

Digital China on the Way

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The Chinese economy has the second largest GDP (normal GDP in USD) in the world. Over the past three decades, the Chinese economy has developed while relying on the manufacturing industry, especially labor-concentrated manufacturing industries like toys and shoes. Moving forward, China needs to turn these industries from low-end to middle-end, and eventually to high-end. In order to create more employment opportunities, China needs to shift its industry policy from manufacturing to service. The most important service industry here is the information technology industry.

Over the past three decades, China has grown to become the biggest PC manufacturing center in the world, due to its ability to supply the cheapest and most skillful workers for this kind of manufacturing industry. But two years ago, Chinese workers requested that companies raise their salaries, and in some factories in coastal areas, the workers started to strike for higher salaries and better treatment. As a result, PC and PC parts manufacturing companies are moving their factories to inland China in order to maintain their low labor costs.

Meanwhile, foreign vendors are changing their strategy by strengthening their service instead of their manufacturing, for example, by creating data centers in China, such as IBM's medical data center in Ningbo, Zhejiang Province, and Fujitsu's internet data center in Nanhai, Guangdong Province. IBM is going to strengthen its smart-planet business in China, including smart grids, e-hospitals, e-retail, etc. Japanese vendors are also strengthening their ICT business in China; Fujitsu wants to strengthen its e-agriculture business in China.

Digital China in the Government's 12th Five-year Plan

China is planning to start a new five-year plan this year, the "12th five-year plan." In this plan, the Chinese government promotes changing the country's economic structure. There are several important points about the background to this plan. First of all, China cannot expect the low-end manufacturing industries to drive sustainable economic development. China needs to strengthen its high-added-value industries, including network service industries like the IT industry, to drive economic development. Second, China cannot expect manufacturing industries to create more employment opportunities, because most manufacturing companies have started to cut labor costs. As a result, manufacturing industries contribute only around 18% of employment opportunities. The only industries that might contribute to employment creation are service industries, especially ICT industries.

Premier Wen emphasized in his "government working report 2011," which was announced in the National People's Congress of China session held on March 5, 2011, that Wulianwang ("the internet of things") could play an important role in increasing industrial

productivity. Wulianwang includes smart grids, e-hospitals, ITS and e-government. It is easy to see that these kinds of modern service industries are all network industries. The important contribution made by network service industries is that of supplying convenience to the consumer, thus expanding the market. China is currently a global manufacturing center; in the future, it will be a global market. The question therefore is how to industrialize information technology. From [Table 1](#) we can see that China has been one of the most important ICT nations in the world. And there is also a big potentiality to create an IT market in China ([Chart 1](#)).

China needs to find some leading industries to drive its economic development. IT service industries could be a main engine for driving economic growth. From [Chart 2](#) we can confirm that the number of Chinese netizens has increased to 420 million – over 30% of China's population. The internet has become a part of everyday life for Chinese people.

Premier Wen emphasized in his government working report that the government would support internet service industries much more during the 12th five-year plan. China will change from a hardware manufacturer to a software creator through the new five-year plan.

Strengths & Weaknesses of China's ICT Industries

China's ICT industries started to catch up to those of developed countries in the mid 1990s. The main players of ICT industries are not in fact state-owned enterprises (SOE), but for the most part small and middle-sized vendors (SMV), which are basically owned by private companies.

Let us go back and take a look at the economic reforms of enterprises, especially the reform of SOEs. Up until the 1990s, the government wanted to maintain the public ownership of SOEs. But

TABLE 1
Information Technology Adoption (2009)

per 100 person	Fixed Telephone Lines	Mobile Phones	Number of PCs	Internet Users	Broadband Subscribers
Australia	42.4	113.8	60.4	74.0	25.4
Brazil	21.4	89.8	16.1	39.2	7.5
China	23.3	55.5	5.6	28.5	7.7
Germany	59.3	127.8	65.3	79.3	30.4
India	3.1	43.8	2.8	5.1	0.7
Japan	34.8	90.1	67.4	78.0	24.9
Korea	39.9	99.2	54.4	81.6	33.8
Russia	31.8	163.6	13.3	42.4	9.2
UK	54.6	130.6	81.2	83.6	29.8
US	49.3	94.8	79.9	76.2	27.1

Source: KKC 2011

the ownership of SOEs is in fact a big problem, and therefore, in the mid 1990s, the government decided to reform the ownership of the SOEs and allow most of them to become modern companies. At the same time, the information technology revolution started. Under the deregulation of the control of enterprises by the government, many SMVs have since been established.

In China, for most private companies, especially small and medium sized companies, funding is a serious problem, because the state-owned commercial banks refuse to lend money to private companies in most cases. But, fortunately, in ICT industries vendors are not capital-concentrated in the initial period. As a result, there were many small vendors established by the end of the 1990s. The strengths of these Chinese ICT industries lie in the following: first, competition among IT vendors contributes to the effectiveness of the industry; second, the market is an open market; and third, regulations were not so strict at the time China began to catch up with other countries.

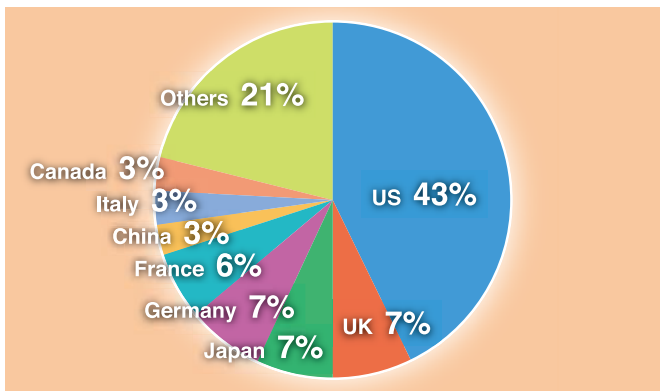
Meanwhile, Chinese ICT industries are facing some serious problems. For example, because the scale of vendors is still too small, it is difficult for them to strengthen research and development (R&D). The first problem is the weakness of technology creation. The second problem is the lack of capital liquidity. For most of the vendors there are many business chances, but they don't have enough capacity to take on the business.

The Chinese government wants to build an effective smart grid in order to protect the environment. But the domestic vendors are not powerful enough to create such new technology. However, if the Chinese government could improve M&A to establish several big vendors, this reform could become a benchmark for the development of ICT industries in China.

It should also be possible for the government to improve companies such as power plants and transportation and distribution companies by forming alliances with IT vendors to create effective systems. Even hospitals can form alliances with IT vendors to create new e-hospital systems. The key point here is to improve M&A with ICT industries in order to enjoy the merit of scale.

On the other hand, ICT development is not a goal, it is simply a tool. How to combine information service technology with other service and manufacturing industries is the really important business. To realize this goal the government needs to privatize the SOEs, including big SOEs like power plants.

CHART 1
Global market for information service



Source: White Paper on Manufacturing Industry, 2010 (METI)

Cloud Computing: New Concept of ICT Service Industries

Why are ICT service industries able to magnify the effectiveness of other industries, including other service industries and manufacturing industries? ICT service industries can overcome the information gap and create symmetry of market information. But ICT service industries are still facing problems such as how to supply convenience in a sustainable manner and how to guarantee security.

The development of personal computer manufacturing is focused on capacity and improving specifications, but the weakness of the network is still a problem. In China the government wants to improve information-sharing through cloud computing. One effort that has been undertaken is improvement of the e-government project, which lets different offices in the government share official information and data. To realize this goal, the government intends to establish a chief information officer (CIO) to improve information-sharing across the different ministries.

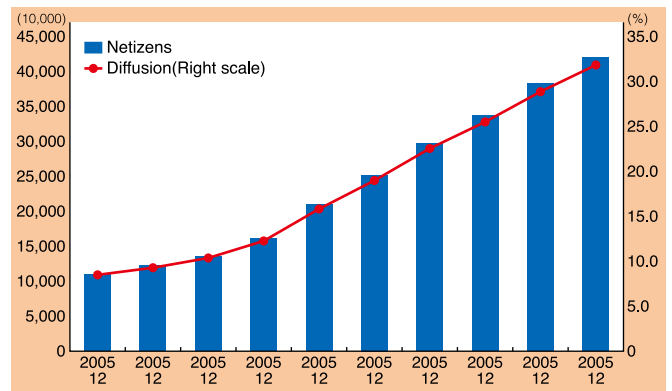
Cloud computing could help to improve information-sharing in not only public sectors, but private companies as well. One good example is the e-hospital system. E-hospital allows the sharing of information in not only one hospital, but among many different hospitals. If you go to hospital A, the doctor there can read information from hospital B, because hospital A and hospital B share the same computing cloud. Similarly, an e-tax system would help us pay taxes more efficiently.

During the 12th five-year plan, China plans to establish many internet data centers in order to strengthen cloud computing. The issue that China faces is how to create a large number of clouds and sub-clouds. It is difficult to imagine the government as the founder of these clouds. Rather, the Chinese government must deregulate the control of the industry and allow foreign companies to invest in computing clouds and their management.

Premier Wen announced in his working report that China would allow foreign investors to establish hospitals in China. American and Japanese vendors are experimenting with Chinese smart cities that include smart grids, ITS and e-hospitals.

Cloud computing systems are a new concept in the ICT service industry. The Chinese central government is designing policies and institutions in order to improve the development of cloud computing. As an experiment, China will likely test the technology in several provinces, such as Guangdong Province, in order to allow the local

CHART 2
Increase in Chinese netizens



Source: CNNIC

governments to help make improvements. The government is also likely to improve alliances between foreign vendors, local vendors and local government, since the experiment here is related to not only the technology, but its management as well.

Brand Strategy of Chinese ICT Companies

If we take a look at the development of ICT industries in China, we find that internet users in China are increasing much more rapidly than its macro-economic development. Taobao.com has become the biggest B-to-C net shopping site and Baidu.com the biggest search engine in China; the main players in the domestic market are to be found amongst the local IT companies. According to the government working report by Premier Wen Jiabao, China's ICT industry could be a strong engine for economic development over the next five years. China's booming information industry is expected to maintain its robust growth for the duration of the 12th five-year plan. The ICT market and its sub-sectors in China are enormous and continued growth is expected, but the industry is intensely competitive and there are many challenges related to regulation and management of the ICT industry, which impact on foreign participation in the market.

Domestic suppliers and vendors are growing ever more sophisticated and are now looking outward towards establishing themselves in international markets as well. International finance will help Chinese companies invest abroad; both Sina.com and Baidu.com are listed in NASDAQ. Neosoft, the Chinese vendor based in Liaoning, has a very good relationship with Japanese IT companies. One successful Chinese business model involves Chinese companies cooperating with foreign vendors; foreign vendors supply the technology, and Chinese companies perform sales in China's domestic market.

Even in IT manufacturing, there is still some room for Chinese companies to cooperate with foreign companies. Lianxiang (Lenovo) announced that it will establish a subsidiary company with NEC that will produce PCs under the NEC brand. Telecom companies are also investing abroad very aggressively. Chinese telecom companies are now creating a strong network in Africa, and cell-phone manufacturers are conducting sales there.

The Chinese IT industry has entered a new stage of developing its global brands, which is a new trend in industry development. This brand strategy is used not only by individual companies, but by the state as well. The Ministry of Industry and Information Technology is going to enforce a new strategy to strengthen the global brands of domestic companies in three ways: the ministry will support domestic companies' brand strategies by supplying subsidies; the government will deregulate the control of Chinese companies' investments abroad; and finally, the government will improve technology transformation through M&A between Chinese companies and foreign companies.

Protecting Intellectual Property Rights

There are those who criticize China for insufficient protection of intellectual property rights. From the American and European viewpoints especially, it seems that China's growth in the global ICT industry is being fuelled by ready access to capital via a massive influx of direct foreign investment, access to the public capital

markets in Hong Kong, and strong government involvement through state-owned enterprises, and government programs and policies.

Since joining the World Trade Organization (WTO), China has strengthened its legal framework and amended its Intellectual Property Rights (IPR) and related laws and regulations to comply with the WTO agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs). Despite stronger statutory protection, however, China continues to be a haven for counterfeiters and pirates. According to one copyright industry association, China's piracy rate remains one of the highest in the world. We can check the applications of IPR in China compared with the main industrialized nations of the world in [Table 2](#).

There are several factors that undermine enforcement measures, including China's reliance on administrative instead of criminal measures to combat IPR infringements, corruption and local protectionism at the provincial level, limited resources and training available to enforcement officials, and lack of public education regarding the economic and social impact of counterfeiting and piracy.

China is a party to international agreements to protect intellectual property, but a company must register its patents and trademarks with the appropriate Chinese agencies and authorities for these rights to be enforceable in China. Copyrights do not need to be registered, but registration may be helpful in enforcement actions.

- (1) Patents: China's first patent law was enacted in 1984 and has been amended twice (1992 and 2000) to extend the scope of protection. To comply with TRIPs, the latest amendment extended the duration of patent protection to 20 years from the date of filing a patent application. Under China's patent law, a foreign patent application filed by a person or firm without a business office in China must be filed through an authorized patent agent, while initial preparations may be done by anyone. Patents are filed with China's State Intellectual Property Office (SIPO), whose offices are responsible for administrative enforcement.
- (2) Trademarks: China's trademark law was first adopted in 1982 and subsequently revised in 1993 and 2001. The new trademark law put into effect in October 2001 extended registration to collective marks, certification marks and three-dimensional symbols, as

TABLE 2

Industrial Intellectual Property Rights (2008)

100 units	Applications			Registrations		
	Number	From Residents	From Non-Residents	Number	From Residents	From Non-Residents
US	4,563	2,316	2,247	1,578	775	802
Japan	3,910	3,301	609	1,770	1,518	252
China	2,898	1,946	953	937	466	471
Korea	1,706	1,271	435	835	611	224
Germany	624	492	132	173	126	47
UK	234	165	69	54	21	33
Spain	39	36	3	23	20	3
Netherlands	27	24	3	21	17	3
Switzerland	20	16	4	8	5	3
Sweden	29	25	4	13	11	2

Source: Japan Patent Office

required by TRIPs. China has a ‘first to register’ system that requires no evidence of prior use or ownership, leaving registration of popular foreign marks open to third parties. Recent amendments to the Implementing Regulations of the Trademark Law allow local branches or subsidiaries of foreign companies to register trademarks directly without the use of a Chinese agent.

- (3) Copyright: China’s copyright law was established in 1990 and amended in 2001. The new rules of implementation came into force on September 15, 2002. Unlike patent and trademark protection, copyrighted works do not require registration for protection. Protection is granted to individuals from countries belonging to the copyright international conventions or bilateral agreements of which China is a member. However, copyright owners may wish to voluntarily register with China’s National Copyright Administration (NCA) to establish evidence of ownership, should enforcement actions become necessary.

There is still a long way for China to go in building a legal system to protect IPR, including strengthening the enforcing of related laws. The ICT industry is typically broken into five broad sectors: hardware, software, service, telecommunications, and semiconductors. The Chinese government is repeating a campaign for the protection of IPR, but it needs to do more to protect software products in particular, since the cost of copying software is so low. Not only is the current situation damaging to foreign ICT companies, but it also results in losses for domestic ICT vendors. Efforts to protect IPR should not be limited to the government, but should also be implemented in public education.

China’s IT Development Strategy & its Impact on Japan

There are many factors that will influence the development of the Chinese ICT landscape over the coming years. The two that will have the greatest effect are the level of government involvement in the economy and China’s ability to become an ICT innovator. According to studies on ICT industry development, the following parameters can be used to evaluate the ICT industry: domestic ICT industry growth, ICT export industry, Foreign Direct Investment (FDI), social impact, protection of Intellectual Property Rights (IPR), and ICT standards.

There are several scenarios of how China’s ICT industries might develop. First is the “global ICT superpower” scenario, which assumes a high degree of government involvement and strong ICT innovation. China would be a leader in defining new global standards and protocols. Second is the “ICT export-limited” scenario, in which government involvement is still strong but the level of innovation is low. In this scenario China shuns global standards and protocols. The third is the “economic powerhouse-limited government” scenario, in which the digital divide persists along the current economic dimensions and piracy continues but, out of self-interest, the ICT industry takes action. In this scenario, China participates in new global standards and protocols.

The Chinese government will have to adjust its policies over time, focusing on facilitation and assistance in ICT export programs and clearing bureaucratic hurdles to ICT investment. The government itself

should invest in ICT, business education and training at all levels while continuing to strengthen and enforce IP laws. Encouraging mergers and acquisitions will help develop economies of scale to support global brands. Meanwhile, end-users of ICT in China will also play a positive role in the success of China’s ICT industry.

- (1) Central Administrators: As the Chinese government continues to restructure and the economy continues to grow, the ICT sector has become a key focus for China. As a result, an ever-increasing number of government agencies have become involved. Formerly, it was just the Ministry of Industry and Information Technology and the State Administration of Radio, Film, and Television that played the key roles in ICT industry administration.
- (2) Central Policies: Key central government policies that hold implications for the ICT industry include: market entry limitation, foreign direct investment rules, and central policies related to China’s 12th five-year plan.
- (3) Provincial ICT Policy: Provincial ICT policy-making largely follows central policies. But each local government tends to compete in attracting investment into the local sector. In strong ICT industry regions, the local governments are able to provide the funds for R&D. In the more peripheral provinces, local governments try to provide more in the way of incentives such as free land leasing, cheap utilities, and tax incentives to attract ICT companies to set up there.

Finally, let us take a look at the impact of ICT industry development in China on Japan and Japanese companies. For most Japanese companies, China is a manufacturing center, and the majority of the business they do there is outsourcing. It is estimated to be 30-50% cheaper to develop computer software in China than in Japan because of the difference in labor costs between the two countries.

But the cost of labor is rising rapidly in China. The provinces in coastal areas are raising the floor of labor costs by 20-30% each year. China is now changing from a global manufacturing center into a global market. As a result, Japanese companies must search for business partners to supply ICT service in China. The solution business will become the main field for foreign IT companies, including Japanese companies.

I would like to point out here that Japanese IT companies need to restructure their investment strategies in China. The attractiveness of the Chinese market lies not only in its size but in its culture as well. The income disparity has increased to such an extent that even the wealthy upper class, which makes up 5% of the population, is a huge market of 70 million people, and the rich Chinese require deluxe service. This purchasing power could contribute to Chinese economic growth. For Japanese IT companies, it is important to strengthen their sales strategy, brand strategy and alliances with Chinese vendors. We do not know whether China will be the final super global market, but it is clear that China is currently the most promising and attractive market in the world. **JS**

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