A newly formed Tsinghua Advisory Board was recruited by Hank Paulson. It included the deans of the MIT Business School and the Harvard Business School; Sir John Brown, chairman of BP; Lee Scott, chairman of Wal-Mart; Steve Ballmer, president of Microsoft; and over 25 other CEOs of major corporations from around the world. All these companies have been deeply committed to China and were consequently very excited to work with Tsinghua. This group provided both the funding and contacts to initiate meaningful field-based case development and research in China.

Our first tangible output of this collaboration was a series of programs on IT, jointly offered with the Tsinghua faculty. The first one, delivered in 2001, was a one-week program entitled “Managing in the Age of the Internet.” I was faculty chairman. It had eight new case studies developed in Hong Kong and China on issues such as project management failures, Internet company successes, and supply chain management issues. We did that program again a year later, with around 16 new pieces of material (developed by both Harvard and Tsinghua faculty), and then a third time last November. That was the beginning of my professional involvement in China.

JR: What is your overall view of China and IT?

WM: The first thing that catches your attention is that this is no third-world, backward nation with regard to IT. What you discover is they’re much, much more interested in information technology, and much closer to us in understanding both the target and implementation processes of IT applications than you would have imagined.

China is a country of 1.4 billion. It’s a country in which the number of Internet users will surpass the number in the United States sometime this year. And it’s a country where there are already over 300 million cell phones. Applications archi-
Architecture is developing in a different way there: it's much more heavily aimed at Web-enabled cell phones because PCs are very expensive vis-à-vis per capita GNP.

When you go to Tsinghua University, it looks like MIT. There is technology everywhere. And this is repeated throughout China. Tens of thousands of miles of fiber have been laid. China Netcom, for example, links over 300 key cities. They have accomplished this very quickly. I remember my first visit to China in 1979, when I led the first HBS delegation to China. There wasn’t a single computer at that time, other than in the military, in the whole country.

The change in IT is representative of the ferocious pace of change in the country as a whole. I remember the Shanghai of 1979, where there hadn’t been a single new building built since 1948. When I go there today, there are 6,000 new skyscrapers, thousands of miles of roads, and a population of 14 million people. This vast change, of course, is not true in the central or western parts of the country. You can argue whether the glass is half full or half empty, but, in totality, what is going on is unbelievable.

In 20 years, they have moved from 80 percent to 70 percent of their 1.4 billion people living out in the countryside. That's a huge shift. This, of course, is why inflation isn't a problem. There's an inexhaustible supply of people who are happy to move to a city, live in the dormitories, work in the factories six days a week, get three square meals a day, and think they have dramatically improved their lives. We often forget our own roots and where we came from. Think about the New England textile companies in 1900. They had people pouring in from impoverished parts of the UK and Ireland. These immigrants thought they’d died and gone to heaven. They only had to work 12 hours a day and they had a warm place to sleep and eat. We, of course, evolved in our expectations; in time, so will the Chinese.

China’s economy is growing at a near-double-digit pace. Consequently, over the next decade, we look forward to huge markets, for example, for washing machines, TV sets, cell phones, and cars. A quarter of the world’s population is there, and they are committed to a very long process of transformation. IT is just one piece, but a very significant piece, of the transformation.

As an example, take the telecommunications industry. In its tenth five-year economic plan, China announced in 2001 that IT development would be a top priority. The plan committed $151 billion to telecommunications infrastructure over five years with the goal of becoming the world’s largest telecommunications market. The plan calls for China to have—by the end of 2005—between 220 million and 260 million fixed-line telephone users, hundreds of millions mobile phone subscribers, and 150 million cable-TV subscribers. I would not bet against it. They are making amazing progress, and this is just one part of a very significant emphasis on IT.

JR: Can you give us some examples of what is going on with IT in organizations in China?

WM: I think you have to look at three different types of organizations—foreign-owned global companies, Hong-Kong based companies, and government companies. You also have to think about what is going on with Internet entrepreneurs.

Cisco is a great example of a foreign-owned global company investing heavily in China. Having entered China in 1996, Cisco is taking advantage of the enormous telecommunications growth. Cisco China today is a $2 billion company. However, Cisco China runs just the way the rest of this information-enabled company runs throughout the world. While some differences exist to meet local needs, Cisco’s systems are global. Their systems in China are based on servers in San Jose, which are backed up by a server farm in Atlanta. What comes off the desktop screens in China is absolutely identical to the USA, except that it is in Mandarin. While international companies in China vary in the way they are organized, Cisco’s global systems approach is very evident in others I have seen.

As an even more interesting example, there is Hong Kong-based Li and Fung—a company most people in the US have never heard about. Li and Fung is a $6 billion, 100-year-old trading company. They link together 4,000 factories in China, Southeast Asia, South Asia, and North Africa to 300 of the largest retailers in the United States and Western Europe. The company had only $1 billion in sales seven years ago. But they’re growing rapidly.

Li and Fung is on the IT applications leading edge. In 1995, they installed a browser-based intranet to tie together their 48 regional offices so
that photographs, orders, etc. could run back and forth. In 1997, they extended the intranet to include their first customers on an extranet. Today, every one of their customers is on the browser-enabled extranet. When you walk through a Li and Fung office, every desk has a screen on it. Some of the screen is in Chinese, some is in English. These people are the quintessential electronic intermediaries. They are the link between the retailers in the West and the manufacturers in the East. They have put together joint purchasing agreements to support their Asian suppliers getting even greater cost economies.

Today, Li and Fung stands in the middle, integrating designers and sales organizations in the US with sources of supply in China. They deliver high-quality, reliable, low-cost service for the global economy.

**JR:** What you are telling me is that the pinnacle of Chinese IT is at least equivalent to ours.

**WM:** What I am saying is that they are very good and growing explosively. Additionally, there are Internet startups all over the place. They are very good technicians, and it shows.

**JR:** But how about the state-owned enterprises that are a very large part of China’s economy?

**WM:** An interesting example that we have studied is COSCO, the #2 shipping company by volume carried in the world. China Ocean Shipping Company (COSCO) started out in 1961 as China’s international shipping company with just four ships. Now their fleet numbers well over 500. They compete with all the major shippers, mostly European. And they operate not only ships but also significant logistics facilities and a host of “land-based businesses,” including finance and real estate.

However, if you read our case on COSCO, you want to cry. They are scrambling. They’re an old line, state-owned enterprise with a long history of paper bureaucracy. They acquired the first commercial computer in China and, consequently, they have legacy problems that most Chinese companies don’t have—yet they’re competing against major shippers. They worry as the port of Singapore (the most sophisticated computer-enabled port in the world) installs its software in ports around the world. COSCO must interface to that software or lose important cost economies. They recently formed a co-venture with the port to work on that interface.

With regard to IT, they are clearly in catch-up mode. While they have developed some state-of-the-art systems, including a satellite-based ship position monitoring system, their recent acquisitions of SAP and other enterprise software have an eerie familiarity with what others are doing—but five years behind. They are just in the process of centralizing more IT management and systems. They are investing a billion Yuan—about $150 million—in IT infrastructure in the next five years, as one step in clawing their way towards world-class internal operations and service. They will make it!!

COSCO is part of the really difficult process of industrial restructuring now underway in China. China looked to the Soviet model, but rejected Russia’s approach of instant capitalism and massive enrichment of a few government cronies. Instead, China’s been encouraging foreign direct investment; they’ve been encouraging foreign companies to come in; and they’ve been working to slim down state-owned enterprises as fast as they can, without triggering a social revolution of the displaced.

It reminds me of a company I work with in Connecticut. In 1900, all their employees lived in company housing. We’ve forgotten that paternalistic part of our own history. That is China’s state-owned enterprises today. They have a wrap-around operation of schooling, health care, and the iron rice bowl from birth to death. But China is unraveling this structure as fast as they can, without the whole thing blowing up. It’s hard!!

The fourth IT sector, Internet entrepreneurs, is explosive. It is impossible to catalog completely, or even well, because it is growing so fast. As one example, reported by my colleague David Lane, one Chinese company has established an e-mail/postal service that expedites correspondence with people in rural areas who do not yet have computers. The company’s service allows e-mail messages to be sent from anywhere in the world to a post office near the addressee’s home. The message is then printed out as a letter, stuffed into an envelope, and delivered in just a few days’ time. The company is even selling advertising on the back of the envelopes. Of course, there are many types of services in China that we also see over here. But there are also many examples of Chinese companies looking at their own envi-
McFarlan and Rockart  |  China and Information Technology

whether they will catch up; the question is when.

They’ve dominated the West in terms of technology for most of the last 8,000 years. For example, who was the greatest naval power in the world in 1400 A.D.? It was China, which had a navy of 30,000 people; it reached out across the Indian Ocean to East Africa and up to the Arabian Peninsula. It had ships ten times the size of the ones in Western Europe. However, when the Admiral, a good friend of the then-Emperor, died in 1429, the Emperor decided that, while the rest of the world might be interesting, the center of all important civilization was in China. So he put more effort into defending the Great Wall to keep out the Mongols. He systemically razed all the boat yards and shut down the entire navy. The result was that when our ancestors came poking around the Cape of Good Hope 130 years later, we were able to define and exploit trade with China. Had history played out just a little differently, in about 1450 Chinese junks would have come up the Thames River and the Seine looking to do business, and the world might be quite different today. In short, they have a history of affinity with technology, and they have a history of writing and communication. The question is not whether they will catch up; the question is when.

One of the more interesting questions is whether China will become a force in outsourcing. I read reports that say India is now graduating 75,000 computer scientists a year. China is graduating only 50,000, but they expect to produce 200,000 a year in the very near future.

Because the language in India is English at the technical level, they have an important head start in outsourcing data centers, call centers, and things of that nature. They’ve also developed high-speed communication links to the rest of the world. In the long term, my guess is that China will be as large or larger in outsourcing of information technology. They have a much stronger and comprehensive technical and communications infrastructure than currently exists in India. They have very good technical schools as well as MBA schools emerging everywhere. English is growing quickly at the younger professional levels. English training now starts in elementary school and is moving through the high schools. They are really ramping up teaching at all levels. For example, it became apparent at Tsinghua that they needed more analytical faculty skills. They went out and found 28 full professors in the U.S. All were tenured professors of finance and economics, all were born in China, all had left China between 1983 and 1988, all had gotten their Ph.D. in the US at major universities, and all were now professors at first-tier universities. They were quite amenable to returning three months a year to teach at Tsinghua. Five of them are now full-time in China. Forrester thinks outsourcing will be as big in China in five years as it will be in India. I am not sure it will be that fast, but, directionally, they are catching up.

Can we shift gears? I would like to hear a little bit about the IT organization; in particular, the role of the CIO there. In my time in Japan, I saw CIOs who were clearly not at the levels we have here. How about China?

First, in my judgment, you are absolutely right about Japan. CIOs there are, in general, deep down in the organization. They mostly have no leverage and are executing an applications portfolio with a heavy focus on transaction processing and engineering support. In China, it’s too early to tell. Obviously, in Internet startups, the CIO is no big deal. Global companies have their own structures, and they fit their Chinese activities into it. In most of the large, state-owned enterprises, where they are only now putting in major packages, I think they don’t yet understand that they’re in an information-enabled economy.
nor the type of long-term commitments they will have to make. Some of the leaders, however, are moving toward a “chief technology officer.” It is just a little too early to tell how it will shake out, but I don’t think it will play out in the Japanese model. The Chinese are much more entrepreneurial and less change-resistant at the core.

**JR:** Warren, you are really very positive on IT in China, aren’t you?

**WM:** In the long term, yes!! China is a country where the growth rate has been astonishing. It isn’t particularly pretty, and there’s a lot of wreckage, but I would not bet against the Chinese with regard to IT. I’m not a great historian, but I’ve focused on it enough to note that in 26 of the last 30 centuries, in any way you cut it—health, longevity, sophistication—the Chinese outperformed the rest. Okay? Take a football team with a 26-4 record that lost the final four. You might figure that they might be able to win a few more along the way. Even in the last convulsive decades of the 20th century, when they weren’t even focusing on IT, the Chinese basically got themselves turned around and are moving ahead. Now, that’s scary stuff. Just visualize what they can do when they really begin to focus.

The level of national involvement in IT is astounding. I was there for the 90th anniversary of Tsinghua University. That’s when I understood that Harvard and MIT are second-tier institutions on some dimensions. We were in their new field house with 6,000 people. Our dean and I had just attended a Tsinghua Advisory Board meeting—so we watched. There were 3,000 students sitting in chairs on the floor of a new auditorium that was completed a week earlier. On one side was the entire presidium of the Chinese government. Now, I don’t believe either a Harvard or MIT graduation has ever been blessed by the presence of the President, Vice President, the entire Cabinet, and head of the House and the Senate.

The speeches began, and I particularly remember the president of Tsinghua University talking about how “this remarkable institution has developed great scientists.” He observed that it was Tsinghua graduates that invented their atomic bomb in 1961. (Thunderous applause.) He observed that it was Tsinghua graduates who invented the Chinese hydrogen bomb in 1965. (Thunderous applause.)

I found myself thinking that if I were back home and even thought about talking about this as a university president, I’d be planning on moving out of the office immediately. They are competitive! They’re science-driven, they’re extremely hard working, and they hate to be behind. Look at their satellites up there. Look at the Chinese astronauts. Look at their IT. That’s a lot of very interesting science. They will be a major global player.

**JR:** Let’s see if we can cap this off, Warren. If I hear what you are saying, we see ourselves in the United States as the dominant player. I hear you saying that in another decade or two, at least from an information technology viewpoint, we probably will not be in that position.

**WM:** We’ll still be a dominant player, but China will be a major player, and, in many ways, a dominant player, too. People think because we invented Microsoft, and Oracle, and HP, and IBM that we are the best users of software. That is not necessarily true. Application software is being installed more or less simultaneously around the globe. And it’s an electronically interlinked world today. Webmail.hbs.edu works on any Internet machine in any hotel, any airport lounge, anywhere inside China. I get my e-mail anywhere from any Internet-enabled machine. That’s what this open interconnectivity is all about. The Chinese are part of this system. They are developing and training people, and they will be a leader.

Let me finish with the high points of Dick Nolan’s closing lecture in our first program in Tsinghua. Dick focused on three myths that have built up about IT in the West.

The first is that English will be the preeminent language of the Internet. He noted in reality how deeply affected he was by all of these screens filled with Mandarin characters. He did some calculations and found that far more than 1.4 billion people throughout Asia and the rest of the world can read those characters—somewhat more than can read English. So his first point is that the predominant language of the Internet today is English but may well be Chinese in the future.

The second myth is that the PC will be the predominant input device to the Internet. Dick said, “Wrong!” His observations in China have led him to believe that the predominant input device
is going to be the Web-enabled mobile phone because that’s how usage is growing all across Asia.

Finally, he said myth number three is that the United States has an enduring long-term competitive advantage in applications. He believes this is hubris. Application software will be installed on a more or less similar time scale around the globe (give or take five years). I believe Dick’s three observations are correct.

JR: Thank you very much, Warren. Your thoughts are most insightful.

ABOUT WARREN MCFARLAN

Warren McFarlan (fmcfarlan@hbs.edu), the Albert H. Gordon Professor of Business Administration, is a senior associate dean and director of the Harvard Business School’s Asia-Pacific Initiative. Professor McFarlan earned his A.B., M.B.A., and D.B.A. from the Harvard Business School. He has been a long-time teacher in the Advanced Management Program: International Senior Managers Program, Delivering Information Services Program and several of the Social Sector programs. He teaches in the second-year course entitled "Managing in the Information Age." He is editor of Information Systems Research Challenge, published by the Harvard Business School Press, 1984. He served as Senior Editor for MIS Quarterly from 1986-1988 and serves on several corporate and non-profit boards. Professor McFarlan’s most recent books include: Connecting the Dots, coauthored with Cathleen Benko; Seizing Strategic IT Advantage in China, coauthored with Professor Richard Nolan, and Professor Guoqing Chen of Tsinghua University; and Creating Business Advantage in the Information Age, coauthored with Professors Lynda M. Applegate and Robert D. Austin.