



Seeking RFID Technical Papers

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RFID Educational Foundation

18 Jun 2008 **Sun Yat-Sen** University

To begin...

- Full Circle – Emily Sopensky
 - TI's HF Toll Roads
 - ITSS
- IEEE
- Technical papers

Full Circle!

- Texas Instruments RFID (TIRIS) 1995-2001
 - 1996 Foshan toll www.iriscompany.com/corp_comm
 - 2008 5th Annual RFID Conference & Trade Show



Electronic future for Foshan

Texas Instruments has won a breakthrough order for its Tiris transponder system in China's Guangdong province.

Sean McManus reports on progress



There are now 23 electronic tolling locations, in or around Foshan City with 36 electronic toll collection readers spread between them

With the number of vehicles on China's roads increasing by around 13-14% each year, and roads authorities keen to develop and revitalise the road network, China has much to gain from electronic tolling.

Now the Chinese Ministry of Transport Of Guangdong Province has endorsed transponder tolling technology for the first time in the city of Foshan.

Foshan is a major city in the densely populated southern province of Guangdong. Tolls are charged on roads entering and leaving the city, but traffic is densely packed and slow-moving at toll plazas, even though roads carry only 3,000 vehicles per lane per day. Electronic tolling will smooth the congestion and reduce pollution.

The solution uses in-vehicle transponders and radio frequency identification. The project began over two years ago, when US engineering company EZ Tech was invited by the Foshan Tongda Advanced Technical and Industry Company to evaluate electronic tolling systems. Six systems were evaluated, including those supplied by Amtech, Combitech, Mark IV and Texas Instruments.

The Texas Instruments system was chosen for the project and is now recommended

by the Chinese Ministry of Transport Of Guangdong Province. One factor that contributed to the contract win by Texas Instruments, was the radio frequency used by its Tiris (Texas Instruments Registration and Identification System) transponders. Tiris operates at 915MHz, which is a comparatively congested frequency in China. Neighbouring frequencies are already allo-

The transponder contains details of the vehicle's license plate and vehicle class and these are displayed on a gantry-mounted variable message sign as the vehicle passes

cated to other mobile communications users, such as the GSM cellular phone network. It was found in trials undertaken by EZ Tech (US), however, that there was no interference between Tiris and mobile communication devices using similar frequencies.

Transponders from other suppliers use the comparatively uncongested 5.8GHz frequency, which might later be affected by applications assigned to neighbouring frequencies. EZ Tech decided to use the more crowded frequency where the effects of interference could be tested before electronic tolling was installed.

Before Tiris was finally selected, pilot trials were carried out at two tolling sites in Foshan City involving 3,000 subscribers. The sites chosen for the test were Sai Hung Qi and Rong Qi District, about 30km apart and both severely congested. The trials were operated on a fully commercial basis and were conducted by Foshan City authorities, without any input either from EZ Tech or from MFS Network Technologies, the company chosen as system integrator.

In the trial each subscriber kept a record of his or her movements for comparison with the automatic tolling record. One million passes were recorded over four months and EZ Tech claims the system was proven to be reliable. After the trial period, the system continued operations and was opened up for full scale use in May 1994.

Expanding project

The project began in February 1996 and has been expanding with the addition of new tolling sites and extra lanes since then. To date the contract has been worth about US\$2 million. There are now 23 tolling locations, with 36 electronic toll collection readers spread between them. This should rise to around 80 by the end of the year. There are now between 30,000 and 40,000 tags in use in the Guangdong province.

Where Tiris has been installed there is a lane set aside for electronic tolling, alongside two or three lanes for manual stop-and-pay cash tolling. The electronic toll collection systems are installed in the existing toll lanes, and the antennae are mounted on the top of gantries 5.5m above the ground. In some sites it is impossible to install a gantry, so in these installations antennae are hung beneath metal canopies.

Transponders are distributed from the customer service centres of the major banks. The banks are also responsible for programming the transponders and tracking the accounts. Most accounts are pre-paid, with drivers recharging their account through the bank, or paying by post or telephone.

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ITS International SEPTEMBER/OCTOBER 1997

Intelligent Transportation Systems

- Sun Yat-Sen University
 - Guangdong Provincial Key Laboratory of Intelligent Transportation System
 - Research Center of Intelligent Transportation System

IEEE Intelligent Transportation Systems Society (ITSS)

- Founding officer of IEEE ITSS
 - Vice President – Publications
- Intelligent Transportation Systems Council
 - Vice President – Publications 2004
 - Vice President – Finance 2001-2003
 - Secretary, 1999-2000, 2003
- www.ieee.org/its

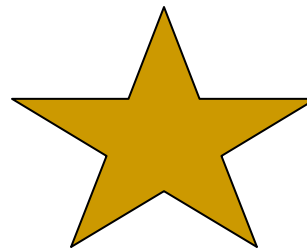
Institute of Electrical & Electronics Engineers, Inc. (IEEE)

- Core purpose:
 - to foster technological innovation for the benefit of humanity

www.ieee.org

- RFID is the emerging STAR!

www.ieee-rfid.org



Institute of Electrical & Electronics Engineers, Inc. (IEEE)



■ Membership

- World's largest membership society for technical professionals
 - + 375,000 members worldwide
 - 160 countries
 - 80,000 student members
 - 10 geographic regions (IEEE-USA comprises 6)
 - 45 technical societies & councils
 - wide range of technical interests

■ Publications

- 1/3 world's technical computing & electronics publications
- + 1.7 million documents in its digital library

■ Standards

- ~1,300 standards & projects under development

IEEE's business

- Membership
- Publications
 - 144 transactions, journals and magazines
 - Peer-reviewed
- Conferences
 - + 850 conferences annually
- Standards
 - e.g., everyone knows & uses 802.11

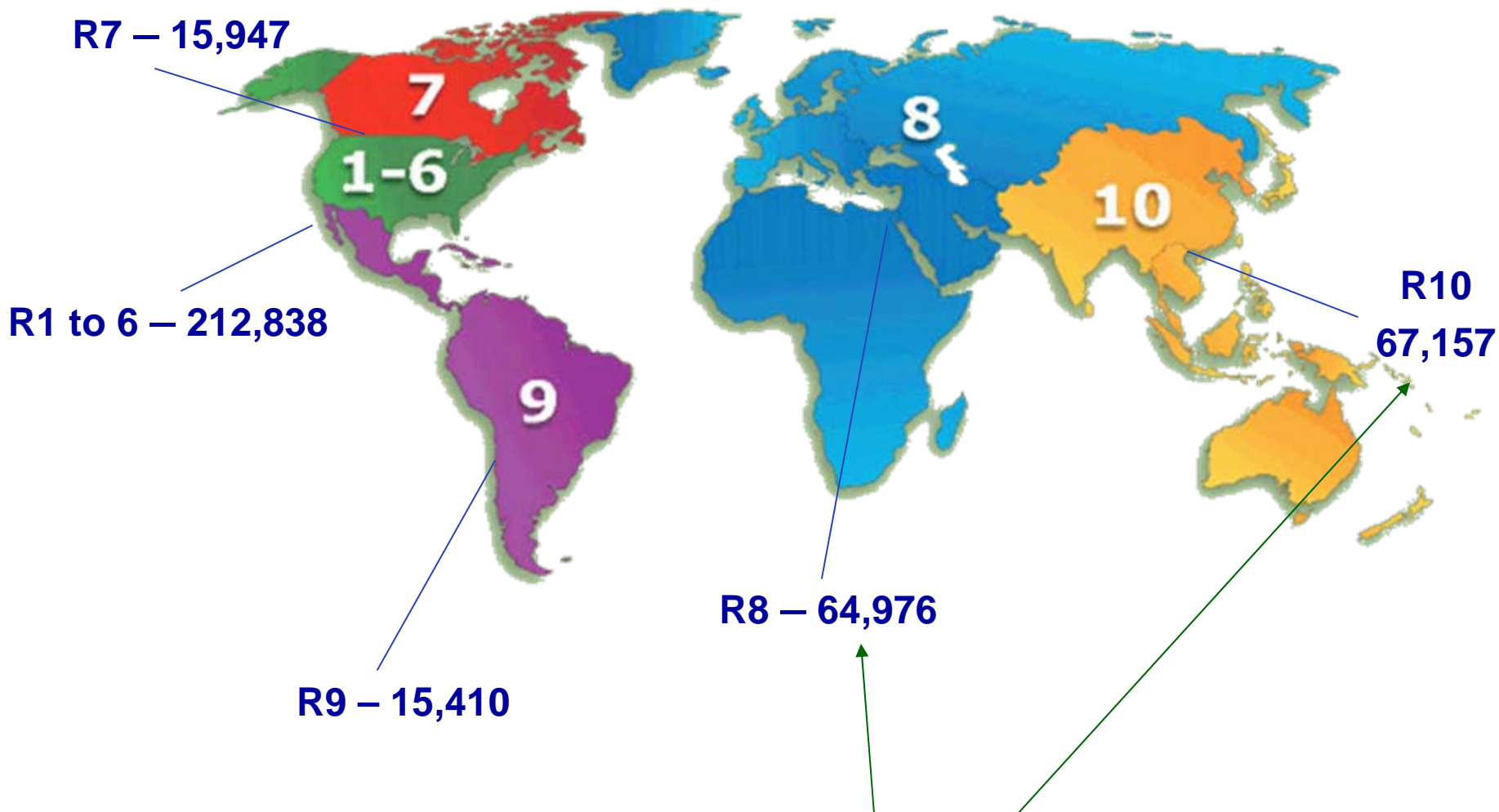
IEEE's business (cont.)

- Most importantly, it's about PEOPLE!
+375K strong!



IEEE Membership By Region (1-10)

31 December 2007

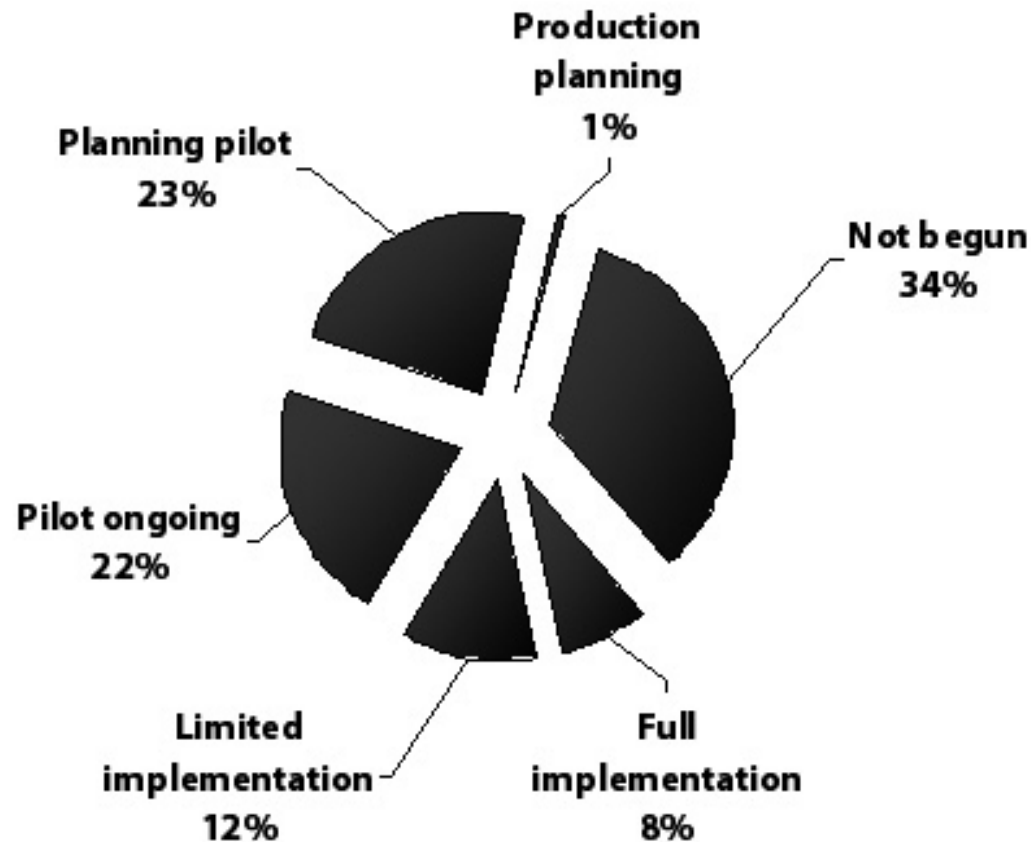


Regions 8 and 10 = largest IEEE Regions

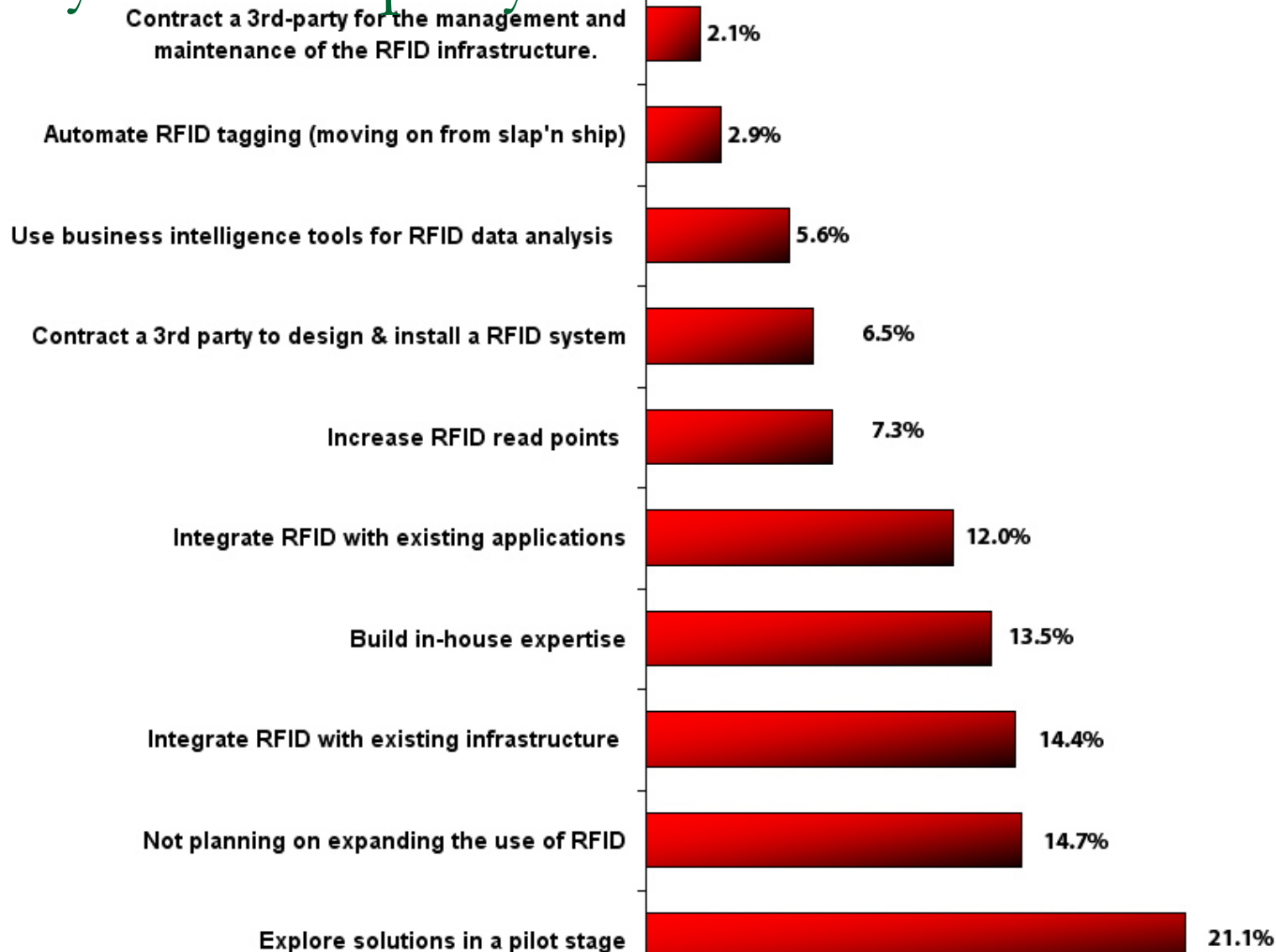
Setting the stage...

- RFID is an enabling technology with disruptive ramifications.
- Emerging, despite 60 yrs
 - Technology issues
 - Policy issues

To what extent has RFID been implemented within your organization?



Select all the **RFID** activities planned by your company in 2007





IEEE RFID 2007

2007	2008
1st International IEEE conference on RFID	2nd
Co-located with RFID World, Dallas	Co-located with RFID Journal Live!. Las Vegas
General Chair, Emily Sopensky	General Chair, Emily Sopensky

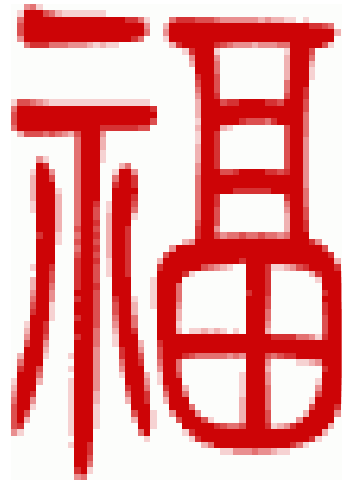
IEEE RFID 2007 and 2008

	2007	2008
Venue	Dallas	Las Vegas
Co-located	RFID World	RFID Journal
Papers	31	44
Attendees	125	164

Paper Stats - IEEE International Conferences on RFID

	2007	2008
#papers rec'd	105	124
#countries submitting	27	25
# papers accepted	31	44
Acceptance rate	29.5%	35.5%
# countries of accepted	12	15

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- May you all have good luck with your business dealings in RFID!



THANK YOU!

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