Public cloud in China: Big challenges, big upside

A recent McKinsey survey provides new insight into the promising public-cloud market in China.

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Ask any business in the United States or other major market about cloud usage, and many will claim that it's already standard. But that's not the case in China, where most companies still rely on local computing in their own data centers. For Chinese business leaders, the hesitation to adopt cloud technologies isn't just an IT issue—it's at the root of a much larger problem. Although China is technologically advanced in many respects, with the world's largest e-commerce market and a thriving mobile-payments landscape, businesses have been slow to invest in IT initiatives that improve operational efficiencies or provide a competitive advantage, including those related to automation or advanced analytics.[1] China's delay in moving to the enterprise cloud is one major factor behind the low digitization rates.

That may soon change, however. Within the technology sector, Chinese business leaders now acknowledge that their low cloud-usage rates are an increasing liability. They're demonstrating their concern by increased investment in both the public and private cloud—and they might leapfrog their global peers. Even the Chinese government has taken note of the cloud's importance and has stated its commitment to growth. According to an action plan issued by the Chinese Ministry of Industry and Information Technology, officials want to increase the scale of the cloud-computing industry more than 2.5 times by 2019, compared with 2015 levels.[2]

For public-cloud providers, these trends represent an important opportunity. Although most Chinese companies now prefer the private cloud, analysts predict that public-usage rates could rise more than 20 percent annually over the next three years. The major public-cloud providers, both local and global, are already moving aggressively to capture business. To gain more insight into this vibrant market, we researched the current state of the enterprise cloud in China, looking at trends related to both private and public usage. We also conducted a cross-industry survey of over 500 Chinese enterprises, with a deep dive on approximately 120 players that spent more than 1 million renminbi (about $154,000) on cloud services (see sidebar, "Our survey methodology"). Here's what we found.

Market snapshot: The current state of the Chinese cloud

China's recent cloud growth initially seems impressive. The country devoted around 14 percent of its total IT budget to cloud services in 2017—more than double the amount spent in 2013. But even with this growth, China still lags behind its global peers in cloud expenditures. In the United States, for instance, cloud spending accounted for around 29 percent of the total IT budget in 2017, up from around 14 percent in 2013 (Exhibit 1).

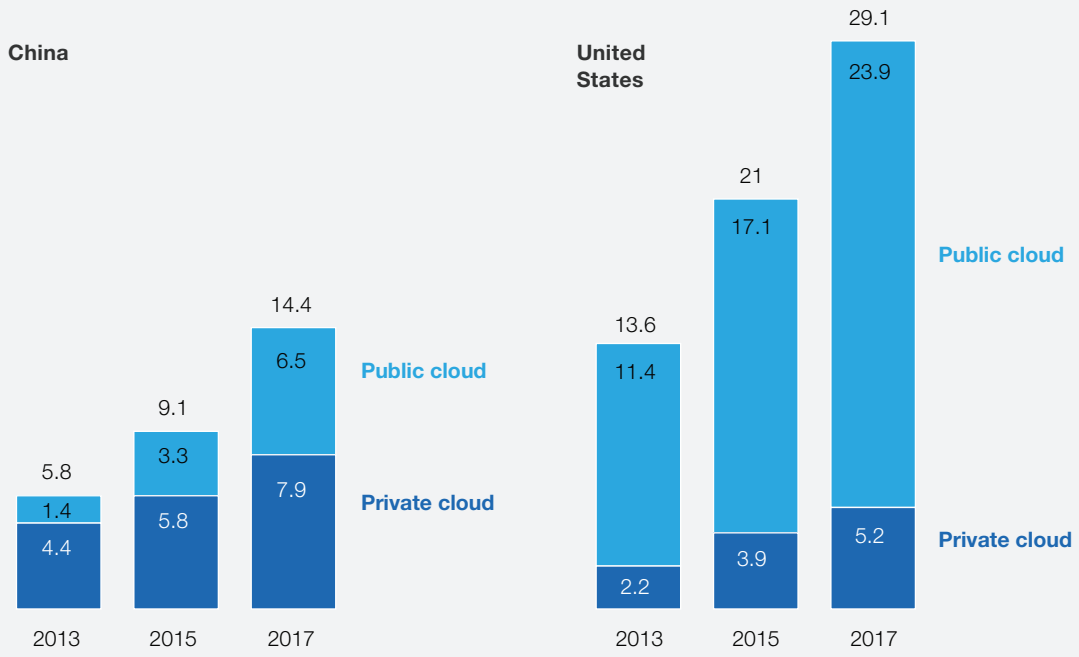
China also differs from many of its global peers in its preference for the private cloud. In the United States, public-cloud spending accounted for around 24 percent of the average IT budget, compared to around 5 percent for the private cloud. In China, however, IT spending is almost evenly split between the public and private cloud.

This snapshot of the Chinese cloud shows where things are now, but it doesn't reveal what's ahead. While the potential opportunities for public-cloud providers appear enormous, competition is already so intense that leading players dropped their prices by more than 30 percent in 2017.[3] Our survey provides some insight into the opportunities and challenges ahead.

All public-cloud providers will continue to find opportunities, regardless of size or location

One survey finding should give hope to all players: the door is open to any qualified provider in China, regardless of size or country of origin. In our survey, respondents reported that four Chinese providers now receive about 64 percent of their

Exhibit 1 **Chinese companies devote less of their IT budgets to the cloud than companies in the United States overall.**



[1] Cloud spending divided by total enterprise IT-software, -services, and -infrastructure spending.
Source: Expert interviews; Gartner; IDC

public-cloud spend (Exhibit 2). The remainder went to multinationals and other Chinese players. Respondents anticipated that the breakdown would be roughly similar three years from now.

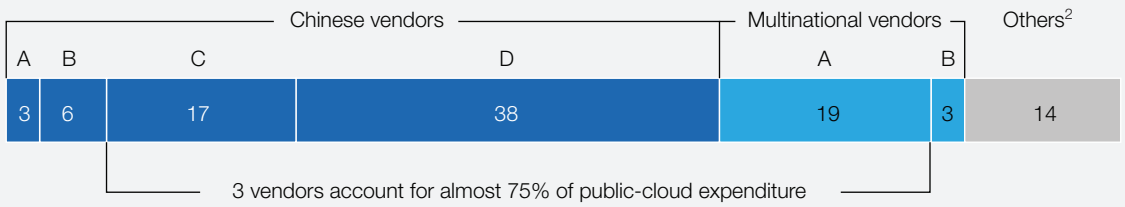
In the future, the public-cloud market should remain wide open, largely in line with the pattern seen today. Although over half the respondents in our survey said that they wanted to work with large-scale Chinese vendors over the long term, 30 percent stated that they'd prefer to engage with global players that had facilities in China and license to operate there (Exhibit 3). Smaller Chinese players will also find a place in the future market, since they were the top choice for 16 percent of respondents.

Public-cloud providers will find that opportunity varies by industry and workload

As in the United States, Chinese internet-services companies, financial services companies, and those within high tech or artificial intelligence are most likely to use the public cloud (Exhibit 4). Among these businesses, usage was by far the highest for internet-services companies, with all respondents in this area reporting some public-cloud expenditures. Financial services was a distant second, at 65 percent.

Exhibit 2 **Our survey respondents used many different cloud providers, with the three largest accounting for almost 75 percent of public-cloud costs.**

Enterprise public-cloud spend by vendor in 2018,[1] % of total cloud spend



[1] Question: What is your approximate split of cloud spend in cloud services among the different vendors you are using? Please distribute 100 points across the vendors.
[2] In our survey, the others category could include multinationals or Chinese companies.

Source: McKinsey China Cloud Survey, 2018

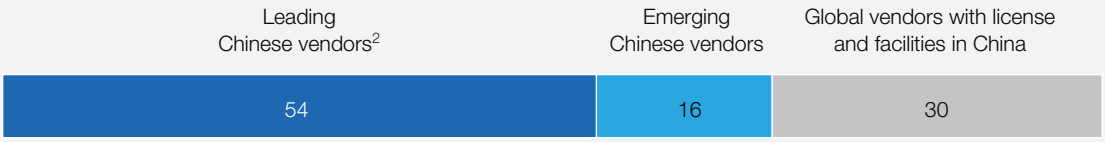
We also identified cloud patterns associated with IT workloads. Using IT spending as a proxy for growth, we asked survey respondents which workloads now received the most funding and whether this would change in 2021. They anticipated some of the greatest increases to be in consumer applications, big data, and business intelligence over the next three years (Exhibit 5). This trend correlates with the Chinese government's push to expand cloud use in these areas to promote GDP growth.

Public-cloud providers will face a strong challenge from the dominant private cloud

Public-cloud providers aren't just competing against one another—they also have to overcome the reluctance of companies to move to the cloud.

Exhibit 3 **While most companies prefer large Chinese cloud providers, global players and small local companies will also find long-term opportunities.**

Preferred vendor to be a long-term partner in cloud,[1] % respondents

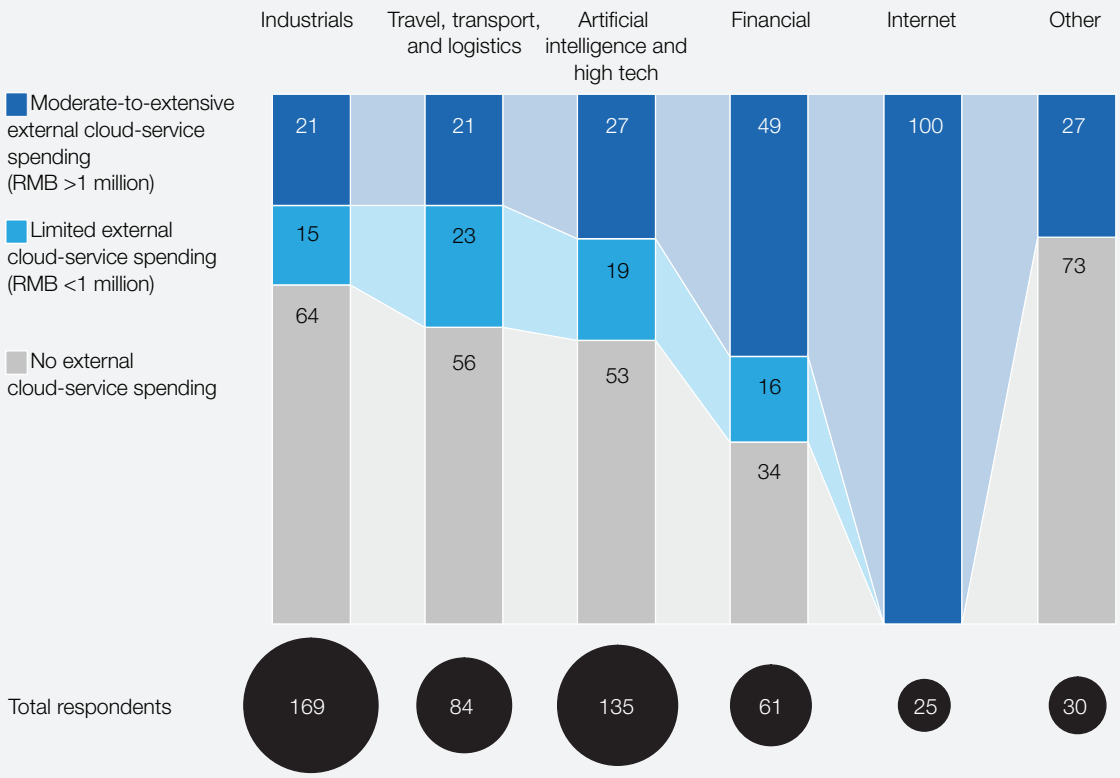


[1] Question: Over the long term, which type of vendor would be your preferred partner in the cloud?
[2] In our survey, leading vendors were defined as the 3 that were largest in terms of market share.

Source: McKinsey China Cloud Survey, 2018

Exhibit 4 **Internet-services companies are most likely to use cloud services, followed by financial companies.**

External cloud-service adoption by sector in 2017,[1] %



[1] Figures may not sum to 100%, because of rounding.

Source: McKinsey China Cloud Survey, 2018

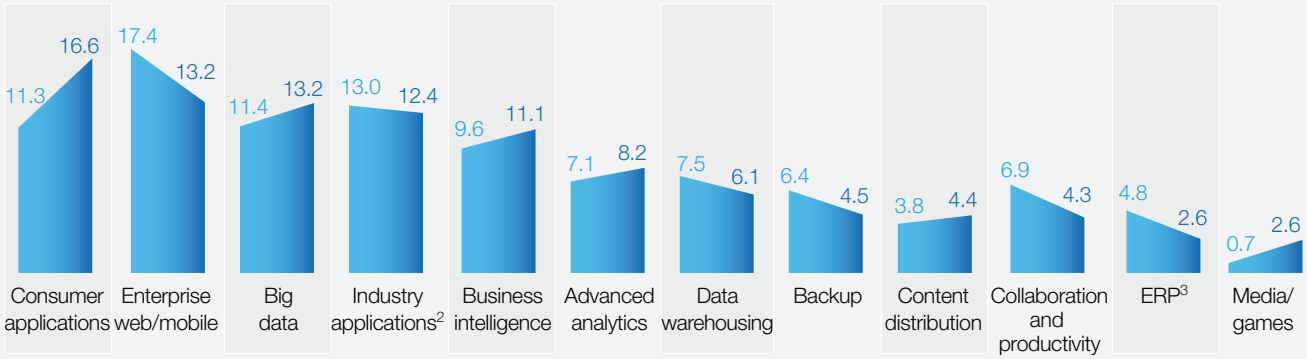
While Chinese businesses may have multiple reasons for wanting to delay migration, our survey suggests that two are particularly important (Exhibit 6).

First, there's the cost and difficulty of migration, which 66 percent of respondents identified as a major barrier to cloud usage. Their concerns are justified, since most Chinese companies have less advanced technology stacks, with most lacking a standard virtualized or containerized workload. These factors complicate all migrations, but the problems tend to be most severe when using a public-cloud provider. On the cost side, Chinese companies face big expenses during cloud migration because they must typically build or create most hardware and software necessary for the shift. That means public-cloud vendors in China can't claim that their

Exhibit 5

Companies are shifting more IT spending to consumer applications, big data, and business intelligence.

2018 enterprise IT spending by workload compared to spending estimated for 2021,[1] % of total IT spending



[1] Question: In your company/organization, what is the approximate split (in %) of total IT infrastructure spend across the following workloads? What do you expect them to be in 3 years? Please distribute 100 points across the different workloads.
[2] Including the Internet of Things.
[3] Enterprise resource planning.

Source: McKinsey China Cloud Survey, 2018

services will reduce IT costs, at least over the first few years of migration, as they do in other countries.

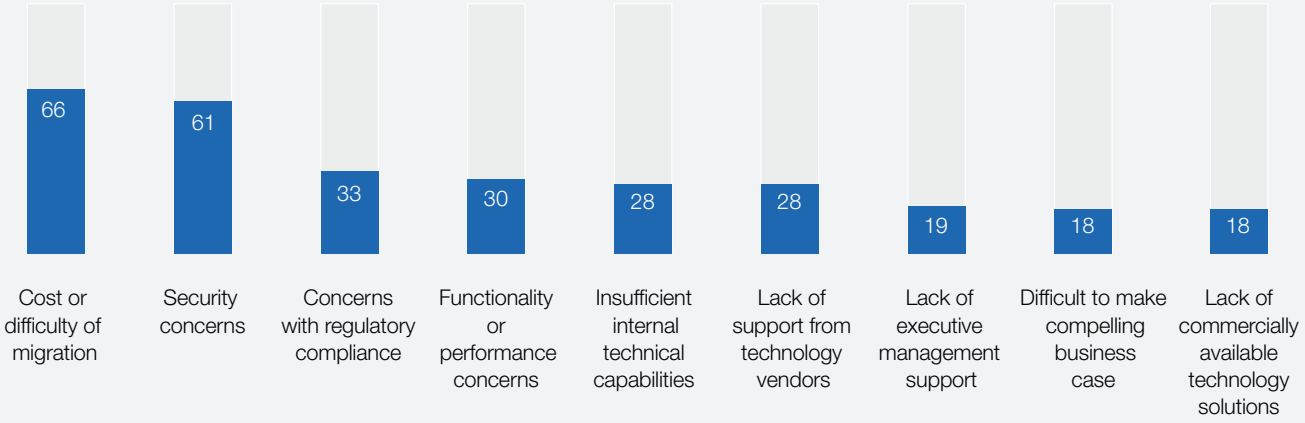
The second major concern relates to security, which 61 percent of respondents cited as a barrier. This finding sharply differentiates China from the United States, where public-cloud providers now offer sophisticated security solutions that enterprises often cite as a benefit. Several factors may explain why our survey respondents lacked confidence in cloud security. First, both local and multinational players in the Chinese market vary in their ability to manage security challenges, so enterprises are naturally concerned that their chosen provider might lack essential capabilities. Their fear of poor security is also heightened because enterprises in China must follow strict data-transmission and storage requirements to meet local regulatory requirements. They can't risk selecting a public-cloud provider that might put them afoul of government standards. It's possible that US providers might allay some of these concerns if they describe their security capabilities to Chinese enterprises.

While migration difficulties and security concerns won't discourage all companies from moving to the public cloud, adoption could be slow. In many cases, the hybrid cloud may emerge as the preferred alternative, since it provides the best of both worlds. For highly sensitive information, companies can maintain private firewalls and control third-party access. At the same time, they can take advantage of the public cloud's scale and low-cost compute power for less sensitive information. In our survey, IT decision makers often indicated that they wanted IT-services companies to provide the expertise required to design and implement hybrid solutions so they could optimize their total cloud spending.

Exhibit 6

Chinese companies are primarily concerned about the cost and difficulty of migration to the cloud (public or private).

Barriers cited for enterprise cloud adoption,[1] % of responses



[1] Question: What are the main barriers to cloud adoption today? Please select all that apply.

Source: McKinsey China Cloud Survey, 2018

Enterprises are open to different working models and prioritize performance

Public-cloud providers are increasingly investing in specific areas, such as artificial intelligence and the management of large data sets, to differentiate themselves from the competition. However, our survey found that Chinese companies did not always require their vendors to have such specialized knowledge. When asked whether they'd prefer to work with a single vendor or a combination of companies that can provide "best of breed" capabilities, they were almost evenly split (Exhibit 7).

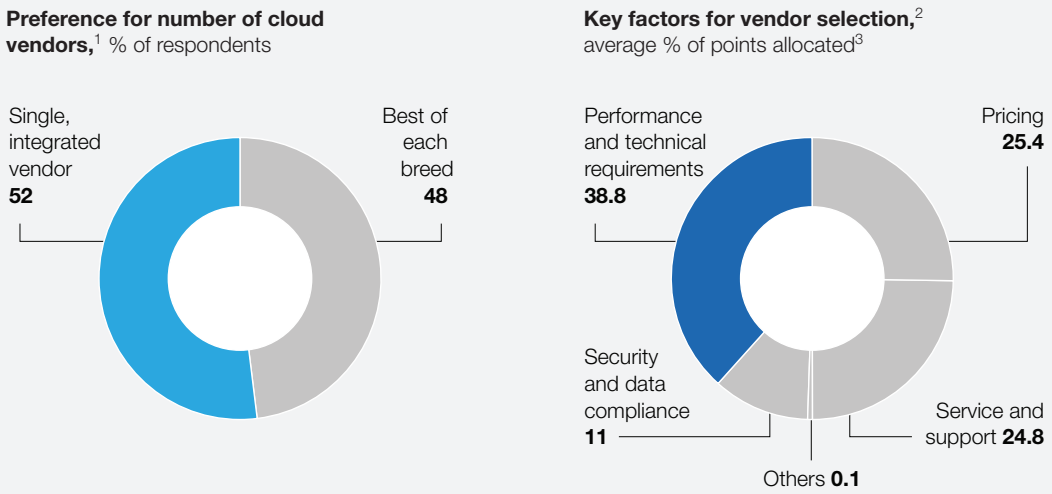
For vendor-selection criteria, most respondents stated that performance and technical requirements were the top considerations—a finding that would likely be replicated in most countries. Pricing was in second place, closely followed by service and support.

Next steps for cloud vendors

Chinese businesses are at different points in their cloud-migration journey, with some having advanced capabilities and others still taking their first tentative steps. Likewise, their needs and requirements will vary. Although public-cloud vendors won't find a single recipe for success in this heterogeneous market, our survey suggests that they'll improve their odds by keeping the following points in mind:

- *It's essential to win based on technology.* Cloud vendors need to develop a full portfolio of capabilities that meet all needs of Chinese enterprises, including those that want to increase their efforts in artificial intelligence, big data, and automation. The best companies will adapt their current strategies to suit the Chinese technology

Exhibit 7 **Chinese enterprises are open to using a single vendor for all cloud services or a combination of qualified vendors.**



[1] Question: When selecting vendor(s), would you prefer a single vendor that provides integrated solutions (incl all infrastructure-as-a-service, platform-as-a-service, and systems-integrator services) or the best vendors for each area?
[2] Question: Which criteria are most important when selecting a vendor for cloud services? Please distribute 100 points (the more points, the more important the factor is).
[3] Figures may not sum to 100%, because of rounding.

Source: McKinsey China Cloud Survey, 2018

stack, rather than expecting companies to possess the same sophisticated hardware and software found in many developed countries.

- *Price wars are inevitable.* In the United States, public-cloud vendors have aggressively lowered prices to gain market share. This approach is possible because they take advantage of scale, increased efficiencies, and falling hardware prices to optimize their cost base and pass the benefits to their customers. This trend has encouraged a faster pace of cloud adoption in the United States. We expect Chinese enterprises to follow a similar pricing strategy as they optimize costs, which could encourage greater public-cloud growth.

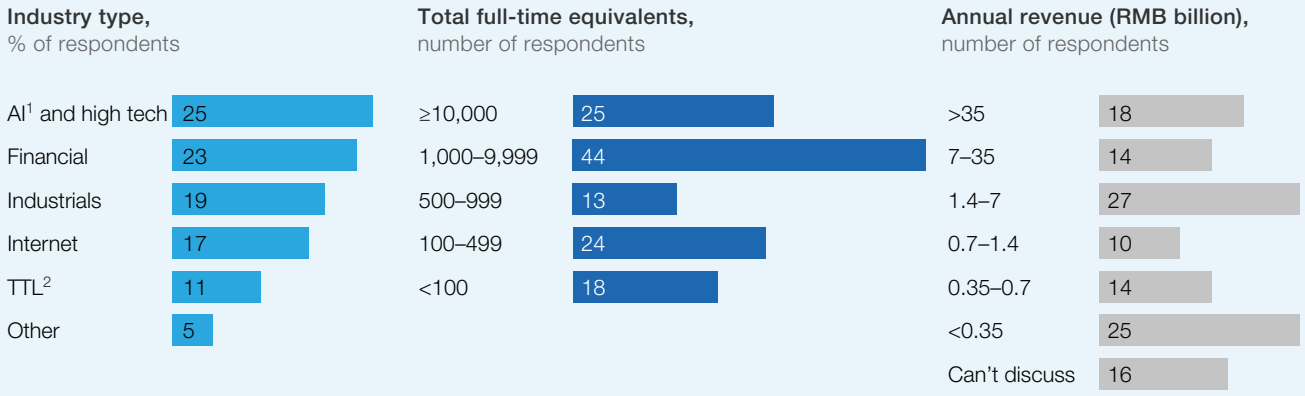
- *Migration must become easier.* With our survey showing that Chinese companies view the costs and difficulty of migration as the greatest barrier to the cloud, vendors must make the process as inexpensive and seamless as possible. This won't be easy because the IT infrastructure within Chinese companies tends to be more diverse than elsewhere. In the United States, for instance, the leading virtualization solution has more than 90 percent share; in China, the leading solution has a 50 percent share. This IT diversity is a challenge for both public- and private-cloud vendors because they must invest in migration tools for multiple technology stacks to enable the rapid shift of workloads from traditional IT environments to their platforms.

Our survey methodology

In early 2018, we surveyed IT decision makers at 504 enterprises based in China about their cloud preferences. Approximately 120 respondents stated that their companies spent more than 1 million renminbi (about $154,000) on external cloud services, and we asked this group over 40 questions about their goals for cloud expenditures, migration of workloads to the cloud, and vendor preferences. Sample questions included, "What criteria are important for selecting a cloud vendor?" and "What are the main barriers to cloud adoption today?" The respondents represented a mix of industries, including internet services; financial; artificial intelligence and high tech; industrials; and travel, transport, and logistics (exhibit). The companies ranged in size from fewer than 100 employees to more than 10,000. Similarly, revenues ranged from under 350 million renminbi annually to over 35 billion renminbi.

Exhibit

The companies in our survey represented a variety of industries and varied by size.



[1] Artificial intelligence.
[2] Travel, transport, and logistics.

Source: McKinsey China Cloud Survey, 2018

- *Security is paramount.* With Chinese companies on high alert for security breaches, especially in industries such as financial services with extensive confidential data, vendors need to share the same priorities. Safeguarding their cloud should be their primary concern.
- *Vendors must make the case for cloud investment.* Since Chinese companies face high migration costs, vendors must build a strong business case for the cloud. They should present it as an engine for digital transformation, not just a technology service, and emphasize

that companies can achieve real bottom-line benefits through digitization. Without such prompts, companies may never overcome their initial inertia.

China is among the top three countries in the world for venture-capital investment in major digital technologies, including artificial intelligence.[4] That alone shows a real belief in the power of technology. Paradoxically, however, Chinese businesses have been slow to use these solutions.[5] It's only recently that they've begun to acknowledge the danger of falling behind and devoted more attention to the cloud. Public-cloud vendors—global and local, large and small—can capitalize on this opportunity, but technical prowess alone won't be enough to win. They'll also have to create an ecosystem that contains system integrators and solution providers with specific industry expertise that can help turn technology investment into business profits. Together, they can unlock value from the public cloud.

[1] For more information, see "Digital China: Powering the economy to global competitiveness," McKinsey Global Institute, December 2017, on McKinsey.com.

[2] "China sets ambitious goal in cloud computing," Chinese Ministry of Industry and Information Technology, April 2017, chinadaily.com.

[3] McKinsey analysis.

[4] Ibid.

[5] Ibid.

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