

RFID and China

Introduction

Many westerners' appreciate that China is the manufacturing capital of the world but few would categorize it as the largest market for technology. Yet China currently has 95 million Internet users with usage growing faster than 20 percent a year. At this rate of growth China will have more Internet users than any other country by the end of 2006. As of 2005, China already has the largest installed base of both land lines (314 million) and mobile telephones (334 million).

Within this economic framework China lays claim to being a technology power user for information super highway. This sets the stage for China to be the largest potential RFID market in the world.

As a result of China's prominent position, many countries, organizations and people are influenced by the perspective and decisions of the Chinese central government. In April 2005, a group of senior 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 the Chinese, American, and Korean Governments. It featured over 50 speakers from organizations such as IBM, Microsoft, Oracle, Savi, Nokia, NTT Data, ISO, UID, EPCglobal, CompTIA, the Korean Association of RFID and many more. The event also featured five key Chinese government officials, including the three department heads of the Ministry of Information Industry.

Note: MII is apparently leading the formation of China's RFID standards. This is vital information for Western companies to understand as they form alliances and strategies for China.

RCF was covered by China's top Media/Press including CCTV and Xinhua Finance. In addition it was covered by internationally respected New York Times and Bloomberg News. Over 500 dignitaries attended.

This report highlights important trends and decisions derived from this meeting.

Background and Important Chinese Beliefs

Central government believes standard setting is a strategic activity to forge the following national objectives:

- Convert trading power to technology power
- Develop intellectual property
- Use RFID as an inflection point in China's quest for hi-tech differentiation and infrastructure efficacy in the global market

It is telling to understand that about half of China's exports are really pseudo-joint ventures, where China's politicians believe their value-add is limited to being a processing center for Japan, United States and Europe. This type of activity and

core competency restricts participation to the low end of the value chain because it requires low cost labor.

The central government's ruling elite also recognizes that China lags developed countries in technology development thereby making China effectively controlled by developed countries. To improve this situation, China believes it is a priority to have intellectual property (IP) in technology and strong participation in the creation of standards. The Chinese realize 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.

So far, China has been an adopter of standards, not a setter. Since the standards' bearer holds an economic advantage, the Chinese desire to be involved in the setting of RFID technology. The country is already using the Golden Card project to facilitate its status as a leading adopter of RFID smart cards also known as the Integrated Circuit (IC) Card.

Golden Card Project¹ is China's Early RFID Beachhead

To help spearhead the transition to a developer of standards and creator of IP, the Chinese government has created the Golden Card Project. It is one of the government officially endorsed Golden series, whereby all state owned properties such as banks, driver license facility, public transit, etc. all use the RFID Integrated Card. The general target is to develop IC cards as a method of payment for 300 million Chinese in 400 cities within 10 years.

This will be a significant change in Chinese culture. Since 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 IC 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 twelve cities and provinces were involved in the pilot phase. IC cards have been distributed and are in operation in Shanghai city, Guangdong Province, Hainan Province, Xiamen city and Wuxi city, Suzhou city and Nanjing city of Jiangsu province. After a slow start the IC cards are beginning to enjoy advantages in China due to the success of the pilot projects and the country's growing economic prosperity. Many companies, as well as the Chinese government, see Integrated Cards as very promising products. Thus far, about 200 million cards, of various types, have been issued.

Promoting the engineering associated with IC 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

¹ Source: Craig Harmon, President QED Systems www.qed.org, www.autoid.org

software, are the engineering topics being emphasized by the government's agenda. Furthermore, the 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 an Integrated card industry using the success of the "Golden Card" projects to stimulate product creation and their usage by average citizens.

Existing Use Cases for RFID in China

The Labor Bureau of Beijing is adopting IC card and related computer technology, and is issuing labor cards to enterprise employees in a variety of labor-related businesses. The card can record an individual's basic data and job information, technical abilities, retirement information, etc. It is viewed as a wholly new and modern administrative technology that can be provided to labor departments and organizations needing employees. In addition, information to help with job-hunting, unemployment relief funds, pensions, etc., will be more easily obtained.

The Chinese government's Golden Card project also aims to create a nationwide, inter-bank credit card clearinghouse. Currently, a number of credit/debit cards can be used online, although the number of cardholders is still small. For example, China's online bookseller, dangdang.com, now takes eight kinds of cards issued by five Chinese national and regional banks, in addition to MasterCard, Visa, American Express and JCB cards, however, so far Golden Card has not significantly changed the most frequently used payment method from being cash.

Madam 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 they wish 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 amongst Sinopec Corp., Bank of China and the Construction Bank of China. Sinopec Corp. signed a framework agreement to build on the Golden Card Project with help of Bank of China and the Construction Bank of China. It is the first time in China that two major commercial banks joined with a major commercial group. Sinopec has the largest product-marketing network and market space in China. Currently it has 15,000 retail stations in 19 provinces, an 84% share in wholesale and 40% share in retail in its principal markets. One of the key partners, the Bank of China, has a long history in financial services and is very experienced in card management and issuance.

This cooperation combines Sinopec Corp's advantage in resources and their marketing network with the strength of the banks' settlement and services resources. The project will reform the oil product retail business and inject it with advanced IT technology, thereby upgrading the traditional marketing network which took hundreds of thousands of people 50 years to amass a sales volume of RMB 120 billion. It is expected that by the end of 2005 the number of retail sites will exceed 20,000, the sales volume of oil products will exceed 52 million tons, and the share in retail will be over 50%. The Golden Card Project will be executed in steps compatible with Beijing's unified planning. The company will roll-out the IC cards to most of its retail stations. The goals are to create a Sinopec retail system with a uniform logo, a well-known brand, convenient services, and advanced management. The Chinese believe RFID technology will support flexible dispatching and optimum inventory management for its petrol stations and convenience stores.

Chinese RFID Standards

The government officially supports the deployment of RFID and desires an open environment for collaboration and absorption of technologies. Government speakers at the RCF conference repeatedly expressed a desire for harmonized development. To the audience, harmonized development was explained as an international standard that is interoperable amongst China, Japan, US 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 China². These standards authorities include ISO/IEC JTC 1/SC 31/WG 4 for RFID technology standards, ISO/IEC JTC 1/SC 31/WG 2 for data construct standards, ISO/IEC JTC 1/SC 31/WG 3 for conformance standards, and the ISO TC 122/104 Joint Working Group (JWG) – Supply chain applications of RFID – for application standards. They are attempting such ISO coordination while being mindful of the continuing presence of EPCglobal initiatives.

It is important to recognize that the standard architecture itself is being criticized by the Chinese. They believe that the emerging EPCglobal standard should clearly demarcate the 7 network layers according to the International Standards Organization's (ISO) Open System Interconnect (OSI) model. Apply this multi-level approach to build standards that are tolerant of China's domestic needs while using this paradigm to allow for top level compatibility of data, low entropy information levels characteristic of order and level playing field for IP to be created. 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 stating they understand that differences in the lower layers are necessary for local issues of frequency assignment while the higher layers such as Layer 7 – The Application

² Source: http://www.chinadaily.com.cn/english/doc/2004-10/24/content_385110.htm

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

China recognizes two important tasks on its agenda for RFID. First it must pursue ways to create and leverage IP rights by having a position in setting standards. In this regard, the Chinese Ministry of Information Industry (MII) and Ministry of Science claimed they are contributing to a white paper on RFID with 13 other countries. During the China RFID Conference, MII publicly invited other countries to join this initiative with the goal of avoiding the duplication of low-level work. The second item is to develop and promote technical skills which help create Chinese standards that are interoperable and global.

Dai Dingji, 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.” This is one area where China desires to develop its home market to purposely support the invention of intellectual property to improve logistics efficiency using technology like RFID.

Specifically, it is the development of standards³ which demonstrates China’s compliance to WTO directives and their ultimate compatibility with the 860 – 960 MHz band of the ISI/IEC 18000-6:2004. This is a top priority for Beijing. Since the significant number of Chinese exports will be to countries compliant with the 18000 part 6 specifications it is important for China to assign frequencies within this band. Most likely it will also specify spread spectrum frequency hopping to offer noise immunity for the air interface. By negotiating standards compatibility, China may then invent applications which 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 their birth date and manufacturer location, lot number, etc. This would become a service with IP rewards for their Chinese sponsors. An outcome that the P.R.C. deems desirable.

Chinese Politics also affect Standards

Q. What does China's desire to play a role in standards mean?

A. Based on the comments made by all five key Chinese political officials at RCF, it is clear that China desires to be a standards co-driver, not a passive adopter of RFID standards. China does not want to yield an IP advantage or make royalty payments to any countries for its domestic RFID standard.

³ Most likely compatible with ISO 18000 part 6

Tell me again! Why can't China join EPCglobal and develop RFID applications?

The direct answer is EPCglobal in China is too much US-Europe centralism and, therefore, fails to satisfy technology sovereignty needs whose primary benefit is the avoidance of royalty payments to rival countries.

Consider that China has experienced 9 % growth a year for more than 25 years, the fastest growth rate for a major economy ever recorded⁴. As a result, their politicians' mentality is that China should be a standards setter not an adopter. Joshua Cooper Ramo provides a fascinating picture of China's new foreign policy. "Rather than building a US-style power, bristling with arms and intolerant of others' world views," he writes, "China's emerging power is based on the example of their own model, the strength of their economic system, and their rigid defense of national sovereignty⁵."

Summary

Many people, especially Western Caucasians, see China as a poor country offering low-cost labor for many years to come. The Chinese government, however, is determined to take steps to replace the ubiquitous label "Made in China" with a more prosperous "Invented in China." RFID is viewed by the Chinese as enough of a disruptive technology to enable China to leap frog rival nations and achieve this next step in China's economic transition.

Author's BIO

Harold Clampitt, CEO of American RFID Solutions, is the Co-founder and Vice Chairman of the *China RFID Training Institute* (CRTI). This body is responsible for ensuring that the curriculum, instructors, labs, student certification testing, and RFID technology nurture subject matter experts. Prior to starting American RFID Solutions, LLC, Mr. Clampitt held technology leadership roles in SAFCO Technologies and Bell Cellular Communications Systems. Previous positions held were: Vice President of

⁴ Source: Newsweek article by [Fareed Zakaria](#) within the May 9 issue

⁵ Source: <http://fpc.org.uk/publications/123>

Engineering, Vice President of Sales and Chief Operating Officer. He has successfully led organizations through start-up, organic growth, mergers and acquisitions as well as joint ventures with companies such as Motorola. He has also created, led and managed P/L centers in Europe, the Middle East, the Asia Pacific Rim, North America and South America. Harold has an international perspective gained from living abroad and traveling to over 40 countries.

Mr. Clampitt earned a Bachelor of Engineering Science, Electrical Engineering from the University of Western Ontario and a Masters of Business Administration with a specialty in Finance from the University of Chicago.

He has been a distinguished speaker at international events in Beijing, Cannes, Hong Kong, London, Munich, Oxford, Singapore and Sydney. Recently, he was a featured speaker at RFID World 2005 and a guest lecturer on RFID at the University of Chicago. He has enjoyed professional recognition with publication of his articles in trade magazines and the Institute of Electrical and Electronics Engineers.

When the opportunity presents itself, he blogs at the following sites www.RFIDhandbook.blogspot.com and www.RFIDinfo.blogspot.com.