

Holes in History: A personal perspective on how and why the early history of today's major interface paradigm has been so often misreported. Jef Raskin The popular media has a poor track record of accurately presenting the recent history of technology. Regarding the story of the origin of human-computer interfaces, they have been very far off the mark.

I have pondered the sources and effects of the errors and wondered how authors expected readers to learn from the experience of others if that experience was grossly misreported? Where did the incorrect information come from? Why didn't the authors pick up a phone and call the people involved—it's not as if this is ancient history and all the principals and their relatives are long dead. Had the writers' quest for truth and the historians' thirst for facts evaporated? Before looking at the reasons for the inaccuracies, I want to first explain why I am in a position to write with some authority on this topic.

In the spring of 1979 I went to the Chairman of the Board of Directors of Apple, Mike Markkula, and proposed that Apple build a new kind of computer. It was to be inexpensive; have a small footprint; use a built-in, graphics-based screen; and—my most heretical point— it would be based on human factors considerations rather than driven by whatever was hottest in electronic technology at the moment. My name for this project was “Macintosh”.

Nick Vedros, Vedros & Associates / Tony Stone Images



Having introduced the concept of human interface development as a discipline at Apple, and being one of the early observers of the work at Xerox PARC, I have subsequently been astonished, amazed, disappointed, and at times upset by what I've read. Even the prestigious Harvard Business Review got the basic facts of the origin of the Macintosh interface nearly backwards. Occasionally, I have written a letter to correct one or another error that appeared in print. Sometimes these letters had the effect of influencing future articles, sometimes they disappeared without a trace, and once or twice they were loudly refuted by people who hadn't been there. There have been many books on the history of Apple, some by or about its major players, and in 1994, the 10th anniversary of the commercial introduction of the Macintosh and the 15th anniversary of the project's inception, a new spate of books and articles appeared. When these works discussed events in which I was not a participant I found them interesting and credible until it occurred to me that if the sections where I knew what had happened were wrong then why should I expect that the rest was accurate? My own collection of contemporaneous drawings, memos, and letters often allows me to fix a date or assign credit accurately; but reporters and writers have not

Stross's Steve Jobs and the Next Big Thing, one notes that they are almost all secondary, taken from earlier books, magazine articles, or newspaper accounts. Rarely are original documents cited; in-depth interviews with participants are only a bit more common. Replication of errors made a decade ago cover the pages like an algal bloom. The more books of this sort that are published, the more "sources" one can find that agree on a "fact." Eventually the fabrication becomes indisputable on the basis that "everybody says so. Look, I have seven references on it." Undiscriminating use of secondary sources is a major problem. But searching through tens of thousands of pages of documents is hard, time-consuming work, and conducting repeated interviews to sort out inconsistencies is a bother. The overwhelming impression one gets is that work and bother are off-putting to these authors.

Over Simplification

Thomas Morton was writing of the history of science (in *American Scientist*, Vol. 82, pg. 182) but his observation fits technology as well: "Historians often reason from the internal evidence...but [in science and technology] a parallelism between two accounts cannot reliably be used to infer that one influenced another (or

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asked to search through this material-or probably most of that in the hands of others-for themselves. There are a number of reasons the historical accuracy has been so bad, and they range from the subtle to the banal. Some writers take a cavalier attitude toward history while others indulge in the crass opportunism that explicitly eschews facts if they would either (a) make an effort to check out or (b) interfere with the attractiveness of the story line in terms of possible movie or TV rights.

Secondary Sources

Let's start with an elementary technique of serious historians: using primary sources whenever possible. Looking at the references in the two most recent books, Levy's *Insanely Great* and

even that they were influenced by a common source.)" It is easier to attribute every invention to one person or organization than have to untangle the unwieldy web of the way things really happened. If the same idea crops up in two places, one must have taken it from the other, according to the usual historical interpretation. Combine this kind of simplification with an avoidance of primary sources and you can wander far from the truth. For example, in Stross's book he speaks of Xerox's Palo Alto Research Center (PARC), "... like Old Testament genealogy, every important development in personal computers traces back to this same single source." To be sure, PARC's influence was broad, deep, and beneficial, but it was by no means the "single source" of "every

important development." Stross's blanket claim ignores the influence of Sutherland's far earlier Sketchpad system, Englebart's prior conception of the mouse and windows, that the all-important invention of the microprocessor itself did not take place at PARC, and that the people who created the early personal computers (Apple I, SOL, Poly 88, Heath H8, IMSAI, Altair, PET, etc.) generally knew nothing of and took nothing from PARC. Many significant examples of influential software that did not derive from PARC's work, such as the systems written by Bill Gates, Gary Kildall, and Steve Wozniak also come to mind.

I can give an example from my own experience that combines these sources of error. In the late 1960's I had come to realize the importance of what is now called WYSIWYG (What You See Is What You Get) displays. It would not do to have a limited set of fonts on a display and a different set of fonts on paper, for example. So, at a time when hardware character generators were universal for computer displays (they could usually generate one ugly font, with underlining, brightness reversal, and blinking as the sole typographic options), I published a proposal that argued that computers would have to be built without them. A few years later, in the early 70's, the researchers at Xerox PARC

that many of the Mac's key concepts had had an independent genesis.

Sloppy Scholarship

Another problem with books on the history of Silicon Valley is a dearth of simple facts checking. Jeffrey Young's book *Steve Jobs*, published in 1988, is one of a number that not only share the same flaws as the books I've already mentioned but is especially weak on details. My copy's margins are full of comments such as "No," "False," and "Not quite." I found myself inserting the names of the actual people involved in a number of places. Even easy-to-check details are flubbed, the go-go-dancer-and-poet-turned computer maven Bana Witt becomes "Bana Whitt" (she deserves a book of her own). Young makes the truly absurd claim that I "saw no need for graphics," in the Macintosh product and so forth. Some books are better than others in this regard (the *Time-Life* series on personal computers is one of the best), but it is clear that some editors, even at such established companies as Viking; Scott Foresman and Co.; Harper & Row; and Basic Books, give little weight to accuracy of detail. John Sculley's book, *Odyssey*, (written with John A. Byrne) says that I was a "programmer" at Apple; I held many positions at Apple, but

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(Palo Alto Research Center) came to the same conclusion independently, and started building computers embodying this idea. The workers at PARC also believed as I did, that human usability was more important than the traditional concerns of computer science at the time: execution speed and the efficient use of memory. When I visited PARC shortly after it was opened, I found, for the first time, a computer-oriented community that was sympathetic to my work. On their part they found an outsider who did not have to be convinced that what they were doing was important or headed in the right direction. If Stross or Levy had gone back and read the works I had written before PARC was founded, or even interviewed the people I had known at PARC, they would have learned

programmer was never one of them. I assume that I haven't been singled out for inaccurate treatment and that an equal percentage of errors apply to other people and events.

Deliberate Misrepresentation

Another cause for inaccuracy is the deliberate misleading of reporters, coupled with some reporters' tendency to believe an apparently sincere and/or famous source. Levy's book gives prominent thanks to Apple's PR department, which learned history of the Mac from Steve Jobs, whose well-deserved sobriquet at Apple (and later at NeXT) was "reality distortion field." Many times I had seen him baldly tell a lie to suppliers, reporters, employees, investors, and to me; Stross's book provides many exam-

ples of this. When caught, Jobs's tactic was to apologize profusely and appear contrite; then he'd do it again. His charm and apparent sincerity took in nearly everybody he dealt with, even after they'd been burnt a few times. For those who didn't know him he seemed utterly credible. In his defense it should be pointed out that some reality distortion is necessary when you are pioneering: when I am conveying my vision of the future I create a non-existent world in the minds of listeners and try to convince them that it is desirable, will become so, and is inevitable. I'm pretty good at this, but Jobs is a master, unconstrained by "maybe" and "probably." His attractive creation-myth was swallowed whole by susceptible reporters who believed that Apple's computers are invented exclusively by college drop-outs and intuitive engineers flying by the seats of their pants. To hear him tell it, the Macintosh had been born, homespun, in Abe Lincoln's log cabin. That it had been spawned by an odd fish, an ex-professor and computer-center director with an advanced degree in computer science, would have blown the story sky-high. A good story will beat out the facts every time, especially

when a writer is looking for a "hook". For example, after Byte Magazine published the "official" version of the creation of the Mac as a cover story in 1984, two enterprising reporters (John Markoff and Ezra Shapiro), acting partly on my comments to them about that article, interviewed the actual crew that created the Mac. The follow-up article was buried toward the back of the magazine, under the weak title "Macintosh's Other Designers." It received, predictably, little attention.

The Halo Effect

This effect causes every invention to be attributed to the leader, most charismatic, or currently most newsworthy member of a group. For example, before Steve Jobs's fumbling at NeXT exposed his weaknesses, he was usually credited with having invented the Macintosh. As his star was declining and NeXT beat one strategic retreat after another, General Magic-cofounded by Bill Atkinson and Andy Hertzfeld who had both worked on the first Mac-was announcing its first product with much hoopla. Thus I found, in the Dec 27, 1993 / Jan 3, 1994 issue of InfoWorld a story hailing Bill Atkinson and

Going by Appearances



Prior to the coming of the microprocessor, the computer industry (exemplified by IBM) was a bastion of corporate formality. When I was invited in the 1960's to give a talk to IBM executives about new directions in computer applications I chose to go tieless in blue jeans and flannel shirt, since I thought this would lend some shock value to my presentation. The talk went well, but when I was invited to join my host for lunch, I was stopped at the door to the cafeteria by a uniformed IBM employee. He said, "You can't come in, sir, without jacket and tie." My hosts had long-since forgotten the rule; nobody even thought of working at or visiting IBM in attire such as mine. We had no extra tie or jacket, and were at an impasse until

someone went ahead, took off his jacket and tie and tossed them back to me. Apparently, the rule was that you could not enter without a tie, but there was no rule about taking it off once inside. This was typical of the computer establishment, so when some of the microprocessor companies started up, they not only abandoned the technical methods of the big computer companies but made a point of also throwing out the trappings. This was especially true at Apple. Properly dressed reporters who visited in the early days, accustomed as they were to traditional computer companies, found the un-computer-company style at least as remarkable as the product. Our penchant for odd dress and irreverent play (frisbees in the hallways and the like) conveyed the spirit of the products and obscured the serious work going on in the cubicles. Our then-unusual life-style made good PR that could reach audiences otherwise uninterested in computers, and gave the products an aura of fun and novelty rather than work and stodginess. This was great marketing, but it was also a smoke screen, one that has continued to befuddle reporters to this day. Many continue to take a penchant for play, eccentric mannerisms, and eclectic dress as a disinclination to do hard and serious work.

Andy Hertzfeld as the creators of the original Macintosh. As John Sculley left his new position as CEO of Spectrum (which he had joined after leaving Apple) under notorious circumstances, a National Public Radio report described him—instead of Jobs and Woz (Steve Wozniak)—as the founder of Apple. The halo effect also assigns superhuman abilities to the

emailed to Cringely to point out that his book—like those of a number of other authors—was wrong; Jobs had indeed made a visit in December, 1979 but the Mac project was proposed in the spring and officially started in September, 1979. In other words, the project was well under way before the event that was supposed to have inspired it took place.

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famous, often overcoming a reporter's credulity: Jeffrey Young writes of the first time that Steve Jobs (along with Atkinson and others) saw the work done at PARC. "Atkinson and the others were asking Tesler questions, one after the other. Tesler was quoted as saying, 'What impressed me was that their questions were better than any I had heard in the seven years I had been at Xerox... Their questions showed that they understood the implications and the subtleties...' " But Young did not ask why they had such a high level and rapid understanding that no other mortals could achieve; the halo effect had blinded him. The real reason for their near-instantaneous grasp is that they had been carefully prepared for the visit. I had repeatedly explained the details of the work at PARC to Atkinson and Jobs; Atkinson (who had been a student of mine and worked with me for years) had grasped the ideas very well, Jobs somewhat less so. Tesler didn't know about this background, wasn't told, and so was bowled over.

The Irrelevance of Truth

The last cause for inaccuracy that I will take up is an overcasual attitude and a kind of arrogance on the part of some writers. It is rare to get an explicit admission of this, but I must tip my hat to Robert Cringely, who writes a delightful column that appears weekly in InfoWorld, a trade journal. In his book on Silicon Valley events, *Accidental Empires*, he has the Mac and Lisa (an Apple computer that didn't make it commercially) projects being created by Steve Jobs after Jobs made the visit to PARC "in 1980" and came back all aglow with inspiration. I

Cringely was unabashed. He emailed back: "As for all the business of what project started when, whether Lisa started before or after Steve visited PARC, whether the Mac had already begun or not, well I don't think that it really matters very much. My attempt was to EXPLAIN (I say that at the front of the book), not to be a historian." How an author can hope to explain what happened if he doesn't even know what happened eludes me.

Later I discovered that the people he interviewed were mostly Apple's PARC expatriates, their association with Apple began after the Mac was well under way. Thus they could only tell him about the development of the ideas at PARC and about the work on Lisa (they were not then associated with the Macintosh project) after some time in 1980—that is after Apple was committed to the basic direction the Mac group had already established. Not terribly aware of that work, they related what they saw only to what they knew from PARC. It's not only books, of course, but other mass-media that have presented a confused view. The PBS special on the history of computers made the same mistake of attributing the genesis of the Mac to Jobs' visit to PARC. When I sent the correct information to Jon Palfreman, its producer at WGBH, he replied, "The part of the program you are referring to comes at the end of a lengthy segment about the highly innovative work done at Xerox PARC. This section was based on extensive interviews with Alan Kay, Bob Taylor and Larry Tesler. The purpose was to show that the key concepts of interface design which today are a feature of most PCs (if

Jef Raskin
8 Gypsy Hill
Pacifica CA 94044 USA
Phone: 415-359-8588
FAX: -9767
email:
raskinjef@aol.com
37x37'37"N
122x31'10"W

you count Windows) were first discussed at Xerox PARC. When those ideas were embodied in a relatively affordable machine-the Macintosh-they began to change the world of personal computing. I was aware of your key role in the Macintosh project, and indeed of the contribution of people who developed Lisa. My aim in this particular program wasn't to detail the history of Apple but to show how the key interface ideas found their way into consumer PCs." By not detailing the history of the product whose commercial success changed the

human-computer interface, he necessarily fails in this attempt (his excuse sounds much like Cringely's). I am forced to wonder about the accuracy of the rest of the series.

What's Missing?

The years of study, thinking, and experimentation by many talented people on the Macintosh project have gone largely unreported, though they led to the breakthroughs that made the Macintosh and the systems that have been built since so much of an improvement over what went before. Against this reality we have the powerful mythological image of Jobs drinking from a Well Of All Knowledge, having an "aha!" experience and coming back at full cry to Apple to create a fantastic project. This scenario is familiar-it parallels that of Archimedes jumping naked out of his bath crying "Eureka!" and a dozen other stories. It is Edison's observation that "Genius is one percent inspiration and ninety-nine percent perspiration," inverted. When Cringely reported in his InfoWorld column for 4 April 1994 that his book was being made into a TV miniseries, he crowed that it represented "the ultimate triumph of style over substance" One can admire his candor while deploring his scholarship and envying his earnings. 2,400 years ago the historian Thucydides had a different aim, "My history has been composed to be an everlasting possession, not the showpiece of an hour." Today we get showpieces. Along with oversimplification, using secondary sources, being weak on background, a lack of attention to detail, getting taken in by the halo effect, and a general attitude problem among some of the people who have reported on the history of technology, there has been a belief in things happening by magic. Intense intellectual effort and technical expertise vanish to be replaced by tales of inspiration and guesswork. The legend tells us that scholarship and hard work is not necessary in order to usher in a new age. Yet the same legends speak with awe of the 80+ hour-per-week grind of the faithful, driven employees. What were they doing all those hours? Drop out, turn on, assume the lotus position, eat jelly beans, have pizza-and-beer parties and enlightenment and fortune will surely follow, sing the storytellers. The truth lies elsewhere. ☺

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