

## John Cassidy on Technology's Future

By coincidence, Microsoft's confirmation that Satya Nadella, a forty-six-year-old Indian-American, will succeed Steve Ballmer as its chief executive came on the same day that Facebook celebrated its tenth birthday. The timing prompts a question: Which of these two global behemoths, both the creations of Harvard dropouts, is most likely to be around in another twenty or thirty years?

Facebook looks like the obvious answer. It has exhibited astonishing growth during the past decade, and now has more than seven hundred and fifty million daily active users, which is more than a tenth of the world's population. More than two-thirds of these daily users—some five hundred and sixty million of them—access Facebook on mobile devices, which, it is widely agreed, represent the future of the technology industry.

Microsoft, on the other hand, is still best known as a desktop company. Its Windows/Office quasi-monopoly (according to a recent estimate, the various versions of Windows still have about eighty-five per cent of the market for desktop operating systems) is more than twenty years old, and many of its efforts to expand beyond this base have failed. Ballmer, who succeeded Bill Gates as C.E.O. in 2000, was widely seen as a businessman who didn't really understand where technology was going. In appointing Nadella, an engineer, to replace him, Microsoft appears to be conceding that the critics had a point. (As part of the transition, Gates, who remains Microsoft's biggest shareholder, has agreed to play a bigger role at the company, acting as a technology adviser to Nadella even as he steps down as chairman.)

The stock market certainly seems to be saying that Facebook's future is brighter than Microsoft's. Shares in Microsoft trade at about thirteen and a half times earnings; those in the social network are at more than a hundred times its earnings over the past twelve months. Since the start of last summer, Microsoft's stock has risen about three per cent. In the same period, Facebook's stock is up more than a hundred and fifty per cent.

And yet, the picture is not quite so black and white. Microsoft dates back to 1975; next year, it turns forty. Facebook won't reach that landmark until 2044. Will it still be going strong then? It might well be; Mark Zuckerberg, its founder, will only be fifty-nine. But can we be sure?

As Brian Arthur, an economist at the Sante Fe Institute, explained many years ago, the technology industry is different from most other businesses, where incumbents, such as Toyota and Hilton, build up franchises that are difficult to dislodge but which don't take over the entire market. The tech industry, on the other hand, is defined by successive waves of innovation, and it operates more like a long-running lottery, with the prize for each drawing being a temporary monopoly. Microsoft is Microsoft because, back in the eighties, it won the lottery for the operating-system market. Facebook is Facebook because it won the lottery for the social-networking market.

In the technology world, market leaders, generally speaking, don't get dislodged by competitors who build a better or cheaper version of their product. Eventually, though, they do tend to get displaced by companies that create, or popularize, a new technology that shifts the entire industry in a different direction. (Look at what digital cameras did to Eastman Kodak.) In assessing the long-term prospects of technology firms, the key issue is how vulnerable they are to such waves of creative destruction. And in conducting such an assessment, short-term indicators, such as growth rates and recent movements in stock prices, can be misleading.

Take Microsoft, which, for a long time now, has looked like a textbook case of a market-leading incumbent about to be swept away. Some fifteen years ago, the government rightfully stymied its efforts to extend its operating-system monopoly into the Web-browser market. Next was the dawn of tablets and other mobile devices, which shifted the industry's center of gravity away from the desktop, which Microsoft owned. And then came the cloud, which enabled rivals like Google to offer cheap Web-based products that undercut Microsoft's costly Office suite. Having been clobbered by that one-two-three combination, how could the company survive?

Quite handily, it turned out. Last summer, in a post called "Steve Ballmer and the Art of Managing a Monopoly," I pointed out that, since 2000, Microsoft had more than tripled its revenues and profits. More recently, at a time of falling P.C. sales, it had still managed affairs so that its overall business grew, partly by creating new products, such as the Xbox gaming console, but also by building upon its existing relationships with corporations, which were always Microsoft's biggest customer, and supplying them with new technology and services.

Since I wrote that piece, nothing has changed very much. Last week, Microsoft announced that its revenues in the last quarter were up eleven per cent compared to the previous year, and it made a net profit of about \$6.5 billion. The fall in P.C. sales continued to hit the firm's consumer business, but its core—selling to businesses—was surprisingly strong. Revenues from the commercial version of Office rose ten per cent, revenues from server products rose twelve per cent, and revenues from cloud products jumped more than a hundred per cent.

The message of all this isn't that Microsoft and its new C.E.O. have it easy; obviously, they face big challenges. But, during the past decade or so, the company has demonstrated that its Windows/Office platform, and the customer base it delivers, is less vulnerable to disruptive technologies and disruptive challengers than many had thought. That's why Microsoft, despite the relatively lacklustre performance of its stock, still has a market capitalization of more than three hundred billion dollars, making it the fourth most highly valued company in the United States. (Apple, ExxonMobil, and Google are the ones ahead of it.)

Compared to Microsoft, Facebook is a stripling, albeit a very vigorous one. Its business is monetizing the information its users provide, and, at the moment, it does this mainly by selling advertising. In the past year, it has demonstrated that it can make money on

mobile, something that Wall Street had been demanding, which is the main reason its market capitalization has shot up to more than a hundred and fifty billion dollars. But a bit of perspective is called for: even after a very strong 2013, Facebook's revenues came in at under eight billion dollars, which is less than a tenth of what Microsoft brought in.

Facebook's profits are growing fast, and it may eventually grow into its lofty valuation. That's what other successful technology companies, Microsoft included, have done. But how strong is its technology platform, and how durable will it prove in the face of new innovations?

It certainly seems robust. Social networking, as its name implies, is a business with strong network effects. Once all your friends are on Facebook, there are significant costs in switching to, say, Google+, and significant benefits in staying put. Facebook has done a good job of exploiting the power of the network, and it keeps innovating. On Monday, it launched Paper, a new iPhone app that is receiving positive reviews. (Wired.com's Kyle Vanhemert wrote, "It's probably the best Facebook has ever looked.") It also expanded its social search engine, Graph Search, which it introduced to the desktop last year, to mobile devices.

In short, Facebook is a powerhouse that has built on its early promise. That explains why its stock is now trading more than sixty per cent above its May, 2012, issue price of thirty-eight dollars. But there are also some disquieting signs, particularly that significant numbers of young people are quitting the site—a fact confirmed by the firm's chief financial officer in a recent conference call with analysts. How many users are leaving? Time's Christopher Matthews recently cited a study that concluded that, compared to 2011, Facebook has almost five million fewer high-school-age users and almost seven million fewer college-age users.

Since young people drive technology trends, these are disturbing figures. They appear to raise the possibility of a newer, hipper destination emerging to challenge Facebook. Wait a minute, though: Facebook already owns one of the likeliest contenders, Instagram. Its purchase of the photo-sharing site, in 2012, for a billion dollars now looks like a very shrewd move. By some metrics, Instagram is now the fastest growing social network there is, and as its revenues grow they will boost Facebook. (That's another advantage of being a market-leading incumbent: you can use your highly rated stock to buy potential competitors before they are big enough to challenge you. In the past, Microsoft, Google, and others have done the same thing.)

So will Facebook outlast Microsoft? I hope I'm still around in 2044 to provide an answer. In the meantime, keep your eyes on Harvard Yard—and on the campuses of Stanford, Cambridge, and Tsinghua universities, and many others, too. The next Zuckerberg or Gates may well be out there somewhere, pulling an all-nighter.