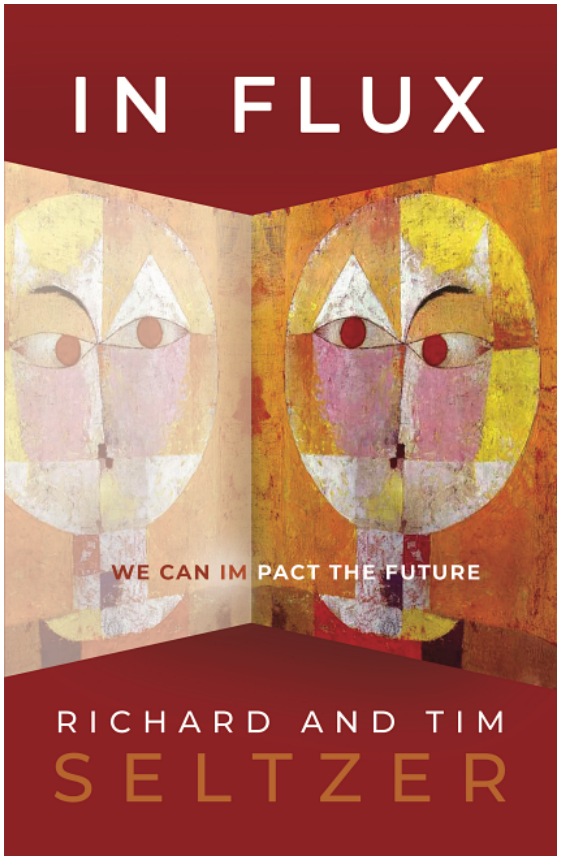

"In Flux" is a personal account that strives to understand how technology is changing our lives. It puts AI into context and suggests how we can nudge the future this way or that.

In Flux

By Richard and Tim Seltzer

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IN FLUX

WE CAN IM PACT THE FUTURE

RICHARD AND TIM
SELTZER

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This book is part memoir, part essay. It reflects the author’s recollections of his experiences and his speculations about the future. The truth being told is the author's truth and may not match what others recall or anticipate.

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Part One: DEC, the Web, and AltaVista

I worked for DEC (Digital Equipment, the minicomputer manufacturer) for 19 years, as a writer, not an engineer; always an individual contributor, never a manager, never involved in decision-making. For the last few years, I was a member of the Internet Business Group, wrote *The AltaVista Search Revolution*, and delivered speeches as the company's "Internet Evangelist." But there was much I didn't know about DEC, the Web, and AltaVista. Plus this all happened 30 years ago. My memory is far from perfect. Other people involved back then probably remember what happened differently than I do.

A Glimpse of the Future

In January 1994, I got a call from Berthold Langer, letting me know that a VP wanted a short video to include in an upcoming internal speech. He wanted to sound visionary and something about the Web might do the trick. I never met the VP, and I don't remember his name.

I immediately got in my car and drove to meet Berthold in Merrimack, to talk about the possibilities. As it turned out, I wrote the script on a pad of paper as I was driving, so when I arrived we got right to work. Berthold helped pick the websites to use as examples and recorded our visits to those sites. Later, someone from DEC's Communications Services recorded the voiceover, and in short-order the three-minute clip was on videotape.

The message was:

> From Georgia to Palo Alto,
> from Oslo to Singapore...
> a vast array of information is being made available in attractive, easy to use form, and for free over the Internet.
> People congregate here, interact here.
> Here the smallest of companies can search and shop on a global scale.
> Here those same small companies can market their abilities and products.
> This means a new array of risks and opportunities.
> Here new business models will evolve quickly, with new kinds of partnership and collaboration, new ways of working together and serving customers and making money.

The video, *A Glimpse of the Future*, was a great success and news of it spread rapidly both inside and outside the company. Today, you can see it at YouTube. (Just search for the title plus Richard Seltzer).

Internal meetings were held to show it and to talk about business opportunities on the Internet. NCSA (the National Center for Supercomputing Applications) developers of Mosaic, the first web browser, asked for thousands of copies and sent them everywhere. Other organizations and companies asked for thousands more.

After that, my boss in US Field Communications let me focus on spreading the word about the Internet inside DEC.

In May, I manned a DEC booth at the first Internet World show. Local sales and tech people set it up and made an Internet connection to the show floor (not an easy matter in those days.) DEC had nothing to sell. My message was that we knew the Internet; and if you wanted to do business there, we could help you figure out what to do and how to do it. At that show, Berthold and I were awarded the first Internet Marketing Award for the video, which by then was legendary.

In June, I was asked to write an Internet segment for Governor Weld's address to the National Conference of Governors, to be held in July in Boston. A senior consulting engineer from our Cambridge Labs set up an Internet connection to the hotel ballroom so the speech could include a live demo of the Web.

Why Did Berthold Call Me?

For 11 years I wrote MGMT MEMO, which was Ken Olsen's vehicle for communicating with the company's 20,000 managers. When Ken was pushed aside and Bob Palmer became president of DEC in 1992, I found myself in limbo, needing to find a new role. Temporarily, I reported to US Field Communications.

Three months before the video, soon before the Web went public in October 1993, Russ Jones a marketer in DEC's Palo Alto research labs, gave me a demo of the Web. After that, he and I worked unofficially to spread the word inside DEC about the Web and its implications for business.

While in Employee Communications, I had championed the cause of the Notes Conferences on DEC's internal network. As often happened

at DEC, the best ideas percolated up from the bottom, by individual initiative rather than corporate plan. Engineers had written Notes Conference software to make it easy for employees to share information and interact with one another over our internal network. Most dealt with matters related to the business. People in Sales and Services could communicate with engineers to get answers and solve problems, without having to know the names, positions, and addresses of experts. These Conferences also included discussions about pets and hobbies, strategy games, and creative writing, as well as classified ads. Over the course of 11 years, I bought three secondhand cars through Notes Conferences.

Periodically, Notes came under fire from Corporate Management and Legal. Problems arose when employees used them to defame individuals or companies. When moderators blocked such postings, the wrongdoers would appeal to Legal claiming their first-amendment rights were being infringed. Legal didn't want to officially sanction the Notes Conferences or to empower moderators to police them because so doing might make DEC liable for everything that happened there.

On my own, not as part of my job, I worked with Alfred Thompson, a leader of the moderators, and helped negotiate an agreement with Legal. The Notes could keep running. But the next time such an incident came to the attention of Personnel, they could all be taken down.

Today's social media companies are still trying to deal with the challenges that arise when technology opens new ways for people to

connect with one another. I wish that DEC had faced that challenge directly and had come up with solutions.

At that time, similar communities were also flourishing on the pre-Web Internet, in the form of usenet newsgroups. Individuals at universities, government agencies, and computer manufacturers shared information with one another on personal matters as well as business, through bundled email messages. That environment of openness and helping one another, without expectation of reward, was similar to the environment inside DEC. I subscribed to and participated in several such groups.

When I saw Russ's Web demo, that was what struck me first. The Web would be a powerful new way for people to connect to people and to form worldwide communities of common interest. That would be the main draw. That's where the first business opportunities would lie. I did my best to spread that gospel.

The phrase "Information Superhighway," popularized by Al Gore, focused on the underlying networking. But connecting people to people mattered more than connecting computers to computers. Computers were the means not the end.

What About Ken?

The corporate culture of DEC made it possible for AltaVista to be developed and launched as a free service. The best ideas came from individuals pursuing their passion without corporate support, sometimes even in defiance of corporate management. The first consideration in making business decisions wasn't short-term profit but

rather "do the right thing." People shared information with one another, treated one another as equals and helped one another, often without expectation of reward. Entrepreneurship was encouraged. At DEC, talented, highly-motivated individuals often pursued common purposes and worked in new and creative ways. The example of DEC let the world know that large numbers of people, working together, often on their own initiative, can repeatedly achieve technological and business success. In so doing, DEC redefined the limits of human potential.

Those principles on which Ken Olsen had built his company were very similar to those on the early Web. I would have expected him to have been an ardent proponent of the Web. He was no longer president, but he was still a presence in the company.

That spring, Ken asked me to demo the Web for him. He seemed more puzzled than curious. Most people at their first demo wanted to grab hold of the mouse and start clicking. Ken didn't want to touch either the mouse or the keyboard. In general, he seemed more interested in the design of computers, particularly their packaging, the boxes, rather than in their use. He depended on secretaries to handle his email.

You could say that at that time most people in DEC were thinking inside the box; while Ken was thinking about the design of the box itself; and Internet opportunities were emerging outside the box in the interactions of people.

In any case, this wasn't his thing. He wasn't interested.

My Sandbox

With guidance from Russ Jones, soon after the video, I started a personal website, as a sandbox, where I could get hands-on experience as an information provider. I wasn't a programmer. I was a writer. Russ didn't understand why I wanted to learn, but he taught me the html tags and syntax needed to write text-only pages and to link pages to one another.

The Web had no central authority. No one had to give you permission to connect a new website or to upload new webpages.

For $40, I bought the domain name "samizdat," meaning "self-published" in Russian. (Twenty years later I sold that name for $20,000 and moved all my files to seltzerbooks.com where they are now.) I also opened an account with Tiac, a local Internet Service Provider. For $29 per month I got Internet access plus 10 Mbytes of web space to do with as I pleased. In plain text (no graphics), that was the equivalent of 20 copies of *Huckleberry Finn*. I could do a lot with that.

Because there was no central authority and as yet there was no general-purpose search engine, users depended on word of mouth and word of click to learn about new websites. Around that time, some grad students at Stanford started building by hand a categorized directory of websites that eventually became Yahoo.

In February, just a month after the video, on my own as an individual, I started a newsletter which I called Internet-on-a-Disk. I listed new and interesting websites and briefly described them. I singled out for praise those that were posting free information and classic public-domain

books. I posted the newsletter at my website and sent it out over relevant usenet newsgroups. That meant my first issue reached over a hundred thousand people. I also started a mailing list of those who wanted to receive future issues directly by email for free.

I was doing this on my own, not as a representative of DEC. Messages from DEC would have been deemed as commercial and would have been prohibited by the newsgroups. My content was welcomed. I tried to do an issue a month.

Before AltaVista was launched to the public in December 1995, *NetGuide Magazine* named my website one of the top 50 websites in the world. And *Internet World Magazine* called it the best personal web page of 1995.

I did my web work alone during my non-existent spare time, on a PC in my basement. As in the classic *New Yorker* cartoon, on the Internet nobody knew I was a dog.

I also wrote a book, *The Way of the Web*, in which I tried to make sense of what was happening. The epigraph read:

> Who owns the Internet? — No one.
>
> Who controls the Internet? — No one.
>
> Where is the Internet? — Everywhere.
>
> Can you understand all and penetrate all with the click of a mouse?
>
> To produce things and to make them well,

but not to sell them,

rather to give them away freely to all,

and by giving to become known and valued;

To act, but not to rely on one's own ability,

to build on the works and lessons of others,

and to let others do likewise —

this is called the Way of the Web.

I published excerpts from the book in my newsletter to get feedback and to make a name for myself, and I tried to get a literary agent. But in the world of traditional publishing, I was still just a dog.

Meanwhile Back at DEC

For a month or two I was part of an unofficial team exploring Internet business opportunities. In August 1994 that team morphed into the Internet Business Group (IBG). Tom Richardson was marketing manager. A few months later Rose Ann Giordano was appointed vice president. I later found out that Alan Kotok, a corporate consulting engineer, was a guiding hand in the background. Our job was to anticipate trends so DEC could stay ahead of them. We learned a lot from one another, testing and improving ideas.

Much to my surprise, trade shows became my responsibility. I had no authority, no staff, no budget (typical DEC style of working). I had to convince people in other groups that showing our Internet capabilities

at trade shows was the "right thing to do." Over the course of a year, I got us into 150 trade shows.

The AltaVista Search Revolution: How to Find Anything on the Internet

In December 1995, the AltaVista search engine was released to the public. It was a research project from DEC's labs in Palo Alto. There was no business plan, no revenue model. The search page had no graphics and no advertising. The service was free for anyone to use. Traffic grew from 300,000 hits on day one to over 80 million per day two years later. Much of the world came to depend on it for business, information, and pleasure.

This was a story that needed to be told in a book aimed at the general public, not just engineers. Wendy Caswell, who was in charge of strategy in the Internet Business Group, suggested that I should write that book. My personal site had been recognized by consumer Internet magazines, and I had written books before, mainly an historical novel published by Houghton Mifflin.

This would be a work for hire. I would have no rights to it. I would get no royalties. I agreed to do it with three conditions.

- I would be acknowledged as the author
- I would have a year to research and write it. For that time, the book would be my only job and I could work on it at home, with no distractions, no conflicting responsibilities.

- DEC would use a literary agent to find a commercial publisher, so the book would be available in bookstores and also to improve my chances of getting future books published.

At that point, all I knew about AltaVista was what I was able to glean from using it.

I went to Palo Alto and spent two weeks interviewing the creators, mainly Louis Monier.

Legal had to approve the text of the book. I had an ongoing battle with them. They wanted the book to reveal as little as possible about how the search engine worked. They considered that proprietary information. But the whole point of the book was to let the public know how to use AltaVista effectively. Legal also didn't want me to name those responsible for designing it. And they wanted to make it sound like this was part of a top-down corporate strategy. Fortunately, probably by dumb luck rather than skill, I won those battles.

Why Was AltaVista Needed?

On the Web, people often freely shared their creative efforts, with no expectation of financial return. A frontier spirit prevailed. The culture encouraged developers to borrow from one another and to build on one another's work, rather than wasting precious time reinventing what had been done before. This meant development happened fast and standards became widely accepted without the need for intervention by industry or government committees.

Content could be added to the Web willy-nilly by anyone and without the provider of the information letting anyone know that it was there. And the content didn't need to be categorized or organized any particular way. It just had to include a few html tags, and soon tools like the Netscape Composer, bundled with the Netscape Browser, made that easy to do.

This freedom and equality, this technological anarchy was in the Internet's DNA. The U.S. Department of Defense, which funded the Internet's beginnings, wanted a network which could not be knocked out in a nuclear war. There would be multiple paths from one point to another. If one path went down, packets of information would follow alternate paths, without disruption. Innovations that supported that anarchy were likely to thrive, while those that sought to impose control and a fixed structure were likely to fail. That anarchy made a search engine like AltaVista necessary and also made natural its release as a non-commercial service that treated all information and all users equally.

In October 1993 a small change in technology — the public release of a web browser, which enabled users to navigate the Internet by pointing and clicking, rather then entering complicated addresses — transformed the Internet from a "techie" environment into a way to connect ordinary people to one another and to vast information resources. At the time I was writing the AltaVista book, the Internet had about 40 million users worldwide, and was adding more than a million new users a month, with no slowdown in sight.

The usefulness of the Web was being undermined by its immensity. Earlier search engines were confined to laboratories and were used by just a handful of specialists. And Yahoo didn't let you search the Web itself, but rather their directory of websites. What was the value of the vast information resources of the Web if nobody knew what was available and how to get to it?

The designers of AltaVista could have charged websites fees to have their pages included or to give them high ranking in search results. They also could have charged people to search. But it was far simpler and more in keeping with the overall anarchic freedom-loving spirit of the Internet to do it all for free. Creating a search engine with that assumption at its base set a precedent and expectation that later search engines were likely to follow.

To convince DEC management to support the enormous investment necessary to pull this off, the developers pitched it as a showcase for DEC's latest Alpha servers. Then the more users and the better the performance the better the public image of DEC and its products. But they were doing this because it was the right thing to do. The Web desperately needed such a service. They knew how to do it. The company had the equipment and software that would be needed. And also, I'm sure, they wanted to see their ideas turned into reality, and their theories proven in an experiment involving hundreds of millions of users. And thanks to AltaVista, free for both users and information providers, delivering results fairly and equally, the Web became so easy to use that it could serve as an extension of your memory and an essential part of your daily life, both personal and business.

How Did AltaVista Work?

AltaVista limited search to plain text — not graphics, not audio, not video, not pdfs. That greatly simplified the challenge. At the time Lou started to design AltaVista, he estimated that all the plain text on the Web amounted to about a quarter of a terabyte. Today you can get that much storage on a flash drive that costs $20.

As an unintended consequence, that limitation helped preserve the Web as a level playing field for businesses of all sizes. Most users connected to the Web by way of dialup modems. For them, graphics and multimedia were slow to download and hence were more a nuisance than a benefit. Expensive multimedia content that major corporations were investing in couldn't be found by way of AltaVista. But the plain text web pages of tiny businesses were easy to find and loaded quickly.

Rather than set up a procedure for webmasters to submit their content, which would be slow and would need supervision to ensure that what they said was true, AltaVista periodically sent out robot users, "crawlers," to visit the entire Internet by following the links it found and to bring back a copy of all the content to be part of a search index.

The crawlers captured every word of every document, not just "key words". They saved every instance of every word together with its web address and the order of the words on the page. That made it possible to perform phrase searches, where the exact order of the words mattered. You could also search for large chunks of text, for instance to detect instances of plagiarism.

This approach eliminated the possible business model of monetizing key words. Instead of capturing all words, the crawlers could have saved only distinctive ones that companies considered relevant to their businesses. Then AltaVista could have sold or auctioned ranking placement for specific words, as Amazon and other sites do today for advertising. But in that case, the search results would have been skewed by the payment, undermining user trust.

In addition, AltaVista's crawlers only looked two layers beyond the home page. Then the crawler would shut off and go to the next site on its agenda. So massive websites with twisting paths of links, designed to display many ads, were cut off at the knees. The vast majority of their content would never be indexed and hence could not be found using AltaVista.

That also meant that, thanks to AltaVista, many visitors would bypass home pages. They would go straight to the information they wanted instead of getting it in small scattered pieces. In practice, AltaVista favored pages with lots of text, even single pages that consisted of entire books, which was the way I had been designing my site from the beginning.

Free and fair search was a form of net neutrality, making all users and all information providers equal.

Finding a Needle in a Haystack Without Disturbing the Haystack

Another team of researchers in Palo Alto had recently developed indexing software that made it possible to quickly and efficiently deal with large amounts of unstructured information.

Directories and databases rely on categorization, which depends on human judgment and is subject to the ambiguities of human language. They would also respond too slowly to the needs of tens of thousands of simultaneous users. And they would age over time, when new developments impacted the way we look at the world.

The AltaVista search index consisted of every single word that the crawlers found on the Web, without any judgment as to what was important or what was related to what. This approach made it possible to quickly find needles in an enormous haystack of information, without having to organize the haystack, without disturbing the haystack in any way.

Crawlers periodically refreshed the content of the search index, deleting everything and replacing it all with what was found this time around, keeping pace with the rapidly changing content of the Web.

From the perspective of AltaVista, all information was created equal and would be treated equally. That gave users confidence that they could trust the results, that no one was putting their fingers on the scale, that information of the smallest companies, even of individuals, would be treated the same as that from the largest corporations.

The developers could have set up AltaVista as a subscription service or could have charged a penny a search. Other DEC researchers in Palo Alto had recently developed a system called Millicent that efficiently enabled micropayments. Despite that temptation, search at AltaVista remained totally free.

Also, the AltaVista solution was scalable. It could keep pace with the explosive growth of the Web, which was fueled in part by AltaVista itself. They could send out more crawlers and send them more frequently. They could add more Alpha servers and more storage. They could also offload traffic to mirror sites.

AOL morphed from being a separate gated online community to becoming an Internet Service Provider. Yahoo, which started as a manually-generated directory of websites, couldn't compete with AltaVista. So Yahoo made a deal by which, instead of their own directory, they used AltaVista for search. That wasn't a secret, but most users weren't aware that when they searched at Yahoo they were actually using AltaVista. That arrangement with Yahoo quickly increased AltaVista's search capacity, but at the cost of brand identity. Our only serious competitor for users was ourselves in disguise.

Advanced Search vs. Entertainment

In addition to simple search, AltaVista offered the option of advanced search, which enabled users to precisely specify what to include and what to exclude. The ranking of results was based on how closely they matched what the user was looking for.

The design team also could have provided a tutorial at the AltaVista site explaining the syntax for advanced search and thereby enabling users to get better results. But someone decided not to, wanting to give the impression that there was no need for explanations or training. While users could click to go into advanced mode and also to search usenet newsgroups instead of the Web, few people did.

Instead, many performed silly searches for the fun of it. With every search, they saw displayed not just the top ranking results, but also the total number of matches and how little time it took to perform the search. Searching for rare words and phrases, particularly long phrases, was very precise and powerful. But many people opted for randomly generated searches or searched for their own names and names of people they knew, checking the number of results out of curiosity or as a game. News articles exploring such trivia helped build AltaVista's acclaim. The showcase became show business, a form of entertainment, as well as an essential tool.

How to be Found

Of course, what really mattered wasn't that your query had two million matches, but rather what appeared on the first or second screen of results. Businesses desperately wanted their web pages to appear high when searchers looked for words related to their products, services, and information. Webmasters agonized over how their pages would fare after the next big crawl.

The ranking rules were simple and clear. I explained them in the book. But major corporations and DEC itself often ignored them.

Text mattered most, plain text — not graphics, not pdfs, not media — the full text of pages, not so-called key words. And above all else, each page should have a unique and descriptive html title, in the underlying coding. Many sites made the mistake of putting the same html title on every page. Others simply left that blank since the words of the html title couldn't be seen by visitors.

Information behind a login/registration procedure was not indexed, even if there was no charge for registering. Web crawlers couldn't fill out forms or answer questions. For the same reason, crawlers couldn't access information in databases. Many commercial sites served up "dynamic" and "personalized" pages. Some used "cookies" (small files that web servers send to browsers) to recognize users and provide them with unique and different experiences each time they came back. Some used database-style applications which assembled new web pages on the fly from pre-stored elements in response to user requests or behavior. But the content on dynamic pages couldn't be indexed, because each URL was unique to that one visit. A web crawler visiting such a site faced the prospect of retrieving an infinite number of custom-created pages, so it halted immediately.

Tragedy of the Commons

Soon after the Web went public, a handful of businesses sent out commercial messages over newsgroups and by bulk email lists to people who never asked for them and didn't want them. Self-appointed vigilantes quickly and effectively punished the spammers. But the spammers protested and the law came down on their side, protecting their first amendment rights and prosecuting the vigilantes. Spam flourished. Our inboxes became clogged with annoying commercial

messages. And far fewer people participated in newsgroups, rendering them far less useful.

That was an instance of the tragedy of the commons, a recurring problem dating back to medieval England and the misuse of common grazing areas in English towns.

Thanks to AltaVista, the searchable Web became a new commons, a valuable resource available for free to everyone and equally accessible by all. But it was soon diluted and polluted by companies who wanted to get more than their fair share. Whatever ranking system AltaVista adopted, some companies would try to game it, and the search engine designers would then change their algorithms to foil those efforts.

Search Engine Optimization (SEO) became a marketing specialty, trying to game the system, to fool AltaVista into giving their employers unfair advantage. Some thought they could drive traffic to their pages by repeating many times words that were important to their target audience. Sometimes they put the repetition at the bottom of the page or in comments not seen by visitors or in wallpaper background. This accomplished nothing, because the designers of AltaVista set up their ranking algorithm so repetition made very little difference, and extreme repetition was punished.

After AltaVista died and Google and Bing took its place, SEO individuals and companies flourished, like snake oil dealers in the Wild West. In its early days, Google purportedly ranked pages and websites based on how many pages from other sites linked to them. So SEO experts paid popular websites to include links to their clients' pages on

pages with totally irrelevant content. That was called "text-link" advertising. At its peak, in response to unsolicited requests from SEOs, I had a few dozen such links unobtrusively placed on pages of mine, and I was paid about $2000 a month to do so. When Google changed its ranking algorithm, that disappeared overnight.

Cabinet Maker in Arizona

While writing the AltaVista book, I experimented with my personal website to learn how content and page design impacted being found and ranking in search results. Following my natural inclinations, my pages were already well in tune with AltaVista's design. I had no technical knowledge and no design talent. My site was a graphic designer's nightmare. And I couldn't afford to hire people with those skills. Doing what I had to do because of limited resources turned out to be the right thing to do.

I added lots of text to my website: my newsletter of course and also entire books, classics that were no longer protected by copyright. And in July, 1996, I started holding weekly chat sessions. I would pick an Internet-related topic, invite an expert, and welcome the public. These were text, not audio chats. I saved the content, edited it, and posted the transcripts on my website. I also posted a list of every book I had read since the fifth grade. And one of my pages linked to every page at my site.

At its peak, my site had over a half million page views per month by over 150,000 visitors. In other words, simple plain-text pages that were easy and inexpensive to design and edit and update were effective at attracting visitors by way of AltaVista.

I'm not saying that Lou Monier and his team intended such consequences. I don't know what was going on in their minds. But their design and policy decisions reenforced the web culture of fairness, equality, and the free sharing of information. And a personal website that cost next to nothing could compete for attention with sites that cost $1 million or more per year to operate.

One day, while I was writing the book, I got a call from the wife of a cabinet maker in Arizona. She had found my phone number on my website. Her husband and his five brothers made hand-carved furniture with skills passed down from generation to generation. They had migrated to the US from Mexico. The market near Phoenix, Arizona, wasn't large enough for them. She was calling me because she thought the Internet might help them to connect to customers farther away. She was hoping for advice on how to do that. She sent me photos of their work and a newspaper clipping about the family and their business. The sample pieces ranged from a leather-seated chair for $85 to an elaborately carved mesquite secretary that took about four months to complete and sold for about $3,700.

I volunteered to help at no charge. I posted on my website a description of their business along with images of samples of their work. The html title was "unique hand-carved Mexican furniture, direct from the designer/artisan, Carlos Melgoza." The text on the web page read:
"Carlos Melgoza sells his unique, hand-crafted furniture directly to the public from his Tucson, AZ, workshop and over the Internet. He offers one-of-a-kind works of art at prices comparable to what you would pay for mass-manufactured pieces. These are the kind of gems you might

hope to find on a trip to Mexico, custom-made to meet your needs." I also included the newspaper clipping.

I linked to those two pages from my home page. Neither I nor they did anything more to promote their business online.

Six months later I heard back from them. Their business was booming, and they were very grateful. Customers found their pages through AltaVista. That was all they needed. To thank me, they made me a cabinet — 6 feet by 3 by 2 feet deep — and shipped it to me in Boston. It's decorated with hand-carved images of characters from my children's book *The Lizard of Oz*.

Flypaper

Around the same time, I started getting emails from friends I hadn't heard from for decades. At first I was flattered. Wasn't it amazing that those people were looking for me? Then it dawned on me — why would they look for me? I pushed back and learned that they were searching for their own names or for subjects near and dear to them. I had content on my web pages that matched their interests and that prompted them to write to me. Instead of me looking for them, I had made it easy for them to find me.

I call this effect "flypaper." It affected my life in unexpected ways. I'll tell you about a couple examples.

While my daughter was visiting my sister on the West Coast, I got an email from Lee Aronsohn, the TV writer and producer (*Two and a Half Men, The Love Boat, Murphy Brown, The Big Bang Theory,* and *Cybil*).

He was a fan of the cartoonist Gary Trudeau, creator of the *Doonesbury* comic strip. A search had brought him to my website, to the list of books I had read, which included *Bull Tales,* self-published by Trudeau while an undergrad at Yale. It was based on his strip about the Yale football team, published in the *Yale Daily News*. Aronsohn wanted that rare book for his collection and was willing to pay handsomely for it. We negotiated over the phone, and, instead of money, I asked him to give my daughter an audition for one of his shows. He agreed and did. She didn't get a part, but she did get the opportunity and experience, which I thought was well worth a book that was gathering dust on my shelf.

My son Bob was a chess prodigy. As a loyal fan, I recorded every move of every one of his 951 tournament games and posted them on my website. Bob Levinson, at the University of California in Santa Cruz, found the games using AltaVista and contacted me. He paid $500 for the right to use those games (in sequence from beginner to life master) to train his research computer chess program. That was an early attempt at Artificial Intelligence (AI). At my suggestion, he named his program "Morph," after the 19th-century American chess champion Paul Morphy and as in "metamorphosis." You can read about Morph in Wikipedia, and you can see Bob's chess games at www.seltzerbooks.com/tour1.html

Internet Evangelist

The AltaVista book was published early in 1997. *Library Journal* said, "This complete guide to using the AltaVista web searching/indexing system will be indispensable to both librarians and patrons.... Get one copy to circulate, nail one down in the computer lab, and pass one

around the reference desk." Translations of the book into Hebrew and Japanese soon appeared.

The summer before, while I was writing the book, the AltaVista Business Group was formed, under Ilene Lang as VP. For almost a year and a half, the AltaVista Group and the Internet Business Group co-existed. Our offices were near one another, but as far as I could tell, there was little communication between the groups. The AltaVista Group redesigned the search website from being focused totally on search to becoming a portal with graphics and ads, apparently in imitation of Yahoo.

DEC sales people booked me to speak at Internet trade shows, conferences and other events around the world. The title on my business card was "Internet Evangelist." No one inside DEC had to approve what I said. My speeches weren't part of any corporate plan.

I spoke at events all over the US and Canada, in Rio de Janeiro, Sao Paulo, Buenos Aires, Bogota, Vienna, and Moscow. Several times, I was a keynote speaker with audiences of thousands.

My most exotic gig was at Victoria Falls in Zimbabwe. A sales team from South Africa hosted a junket for their customers. My talk was the excuse for the trip. They wanted me to get that over with quickly. Then we canoed on the Zambezi River, just above the falls, with hippopotami popping up trying to tip over our boats and elephants playing water games on the shore.

For large audiences, I talked about how the Internet was impacting nine industries and would transform them over the next 10-20 years.

- publishing
- broadcast
- banking/finance
- telecommunications
- education and training
- manufacturing
- service
- healthcare
- retail

For smaller audiences, I delivered tutorials on how to use AltaVista search and how to design web pages and sites so they would be found.

Instead of PowerPoint (which in those days couldn't handle Internet links), my slides were html files, so I could connect live to examples.

Concentric Circles: The Importance of People Connecting to People

In my speeches, I only used one graphic, which portrayed business opportunities on the Internet in a series of concentric circles. People connecting to people was the heart of the Internet. Startup businesses should focus there. If you built an audience by offering free information and services and enabling visitors to interact, then you could build businesses around the needs of that audience.

The farthest circle was the realm of transactions, where people buy merchandise. At that time, ecommerce was in its infancy.

The gravitational pull of the Internet was toward the center — toward users interacting with one another and toward the rich resources of free information. To catch the interest of Internet users and earn their loyalty to come back again and again to do business, companies should build on this environment, rather than simply mimic their old business models.

The Last Days of DEC and Beyond

At the end of 1997, DEC's Internet Business Group was dissolved. I was still in high demand to deliver speeches at Internet events, but I didn't have a home inside DEC. A kind soul let me continue my speech-making under her budget, but my work had nothing to do with the mission of her group.

I wrote another book on my own, *The Social Web*, but once again couldn't find a publisher.

In June 1998 DEC was sold to Compaq. And, in October, I was laid off, two weeks before I was supposed to speak in China.

When Compaq bought DEC, Google was a tiny startup literally working out of a garage. It wasn't incorporated until three months later. Compaq had no idea of what to do with AltaVista. It brought in no money. What was the point of it? Rumor had it that AltaVista was valued at zero for purposes of setting the purchase price. Compaq got rid of it a year later.

On my own, I called myself an Internet Marketing Consultant. One of my customers was Ken's new company Advanced Modular Solutions. It

felt unreal sitting at a table in the cafeteria with the great man and having casual conversations. His new company was selling a central computer with monitors on desktops. Several times when I was there, the central computer went down and for hours or days no one could get to their files.

The agent who sold the AltaVista book got me a contract to write *Shop Online the Lazy Way* as part of a series Macmillan was starting to compete with the Dummies series of books. I had to follow a detailed constraining template. And as soon as the book was published, the publisher of the Dummies books bought the series from Macmillan to take the books off the market, eliminating a competitor.

Then my agent got me a book contract with John Wiley and Sons. Finally, I could say what I wanted to say. The title was *Web Business Bootcamp*. But it took them a year to get it into print and by then the Internet bubble had burst and many of the sites that I had used as examples were out of business. The book was obsolete from day one.

During those wild early days of the Web, I was about 50 years old, with four kids and two mortgages. With school drop-offs and pick-ups, I had to commute for two hours each way. My highest salary at DEC was $70,000 per year. But I was in the right place at the right time and had the privilege of telling large numbers of people what was going to happen in the near future, not because I was a prophet, but because it was obvious. The Internet was changing how people connected to people and hence was changing the world of business. For a few brief years I felt I was at the forefront, that I could make a difference, that I could help change the world for the better, that maybe this time the

tragedy of the commons would turn out to be a comedy, with a long-lasting happy ending. That was a huge high, worth far more than money.

The Web Today and Tomorrow

In the early days of the Web, I expected it to bring people together in communities of interest. But over the last 30 years it has morphed into its opposite, leading to hatred and division. So what went wrong? Why are today's social media driving us apart? And what can we do to restore the promise?

Now I see the tie between the power of today's gargantuan web businesses and the massive quantities of user data those companies have collected. Based on their analysis of that data, they are able to influence what people buy, what they believe, whom they vote for, and whom they hate.

Cookies have become widely used not just to customize and streamline users' experiences at websites, but also to record user behavior and preferences, showing patterns of behavior, what leads to what, and hence how to sway not just individuals, but classes of visitors — herding them into behavior-oriented and opinion-oriented communities. Cookie-enhanced user data has enabled social media companies like Twitter (X) to increase traffic and hence advertising revenue by sparking and promoting discord. They can recognize points of contention and amplify them, making communities increasingly isolated from and at odds with one another, making them echo chambers, each with its own view of reality, mutually exclusive and manipulable. By fostering such behavior, those companies can

stimulate involvement based on obsessive interest in particular issues. User engagement can become both addictive and pernicious.

Large companies that not long ago grew from tiny startups now have unfair advantage, due to their massive quantities of user data and the hardware and software they have to analyze it. For such companies, user data is a tangible asset, like hardware and software, that they and only they can use to generate profit. This is a new kind of intellectual property and a new kind of political power. It's now exclusively in the hands of very few companies, and advances in technology, such as Artificial Intelligence, will enable them to better analyze their user data and better manipulate user opinions and behavior. Hence those companies are likely to become all the more wealthy and powerful.

Today, user data, not market share, determines business advantage. With the data at the disposal of Amazon, that company can quickly move into and dominate one new industry after another and yet keep its market share in each of them low enough to elude monopoly-busting legal action.

AltaVista faced a similar issue in its early design stage. The designers could have captured and analyzed the user data of every single searcher. They could have built profiles of millions of individual users based on what they searched for and when. They decided not to do so because it would be an invasion of privacy.

In parallel, other researchers at the Palo Alto labs were working on software to analyze user tastes and preferences — to detect patterns of purchasing behavior. If you like this, you'll probably like that as well,

so shoppers could be prompted to buy Y and Z as well as X. That kind of capture and analysis of online activity is far more sophisticated today thirty years after the heyday of AltaVista. And when shopping, we may find those prompts helpful rather than intrusive. But when applied to the management of online communities and when an online retailer becomes as humongous as Amazon, user data becomes extremely powerful.

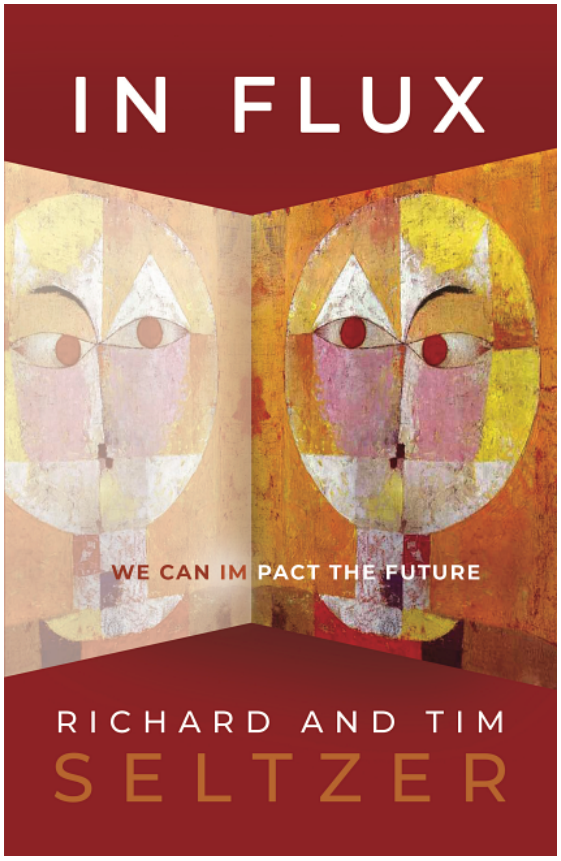
Is there a solution? I'm not a software engineer, and I'm certainly not a prophet, given that the Web has evolved to become the opposite of what I evangelized about. But I suspect that the best way to stop this pernicious trend would be to break up user data monopolies. Make it illegal to capture, store, and analyze large collections of user data. Perhaps even outlaw cookies.

That would make your online social and shopping experiences less convenient and less engrossing. But the result could be a more even playing field rather than the untrammeled growth of a handful of data-rich mega-companies and a world fragmented into not communities of interest but rather communities of hatred and bias and ignorance. This would be the modern equivalent of trust busting.

Also, in hindsight, it occurs to me that AltaVista could have used the Millicent micropayment system to charge for advanced search, while keeping simple search free. That would have been consistent with both web culture and DEC culture. Alan Kotok's bio in Wikipedia indicates that he believed Millicent was a major lost opportunity. Russ Jones, too, was a strong advocate for it.

When I was writing the book, about 10% of AltaVista searches were advanced search. That percentage would have increased if more people had realized its power and had known how to use it effectively. In December 1997, two years after the AltaVista launch and six months before Compaq bought DEC, AltaVista was getting 80 million searches a day, with an enormous upside. Charging a nominal search fee might have been enough to keep DEC afloat.

And doing that would also have showcased Millicent as a software product, which could have enabled the launch of many new businesses based on micropayments, rather than subscriptions or advertising.



"In Flux" is a personal account that strives to understand how technology is changing our lives. It puts AI into context and suggests how we can nudge the future this way or that.

In Flux

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