on option: consumption mode.

When Page was my primary machine, every morning at a few of the places I worked, I would spend the first few minutes after arriving at an office scrounging around for a full keyboard to plug in. It was probably not the most professional start to the day, and some days I bombed out and had to use the afterthought lid keyboard. Really, we're stuck with a solution like one of the above, where the tablet is walking around at all times with a serviceable keyboard.

The producers of the modern ebook give up on the keyboard entirely. All the input you need is to point to things. If you want to type, there's a zero-feedback picture of a keyboard on the screen. That's the read-only model, and is exactly what you need if all you're doing is reading PDFs and listening to music.

The Apple thing I was rummaging through my email looking for something, and came across this:

Date: Fri, 26 Mar 2004 14:17:14 -0500

From: Ms AJ of Richmond, VA

To: B

> Are you gonna buy one of those tablet PCs?

I'm waiting for the rumors of a Mac tablet (which have been circulating for at least a year) to come true. I would so be in line for that. Especially if it came in red. Until then, I dream. I wonder if a Mac tablet would be truly innovative, or just a cuter rehash of the ones on the market now?

Talk of tablets at the current time stamp is due to Apple finally coming out with the iPad, a device that looks a lot like a book reader, but which is billed as a tablet computer, like the PCs I've described above.

It's probably not at all what Ms AJ had been expecting in 2004. It is clearly a consumption-side, not a production-side box, much like Amazon's Kindle or Sony's

iReader. I'd mentioned that you can always turn a read-mode tablet into a write-mode PC by just plugging in a USB keyboard—except the iPad doesn't have a USB port, so you can't just walk in to the office and borrow one of the keyboards they have at the bottom of the supply cabinet. That is, Apple's tablet PC is in no way a tablet PC, because it has no interest in providing the tools needed for seriously producing content; it is a smart ebook reader.

It doesn't even come in red.

¿How does Apple make its money? Let's RTF10K10K, which reports the following net sales, in billions of dollars:¹

PCs	13.9
iPods	8.1
iPhones (+AT&T)	13.0
Other gadgets	1.5
total, things	36.5

iTunes	4.0
other software	2.4
total, data	6.4

Apple is still firmly grounded in hardware, though it would be nice to know how much of that 13 billion dollars for the iPhone is from AT&T service contracts and how much is from sales of little glowing boxes—I'm not in the mood to do the research right now.

But only about a third of its net hardware sales involved devices with keyboards. The other two thirds is about devices based around passive information consumption. Include data, and sales of things with keyboards becomes an even smaller percentage.

I suppose that's a fine business strategy. I mean, most folks don't type 70 words per minute, and don't have a novel they're working on in the background. Most folks' visual arts don't require pixel-level precision—I'm delighted if I can draw a cartoon orange. And hey, if everybody spent all their time writing their novels, there'd be nobody who had time to read any of the finished works.

Consuming more than we produce is not Apple's doing, just human nature. The market has taught Apple that it can make more cash by making something built around passive consumption, and leave every other company to fight over the market for producers who use keyboards.

I really don't care whether Apple's products win or lose in the market, because the genre is there regardless. The music player market was crowded before the iPod existed, and it is not the first entrant to the field of e-readers, coming after Amazon, Sony, Barnes & Noble, and PC manufacturers who've been making odd-form PCs for a decade or two. I'm not even annoyed by the lettering on the wall that many people—especially students—are going to have a primary laptop-like gadget that is focused on consumption of A/V materials and maybe, if there's enough cash left over, an actual laptop for secondary use.

¹Apple doesn't want me directly linking to its 10K, so go to <http://www.apple.com/investor/> and click on the "2009 Form 10-K/A filed January 25, 2010", giving 2009 revenue, amended Jan 2010. This table is from p 61.

But if we want to be active, good computing takes two devices: a good screen for engaging in the miracle of reading, and a good keyboard for engaging in the miracle that is typing. And gosh, a 35 cm screen makes subscripts so much clearer than a 25 cm screen.

References

Ray Bradbury. *Fahrenheit 451*. Del Rey, 1953.