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## *Prospects for the Software Development Industry in Japan and China (Summary)*

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This paper will give an overview of the current condition of the information technology industry and human resources in China, and how human resources are managed in the United States, which leads the global information technology industry. The development of business cooperation between Japan and China will also be discussed, based on hearings in China.

### **1. Telecommunications and the Information Technology Industry in China**

The Chinese government regards the information technology industry as a core industry and actively makes investments to improve the information technology sector. Led by the government, the environment of the industry is

improving.

Currently, the United States is far and away the leading nation in the information technology industry, due to the mitigation of regulations and advanced technology innovation, etc. The scale of the market in the United States is approximately double that of Japan, which is presently a major market in Asia. However, bearing in mind the huge potential market of China (with its population of 1.3 billion), cooperation between Japan and China in the information technology sector will be an important element as a basis of regional development.

## **2. Human Resources in the Information Technology Industry**

Approximately half of all graduates in China (whose number totals over 800,000) major in scientific areas. Some graduates with special knowledge go to the United States and become key members of leading industries, such as the computer software development industry in Silicon Valley, which is a world center of advanced technologies and enterprises.

The information technology industries, including software related enterprises, are currently led by the United States and its enterprises, as represented by Silicon Valley. Increasingly, human resources with highly advanced knowledge of information technology will be required in the United States, Europe and Japan. It is expected that acquiring these people will become extremely hard.

## **3. The Software Industry in India**

India has become a leading global supplier of human resources with information technology knowledge. The software development industry was firmly established in India by special policies, including the "computer policy" announced in the middle of 1980s. A network of the private, public and academic sectors has been created in cooperation with higher educational institutions, such as universities, as human resource suppliers.

In Japan, although there is an intention to employ Indian experts, the computer industry and others are facing a shortage of translators and interpreters. Communication and mutual understanding are necessary in various situations in the labor-intensive software development industry.

## **4. The Software Industry in China**

The basis for information technology industry development has already been laid, and has progressed in Beijing, since various research institutes and other organizations are concentrated there.

Meanwhile, a positive environment for development, with a profusion of research institutes, universities and enterprises, has not yet been created in inland China, such as the northeast region. Nevertheless, there are some

successful examples, such as Shenyang NEU-ALPINE Software Co.,Ltd in Shenyang, Liaoning Province.

The northeast region of China has an advantage in industrial policy towards the Japanese market compared with other provinces and regions in China, as there are many people who study the Japanese language.

## **5. The Software Industry in Japan**

According to the fact-finding survey of selected service industries conducted by the Ministry of International Trade and Industry, the software industry grew from 1995 until 1999, as its annual sales increased 79%, and the number of employees increased 45% (Table 3) in this period. According to the IT services industry in Japan 2000 published by the Japan Information Service Industry Association, many entrepreneurs feel the shortage of system engineers who can design computer systems for individual work, while the scale of the industry is expanding. Therefore, a cooperative system between Japan and China could be worth considering, in which the Japanese side would be in charge of management and the Chinese side would write programs.

## **6. Prospects for the Network of the Software Industry in Japan and China**

From a Chinese viewpoint, although Japan is not like Silicon Valley in terms of technology and accumulated information, the Japanese market is second only to the United States in terms of scale. Therefore, human resources who can develop computer software or/and use the Japanese language can be utilized, and the regional industries can be promoted, if Northeast China targets the Japanese market. Also, at the actual working level, this system could serve as preparation for new product development for the Chinese market in the future by accumulated know-how through the software development project for the Japanese market.

Meanwhile, competition with small and medium-sized software enterprises in China would become higher for Japanese enterprises. It is necessary for these Japanese enterprises to produce highly specialized value added software. Therefore, research and development will be essential for them. In China, since there are many instances where university professors establish enterprises, it is possible for these enterprises to have a close liaison with universities and research institutes, which have special knowledge. Then, if a pattern to utilize the advanced knowledge of universities and research institutes and establish an industry can be set up, it will be possible for Japan and China to establish a relationship as equal partners exchanging abilities and capacities mutually in the business network.

For the local enterprises and governments, the business network between Japan and China can be taken as an opportunity to activate regional industries.