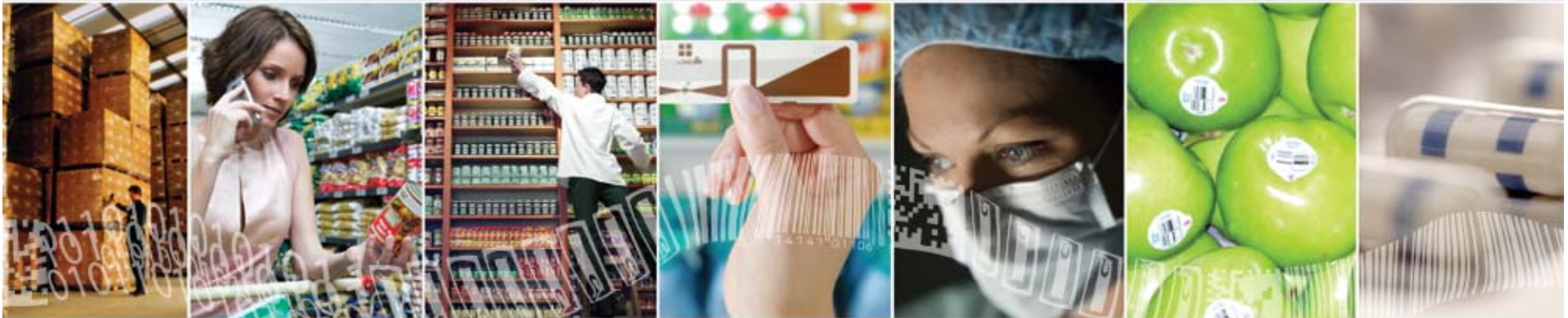




# EPCglobal - developing the global standards infrastructure

Chris Adcock

President, EPCglobal Inc.





# Agenda

- About EPCglobal
- Why are standards important
- The EPCglobal Network
- EPCIS – EPC information Services
- ONS – Object Naming Services
- Discovery
- Summary





## EPCglobal – where did it come from?

- Four year research program with Auto ID Center
  - 100+ organizations involved
- End 2003 – responsibility for adoption and standards transferred to GS1
- EPCglobal created
- Part of the GS1 worldwide organization.
  - 108 GS1 organizations
  - GS1 covers >1.1million companies, 20 sectors
  - Expert organization – 30+ years experience.





# EPCglobal Purpose



Take a global leadership role in developing and promoting multi-industry, user driven standards for utilising the EPC

## Principles:

- Neutral
- Not for profit
- Committed to open and royalty free standards
- User driven



## Global membership growth continues

**February 2008**

<b>Asia Pacific</b>	<b>220</b>
<b>Europe</b>	<b>293</b>
<b>Latin America</b>	<b>33</b>
<b>ME &amp; Africa</b>	<b>19</b>
<b>North America</b>	<b>670</b>
<b>TOTAL</b>	<b>1235</b>

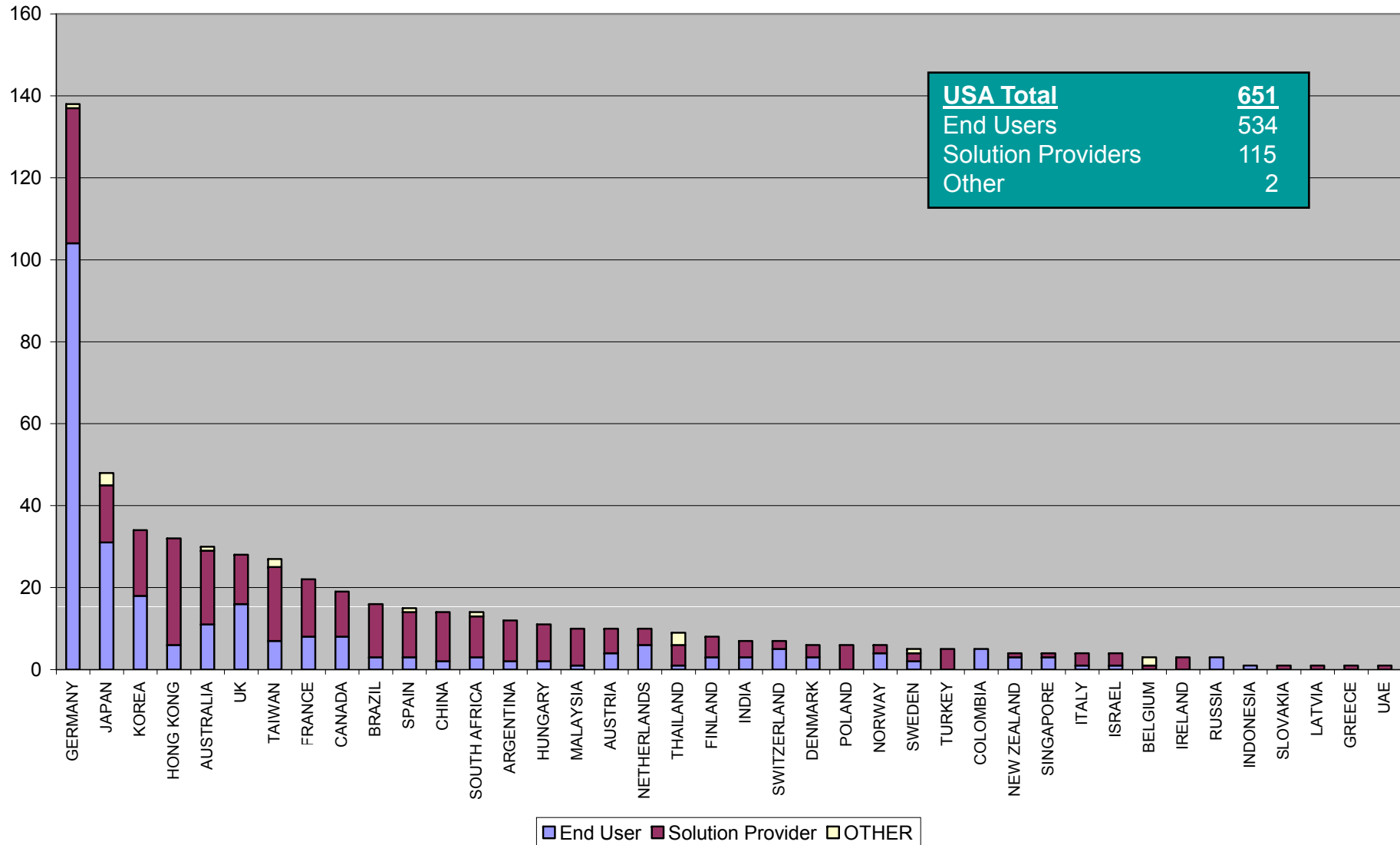
- Each member joins only once in the location of the global head office
- Currently spans 41 countries



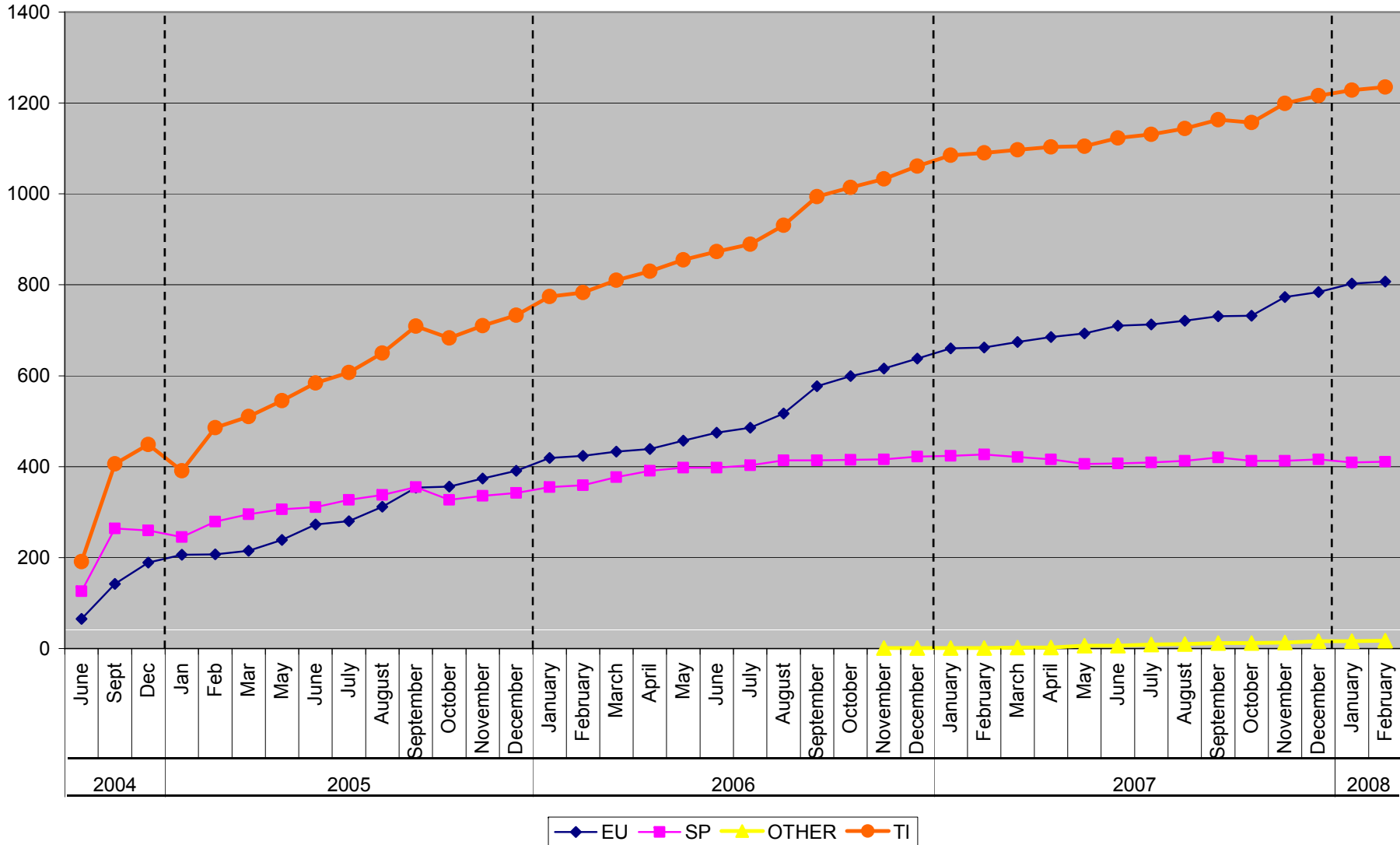


# Membership spans 41 countries

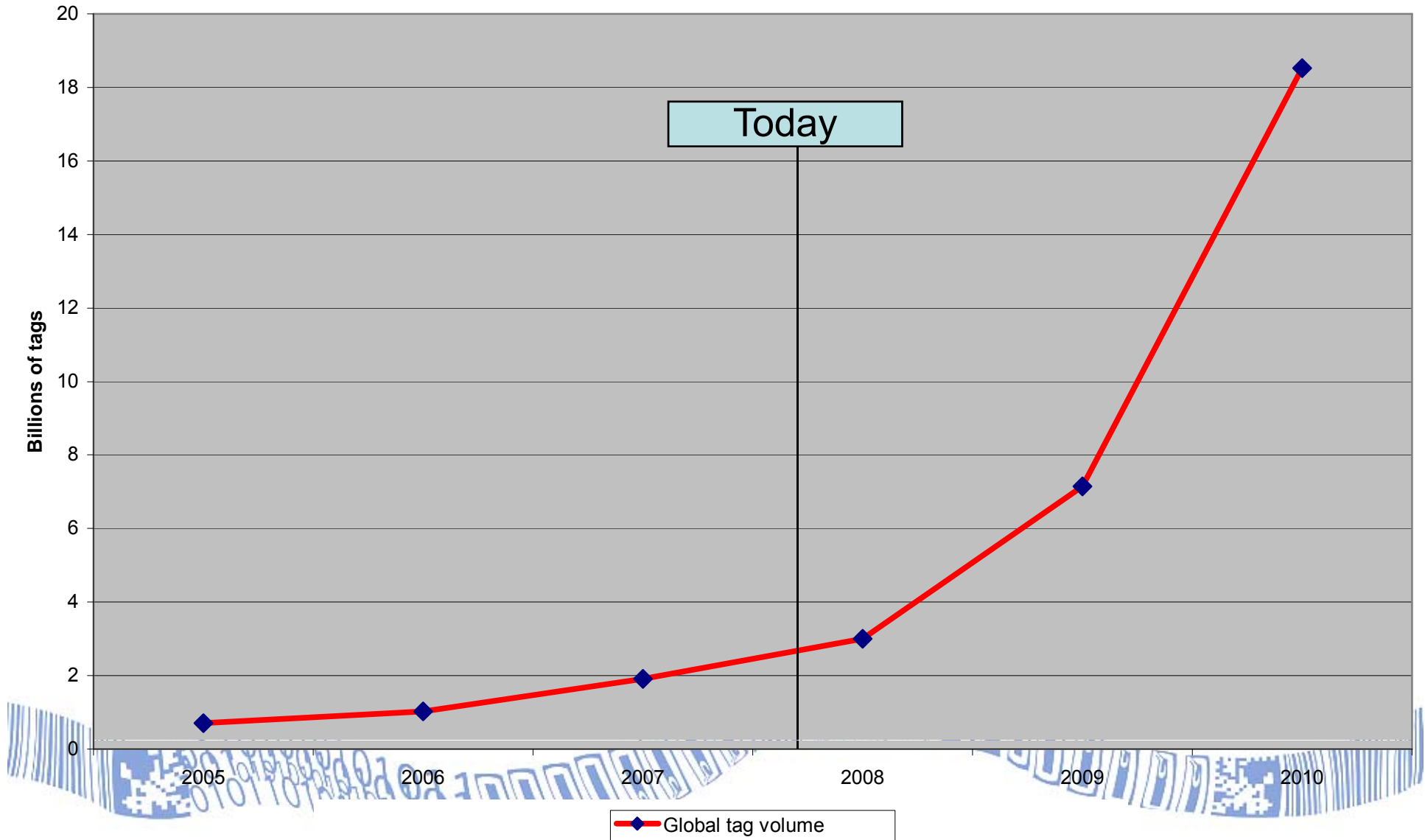
(February 2008)



# Membership trends 2004 - 2008



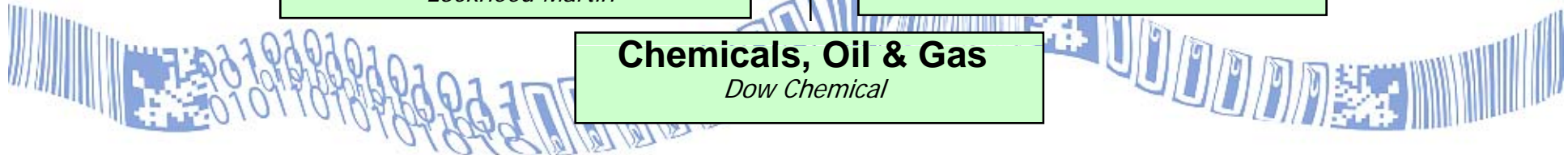
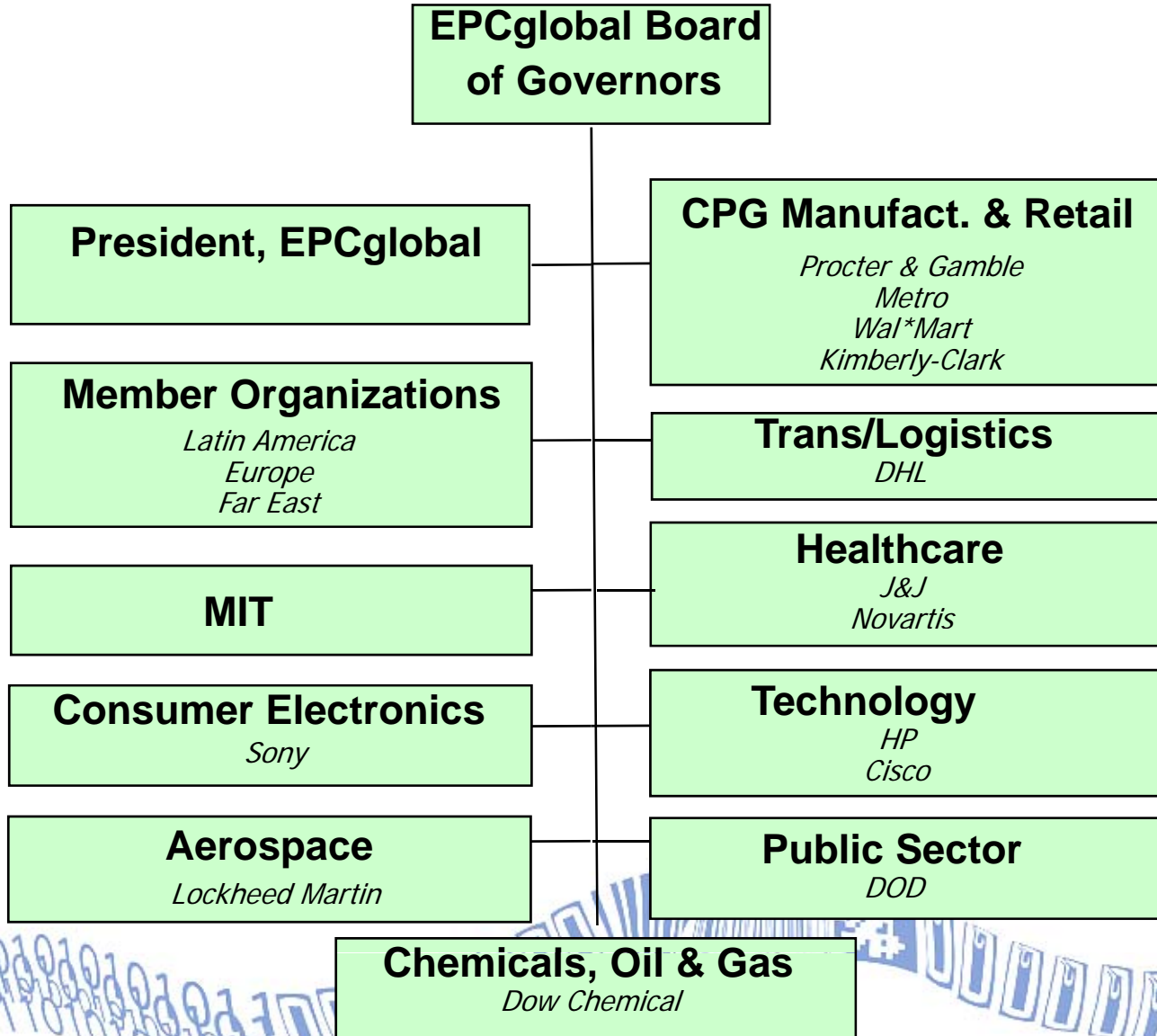
# Where's it all heading?



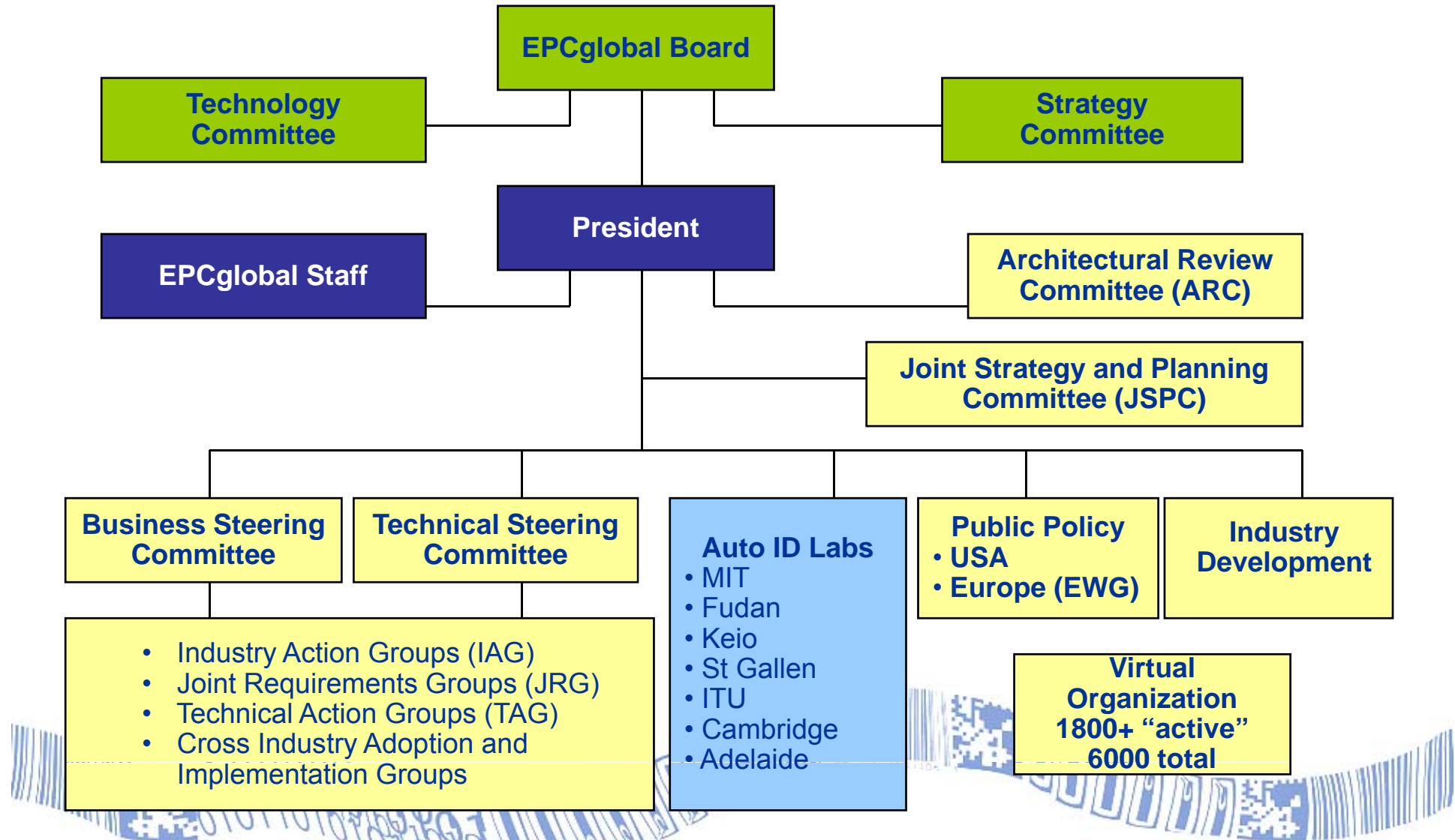
Source: ID TechEx Study 2007



# EPCglobal Board of Governors



# How the pieces fit together



## Who needs standards anyway?

- Paper sizing - A4 or is it "legal" in the US?
- Is quadband sufficient in Japan or Korea?
- Blue-Ray or Toshiba HD DVD?
- Plumbers around the world some work in inches whilst others work in centimeters
- How many power adapters does the typical "road-warrior" carry?

*"I have nothing against foreign languages,  
I just wish everyone would speak the same  
foreign language"* Theodore Roosevelt



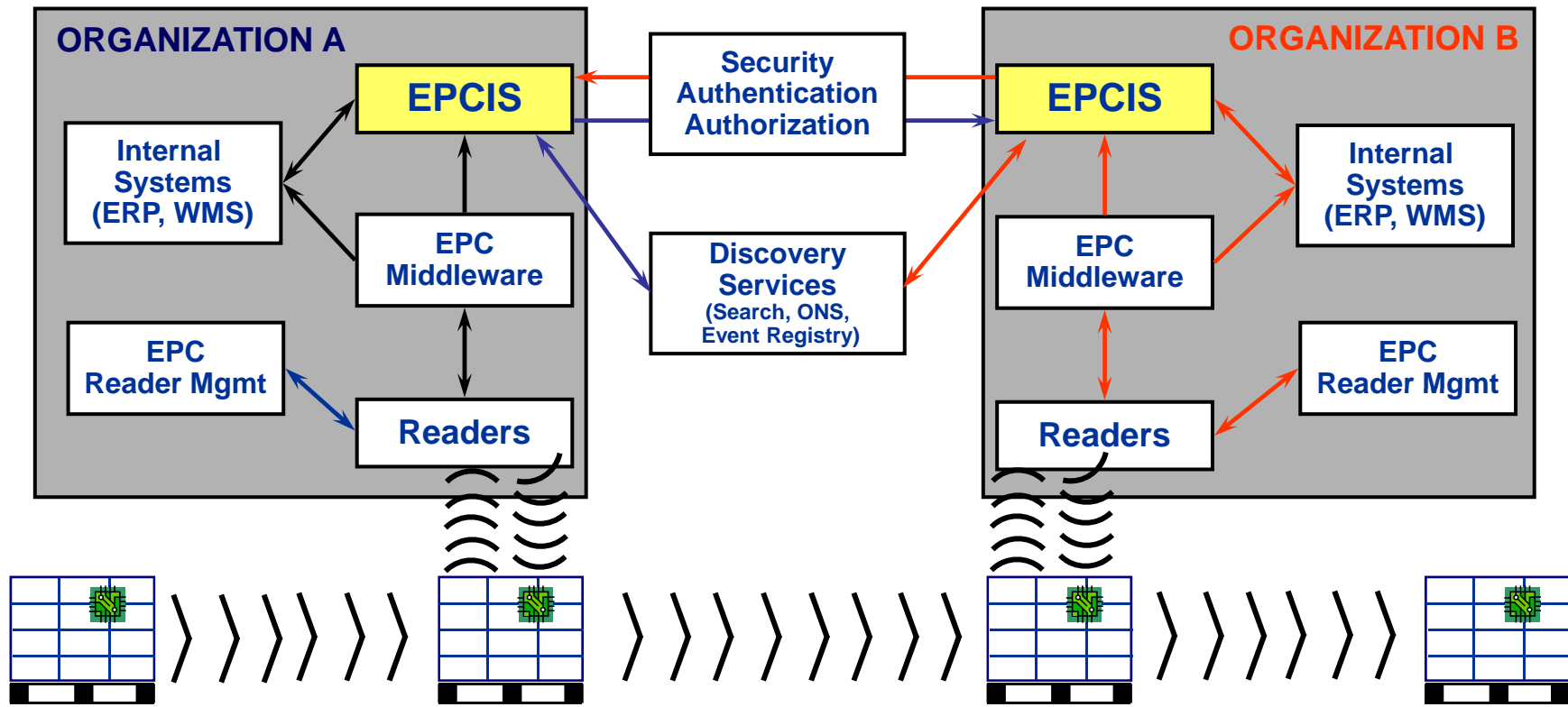


## Why are global standards important?

- Reduce complexity
  - Within and between organizations
  - For H/W and S/W providers
- Reduce cost
  - Implementation
  - H/W, S/W and Integration
- Facilitate trading partner collaboration
- Allow organizations to focus more on how to use the information than how to get information
- It's about the “solutions” not the “technology”

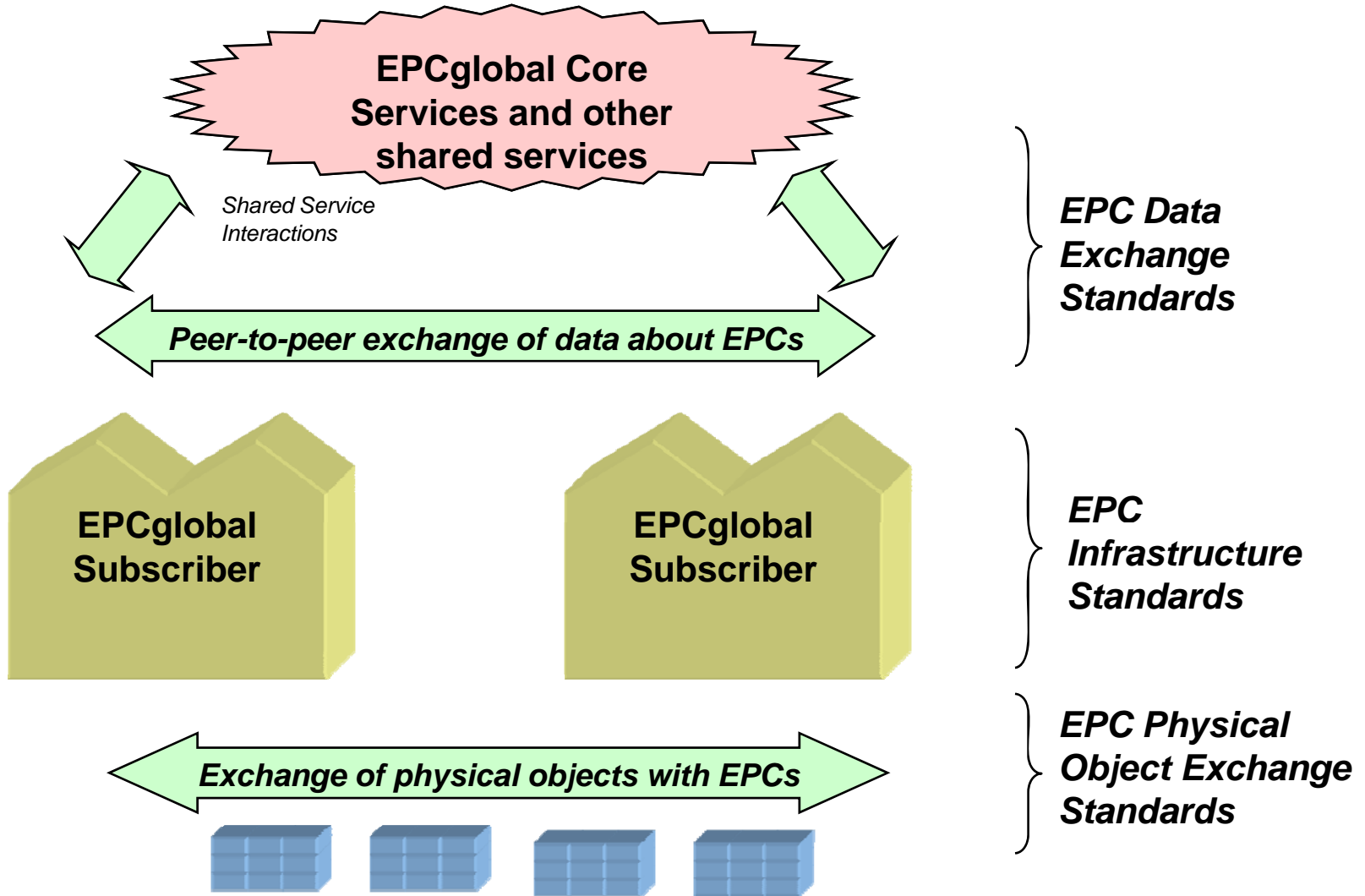
# The EPCglobal Network

**Supply Chain Visibility**  
*Event Related Information*



Tagged Units Moving Through the Supply Chain

# EPCglobal Standards Overview



# EPCglobal Standards Summary

Standard	Ratified	Cert Program	Next Versions
Tag Data	√		√
Tag Data Translation	√		
UHF Class 1 Gen2	√	√	√
Low-Level Reader Protocol (LLRP)	√	√	
Reader Management	√	√	
Application Level Events (ALE)	√	√	√
Object Naming Service	√		
EPC Information Services (EPCIS)	√	√	
Drug Pedigree	√	√	

*Identify*

*Capture*

*Exchange*



# Certification drives confidence

- Hardware certification
  - 18 vendors
  - 39 products (readers, integrated circuits, tags, printers, interoperability)
- Software certification
  - 23 vendors
  - 34 products (ALE, EPCIS, Reader Protocol, Pedigree)
- Accredited Test Center
  - 9 across the world
- Approved RFID Test Center
  - Making certification available across the world
  - 3 currently





# Regulatory infrastructure

- Spectrum allocation to allow use of Gen2
- UHF spectrum (860-960 MHz) and power regulations (2w erp/4w eirp)
- Significant progress – **91.8% Global GNI covered:**

ITU Region					
1		2		3	
EU and Africa		Americas		Asia Pacific	
Europe		USA		Australia	
CEPT		Canada		New Zealand	
South Africa		Central America		Japan	
Israel		South America		South Korea	
				Singapore	
				Thailand	
				Hong Kong	
				China	
				Malaysia	
				Taiwan	
				India	

Key: Allocation progress	
Early stage	
Advanced	
Final allocation	



# Standards stakeholders

- Participation in standards (not an exclusive list!):
  - Ensuring standards relevance
    - User requirements drive the process
    - Multiple industry involvement
    - Global participation
  - ISO
    - Submission of standards for ISO consideration
    - Joint working committee to share information and avoid any divergence
  - ETSI
    - Support for evolution of regulatory framework
  - Public policy and standards – working “together” to meet the needs of all stakeholders





## Public Policy

- Privacy remains a key concern
- Industry needs to take further and continual action to understand and address the concerns of legislators
- Deactivation and notice are currently points of focus but need to strike a balance between consumer protection and workable solutions
- Accountability for conformance to guidelines needs to be strengthened
- EPCglobal has recently engaged in raising awareness to **consumers**, by launching **its DiscoverRFID.org** portal.



## EPCglobal Standards - relevance to the Internet of Things





# EPCglobal Standards

- EPCglobal is “frequency and tag neutral”
  - Passive tags
  - Active tags
  - Pallet, case, item level...
- Initial standards set has been completed but is still being expanded
- Key areas that will underpin “The Internet of Things” concern exchange of information
  - EPCIS
  - ONS
  - Discovery





# EPCIS

## EPC information Services



# What is EPCIS Data?

EPC Events answer 4 questions – *What, Where, When, and Why*

<b>What</b>	<ul style="list-style-type: none"><li>• EPC number (can leverage master data)</li><li>• Manufacturing Data (lot, batch, expiration date)</li><li>• Transactional Data (PO, Shipment, Invoice)</li></ul>
<b>Where</b>	<ul style="list-style-type: none"><li>• Location (can be fixed or moving – leverage master data)</li></ul>
<b>When</b>	<ul style="list-style-type: none"><li>• Event Time</li><li>• Record Time</li></ul>
<b>Why</b>	<ul style="list-style-type: none"><li>• Business Process Step – e.g.: Receiving, Shipping</li><li>• Product State – e.g.: Saleable, Active, In Transit</li><li>• Current Conditions – e.g.: Temperature</li></ul>

The EPCIS standard enables extending event data in each direction



## Why is EPCIS valuable?

- Provides standard capture & query interfaces to enable track and trace, product authentication, diversion detection etc
- Security is a core concept – Each trading partner keeps their data only share on an on-demand basis
- Can route events to existing enterprise applications
  - Layered architecture can support long-term scalability and flexibility
- No vendor lock in - 20+ companies active in EPCIS SAG – interoperability tests conducted with 12 companies
- Already in use today in FMCG and HLS

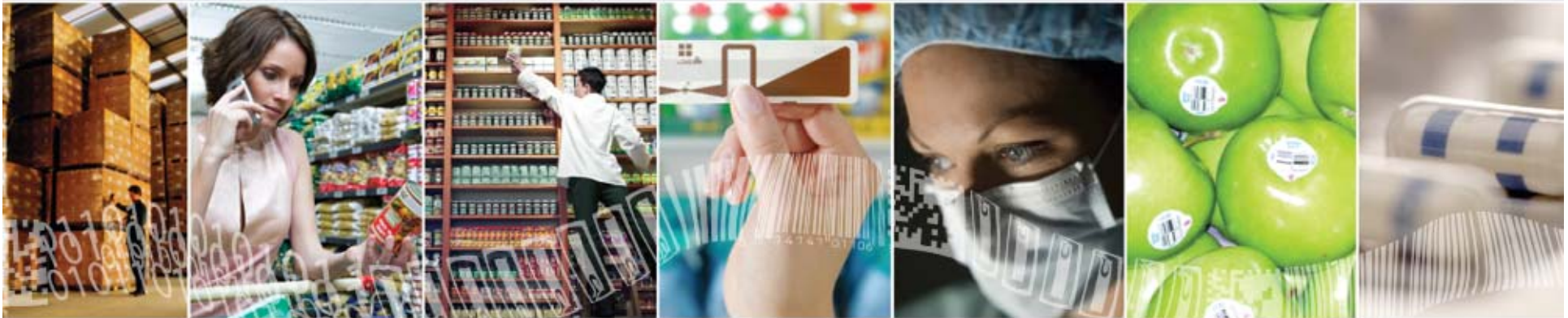






# ONS

## Object Naming Services





## Object Naming Service

- The Object Name Service (ONS) as currently designed is a lookup service that **locates the EPCIS of the issuing authority** for EPC (usually a manufacturer)
  - Useful if all you need to find is the manufacturer
  - E.g., consumer-facing scenarios: “smart refrigerator”
  - Does *not* find other parties in the supply chain
- The future is more about Data Discovery rather than ONS





## Object Naming Service (2)

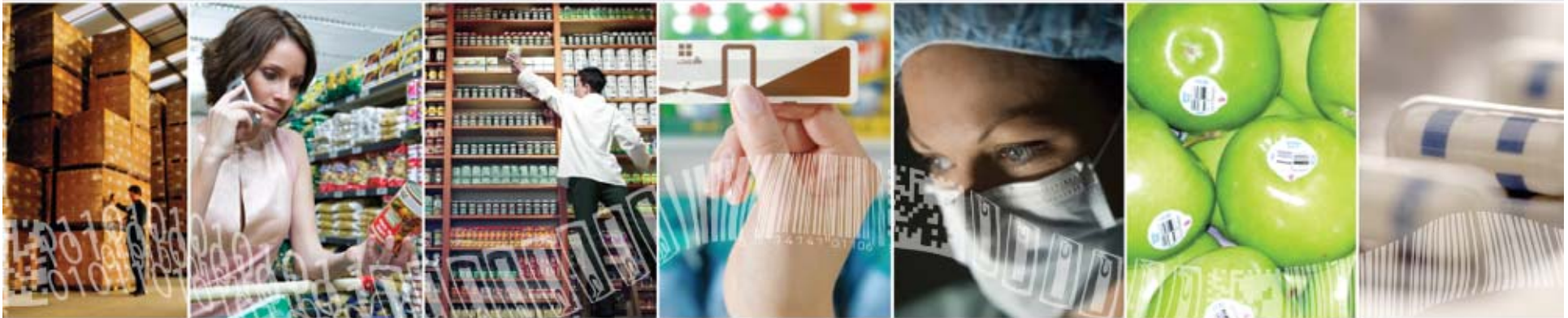
- Currently there is one authoritative source (onsepc.com) for registered EPCglobal Manufacturer IDs
  - Replicated in eight locations globally
- Used by retail
  - Validation of EPCglobal subscribers
  - Determine company prefix length
- Centralized root is the more technically straightforward, however it does not meet geopolitical concerns
  - Centralized vs. decentralized vs. distributed



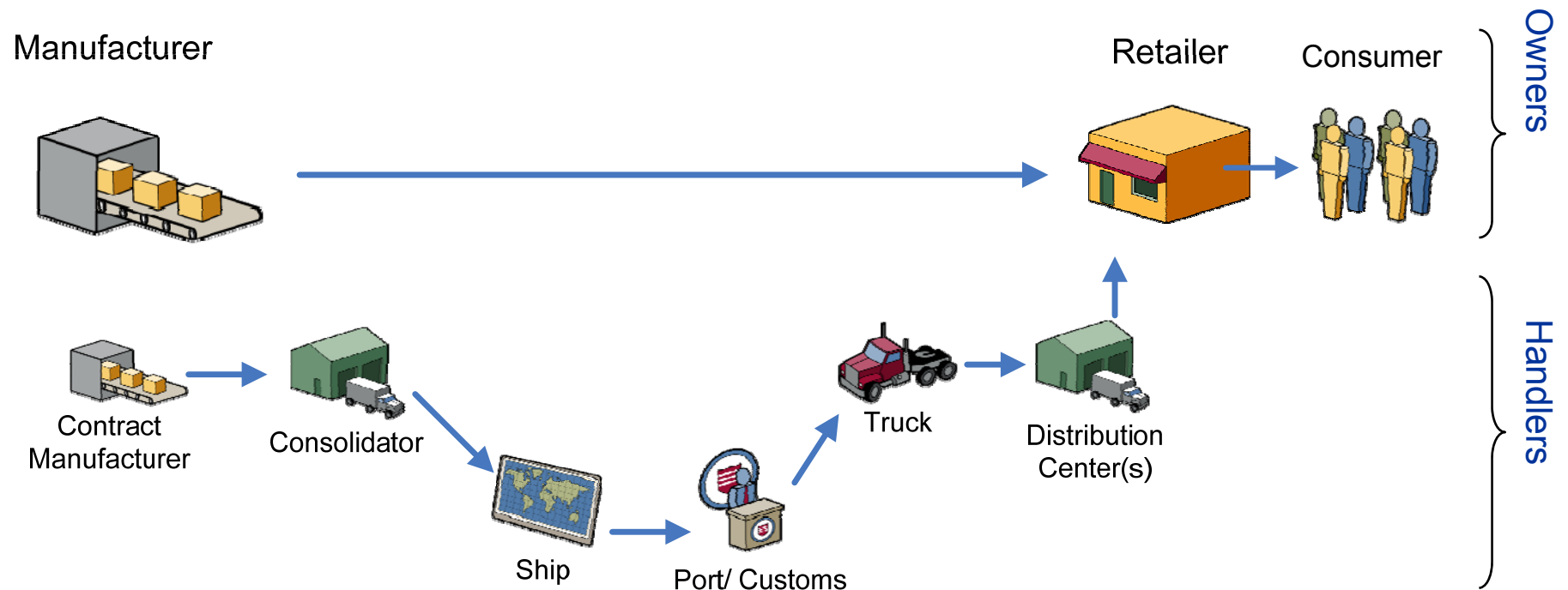


# Discovery

## Discovery Services



# The Supply Chain is Simple ...Right?



- Even “Simple” supply chains have multiple touch points and handlers before reaching a final destination.
- Complex supply chains, with multiple product owners, have a greater need to locate products and ensure they were sold through the proper channels.

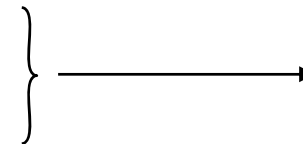
# What is “Discovery”?

- “Discovery” =
  - **Finding** and obtaining all relevant EPCIS data...
  - to which a party is **authorized**,...
  - when some of that data is under the control of other parties with whom **no prior business relationship** exists
- EPCglobal Data Discovery standards group kicked off in November 2007.
  - Current focus - business requirements and use cases
  - Future work on technical architecture after business requirements
  - Secure and authorized access to Discovery Service information is key to adoption
  - ONS may play a role for Discovery Services

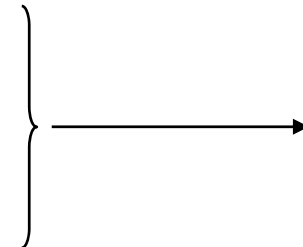


# Business Use cases for Discovery

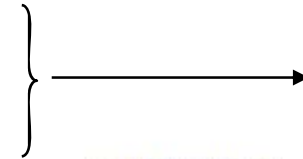
- Inventory Visibility
  - Product Visibility
  - Recalls
- Brand Protection
  - Counterfeit
  - Diversion, Gray Market
  - Channel Management
- Chain of Custody
  - Track and Trace
  - Electronic Pedigree



Discovery enables traceability of products



Discovery enables traceability and authentication of products



Discovery supplies the data location for creating the pedigree





## Summary

- EPCglobal has completed the initial standards set for the use of RFID
- Usage of EPCglobal standards is expanding rapidly around the world, particularly Gen2 and EPCIS
- Tag and frequency neutral
- EPCIS / ONS / Discovery will underpin a significant part of the Internet of Things
- Privacy concerns need to be kept at the forefront of our minds and actions







# Questions?

