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VIEWPOINT

By Craig Harmon and Leslie Downey

RFID: Will China Throw a Monkey Wrench?

Without Beijing's support -- which doesn't appear likely -- of international efforts to set a global standard, world trade could suffer

Will China play ball or go its own way and buck international efforts to establish radio-frequency-identification (RFID) standards? The answer to that question will have a profound impact on the future of global trade for the likes of Wal-Mart (**WMT**), Procter & Gamble (**PG**), and thousands of other U.S. and European companies. Multiple RFID standards could mean substantially more information-technology investment for large companies and insurmountable trade barriers for smaller ones.

RFID is a technology that uses radio waves to identify objects, such as goods in supply chains. Attached to an object is an RFID "tag," made of an integrated circuit and an antenna, which sends the object's identification information to a wireless receiver, called a "reader." Readers convert the information into a digital format that can be sent to a company's operations and accounting systems, and to its trading partners.

MORE PRECISE DATA. The potential efficiencies for global supply chains are enormous, and many predict widespread adoption of RFID technology over the next 10 to 15 years by retailers and manufacturers worldwide. Unlike bar codes, which must be scanned individually (usually manually), multiple RFID tags can be read simultaneously by a reader, which needs no human operator.

And an RFID tag accommodates a serial number, enabling identification of a unique object -- whereas, bar codes are limited to identifying the "class" of an object (such as the stock keeping unit, or SKU). With the ability to capture more accurate and precise data, and share it with supply chain partners, companies can fine-tune their supply chains to optimize sales while reducing costs.

Wal-Mart has already set an aggressive timetable for receiving RFID-tagged cases and pallets from its top 300 suppliers at selected U.S. locations. Target (**TGT**) and Home Depot (**HD**) have also begun RFID trials. However, these and many other companies know they can't fully reap the benefits of RFID unless they and their global trading partners adopt a common set of standards.

ITS OWN COURSE. Many large U.S. and European retailers and manufacturers have embraced a set of RFID standards recently developed by a newly created standards organization. Now they're seeking to gather their Asian trading partners into the fold. China hasn't yet adopted RFID standards, but it has promised to articulate its position on some of the standards in the coming months. Recent statements indicate that its conformity is hardly assured.

To China, developing RFID standards doesn't mean embracing those already created by the West. Recent statements and actions by Chinese officials indicate that China intends to chart its own course, not necessarily in line with the recently developed "international" standards. Given China's growing economic clout and cohesion with other East Asian countries, nonconformity may lead to a proliferation of regional standards that limit the use of RFID or force the creation of a complicated set of translating interfaces between different "standards."

Since 1990, China's share of world trade has more than tripled. Over 70% of the more than \$200 billion in goods imported into the U.S. from the Pacific Rim come from China. More than 65% of nonfood products sold by Wal-Mart are manufactured in China, and Wal-Mart is said to be planning to increase purchases from China in future years.

TWO STANDARDS SO FAR. The stakes are high for China, too. U.S. imports are the key contributor to its continuing trade surplus. Wal-Mart alone would rank as China's sixth-largest export market if it were a country. So why wouldn't China want to play ball?

The Geneva-headquartered International Standards Organization (ISO), of which the U.S. is a member, has been developing RFID standards since 1997. Dissatisfied with the pace of that development and the cost of ISO-compliant tags, Wal-Mart and several major U.S. manufacturers set up a new standards organization in 2003, to work in parallel. The organization, EPCglobal, now has more than 500 members, mainly in North America and Europe, and has thus far concentrated on developing RFID standards for supply-chain applications.

To date, EPCglobal has published two major standards: a registry of manufacturers and their supply-chain partners, and the so-called Generation 2 (Gen2) Ultra High Frequency (**UHF**) standard addressing the radio communication between RFID readers and "passive" tags (low-cost tags without batteries). In January, EPCglobal submitted its Gen2 standard to ISO for ratification.

"MUST BE INTEROPERABLE." ISO's preliminary review committee has given its endorsement, and ratification by ISO's international membership is expected in 2006. As a member of the World Trade Organization (WTO), China is generally obligated to support global standards such as ISO's, but it has shown no inclination to accept the ISO version of Gen2.

The Chinese government has acknowledged the importance of RFID technology and standards to China's future economy -- not only export manufacturing but importation and domestic manufacturing and transport. China's Ministry of Information Industry (MII), the agency responsible for formulating the country's RFID policies, has been a strong advocate of creating China's own intellectual property. In a June 16 speech at the 2005 China RFID Applications Summit Forum in Beijing, Madame Zhang Qi, a senior official in the agency observed: "Whatever becomes the China RFID standard will influence global standards and must be interoperable."

Recent actions by other Chinese government officials have appeared to drive home that point. In July, the U.S. National Institute of Standards in Technology (NIST) canceled a long-planned U.S.-China workshop on RFID standards development when it learned that only a handful of the expected Chinese delegates would be attending. Among the delegates opting out were those from MII.

Despite the technical nomenclature involved, economics and politics will play heavily into China's choice of RFID standards in the coming months. There are three areas of debate.

Tag-Reader Communication: In determining the specifications in Gen2, EPCglobal referenced intellectual property made available on a licensed basis by several companies. Nevertheless, in late 2004, EPCglobal announced that its standard could be implemented "royalty free," that is, vendors could develop Gen2-compliant products without infringing on any patents.

But Intermec, a U.S. company (and EPCglobal member) with more than 140 RFID patents, countered that many Gen2-compliant products would likely use its technology, for which it planned to charge royalties. Numerous other companies have followed suit. The Chinese have demonstrated a reluctance to pay royalties to private enterprises outside China. This issue undoubtedly figures prominently in China's RFID standards debate.

Electronic Product Code (EPC) Numbering System: China's choice of an EPC numbering system to identify RFID-tagged objects may have the longest-term impact on global RFID standards. In the encoding scheme developed by EPCglobal, the EPC on each tag would be a short but unique number similar to a license plate on a car. An authorized party seeking detailed information about a tagged object looks up the object's EPC in a database.

In order for their products or shipments to be included in such databases, companies must register with EPCglobal and pay an annual fee. China has implemented its own EPC classification system for domestic product labeling called the National Product Code (NPC). The NPC has recently been expanded to include an item-specific serial number.

Though China is still grappling with the numbering system it will use in RFID tagging, some Chinese officials have recently expressed an intention to continue using the NPC, at least, within China. In debating whether to use EPCglobal's EPC numbering system for exports, officials have expressed reservations about requiring Chinese manufacturers to join and pay EPCglobal and incorporate an additional EPC numbering system in their operations.

Data Sharing Among Supply Chain Partners: Along with an EPC numbering scheme, EPCglobal has recommended a system by which supply-chain partners can share product information. The system involves an EPCglobal-maintained registry of companies with databases containing information about product specifications, manufacturing, or transport. EPCglobal has subcontracted the maintenance of this registry to Verisign ([VRSN](#)), a U.S. company.

China has contended that a system involving critical information resources controlled outside its borders would violate state security. Recently an MII official made it clear that China intends to develop its own product-information registry. In exchange for fees, EPCglobal or other organizations may access China's registry, he stated, but the data will reside in China.

When it comes to RFID standards, China may play ball, but it's looking more and more like a whole new ballgame.

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