

# Infrastructure Issues and Standards for RFID/GTIN Deployment



*Peter Winer*

*Big Chief Partners, Inc.*

*[pwiner@bigchief.com](mailto:pwiner@bigchief.com)*



# Introducing Big Chief Partners

power and  
direction  
power online

- Consultants and Software Engineers
- Focused on RFID since early 2001
- Clients include
  - Tag and Reader Manufacturer
  - RFID Infrastructure Developer
  - Opportunistic Software Vendors
  - RFID End Users
  - Venture Community

# Opportunistic Software Vendor

power and  
direction  
power online

- TimesTen, Inc  
(<http://www.timesten.com>)
- Established vendor of ultra fast real time data and event management
- Seeking a presence in growing RFID space
- We bolstered their opportunistic strategy

# RFID End User

power and  
direction  
power online

- Service provider to major pharmaceutical companies
- Seeking to capitalize on RFID to improve logistics
- Needing to better understand benefits and limits of the technology
- We're helping to devise their strategy

# Venture Community

power and  
direction  
power online

- For investors
  - Opportunity and technology briefings
  - Evaluate early stage companies
  - Very limited matchmaking
- For startups
  - Technology evaluation
  - Competitive analysis
  - Matching opportunity vectors
  - Refining messages

# WebLink from Philips Semiconductors

power and direction  
power online

- RFID Infrastructure and Services
  - Middleware: event management & trust
  - Reader application platform
- Reference platform for Near Field Communications
- Industrial and consumer applications
- For more information:
  - <http://semiconductors.philips.com/identification/markets/weblink>
  - <http://weblink.bigchief.com>

# Overview

power and  
direction  
power online

- Infrastructures and issues related to the Sunrise 2005 initiative
- Comparative discussion of RFID infrastructure with focus on:
  - Status of emerging standards
  - Use of mature, developed technology
  - Connection to real benefits
  - Consumer privacy

# GTIN and Sunrise 2005



power and  
direction  
power online



# GTIN Defined

power and  
direction  
power online

- Global Trading Item Number
- An umbrella for a set of standard item numbering systems
- Includes EAN-8 and EAN-13, in wide use outside North America
- Prescription for enterprise systems that simultaneously support multiple formats

# Sunrise 2005 Defined

power and  
direction  
power online

- Culmination of an 8-year process
- Guidelines improving compatibility between North American companies and the rest of the world
- Reduces packaging costs
- Reduces Information Technology costs
- Improves information sharing

# GTIN Impact on Infrastructure

power and  
direction  
power online

- Based on mature bar codes
- In most cases, bar code hardware does not need to change
- The focus for change is enterprise databases and data interchange between trading partners
- The benefits are clear

# RFID

power and  
direction  
power online



# RFID History

power and  
direction  
power online

- RFID has been deployed for decades
- Simple, expensive tags have been attached to valuable, large, slow-moving items
- Examples include rail cars, cattle and trucks
- Tags stored unique serial numbers just like bar codes
- More durable and readable without line of sight

# Interest in RFID Explodes

power and  
direction  
power online

- Two separate vectors emerge in the 1990s
- ISO-Standard tags gain new capabilities, opening up new applications
- The Auto ID Center discovers RFID and promises very low priced tags

# Today's Result: Three RFID spaces

power and  
direction  
power on the online

- Mobile commerce applications based on ISO-Standard tags with security and authentication
- The Internet of Things based on very low priced tags in supply chains
- The future promise of Digital Identity based on the combination of security and low cost

# The Internet of Things

power and  
direction  
power online

- Wal-Mart
- U.S. Department of Defense
- European Retailers
  - Carrefour, Tesco, Metro, M&S
- North American Retailers
  - Albertson's, Costco, Target, Home Depot
- No item-level tagging or smart shelves

# Mobile Commerce with RFID

power and  
direction  
power online

- Toll roads
- Public transport
- Gasoline
- Coffee shops
- Convenience stores
- Entertainment venues

# Digital Identity

power and  
direction  
power online

- Loyalty cards
- Digital rights management
- Machine Readable Travel Documents
- National Identity card
- Able to store biometric information such as facial scans, fingerprints or retinal scans
- Could pose significant risk to personal privacy

# RFID and Privacy

power and  
direction  
power online

- Consumer knowledge and choice are critical
- Enterprises will need to earn customer trust
- Otherwise, customers will opt out
- Governments are not similarly limited
- Consumers must stand for strict limits on government use of RFID

# RFID Infrastructure and Standards



power and  
direction  
power online



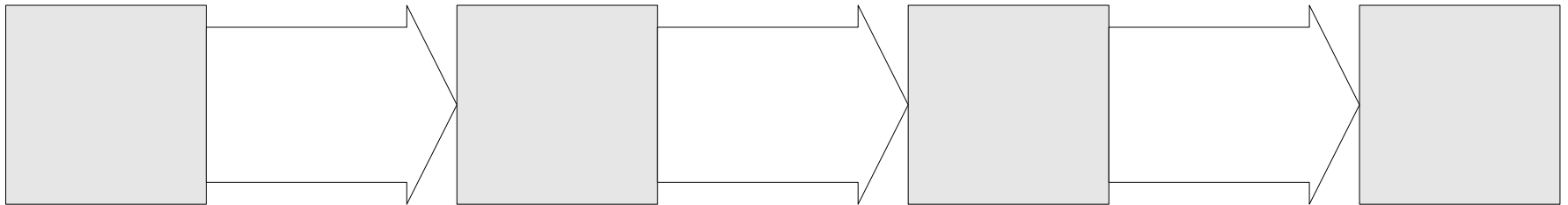
# RFID Deployments have Layers

power and  
direction  
power online

- Electronic Product Code (EPC)
  - Yet another item numbering system
  - Standard for RFID tag functionality
  - RFID tag data format
- Readers and Networking Hardware
- Middleware Software
- Repositories and Data Formats

# Typical RFID Architecture

power and  
direction  
power online



# The State of the Standards

power and  
direction  
power online

- All of these standards are still in definition
- Many pure play startups are launching
- Many established opportunists are jumping in
- Important mandates for 1/1/2005 have been declared
- The Open Source Savant
- Some examples will be discussed at 2:30PM today

# The EPC Standard

- Definition of unique, structured numbering
- Can be converted to GTIN
- Will require further investment for companies beyond GTIN compliance
- Tags are programmable
- Tags can be read by any reader
- No security features

# EPC Issues

power and  
direction  
power online

- Emergence of EPC is perplexing in the context of GTIN
- EPC-based tags are very similar to bar codes
- Can offer faster performance
- Create different environmental constraints
- Significantly more expensive

# RFID Middleware

power and  
direction  
power online

- Three approaches
  - Modifications to established middleware
  - Deploy distributed network hardware
  - Deploy new middleware such as Savant, purpose-built for RFID
- Or, some combination of the three approaches

# Information Sharing and Repositories

power and  
direction  
power online

- Object Naming Service (ONS)
- Physical Markup Language (PML)
- EPC Information Service (EPC-IS)
- Really just concepts now

# Some Conclusions

power and  
direction  
power online

- RFID technology domain is very far-reaching
- Standards and technologies are still being defined
- Benefits to potential collaborators are not always balanced
- Security and authentication need more emphasis
- Consumer privacy is not assured

# More Conclusions

power and  
direction  
power online

- RFID is a compelling technology
- It is an accelerator or an enabler
- RFID by itself is not a solution
- EPC numbering and RFID deployment should be evaluated separately
- Successful deployments must deliver overwhelming value
- Applications that require new behavior or collaboration are risky

# Advice for Retailers

power and  
direction  
power online

- For supply chain:
  - Cost and benefit could be out of balance for several more years
- For mobile commerce:
  - Convenience leads to increased loyalty and increased sales
  - Major players are driving adoption
  - Potential for leveraging adjacent deployments

# Advice for Manufacturers

power and  
direction  
power online

- You might be forced to adopt RFID to keep your biggest customer
- Leading analysts are now recommending “slap and ship”
- This should cause concern
- Emergence of very low cost RFID is still several years away

# Advice for Consumers

power and  
direction  
power online

- Diminished privacy should not be accepted
- Trust is equally important
- Decide which information must be kept private
- RFID can offer improved convenience

# Questions

power and  
direction  
power online

*Peter Winer*

*Big Chief Partners, Inc.*

*[pwiner@bigchief.com](mailto:pwiner@bigchief.com)*



# Resources

power and  
direction  
power online

- Online magazines
  - RFID Journal
  - Frontline Today
  - RFID News
- Many Weblogs
  - [www.bigchief.com/weblog](http://www.bigchief.com/weblog) (me)
- Analysts
  - Forrester
  - ABI Research
  - AMR Research
  - Venture Development Corporation
  - Gartner