

STRATEGY PRACTICE

A CEO's guide to innovation in China

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Dynamic domestic players and focused multinationals are helping China churn out a growing number of innovative products and services. Intensifying competition lies ahead; here's a road map for navigating it.

China is innovating. Some of its achievements are visible: a doubling of the global percentage of patents granted to Chinese inventors since 2005, for example, and the growing role of Chinese companies in the wind- and solar-power industries. Other developments—such as advances by local companies in domestically oriented consumer electronics, instant messaging, and online gaming—may well be escaping the notice of executives who aren't on the ground in China.

As innovation gains steam there, the stakes are rising for domestic and multinational companies alike. Prowess in innovation will not only become an increasingly important differentiator inside China but should also yield ideas and products that become serious competitors on the international stage.

Chinese companies and multinationals bring different strengths and weaknesses to this competition. The Chinese have traditionally had a bias toward innovation through commercialization—they are more comfortable than many Western companies are with putting a new product or service into the market quickly and improving its performance through subsequent generations. It is common for products to launch in a fraction of the time that it would take in more

developed markets. While the quality of these early versions may be variable, subsequent ones improve rapidly.¹

Chinese companies also benefit from their government’s emphasis on indigenous innovation, underlined in the latest five-year plan. Chinese authorities view innovation as critical both to the domestic economy’s long-term health and to the global competitiveness of Chinese companies. China has already created the seeds of 22 Silicon Valley–like innovation hubs within the life sciences and biotech industries. In semiconductors, the government has been consolidating innovation clusters to create centers of manufacturing excellence.

But progress isn’t uniform across industries, and innovation capabilities vary significantly: several basic skills are at best nascent within a typical Chinese enterprise. Pain points include an absence of advanced techniques for understanding—analytically, not just intuitively—what customers really want, corporate cultures that don’t support risk taking, and a scarcity of the sort of internal collaboration that’s essential for developing new ideas.

Multinationals are far stronger in these areas but face other challenges, such as high attrition among talented Chinese nationals that can slow efforts to create local innovation centers. Indeed, the contrasting capabilities of domestic and multinational players, along with the still-unsettled state of intellectual-property protection (see sidebar, “Improving the patent process”), create the potential for topsy-turvy competition, creative partnerships, and rapid change. This article seeks to lay out the current landscape for would-be innovators and to describe some of the priorities for domestic and multinational companies that hope to thrive in it.

China’s innovation landscape

Considerable innovation is occurring in China in both the business-to-consumer and business-to-business sectors. Although breakthroughs in either space generally go unrecognized by the broader global public, many multinational B2B competitors are acutely aware of the innovative strides the Chinese are making in sectors such as

¹ Commercialization differs from *shanzhai*, or “copycat innovation.” Many executives in the developed world misunderstand *shanzhai*, believing that it is purely the replication of an innovation developed in another market. Although this does occur, products developed through the *shanzhai* approach incorporate features specifically for the Chinese market. *Shanzhai* is quite prevalent in consumer products categories such as packaged goods and electronics. It can also be found in the business-to-business domain, where local companies produce knockoffs of successful foreign products or business models.

Improving the patent process

In innovative sectors such as biotechnology, electric vehicles, pharmaceuticals, and solar energy, the number of patent applications from Chinese companies is rising. In fact, Huawei and ZTE ranked among the world's top five corporate patent registrants by volume in 2010. Intensifying patent activity reflects a growing recognition that intellectual property is essential to value. As this mentality takes hold, domestic innovators may pressure the government to create a more modern intellectual-property system.

Currently, China recognizes three categories of patents: invention (what most people elsewhere think of as worthy of a patent), utility (a new use for something that already exists), and design. Invention patents run for 20 years, the others only for 10. Patent reform—such

as reducing the duration of design or utility patents and raising the bar for what can be registered in those categories—would be a powerful way for the Chinese government to signal its seriousness about promoting indigenous innovation. If China decides to move ahead with patent reform, a desire for global consistency could well make it a high-priority multilateral issue.

Without patent reform, companies must rely on one of two strategies for protecting intellectual property. The first is to continue to outrun the competition by developing increasingly innovative solutions or building in protection through complex integration that is difficult to reverse-engineer. The second is to create easily identifiable technology “signatures” that would be hard to refute in legal proceedings.

communications equipment and alternative energy. Interestingly, even as multinationals struggle to cope with Chinese innovation in some areas, they seem to be holding their own in others.

The business-to-consumer visibility gap

When European and US consumers think about what China makes, they reflexively turn to basic items such as textiles and toys, not necessarily the most innovative products and rarely associated with brand names.

In fact, though, much product innovation in China stays there. A visit to a shop of the Suning Appliance chain, the large Chinese consumer electronics retailer, is telling. There, you might find an Android-enabled television complete with an integrated Internet-browsing capability and preloaded apps that take users straight to some of the most popular Chinese Web sites and digital movie-streaming services. Even the

picture quality and industrial design are comparable to those of high-end televisions from South Korean competitors.

We observe the same home-grown innovation in business models. Look, for example, at the online sector, especially Tencent's QQ instant-messaging service and the Sina Corporation's microblog, Weibo. These models, unique to China, are generating revenue and growing in ways that have not been duplicated anywhere in the world. QQ's low, flat-rate pricing and active marketplace for online games generate tremendous value from hundreds of millions of Chinese users.

What's keeping innovative products and business models confined to China? In general, its market is so large that domestic companies have little incentive to adapt successful products for sale abroad. In many cases, the skills and capabilities of these companies are oriented toward the domestic market, so even if they want to expand globally, they face high hurdles. Many senior executives, for example, are uncomfortable doing business outside their own geography and language. Furthermore, the success of many Chinese models depends on local resources—for example, lower-cost labor, inexpensive land, and access to capital or intellectual property—that are difficult to replicate elsewhere. Take the case of mobile handsets: most Chinese manufacturers would be subject to significant intellectual property-driven licensing fees if they sold their products outside China.

Successes in business to business

Several Chinese B2B sectors are establishing a track record of innovation domestically and globally. The Chinese communications equipment industry, for instance, is a peer of developed-world companies in quality. Market acceptance has expanded well beyond the historical presence in emerging markets to include Europe's most demanding customers, such as France Télécom and Vodafone.

Pharmaceuticals are another area where China has made big strides. In the 1980s and 1990s, the country was a bit player in the discovery of new chemical entities. By the next decade, however, China's sophistication had grown dramatically. More than 20 chemical compounds discovered and developed in China are currently undergoing clinical trials.

China's solar- and wind-power industries are also taking center stage. The country will become the world's largest market for renewable-energy technology, and it already has some of the sector's biggest companies, providing critical components for the industry globally.

Chinese companies not only enjoy scale advantages but also, in the case of solar, use new manufacturing techniques to improve the efficiency of solar panels.

Success in B2B innovation has benefited greatly from friendly government policies, such as establishing market access barriers; influencing the nature of cross-border collaborations by setting intellectual-property requirements in electric vehicles, high-speed trains, and other segments; and creating domestic-purchasing policies that favor Chinese-made goods and services. Many view these policies as loading the dice in favor of Chinese companies, but multinationals should be prepared for their continued enforcement.

Despite recent setbacks, an interesting example of how the Chinese government has moved to build an industry comes from high-speed rail. Before 2004, China's efforts to develop it had limited success. Since then, a mix of two policies—encouraging technology transfer from multinationals (in return for market access) and a coordinated R&D-investment effort—has helped China Railways' high-speed trains to dominate the local industry. The multinationals' revenue in this sector has remained largely unchanged since the early 2000s.



Wind turbine manufacturing in China's Shandong Province.

But it is too simplistic to claim that government support is the only reason China has had some B2B success. The strength of the country's scientific and technical talent is growing, and local companies increasingly bring real capabilities to the table. What's more, a number of government-supported innovation efforts have *not* been successful. Some notable examples include attempts to develop an indigenous 3G telecommunications protocol called TDS-CDMA and to replace the global Wi-Fi standard with a China-only Internet security protocol, WAPI.

Advantage, multinationals?

Simultaneously, multinationals have been shaping China's innovation landscape by leveraging global assets. Consider, for example, the joint venture between General Motors and the Shanghai Automotive Industry Corporation, which adapted a US minivan (Buick's GL8) for use in the Chinese market and more recently introduced a version developed in China, for China. The model has proved hugely popular among executives.

In fact, the market for vehicles powered by internal-combustion engines remains dominated by multinationals, despite significant incentives and encouragement from the Chinese government, which had hoped that some domestic automakers would emerge as leaders by now. The continued strength of multinationals indicates how hard it is to break through in industries with 40 or 50 years of intellectual capital. Transferring the skills needed to design and manufacture complex engineering systems has proved a significant challenge requiring mentorship, the right culture, and time.

We are seeing the emergence of similar challenges in electric vehicles, where early indications suggest that the balance is swinging toward the multinationals because of superior product quality. By relying less on purely indigenous innovation, China is trying to make sure the electric-vehicle story has an ending different from that of its telecommunications protocol efforts. The government's stated aspiration of having more than five million plug-in hybrid and battery electric vehicles on the road by 2020 is heavily supported by a mix of extensive subsidies and tax incentives for local companies, combined with strict market access rules for foreign companies and the creation of new revenue pools through government and public fleet-purchase programs. But the subsidies and incentives may not be enough to overcome the technical challenges of learning to build these vehicles, particularly if multinationals decline to invest with local companies.



A Chinese-built high-speed train at the Wuhan Railway Station, in Wuhan, China.

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Four priorities for innovators in China

There's no magic formula for innovation—and that goes doubly for China, where the challenges and opportunities facing domestic and multinational players are so different. Some of the priorities we describe here, such as instilling a culture of risk taking and learning, are more pressing for Chinese companies. Others, such as retaining local talent, may be harder for multinationals. Collectively, these priorities include some of the critical variables that will influence which companies lead China's innovation revolution and how far it goes.

Deeply understanding Chinese customers

Alibaba's Web-based trading platform, Taobao, is a great example of a product that emerged from deep insights into how customers were underserved and their inability to connect with suppliers, as well as a sophisticated understanding of the Chinese banking system. This dominant marketplace enables thousands of Chinese manufacturers to find and transact with potential customers directly. What looks like a straightforward eBay-like trading platform actually embeds numerous significant innovations to support these transactions, such as an ability to facilitate electronic fund transfers and to account for idiosyncrasies in the national banking system. Taobao wouldn't have happened without Alibaba's deep, analytically driven understanding of customers.

Few Chinese companies have the systematic ability to develop a deep understanding of customers' problems. Domestic players have traditionally had a manufacturing-led focus on reapplying existing business models to deliver products for fast-growing markets. These "push" models will find it increasingly hard to unlock pockets of profitable growth. Shifting from delivery to creation requires more local research and development, as well as the nurturing of more market-driven organizations that can combine insights into detailed

Chinese customer preferences with a clear sense of how the local business environment is evolving. Requirements include both research techniques relevant to China and people with the experience to draw out actionable customer insights.

Many multinationals have these capabilities, but unless they have been operating in China for some years, they may well lack the domestic-market knowledge or relationships needed to apply them effectively. The solution—building a true domestic Chinese presence rather than an outpost—sounds obvious, but it’s difficult to carry out without commitment from the top. Too many companies fail by using “fly over” management. But some multinationals appear to be investing the necessary resources; for example, we recently met (separately) with top executives of two big industrial companies who were being transferred from the West to run global R&D organizations from Shanghai. The idea is to be closer to Chinese customers and the network of institutions and universities from which multinationals source talent.

Retaining local talent

China’s universities graduate more than 10,000 science PhDs each year, and increasing numbers of Chinese scientists working overseas are returning home. Multinationals in particular are struggling to tap this inflow of researchers and managers. A recent survey by the executive-recruiting firm Heidrick & Struggles found that 77 percent of the senior executives from multinational companies responding say they have difficulty attracting managers in China, while 91 percent regard employee turnover as their top talent challenge.

Retention is more of an issue for multinationals than for domestic companies, but as big foreign players raise their game, so must local ones. Chinese companies, for example, excel at creating a community-like environment to build loyalty to the institution. That helps keep some employees in place when competing offers arise, but it may not always be enough.

Talented Chinese employees increasingly recognize the benefits of being associated with a well-known foreign brand and like the mentorship and training that foreign companies can provide. So multinationals that commit themselves to developing meaningful career paths for Chinese employees should have a chance in the growing fight with their Chinese competitors for R&D talent. Initiatives might include in-house training courses or apprenticeship programs, perhaps with local universities. General Motors sponsors projects in

which professors and engineering departments at leading universities research issues of interest to the automaker. That helps it to develop closer relations with the institutions from which it recruits and to train students before they graduate.

Some multinationals energize Chinese engineers by shifting their roles from serving as capacity in a support of existing global programs to contributing significantly to new innovation thrusts, often aimed at the local market. This approach, increasingly common in the pharma industry, may hold lessons for other kinds of multinationals that have established R&D or innovation centers in China in recent years. The keys to success include a clear objective—for instance, will activity support global programs or develop China-for-China innovations?—and a clear plan for attracting and retaining the talent needed to staff such centers. Too often, we visit impressive R&D facilities, stocked with the latest equipment, that are almost empty because staffing them has proved difficult.

Instilling a culture of risk taking

Failure is a required element of innovation, but it isn't the norm in China, where a culture of obedience and adherence to rules prevails in most companies. Breaking or even bending them is not expected and rarely tolerated. To combat these attitudes, companies must find ways to make initiative taking more acceptable and better rewarded.

One approach we found, in a leading solar company, was to transfer risk from individual innovators to teams. Shared accountability and community support made increased risk taking and experimentation safer. The company has used these “innovation work groups” to develop everything from more efficient battery technology to new manufacturing processes. Team-based approaches also have proved effective for some multinationals trying to stimulate initiative taking.

How fast a culture of innovation takes off varies by industry. We see a much more rapid evolution toward the approach of Western companies in the way Chinese high-tech enterprises learn from their customers and how they apply that learning to create new products



Chinese innovation is evolving across a range of industries. Read “Three snapshots of Chinese innovation,” on [mckinseyquarterly.com](https://www.mckinseyquarterly.com), for ground-level views from the automobile, semiconductor, and pharmaceutical industries.

made for China. That approach is much less common at state-owned enterprises, since they are held back by hierarchical, benchmark-driven cultures.

Promoting collaboration

One area where multinationals currently have an edge is promoting collaboration and the internal collision of ideas, which can yield surprising new insights and business opportunities. In many Chinese companies, traditional organizational and cultural barriers inhibit such exchanges.

Although a lot of these companies have become more professional and adept at delivering products in large volumes, their ability to scale up an organization that can work collaboratively has not kept pace. Their rigorous, linear processes for bringing new products to market ensure rapid commercialization but create too many hand-offs where insights are lost and trade-offs for efficiency are promoted.

One Chinese consumer electronics company has repeatedly tried to improve the way it innovates. Senior management has called for new ideas and sponsored efforts to create new best-in-class processes, while junior engineers have designed high-quality prototypes. Yet the end result continues to be largely undifferentiated, incremental improvements. The biggest reason appears to be a lack of cross-company collaboration and a reliance on processes designed to build and reinforce scale in manufacturing. In effect, the technical and commercial sides of the business don't cooperate in a way that would allow some potentially winning ideas to reach the market. As Chinese organizations mature, stories like this one may become rarer.



China hasn't yet experienced a true innovation revolution. It will need time to evolve from a country of incremental innovation based on technology transfers to one where breakthrough innovation is common. The government will play a powerful role in that process, but ultimately it will be the actions of domestic companies and multinationals that dictate the pace of change—and determine who leads it. ○

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