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Developing a Strategy for Digital Convergence

by Sean Silverthorne

Technology was getting dull earlier this decade, says **David Yoffie**. But the sudden arrival of digital convergence has turned the tech world upside down. What are the right bets to place? Key concepts include:

- Digital convergence has arrived, creating entirely new products, services, and collaboration opportunities.
- The technology industry is tilting to horizontal. Players need to learn to complement each other as well as compete.
- Network effects create strong market advantages for companies that can capitalize on them.



Following the dot-com bust at the turn of the century, the technology business went through a gloomy period, 2001-2002, when innovation

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dried up, MBAs looked for careers in finance, and investors put their funds in a holding pattern.

"Technology became boring," says David Yoffie, the Max and Doris Starr Professor of International Business Administration at Harvard Business School and an expert in technology strategy.

So when Yoffie began a three-year effort to update an HBS elective course on strategy development in technology-intensive companies, he decided the final module would look at how maturing technology companies make the transition to the next generation of products. But as he did research and talked to tech companies, he came to an inescapable conclusion: Technology was about to get exciting again.

"As I developed new materials, I realized that digital convergence was really happening," Yoffie says. Long predicted but never realized, convergence is the idea that as the worlds of entertainment, computing, and communication go digital, they can be combined to create exciting new products, services, and business opportunities.

The arrival of convergence not only changed how Yoffie designed the course, called Strategy and Technology, but it's also changing how managers in tech-intensive companies are dealing with this issue on the front lines.

Yoffie begins the course by exploring the special nature of tech firms. "What are the unique aspects of technology business that have an impact on strategy formulation?" he asks. "What makes technology-intensive businesses different from other businesses?"

Why Tech Businesses Are Different

In fact, says Yoffie, technology company managers must deal with a number of factors that many other industry executives don't, including:

- The tech company's most valuable assets in the form of human capital walk out the door every day.
- Tech companies largely rely on components from other vendors, meaning that complementary assets must be managed adroitly. Case in point, the relationship between Microsoft and Intel.

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- Tech companies contend with high, upfront fixed costs and low marginal costs.
- They deal with the effect of standards in locking in customers and raising switching costs.

With the unique aspects of the technology business in place, Yoffie turns to the introduction of "network effects"—the idea that the value or utility of a product goes up as more people use it. A telephone holds no value if there is only one in the world—but the technology becomes increasingly valuable as more people use it. In a business with strong network effects, "you have the capability of winner-take-all," says Yoffie. Many dot-com companies assumed strong network effects around their businesses, then lost more than a trillion dollars chasing something that didn't exist.

Network effects can speed the adoption of a new product as well as create high barriers to entry for competitors. "All of this creates a sense of urgency if you want to play in this world," says Yoffie.

Following network effects, Yoffie discusses value creation and building ecosystems, which is where students look at the problem of investing and managing complements. The third module is about capturing value through intellectual property regimes, standards, and technology platforms.

Digital convergence takes center stage in the final module.

Convergence examples, suddenly, are plentiful. Computing and entertainment have come together in the TiVo video digital recorder, which allows users to time-shift their TV viewing. According to Yoffie, entertainment and communications are coming together to produce a mobile music revolution—the distribution of digital music over wireless networks. And your cell phone has also become a camera, music and video player, personal organizer, instant messaging device, and any number of other products all rolled into one.

Convergence Of Factors

Why convergence now? A primary factor is the ever-onward march of processor technology. By the year 2010, says Yoffie, who sits on the board of chipmaker Intel, a single computer chip will deliver 1 teraflop

of processing power, and today's high-end, high-speed chips will migrate down into a wide swath of consumer devices. Another key driver is the arrival of broadband technology on a global scale, which allows bandwidth-intensive applications, such as video, to shoot from device to device in the blink of an eye. Wireless is another enabling technology, allowing the computer and other digital devices to access the Internet and other networks from an ever-increasing number of remote locations.

IN A BUSINESS WITH STRONG NETWORK EFFECTS, YOU HAVE THE CAPABILITY OF WINNER-TAKE-ALL.

Yoffie sees much of the technology business tilting horizontally. Take the future of semiconductors, for example. The dominant chip companies have traditionally been vertically integrated: Intel did (and does) its own R&D, design, fabrication, and distribution of its products and technologies. But now in the horizontal model, smaller competitors are sustaining themselves on discrete pieces of the business. RAMBUS offers the core technology, NVidia specializes in design, and TSMC offers fabrication services.

"The key strategic question is where to play in the value chain; very few firms can be successful along the entire vertical chain in a converging world. In the course, we try to dissect where, and under what conditions, you want to focus on horizontal layers in the value chain versus offering fully integrated solutions," says Yoffie.

The horizontal world also poses challenges for companies that are building products using parts, technologies, and services from outside vendors. "The challenge is that when multiple technologies are integrated into products and services, companies are forced to manage, develop, and/or integrate technologies beyond their traditional spheres of competence."

Staying On Course

In designing the course, Yoffie had some unique obstacles to overcome. "Since no significant course development on the interface between technology and strategy had occurred since the end of the dot-

com boom, there was relatively little fresh material available. It has taken three years to produce the entire course. Initially, I had to depend extensively on visitors from technology companies, readings from the literature, and various exercises to fill in the gaps."

He could also count on the research he did in writing his last three books: *Competing in the Age of Digital Convergence*, *Competing on Internet Time*, and *Judo Strategy*.

"The theory was to explore interesting topics with interesting companies, and use the field research as a vehicle for more in-depth empirical and theoretical research," explains Yoffie.

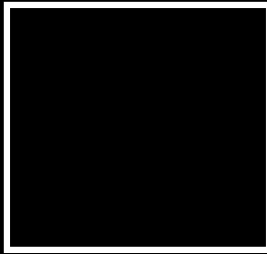
Yoffie's updated course returns to the classroom in the 2006-2007 academic year with several new cases. "These range from the very technical—VMWare, which develops software for virtualization on servers, and SAP, which develops software for enterprises—to the very topical—The Wireless Mobile Music Revolution, which explores whether wireless carriers can beat Apple's iPod in digital music."

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