



## An era of error

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..... I put on the swami's hat and stared into the crystal ball. I tried to prognosticate future trends. And I could not do it.

Don't get me wrong. Some things are utterly predictable. Moore's law will somehow continue. Microsoft certainly will not go bankrupt. Larry Ellison will continue to have opinions. But you already knew this and there is no interesting trend around those facts.

Here is what vexes me. Consider the last 10 years; if anyone had tried to forecast what was about to transpire in business, such a forecast would surely have been way off mark.

In retrospect, many important and interesting trends were unknowable until they happened. Why is that? Because these trends were linked to human error. Let me illustrate with a few examples from the last decade.

### Asleep in the field

One mistake is very common: Executives become so focused on internal processes, they miss obvious signals that the rest of the world is changing. To illustrate, look at Microsoft and Intel, the two most successful companies in high technology. Their most recent big mistakes had huge consequences.

In Microsoft's case, it devoted most of its actions for several years to making up for an earlier error. Indeed, Microsoft fought an antitrust case because government prosecutors thought Microsoft overreacted to its own error.

Recall that Bill Gates, the self-appointed "smartest man in the world," and Nathan Myrvoid, Microsoft's designated futurist in the early 1990s, correctly forecasted that TCP/IP would become important for operating systems. They even put TCP/IP compatibility into Windows 95.

Of course, this was not a difficult design decision because virtually all versions of Unix had been TCP/IP compatible for nearly a decade by that point. Such plumbing was necessary for Windows NT if that product was to compete with Unix in the server or client-server market.

The serious oversight came later, just as Windows 95 was close to shipping. Upper management had become so focused on shipping Windows 95—which was already late to market—that they failed to see another emerging business paradigm. The error, as everyone now knows, was further sharpened by the entry of a newly founded firm, Netscape, which engineered a commercial browser.

I actually admire Bill's initial insightful response, encapsulated in an internal memo written in the spring of 1995. Entitled "The Internet Tidal Wave," it was a good first step toward admitting error. The memo is also quite prescient about some future developments.

Like most people, I admire little of what came next: Microsoft took actions that served no other purpose (for example, like serving customers' needs) than to "maintain its monopoly," a finding that even a conservative appeals court upheld. Microsoft's overreaction to its own error

defined the tenor of the browser market. These events are what everyone in the industry focused on for years.

In case the first example seems too exclusive, consider Intel around 1996 to 1997. To put it bluntly, Andy Grove and company had become addicted to the higher profit margins affiliated with selling faster CPUs for high-end PCs. They also had ambitions to move into servers, feeding their addiction even more. As a result, they paid no attention to the low-end, bread-and-butter part of their market.

What happened? Oversimplifying a bit, AMD seized the opportunity and introduced a cheap, low-end CPU for a cheap, low-end PC. This coincided with the birth of the under-\$1,000 PC.

Again, Intel's response defined the PC market for a few years. Intel did not let pride get in the way of reacting to its own oversight. The Intel Celeron chip was as imperfect a product as any ever sold—it was nothing more than a partly disabled Pentium. But it had one virtue: It came to market quickly, without needing extra fab capacity. And its design changes to the Pentium architecture were incremental.

We still live with those consequences.

### Trying to look good

Another type of error can also define a competitive era. In particular, there is something engaging about watching a public relations disaster, as when executives lie and are caught. The most interesting disasters are those in which people take lies as truth for long enough to shape

investment decisions. In this sense, these lies can define an era, though not necessarily for the better.

Consider the division at Enron that traded and swapped rights for online bandwidth. It actually never made any money. In fact, there were never many customers for the services it offered. Yet, clever accounting, public relations, and hidden information fostered an illusion that

- the division did something useful, and
- it was profitable.

This division was the darling of scores of new-economy gurus for several years. They loved making diagrams about how the business was supposed to work, proclaiming it a harbinger of B-to-B commerce.

Most remarkable of all, nobody really knew the truth until well after Enron imploded—not the reporters who profiled the firm during its rise in the 1990s, not the wimpy auditors who signed off on the books, and not the stock analysts who sanctioned a market capitalization that made Enron among the 10 wealthiest firms on the planet. Eventually, prosecutors indicted most of the key executives at that division.

Would the B-to-B craze have happened without Enron's deception? Yes, probably, but it would have been less nutty if the new-economy fanatics had not had such a crazy example to point to as a success.

Speaking of effective public relations, Bernie Ebbers, flamboyant former WorldCom chief executive officer, provides another good example. One of Ebbers' goals in life was to keep his firm's stock price high. He succeeded for a while, but his actions allegedly became deceptive and also messed with the fortunes of others.

To be fair, he had quite a lot of wit, charm, and drive. He could keep Wall Street analysts from asking hard questions about how his chief financial officer produced revenue growth through playing accounting games with the good will of acquired firms. Although this accounting practice was not particularly admirable, it was not illegal. Stock analysts should know better than to reward it, but they did anyway.

Not surprisingly, revenue growth through acquisition must eventually come to an end, particularly when there are no other firms left to acquire. In this case, the strategy ended when antitrust regulators in the US and Europe blocked WorldCom's acquisition of Sprint. After that, the chief executive officer and the chief financial officer had to actually report the honest slow growth occurring in their remaining businesses.

Except that they did not, at least for a while.

The two have not yet gone to trial, so the allegations are still a bit imprecise. These allegations go something like this: It seems that, for a couple years, the chief financial officer reclassified operational expenses as capital expenses. This reclassification hid at least several billion dollars in expenses, fostering the false appearance that the firm was profitable.

To be sure, somebody eventually was going to find out, even a sleepy auditor. In this case, the inside auditors got there before the outside ones.

Anyway—and this is the point of this example—by the time the bad publicity emerged, a lot of water had gone under the proverbial bridge. It might be difficult to remember, but WorldCom's actions in the late 1990s colored strategies elsewhere. Remember all the stuff about the growing backbone traffic, and so on? These sorts of announcements helped fuel the perception that Internet traffic could grow boundlessly and that WorldCom was at the center of tons of traffic. This perception set off a panic at AT&T, for example, and shaped its infrastructure strategy. The same perception also convinced investors to channel billions of dollars into telecommunications infrastructure firms, such as Qwest and Level 3.

Perhaps we still would have had a boom in telecommunications infrastructure building without WorldCom, but surely it would not have been as wasteful.

## Scenario planning

One other type of error shapes competitive outcomes; it occurs when somebody fails to do basic planning and, as a result, wastes a lot of money. Sometimes society learns from this wastefulness;

sometimes it does not. The previous era had this error in spades.

Consider Webvan, which lost at least \$1 billion (a billion here, a billion there, who's counting).

What happened? First, Webvan built brand new, gold-plated facilities simultaneously in multiple locations, going nationwide as quickly as possible. This violates every known maxim for growing a new local service, but nobody seemed bothered by the lack of systematic exploration and development.

Second, and more to the point, no matter how shiny the facilities, there was something fundamentally unprofitable with the business model from the outset. It only takes a little homework to figure out that the grocery business is a low-margin business. It will never be anything else, no matter how business owners keep the inventory, deliver the goods, or structure a Web page. Like any low-margin business, the grocery business makes up for low profit-per-unit with high volume.

In other words, Webvan was only going to work if its volumes were extraordinarily high. But wait, how high is that? To cover the costs of brand-new, shiny facilities, this business needed all the online households in the cities it serviced to adopt online grocery shopping. How much of a long shot was that—a pretty big one, as it turned out. In other words, profitability was implausible.

Investment houses should have known this fundamental fact about the grocery business, but they poured tons of money into Webvan anyway. Sure, these firms believed they could suspend the old rules for dot-com investments. But it also was such a colossal waste of money that Webvan did not live long.

If this episode was good for anything, it's that it reminded the investment community to express skepticism about return on investment. Ultimately, such skepticism might help direct funds into places where the Internet might actually change things.

Let anyone think bad planning confines itself to new Internet businesses, consider one of the biggest planning errors in the history of technology markets. Apple com-

mitted this error during the launch of its handheld organizer, the Newton. John Sculley, Apple's chief executive officer at the time, launched an entire product category, which helped society immeasurably and lost Sculley his job at the same time. Now, how's that for an impressive error!

What error did Sculley commit? He over-promised on the product's first generation. Or, more to the point, he promised a revolution, then did not deliver. Remember what he said about handwriting recognition technology? He got lots of attention and attracted more than 100,000 first-time buyers. But he also set his buyers up for disappointment, lost their trust, and sullied his firm's reputation.

This error was entirely avoidable. Sculley worked in well-known territory. Several books outline how to manage expectations during a product launch and then use multiple releases to hone the product based on user experience. This phased rollout of functionality is a basic lesson in any class on technology strategy.

Despite the heartburn it caused Sculley, this mess produced fallout that benefited society. All the attention legitimized the handheld organizer as a product category, generating many imitations and competing products. Eventually, the Palm Pilot emerged as a simple, functional version of the device that Sculley had wanted all along.

Indeed, this market is now worth over a half billion dollars a year in revenue. These devices are a staple in every professional office, defining a whole new use for microelectronics in business.

### Forecasting trends

I have looked into the crystal ball. I can confidently forecast one thing about business: There will be errors and they will come from all corners.

Think about the implications of that observation: If error defines the conversation we all have, if it defines the tenor of competitive activity and the salient pattern of these markets, then the key events of the future are unpredictable, by definition.

In other words, to see the future, just wait for the next big mistake. But don't try to forecast it. That would be an error.



## Evolution

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..... Evolution binds the otherwise unrelated topics I discuss this time. On one hand, a science fiction novel shows what might happen if fate should bring together the right mixture of nanotechnology, bacteria, viruses, solar power, agent software, adaptive self-organizing systems, rapid evolution, and corporate malfeasance. On the other hand, products I have been reviewing (and using) for more than 15 years continue their steady evolution.

**Prey**, Michael Crichton (Harper Collins, 2002, 382 pp., ISBN 0-06-621412-2, \$26.95)

In this novel, Michael Crichton, already famous for earlier works such as *The Andromeda Strain* and *Jurassic Park*, places current technologies into a completely plausible situation, then develops the story into an engrossing thriller. Somewhere in the process, he crosses the line from believable to unbelievable. I'm not sure at what point in the book I started to feel that way, but by the time I did, I was already hooked.

I should say at the outset that I did not read this book; I listened to it in 45-minute chunks while driving. George Wilson's reading nicely conveys the matter-of-fact tone in which the protagonist, Jack Forman, a programming manager, recounts his attempts to rein in a project that has gone badly and dangerously out of control.

Forman, fired for blowing the whistle on questionable corporate accounting practices, has been an unemployed

househusband for many months when his former company asks him to consult. They have sold Forman's software to another company, which is having trouble with it.

The new company, it turns out, is Xymos, the firm for which Forman's wife is a marketing director. She looks at Xymos as her last chance to make a fortune, and she has cut a few corners to bring the story to this point. She should have read some of the project management books that I reviewed recently in this column. It could have saved her from a lot of trouble, but then there would be no story.

Forman heads for the remote desert facility where the problem lies, and he finds that Xymos has used agent software that Forman's team developed at the first company. The software produces agents that exhibit predator-prey behavior, but Xymos has put the agents to another use: a military contract to create a spy camera made from a swarm of billions of nanomachines.

Unable to solve the problem of how to prevent air currents from disrupting the swarm's structure, Xymos has turned swarms loose in the desert to see if a solution emerges as they evolve. Through a series of plausible circumstances, the swarms can use solar power and already carry with them their means of manufacture when Xymos turns them loose.

They multiply and evolve at a rapid rate. Adaptive behaviors emerge.

Humans become their prey, and it looks as if they have a good chance of wiping us out. From this point, the novel-