REVIEW --- Why Software Is Eating The World

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ABSTRACT

[...] software is eating the world. Today, the world's largest bookseller, Amazon, is a software company -- and while Borders was thrashing in the throes of impending bankruptcy, Amazon rearranged its website to promote its Kindle digital books over physical books.

FULL TEXT

This week, Hewlett-Packard (where I am on the board) announced that it is exploring jettisoning its struggling PC business in favor of investing more heavily in software, where it sees better potential for growth. Meanwhile, Google plans to buy up the cellphone handset maker Motorola Mobility. Both moves surprised the tech world. But both moves are also in line with a trend I've observed, one that makes me optimistic about the future growth of the American and world economies, despite the recent turmoil in the stock market.

In short, software is eating the world.

More than 10 years after the peak of the 1990s dot-com bubble, a dozen or so new Internet companies like Facebook and Twitter have prompted fears of a new bubble, due to their rapidly growing private market valuations, and even the occasional successful IPO.

I, along with others, have been arguing the other side of the case. (I am co-founder and general partner of venture capital firm Andreessen-Horowitz, which has invested in Facebook, Groupon, Skype, Twitter, Zynga, and Foursquare, among others. I am also personally an investor in LinkedIn.) We believe that many of the prominent new Internet companies are building real, high-growth, high-margin, highly defensible businesses.

Today's stock market actually hates technology, as shown by all-time low price/earnings ratios for major public technology companies.

But too much of the debate is still around financial valuation, as opposed to the underlying intrinsic value of the best of Silicon Valley's new companies. My own theory is that we are in the middle of a dramatic and broad technological shift in which software companies are poised to take over large swathes of the economy.

With the technology finally in place, and with more than two billion people now using broadband Internet, more major businesses and industries are being run on software and delivered as online services -- from movies to agriculture to national defense. Many of the winners are Silicon Valley-style technology companies that are invading and overturning established industries.

Perhaps the single most dramatic example of this phenomenon of software eating a traditional business is the suicide of Borders and rise of Amazon. In 2001, Borders agreed to hand over its online business to Amazon under the theory that online book sales were nonstrategic and unimportant. Oops.

Today, the world's largest bookseller, Amazon, is a software company -- and while Borders was thrashing in the throes of impending bankruptcy, Amazon rearranged its website to promote its Kindle digital books over physical books. Now, even the books themselves are software.

Today's largest video service by number of subscribers is a software company: Netflix. Cable companies are having to adapt by becoming software companies themselves, offering services that beam their content to smartphones and tablets.

The dominant music companies are software companies, too: Apple's iTunes, Spotify and Pandora. Traditional record labels increasingly exist only to provide those software companies with content. Industry revenue from digital channels totaled $4.6 billion in 2010, growing to 29% of total revenue from 2% in 2004.

Today's fastest-growing entertainment companies are videogame makers -- again, software -- with the industry growing to $60 billion from $30 billion five years ago. And the fastest growing major videogame company is Zynga (maker of games including "FarmVille"), which delivers its games entirely online. Zynga's first-quarter revenue this year grew to $235 million, more than double revenues from a year earlier. Rovio, maker of "Angry Birds," is expected to clear $100 million in revenue this year (the company was nearly bankrupt when it debuted the popular game on the iPhone in late 2009). Meanwhile, traditional videogame powerhouses like Electronic Arts and Nintendo have seen revenues stagnate and fall.

Today's largest direct-marketing platform is a software company -- Google. It's been joined by Groupon, Living Social, Foursquare and others, which are using software to eat the retail marketing industry. Groupon generated over $700 million in revenue in 2010, after being in business for only two years.

The fastest growing telecom company is Skype, a software company that was just bought by Microsoft for $8.5 billion. The two biggest telecom companies, AT&T and Verizon, have survived by transforming themselves into software companies, partnering with Apple and other smartphone makers.

For the first time ever, on LinkedIn, employees can maintain their own resumes for recruiters to search in real time -- giving LinkedIn the opportunity to eat the lucrative $400 billion recruiting industry.

Software is also eating much of the value chain of industries that are viewed as primarily existing in the physical world. In today's cars, software runs the engines, controls safety features, entertains passengers, guides drivers to destinations and connects each car to mobile, satellite and GPS networks. The trend toward hybrid and electric vehicles will only accelerate the software shift -- electric cars are completely computer controlled.

Today's leading real-world retailer, Wal-Mart, uses software to power its logistics and distribution capabilities, which it has used to crush its competition. Likewise for FedEx, which is best thought of as a software network that happens to have trucks, planes and distribution hubs attached. And the success or failure of airlines hinges on their ability to price tickets and optimize routes and yields correctly -- with software.

Oil and gas companies were early innovators in supercomputing and data visualization and analysis, which are crucial to today's exploration efforts. Agriculture is increasingly powered by software as well, including satellite analysis of soils linked to per-acre seed selection software algorithms.

Many of the leading innovators in financial services are software companies, such as Square, which allows anyone to accept credit-card payments with a mobile phone, and PayPal, which generated more than $1 billion in revenue in the second quarter of this year.

Even national defense is increasingly software-based. The modern combat soldier is embedded in a web of software that provides intelligence, communications, logistics and weapons guidance. Software-powered drones launch air strikes without putting human pilots at risk.

This massive shift is a profoundly positive story for the American economy. It's not an accident that many of the biggest recent technology companies are American. Our combination of great research universities, a pro-risk business culture, deep pools of innovation-seeking equity capital and reliable business and contract law is unparalleled in the world.

There are challenges. Every new company today is being built in the face of massive economic headwinds. And many people in the U.S. and around the world lack the education and skills required to participate in the great new companies coming out of the software revolution. There's no way through this problem other than education, and we have a long way to go.

I'm privileged to work with some of the best of the new breed of software companies, and I can tell you they're really good at what they do. If they perform to my and others' expectations, they are going to be highly valuable cornerstone companies in the global economy, eating markets far larger than the technology industry has historically been able to pursue.

That's the big opportunity. I know where I'm putting my money.

Mr. Andreessen is co-founder and general partner of the venture capital firm Andreessen-Horowitz. He also co-founded Netscape, one of the first browser companies.

(see related letter: "Letters to the Editor: Programming Should Be Required Language" -- WSJ August 29, 2011)

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