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Dateline: June, 2003

Wal*Mart to Top 100 Suppliers:

"Tag 100% Cases & Pallets"



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Agenda

- RFID 101
- The Business Case
 - Retailer and Supplier
- Pilot Objectives

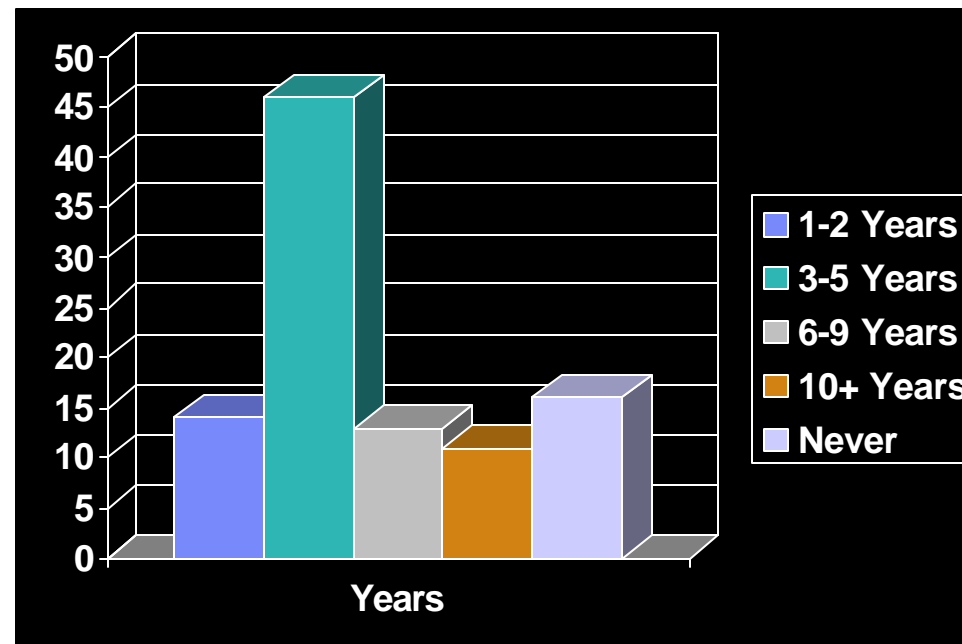


Top Eight Things to Track

8. Golf Balls
7. Boss
6. Staff
5. Beverages
4. Money
3. Credit Cards
2. Children on a Friday night
1. Wife on a Friday night



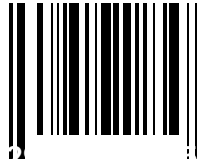
When does a company anticipate a return on its RFID investment?



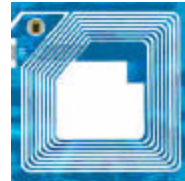
RFID 101



EPC / RFID and Bar Codes



Inexpensive
Installed infrastructure
Data capture signal – it 'beeps
when it reads'

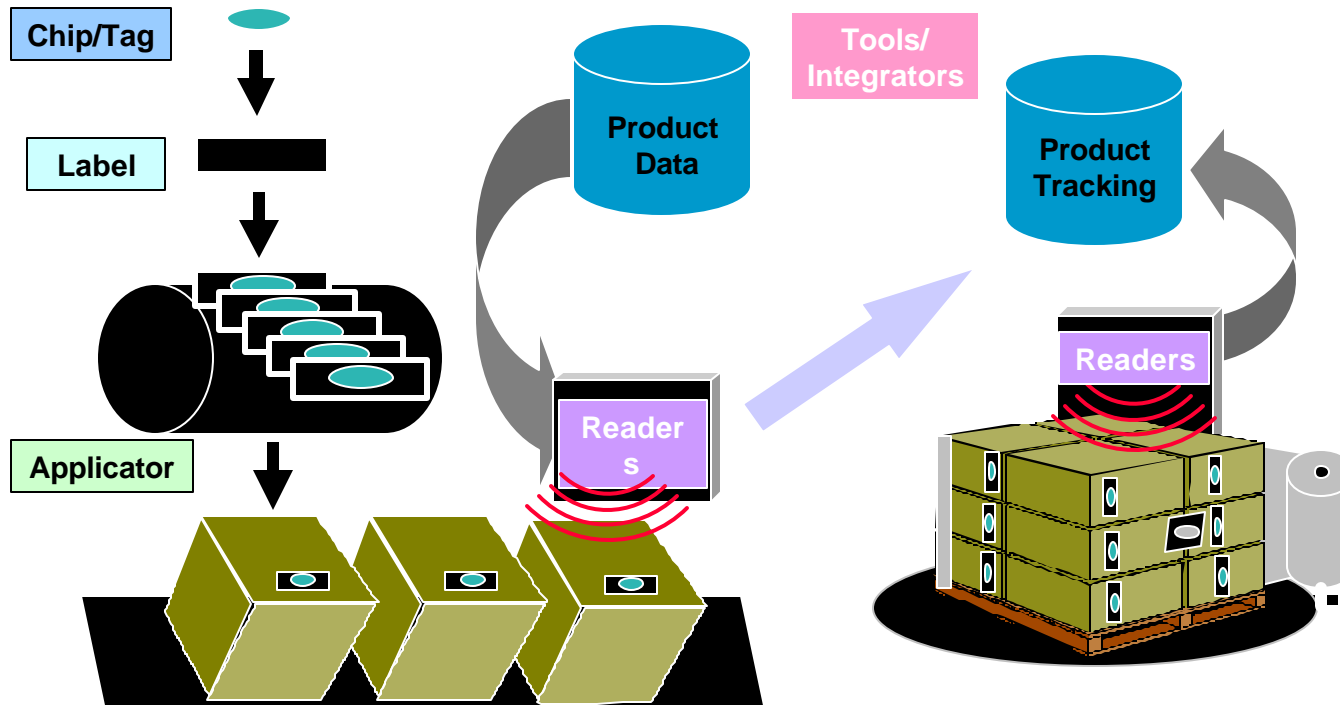


Passive data capture (no human intervention)
No optical line-of-sight required (convenience)
Ability to read multiple tags simultaneously (efficiency)
Serialization of product code enables
 Track and trace – specific case identification for
 precise recall capabilities
 Authentication – identify counterfeit
Future tags may have ability to update content
 Multiple write capability – update data along the
 supply chain, providing a history
 Enhanced functionality – environmental
 information
 Exchange data more real-time information

Bar codes and RFID tags will co-exist for a long time!

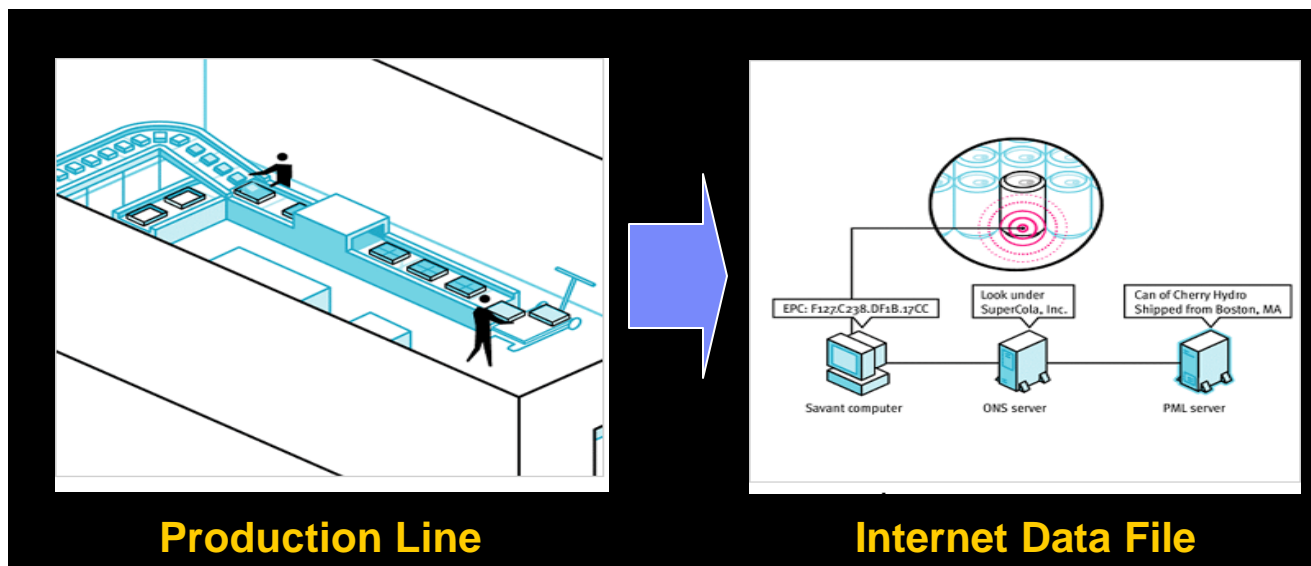


Technology Deployment (Generic)



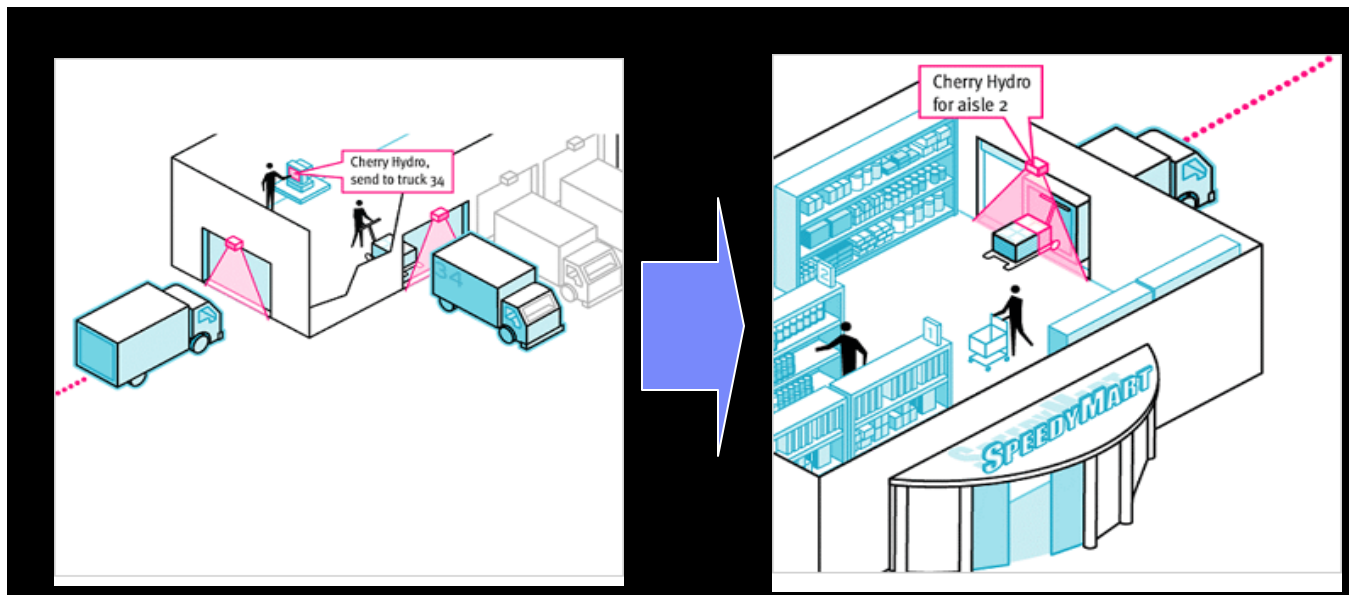
EPC Vision:

1. Information from the tag is posted to internet servers at the plant production line.



EPC Vision:

2. "Readers and Transmitters" are used to update location of product in the supply network.

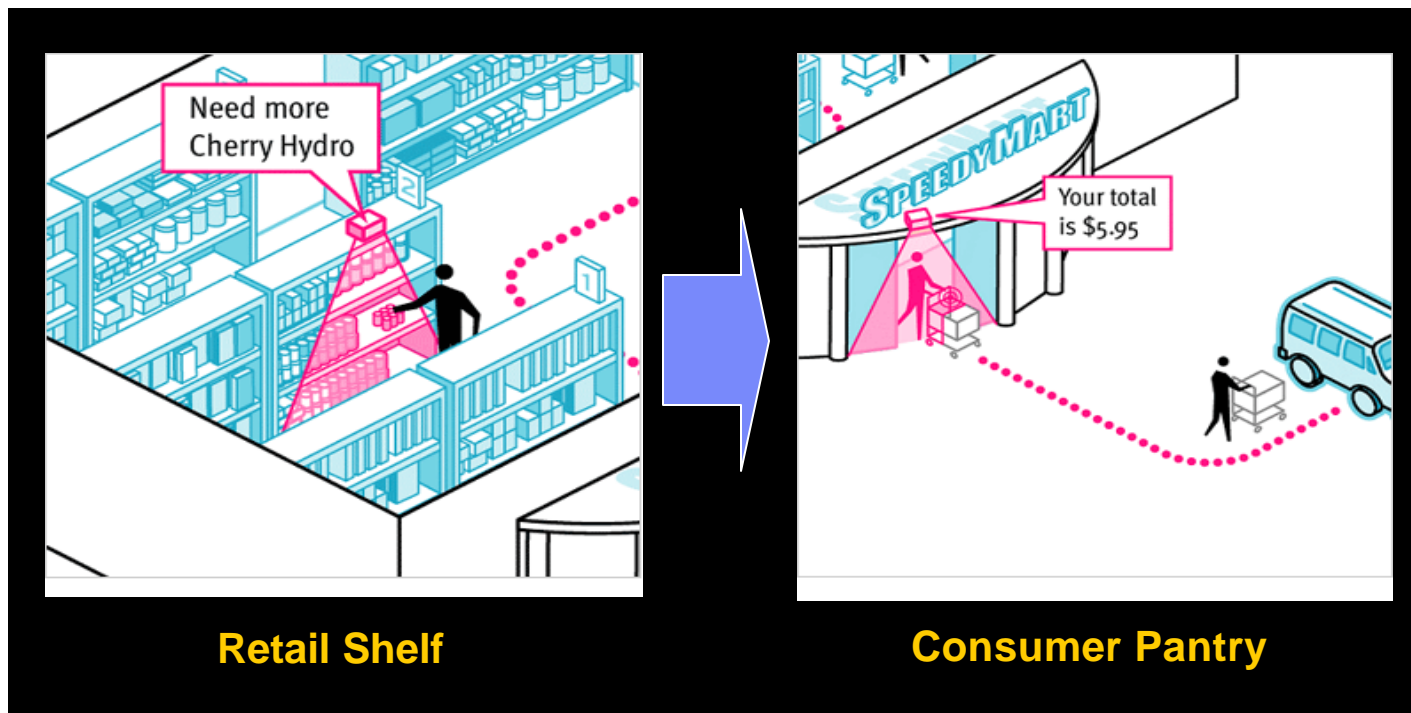


Customer Warehouse

Store Dock

EPC Vision:

3. At the point of purchase retail inventory is updated and manufacturers receive notice for replenishment.



Comparing/Contrasting UHF & HF Tags

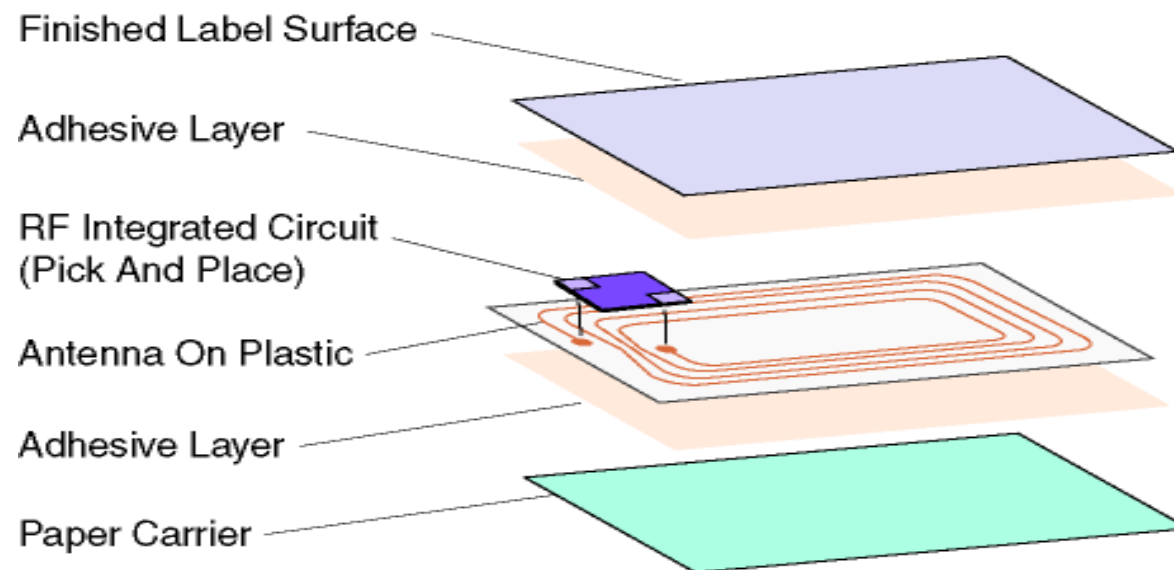
UHF (915MHz or 868MHz)	HF (13.56MHz)
Smaller	Bigger
Cheaper	More expensive
Faster (5-10ms read time)	Slower (50-100ms read time)
Restricted in some countries	Globally available
Less penetration of metals	Better penetration of metals
Shorter read range	Longer read range
Freq hopping to minimize interference	No frequency hopping
Plastic electronics are not fast enough for UHF tags	Plastic electronics are fast enough for HF tags

Take away:

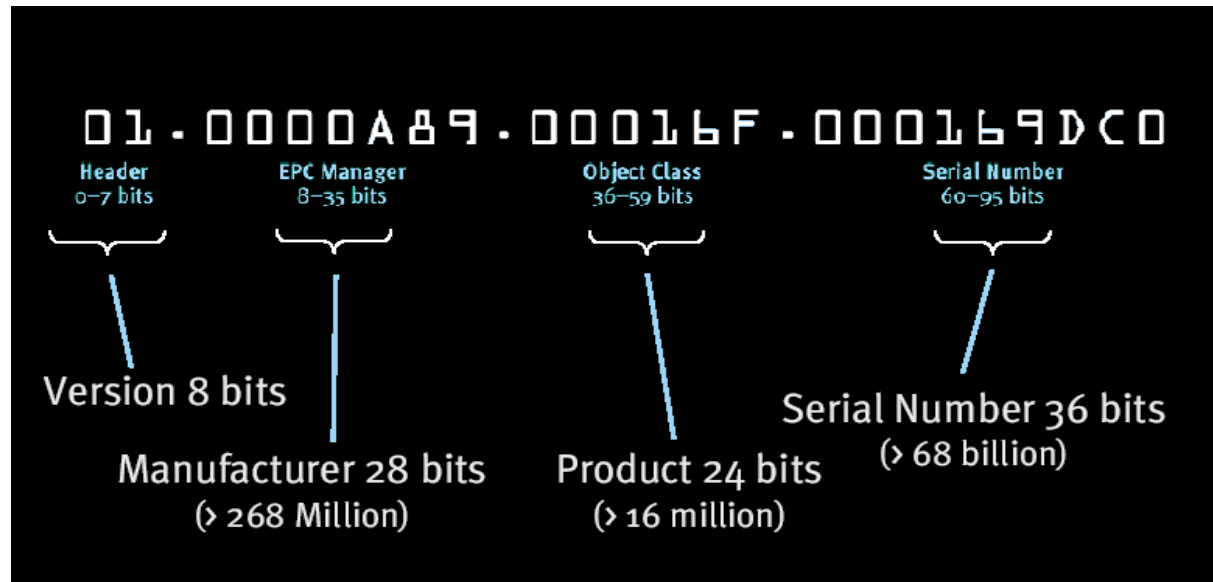
- UHF tags will be used for pallets & cases
- Plastic electronic HF tags will be used for items



Layers Of An RFID Tag



EPC: 96-Bit Version

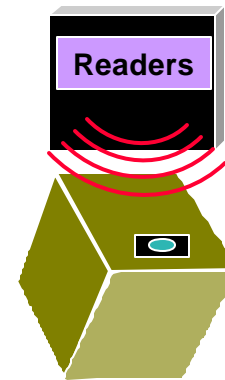


- Provides a *unique identifier* (or license plate) for every distribution object
- Designed to be scalable and extensible
- Serves as a *key* to a back-end database
- More powerful than a UPC, but can still track objects at the SKU-level



How Does RFID Work?

- RFID readers emit EM waves
- EM waves wirelessly power up nearby tags
- EM waves also carry encoded reader commands
- Tags in close proximity respond to reader commands
- Readers can read multiple tags at once
 - This property is called anti-collision
 - Typical spec → 200 tag reads per second
- Readers filter tag data dumping relevant info to a back-end network for storage & data processing



Customized Reader Solutions Are Required



1. Case conveyors



2. Palletizers



3. Smart forklifts



4. Pick-bays



5. Doorways

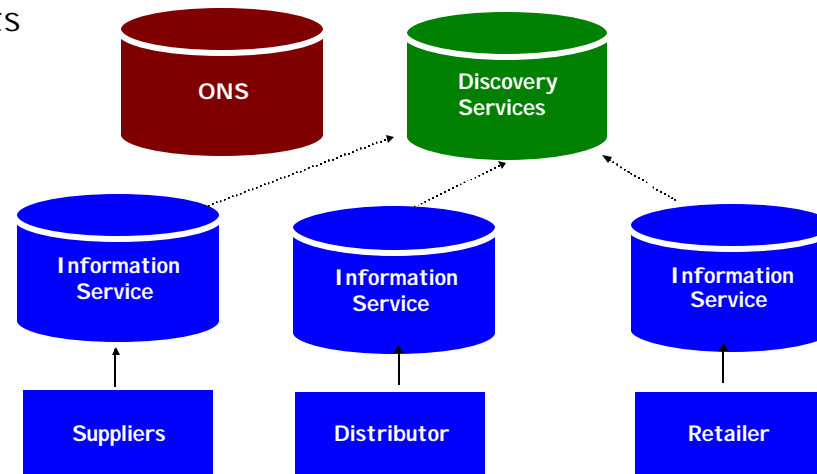


6. Handhelds



EPC Network

- The EPC network is the key to making RFID successful
 - EPC network allows us to take RFID outside the four walls and create value for the entire supply chain
 - Leverage the existing Internet infrastructure to create a low cost standards-based set of services
 - Three main components



EPC Middleware

- The Auto-ID Center developed a software technology called Savant to deal with the management and movement of the enormous volumes of EPC data
- A Savant differs from most enterprise middleware in that it uses a distributed architecture and is organized in a hierarchy that manages the flow of data.
- Savants will run in stores, distribution centers, factories and other locations, gathering, storing and managing data, and interacting with other Savants in other locations.
- Savants will also be capable of monitoring data, correcting errors in data coming from readers and making decisions on where data needs to be sent



Business Case...

- The strategy is not about RFID ...
- Make sure product is where it's suppose to be for the least cost!
How are you going to ...
 - Improve trace ability
 - Product availability
 - Merchandizing
- We are moving from a push environment to a pull environment – demand driven supply chain
- Two ways to make money .. This is about the second way
- Simple compliance is going to be a negative proposition, companies need to look at the big picture – how are they going to change their business with technology



The business case for Retailers is compelling

- Increased productivity within the store
- Improved inventory accuracy with capture of ALL inventory movements – backroom to selling floor – total **automated replenishment**
- Lower inventory levels from improved inventory visibility
- Improved customer service through reduced out of stocks by maintaining selling floor perpetual inventory (3-4% lost due to lost sales)
- Lower shrinkage could result in 1-7% savings
- Increased sales from improved in stock positions
- Enhanced Freshness



Retailers – Wal*Mart has taken the reins

- June, 2003 – “The shot heard ‘round the RFID world”
 - Top 100 Suppliers to tag pallets and cases by January 2005
 - All Suppliers to tag pallets and cases by December 2006
- Creating 100 laboratories around the world
 - Setting the bar at 100% participation
 - Looking to solve for the issues
- Supplier Collaboration Board (early adopters, including Kraft)
 - Kraft one of first eight pilot suppliers tagging cases in 2004
 - Wave I (2004) – 3 DC’s, 150 stores Dallas market; all formats
 - Wave II (2005) – 4 additional DC’s (all RDCs); 350 additional stores
 - Kraft tagging 50+ SKUs to original 3 DCs; ramping up slowly



Customer initiatives are driving our pilot activities

- Target
 - Began tagging mid-Oct'04 – 1 DC (TX), 10 stores, 3 SKUs
 - Pilot expansion to 50 store in 2005; maintaining limit SKU scope
- Albertson's
 - Dallas pilot; initially 3 SKU's; minimal expansion
 - Develop promotional compliance, new product intro applications
- Metro (Germany)
 - Future Store initiative – tagging one item
 - Nov. '04 pallet tagging pilot; expand to cases in early 2006
- Dept. of Defense – DeCA start up postponed until Jan. '07

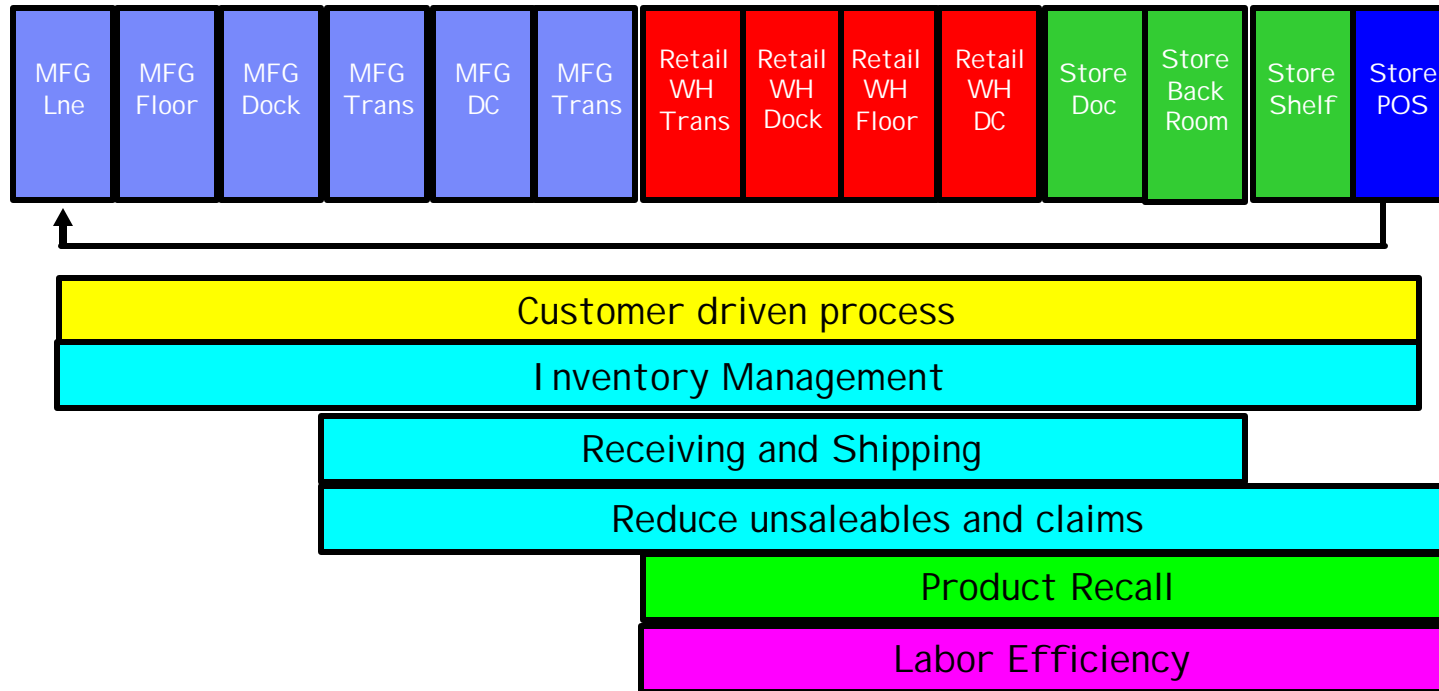


Supplier Business Case

- EPC/RFID provides visibility
 - Accuracy – passive collection, no human intervention
 - Granularity – at every inventory / transition point
 - Ubiquity – based on infrastructure, not human resource involvement
- Visibility enables predictability, responsiveness improving velocity
 - Warehouse, store inventory levels identifying short stock and out of stock
 - Velocity of inventory changes identifying bottlenecks, predicting shortages, prioritizing deployments
 - Demand signals integrated with upstream production planning, deployment
- Higher velocity reduces working capital requirements while driving revenue
 - Reduced safety stock throughout the supply chain
 - Cycle time compression
 - Improved retail in-stock position
 - Reduced unsaleables through improved inventory control
 - Reduced product diversion through trace ability of individual cases
- High value products (electronics, pharmaceuticals) have a stronger case
 - Tag costs represent a smaller percent of gross margin
 - Subject to greater levels of counterfeit, shrink



Supplier to Retail Process



EPC in its commercialization infancy

- What's here...tremendous potential
 - Passive data integration
 - Accurate inventory measurement
 - Unprecedented visibility
- What's on the horizon...
 - Retail in stock improvements
 - Lower inventories, improved code date mgmt.
 - Productivity enhancements
- What's missing...
 - Foundational data synchronization
 - Collaboratively developed and open technology, data, application standards
 - Commercially proven, affordable tags, readers
 - Investment / benefit alignment



Pilot Activity

- Southern Market
 - 'Slap & Ship' infrastructure
 - Dry / ambient network
- Limited products
 - RF friendly
 - Case & pallet tagging
- Use case applications
 - Detection rates / visibility
 - New item launch*
 - Promotional execution*



Objectives of Pilot Activity

1. Assess technology requirements, performance
2. Validate use cases
3. Identify business benefits
4. Understand long term deployment strategies

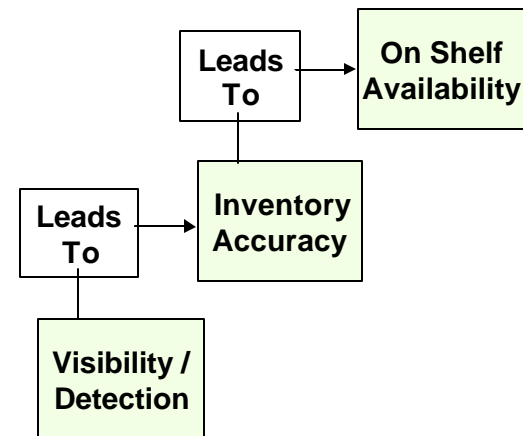


Objective: Assess technology requirements, performance

- Identify engineering requirements
 - Environmental
 - Process design
- Assess technology performance
 - Tag / antenna design
 - Product / packaging RF characteristics
 - Interoperability of tag / reader products
 - Durability across the supply chain
- Learnings to date
 - Early stage technology with interoperability, performance issues
 - Production pilots have identified issues, solutions
 - Greater participation will drive further technology development

Objective: Validate Use Cases

- Supply chain visibility
 - Case detection rates
 - Read points across supply chain
- Inventory accuracy
 - RFID driven inventory calculation
 - Benchmark vs. existing perpetual inventory
- On shelf availability
 - Identify current benchmarks
 - Integration with POS data
 - RFID enabled process change
 - RFID OSA vs. benchmark
- Learnings: Focus limited to visibility



Objective: Identify Business Benefits

- Validate technology performance to use case requirements
- Identify business process changes that link technology with business benefit
- Model business process changes in production mode
- Measure business benefits vs. control scenario; pre / post
- Learnings to date: Current pilots lack scale to drive true productivity; technology performance insufficient to sustain business processes

Objective: Understand LT deployment strategy

- Technology Development
- Operational Requirements
- Information Technology Requirements
- Deployment options / dynamics

Pilot Key Challenges

- Improving technology performance
 - UHF Gen 2
 - Laws of physics - Liquids absorb RF, metals/foils reflect, humidity impacts
 - One size does not fit all
 - Process changes to 'fill the gaps'
- Calibrating costs and benefits
 - Scale required to reduce costs - *applied* tag costs
 - Deployment required to drive benefits
- Managing complexity of deployment
 - Complex distribution flow of cases into customer locations (DPS, 3rd party sourcing)
 - Technical architecture requirements
 - Data / application integration



Key Principles

- Lead with well defined business processes
- Determine business rules that govern data collection and storage
- Leverage existing architectures and framework for data integration
- Make sure data interpretation and analytics provide information people can act on



Next Steps

- Manage customer engagements productively, collaboratively and prudently
- Continue industry engagement for standards, dialogue
- Install minimal infrastructure to support research, learning and pilot engagements
- Expand and deepen business case assessment
 - Broaden assessment to include upstream activities
 - Manufacturing
 - Procurement
 - Identify opportunities to redesign business processes rather than overlay the technology onto existing processes



Next Steps for Others

- Understand the potential and limitations of evolving EPC/RFID technology
- Develop high level business cases to establish near term priorities
- Participate in industry forums to establish industry standards that reflect the interests
- Establish “slap and ship” capabilities for near term pilot support
- Provide input to OB budgetary plans



Summary

- EPC/RFID has the potential to be a transformational technology that change our expectations of supply chain performance
- Institutionalizing this opportunity requires the integration of business process change and technological development
- Steady progress will be required to validate the business proposition as we align the costs and benefits with our customers
- To make EPC/RFID a reality, we need to develop open, inclusively defined technology, data and application standards

