

RFID and China

As rulers of the world's largest potential RFID market, Chinese leaders view the setting of RFID standards as critical to its economic strategy.

Aug. 8, 2005—China is the manufacturing capital of the world and the largest market for technology. Currently, the country is home to 95 million Internet users. With usage growing faster than 20 percent a year, China will have more Internet users than any other country by 2006. It already has the largest installed base of both landlines (314 million) and mobile telephones (334 million). Within this economic framework, China lays claim to being the largest potential RFID market in the world. And since the standards bearer holds an economic advantage, Chinese political officials have stated that their nation needs to be involved in the setting of RFID standards.

In late April, a group of senior Chinese government officials discussed their views at the [RFID China Forum \(RCF\)](#) in Beijing. The RCF was the largest and most influential RFID gathering in mainland China, attended by representatives of the Chinese, American and Korean governments. It featured more than 50 speakers from such organizations as [IBM](#), [Microsoft](#), [Oracle](#), [Savi Technology](#), [Nokia](#), [NTT Data](#), [ISO](#), [UID](#), [EPCglobal](#), [CompTIA](#) and the [Korean Association of RFID](#). The event also included five key Chinese government officials, including the three department heads of the Ministry of Information Industry, which is leading the formation of China's RFID standards.

Standards and Strategy

China's central government believes standard setting is a strategic activity to forge the following objectives: convert trading power to technology power; develop intellectual property (IP); and use RFID as an inflection point in China's quest for high-tech differentiation and infrastructure efficacy in the global market.

The central government's ruling elite recognizes that their nation lags behind other countries in technology development, thereby making China effectively controlled by developed countries. The government realizes that countries that own IP typically spend more on research and development—plus, they significantly influence standards to gain an economic advantage over rival countries.

To help spearhead the transition to a developer of standards and creator of IP, the Chinese government has created the Golden Card Project. This is one of the government-endorsed Golden series, whereby all state-owned properties—such as banks, driver's license issuers and public transit—all use smart cards containing RFID tags to accept payment from their customers. The general target is to develop smart cards as a method of payment for 300 million Chinese in 400 cities within 10 years.

China is a society in which cash is the traditional method of payment and, therefore, widely circulated (this is also the common situation in most other Asian countries). At the beginning of China's smart card deployment, the concept was not well accepted by most Chinese people; however, there is a Chinese saying that "everything's hard in the beginning."

Initially, 12 cities and provinces were involved in the pilot phase. Smart cards have been distributed and are now used in the cities of Shanghai, Xiamen, Wuxi and Suzhou, and in the provinces of Guangdong, Hainan

and Jiangsu. After a slow start, the smart cards are beginning to enjoy advantages in China due to the success of the pilot projects and the country's growing economic prosperity. Thus far, about 200 million cards of various types have been issued.

Promoting the engineering associated with smart cards is another key aspect of the Golden Card project. In the country's ninth Five-Year Plan, the R&D of the basic chips embedded in the cards, the creation and improvement of card operating equipment systems (denoted COS), and the development of relevant software, are the engineering topics being emphasized by the government's agenda. Furthermore, associated network products such as routers, line concentrators, modems, network cards, display terminals, output equipment, charge machines and automatic counter machines are also undergoing intense R&D. China intends to create intellectual property and accelerate the construction of a smart card industry using the success of the "Golden Card" projects to stimulate their usage by average citizens.

Zhang Qi, director-general of the Ministry of Information Industry, told the RCF conference audience that 44 million smart cards have been issued for public transit alone. China perceives that RFID will be a major contributor to its IT industry, and it wishes to pursue strong and orderly development of this sector. "One billion smart cards are expected to be eventually deployed within this sector," said Qi.

As an example of how RFID will be a major contributor to China's IT infrastructure, consider the June 9, 2004, announcement by Sinopec Corp., Bank of China and the Construction Bank of China. Sinopec signed an agreement to grow the Golden Card Project with help of the latter two institutions. This represents the first time in China that two major commercial banks joined with a major commercial group.

Sinopec has the largest product-marketing and retail network in China. Currently, it has 15,000 retail stations in 19 provinces—an 84 percent share in wholesale and 40 percent share in retail in its principal markets. Bank of China has a long history in financial services and is very experienced in card management and issuance. Sinopec will roll out the smart cards to most of its retail stations. The goal is to create a Sinopec retail system with a uniform logo, a well-known brand and convenient services.

Chinese RFID Standards

Government speakers at the RCF conference repeatedly expressed a desire for harmonized standards development. To the Chinese, harmonized development means an international standard that is interoperable among China, Japan, United States and Europe.

Xu Qin, deputy director of the Department of High Tech Industrial Development under the National Development and Reform Commission, has stated that the government will be involved with setting an RFID standard for China and will try to coordinate its efforts with those of the International Standards Organization.

It's important to recognize that the standards architecture itself is being criticized by the Chinese. They believe that the emerging EPCglobal standard should clearly demarcate the seven network layers according to ISO's Open System Interconnect (OSI) model. Use this model to build standards that are tolerant of China's domestic needs while allowing top-level compatibility of data and, thereby, level the playing field for creation of Chinese IP. In this scheme the frequency, modulation and protocol used in the air interface are lower levels in the hierarchy. Thus, when the Chinese state they desire an interoperable and international standard, they are saying they understand that differences in the lower layers are necessary for local issues of frequency assignment while higher levels such as Layer 7—the application layer—should be compatible to permit ubiquitous adoption of RFID. It is also at this level that the Chinese desire to create intellectual property.

Chinese RFID Agenda

Dai Ding, vice chairman of China Federation of Logistics and Purchasing, told the RCF conference that "logistics modernization is a key driver for success in China's retailing sector." He also said "RFID will give

China the infrastructure to reduce the percent of GDP that is consumed by logistics, thus making China more efficient.”

Since a significant portion of Chinese exports will be to countries compliant with ISO 18000-6, which defines the air interface for RFID devices operating in the 860 MHz to 960 MHz, China wants to develop standards and assign frequencies that are compatible. This is a top priority for Beijing. Most likely China will also specify spread-spectrum frequency hopping to offer noise immunity for the air interface.

Finally, by negotiating standards compatibility, China may then invent applications that have value in world markets. For example, the Chinese R1 Alliance is developing a solution to eliminate product counterfeiting by using the UID (unique identification) serial number embedded in RFID tags and coupling the UID with real-time database transactions to authenticate products and certify such things as manufacturing date, location and lot number. This would become a valuable service with IP rewards for its Chinese sponsors—an outcome that the government deems desirable.

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