



Room for a thousand flowers to bloom

SHANE GREENSTEIN
greenstein@kellogg.northwestern.edu

.....●Market value for nascent goods and services cannot be discovered in a laboratory. Scientists in lab coats cannot distill it from interviewing potential customers and vendors. It can be discovered only through market experience.

Does concentrated commercial leadership or dispersed commercial leadership more efficaciously explore value? Concentrated or dispersed commercial leadership describes whether a small or large range of firms, respectively, can commercialize potential services and products for a similar, though uncertain, technological opportunity.

This is both a philosophical and a practical question. The philosophical viewpoint questions whether there's merit to letting a thousand flowers bloom. The practical viewpoint questions what happens when the market lacks room for such variety.

The details of this debate lie at the heart of competitive analysis in venture capital firms and Wall Street offices.

The case for dispersion

Market value can be unknown for a number of reasons. Primitive technologies might need improvements before reaching customers, user systems might need refinement to become more functional, or firms might need to figure out how to routinize a business to achieve low cost.

Dispersed commercial leadership explores the unknown more quickly than concentrated leadership for two reasons. One of these is a statistical property of Darwinian selection: It is more desirable

to let a thousand flowers of various species bloom when most species are destined to die. A wider variety raises the probability that an unusually good species will bloom and survive.

In other words, most new firms exploring a technological opportunity do not survive a market test. A wider variety of firms increases the chances that at least one will survive.

Beyond selection, more dispersed commercial leadership has another, more subtle effect. It increases the likelihood that a so-called contrarian reaches the marketplace sooner. This effect can be readily visible if the contrarian quickly spurs innovative responses from established firms who otherwise would not have taken any action.

Plenty of historical and contemporary examples illustrate these two observations.

Probably the best illustration of dispersion's benefits occurred in 1993, just after Internet access was legalized in the US. Pervasive Internet service was regarded as a pipedream. Most insiders didn't foresee its commercial form. The first advertised services for commercial access appeared that year, but all of these came from non-mainstream firms, except for MCI and IBM, who ran the Internet for the National Science Foundation until that point.

Although Netscape is often credited as the killer app of the early commercial Internet, this characterization is incomplete. Many firms served as early catalysts before Netscape was founded—for example, Netcom, PSINet, and countless regional ISPs. They spurred the revolution

because they revealed a market for commercial Internet services.

Another great illustration comes from events in 1998, a time of urgent investment in infrastructure to meet growing demand for Internet services. The dispersion of commercial leadership led to a thorough exploration of the commercial landscape. In fact, it appeared to be a frenzy at the time. It involved large and small companies, as well as new and established enterprises from every major incumbent firm in computing and communications.

By the way, to those who were watching carefully, already by this point there were signs of the inexorable emergence of a small number of standardized technical processes for routine tasks. Dispersion would decline as soon as a firm (or set of firms) figured out how to wring efficiencies out of those emerging standard processes. To be sure, before that happened, the dot-com bust brought about a sharp shakeout. My point is that standardization alone *could have* done it, too.

Do not misinterpret that statement. I said *could have* not *would have*. Virtually all dispersed markets eventually become standardized, but not all of them become more concentrated as a result. This is a big open question in practice: Will the introduction of a standard change a market's structure, and why? The answer usually is not straightforward. Although control of de facto standards acts as an instrument for sustaining concentration, sometimes the creation of a standard (especially nonpro-

continued on p. 93

continued from p. 6

proprietary ones) can nurture the emergence of new uses, users, and entrants.

Limits on dispersion

What can limit the blooming of a thousand flowers? As it turns out, many of its limits are simple and unglamorous.

For one, some opportunities need exploration, but the market inherits the concentration of closely related predecessor markets. That can make it too expensive for anyone to build the brand name, distribution network, or product laboratory needed for large-scale exploration.

For example, IBM's dominance of the computer market in the 1970s cast a huge shadow over the PC market just as it got off the ground. Once IBM succeeded with its initial design, the PC hardware market remained concentrated for the next five years. Exploration was valuable, but nothing could stop the concentration of commercial leadership during this period.

Indeed, you might say a thousand flowers did bloom where there was room. Variety flourished in the parts of the market that IBM did not dominate, such as software applications.

A potential limit also can arise from a severe technical constraint. For example, consider database management. It can be ridiculously inefficient to frequently switch ownership and maintenance over databases just to nurture exploration.

As an illustration, consider the databases for each top-level domain name, such as com, net, org, bus, info, and edu. Though the Internet's operations are young enough to benefit from exploring a variety of norms for managing these databases, it is impractical to experiment with different firms each year for each top-level domain. A monopoly will exist in each registry for the foreseeable future.

Sometimes technical constraints do not have to lead to monopoly. The present situation in satellite radio illustrates the point. Both Sirius and XM have attempted to build the customer base necessary to cover their expenses. Each has tinkered with its services and lost money every day for several years. For now, the market has

room for only two firms. If it grows, however, that might change.

A different sort of limit arises from buyer habits in mainstream markets. Business users have limited capacity to integrate technologies from a variety of firms; hence, they prefer to limit their choices to a small number of vendors. In such a setting concentrated leadership can help organize technological transitions and upgrades, limiting exploration to the preferences of the few firms who dominate the market.

Microsoft, Cisco, and Intel all play this role in their core markets. Although each of them faces some competition, none of that competition will put them out of business anytime soon. Finally, even when exploration motivates many new entrants, technology markets remain concentrated because established firms have the ability to buy cooperation from the explorers who are in the best position to form tomorrow's leadership. So many examples show this process at work that it is more easily illustrated through its failures, which are rare.

Many people forget that Microsoft tried to buy Netscape months prior to its initial public offering, a prospect that Netscape's venture capitalists welcomed. Indeed, there was a price at which this sale would have occurred, but Microsoft offered only several hundred million dollars, undervaluing Netscape (and the Internet's commercial potential).

In other words, Microsoft ended up facing a threat in Netscape because of a poor forecast. That illustrates the main point: We do not hear about such errors often because leading firms, Microsoft included, do not make them often. Most leaders buy their future competitors before they ever blossom.

The present era

The tension between concentration and dispersion never goes away. Some years in some markets the pendulum swings one way, then other times it swings in the opposite direction.

At first glance, commercial leadership currently appears headed toward more consolidation. Whether we discuss telephone companies, data equipment firms, portals,

PC operating systems, PC hardware, cable companies, or satellite services, dominant firms control many layers of the modern Internet economy. The state of things would shock a market participant who experienced the frenzy of the late '90s.

Yet there still are signs of a thousand flowers, especially in the wireless access market. For example, while Wi-Fi grows, the cellular carriers continue to invest in related services with quite distinct operational norms. The equipment firms for mobile devices approach this situation from a variety of perspectives, too. It involves BlackBerrys and Palm handsets, or cellular phones by Motorola, Nokia, Erikson, Samsung, and others, not to mention equipment from Broadcom, Netgear, Cisco, and many start-ups.

I am not sure how this situation will end. Some wireless markets must be explored on a large scale—for example, worldwide distribution of cellular handsets inherently requires partnerships among large firms. Yet, it is undeniable that some wireless markets are best explored by small, innovative teams playing around with unlicensed spectrum, as some of the mesh network groups do. Moreover, a few standards committees, such as those writing next-generation Wi-Fi and WiMax, are looking into new technologies. These also could open up huge opportunities.

Broadly speaking, such tension is good for everyone. Society benefits when the structure of supply nurtures learning in uncertain market environments. That raises the likelihood of generating an accumulated market experience greater than any individual firm could or would produce by itself.

If you prefer to speak metaphorically, then say it this way: there is a big difference between a field seeded with a uniform species of flowers and one seeded with a wide assortment of varieties. While survival is hard to predict in either case, the latter is much more likely to blossom into someone's field of dreams.

For further information on this or any other computing topic, visit our Digital Library at <http://www.computer.org/publications/dlib/>.