



DOI:10.1145/1629175.1629189

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Technology Strategy and Management

The Evolution of Platform Thinking

How platform adoption can be an important determinant of product and technological success.

IN SEVERAL OF my prior publications, including my *Communications* columns on Microsoft, Apple, and Google, I have argued that companies in the information technology business are often most successful when their products become industrywide *platforms*. The term “platform,” though, is used in many different contexts and can be difficult to understand. I am currently finishing a book on best-practice ideas in strategy and innovation, and include a chapter on how platform thinking has evolved.¹ This column summarizes some of my findings.

Most readers have probably heard the term platform used with reference to a foundation or base of common components around which a company might build a series of related products. This kind of in-house “product platform” became a popular topic in the 1990s for researchers exploring the costs and benefits of modular product architectures and component reuse.²

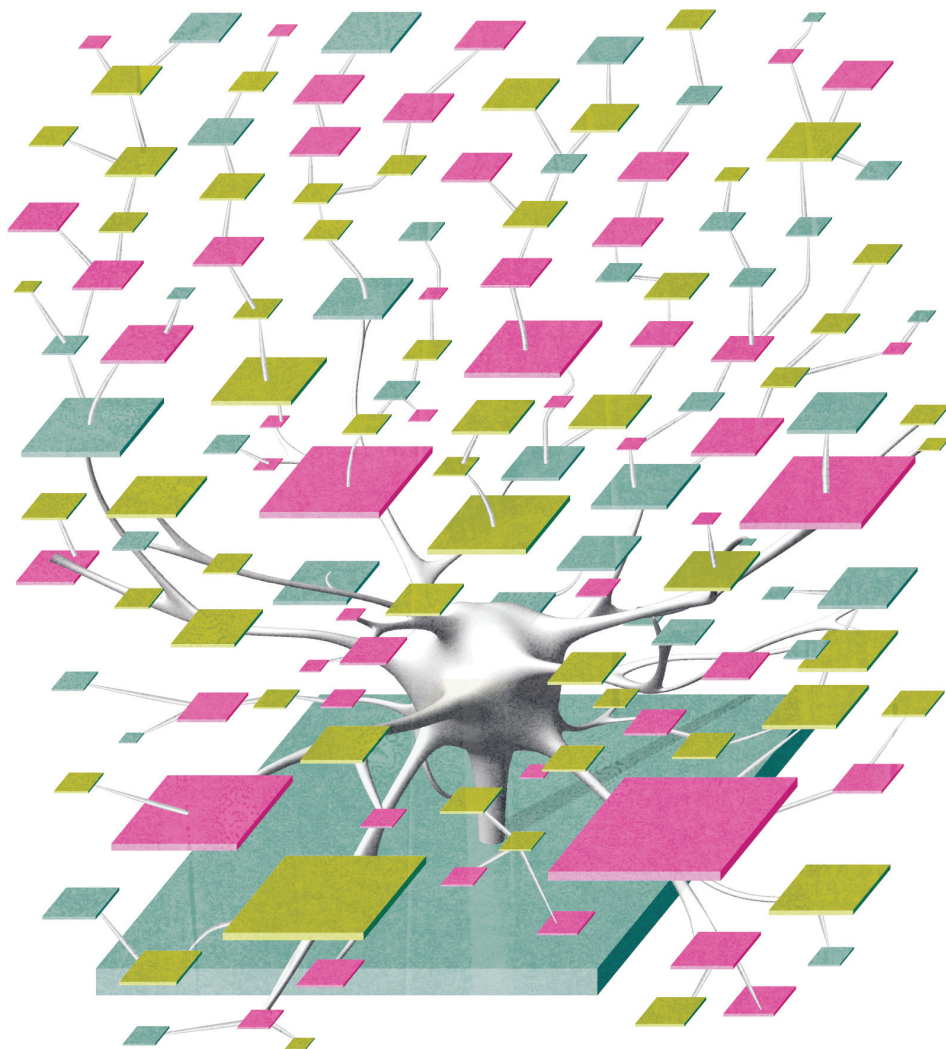
I was among this group, having studied reusable components and design frameworks in Japanese software factories, reusable objects at Microsoft, and reusable underbody platforms at automobile manufacturers.³

Product versus Industry Platforms

In the mid- and late 1990s, various researchers and industry observers, including myself, also began discussing technologies such as Microsoft Windows and the personal computer, as well as the browser and the Internet, as “industrywide platforms” for information technology. Most of us saw the PC as competing with an older industry platform—the IBM System 360 family of mainframes. It took a few more years to devise frameworks to help managers use the concept of an industry platform more strategically. One of my doctoral students, Annabelle Gawer, took on this challenge for her MIT dissertation in the late 1990s, which became the basis for our 2002 book, *Platform Lead-*

ership: How Intel, Microsoft, and Cisco Drive Industry Innovation. In this book and subsequent articles we tried to clarify the characteristics of a product versus an industry platform.⁴

Gawer and I argued that an industry platform has two essential differences. One is that, while it provides a common foundation or core technology that a firm can reuse in different product variations, similar to an in-house product platform, an industry platform provides this function as part of a technology “system” whose components are likely to come from different companies (or maybe different departments of the same firm), which we called “complementors.” Second, the industry platform has relatively little value to users without these complementary products or services. So, for example, the Windows-Intel personal computer or a smartphone are just boxes with relatively little or no value without software development tools and applications or wireless telephony



ers in the ecosystem that create or use complementary innovations, the more valuable the platform (and the complements) become. This dynamic, driven by direct or indirect network effects or both, encourages more users to adopt the platform, more complementors to enter the ecosystem, more users to adopt the platform and the complements, almost ad infinitum.

Standards Are Not Platforms

We have seen many platform-like battles and network effects in the history of technology, mainly in cases with incompatible and competing standards. It is important to realize, though, that standards by themselves are not platforms; they are rules or protocols specifying how to connect components to a platform, or how to connect different products and use them together. Prominent historical examples of platforms incorporating specific standards include the telegraph, telephone, electricity, radio, television, video recording and, of course, the computer. Understanding how standards initiatives are likely to play out is often an essential part of understanding which platform is likely to win the majority of a market, if one winner is likely to emerge.

Not surprisingly, there has been a growing amount of both theoretical and empirical research on industry platforms, particularly in economics but also in strategy and management of technology. Competition in the consumer electronics and computer industries spurred a great deal of thinking on this topic beginning in the early 1980s, just as the arrival of the Web did in the mid-1990s. Influential early work by economists mostly took the form of theory and models with few detailed case studies. This is still a relatively new topic and there are few large-sample studies. But the key concepts are all there—how platform industries or products are affected by standards and technical compatibility, the phenomenon of network or positive feedback effects, and the role of switching costs and bundling.⁵ Switching costs and bundling have become strategically important because companies often can attract users to their platforms by offering many different features for one low price, and can retain users by making it technically difficult to move

and Internet services. The company that makes the platform is unlikely to have the resources or capabilities to provide all the useful applications and services that make platforms such as the PC or the smartphone so compelling for users. Hence, to allow their technology to become an industrywide platform, companies generally must have a strategy to open their technology to complementors and create economic incentives (such as free or low licensing fees, or financial subsidies) for other firms to join the same “ecosystem” and adopt the platform technology as their own.

A second key point is that, as various authors have noted, the critical distinguishing feature of an industry platform and ecosystem is the creation of “network effects.” These are positive feedback loops that can grow at geometrically increasing rates as adoption of the platform and the complements rise. The network effects can be very powerful, especially when they are “di-

rect,” such as in the form of a technical compatibility or interface standard—which exists between the Windows-Intel PC and Windows-based applications or between VHS or DVD players and media recorded according to those formats. The network effects can also be “indirect,” and sometimes these are very powerful as well—such as when an overwhelming number of application developers, content producers, buyers and sellers, or advertisers adopt a particular platform that requires complements to adopt a specific set of technical standards that define how to use or connect to the platform. We have seen these kinds of interface or format standards, and powerful network effects, with the Windows-Intel PC and application development services on the eBay, Google, Amazon, and Facebook social networking portals as well as new electronic book devices, among many others.

Most important with a network effect is that the more external adopt-

to another platform. This is why, for example, cable and telephone companies now compete to offer bundled voice, data, and video services to the home.

Another important insight for managers from the economics research is that platform industries tend to have more than one market “side” to them.⁶ We can see this clearly in the personal computer industry. Microsoft and Apple compete not merely to attract end users to their products. They also have to attract software and hardware firms to build applications products and peripheral devices, such as printers and Webcams. In newer “multi-sided” platform markets such as social networking or Internet media, Google, Microsoft, Facebook, and other companies compete not simply for end users and application developers, but also for a third segment of the market—advertisers. Companies that like to sell video clips have an even more complicated market challenge. They have to attract not only end users, application developers, and advertisers, but also producers of content as well as aggregators of other people’s content.

Even in simple two-sided markets, strategy and pricing can get complicated quickly.⁷ In 1998, for example, David Yoffie and I wrote a book called *Competing on Internet Time: Lessons from Netscape and its Battle with Microsoft* that looked at how Netscape and Microsoft used one-sided subsidies, following the mantra of “free, but not free”—give one part of the platform away, such as the browser, but charge for the other part, such as the server or Windows.⁸ Adobe has done the same thing by giving away the Acrobat Reader and charging for its servers and edit-

We are still in the early stages of understanding how common and important industry platforms really are.

ing tools. Or firms can give one part of the platform away to some users (students or the general consumer) but charge others (corporate users). We also discussed the strategy of “open, but not open”—make access to the interfaces easily available but keep critical parts of the technology proprietary or very distinctive, such as Netscape did with the Navigator browser and its server, special versions of programming languages, and intranet and extranet combinations. Microsoft has done this with the entire set of Windows technologies, including Office and other applications.

Other researchers have done important theoretical and empirical work on what makes for a “winner-take-all” market.⁹ The conclusion seems to be that as long as there is room for companies to differentiate their platform offerings, and consumers can easily buy or use more than one platform, then it is unlikely for one dominant platform to emerge—unless the direct or indirect network effects are overwhelmingly strong. This is why the video game market has not seen one clear platform winner. The platforms (the consoles from Sony, Microsoft, and Nintendo) are different enough, most users can afford to buy more than one console (they are subsidized by the makers, who hope to make money from software fees), and truly hit complements (the games) often become available on all three platforms.

Conclusion

We are still in the early stages of understanding how common and important industry platforms really are. Apart from the examples I discussed in this column, new battles keep appearing in technologies ranging from electronic payment systems to electronic displays, automotive power systems, long-life batteries, and even the human genome database (for disease research and new drug discovery). The closer we look at modern technologies, the more likely we are to see platforms, and even platforms embedded within platforms. Who wins and who loses these competitions is not simply a matter of who has the best technology or the first product. It is often who has the best platform strategy and the best ecosystem to back it up. C

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