



RFID Implementation Issues and Experiences

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Agenda



- Changes in your business, why?
- Overview of RFID: opportunities and benefits
- HP's own business and RFID
- Beyond RFID: PT&A
- Questions and Answers



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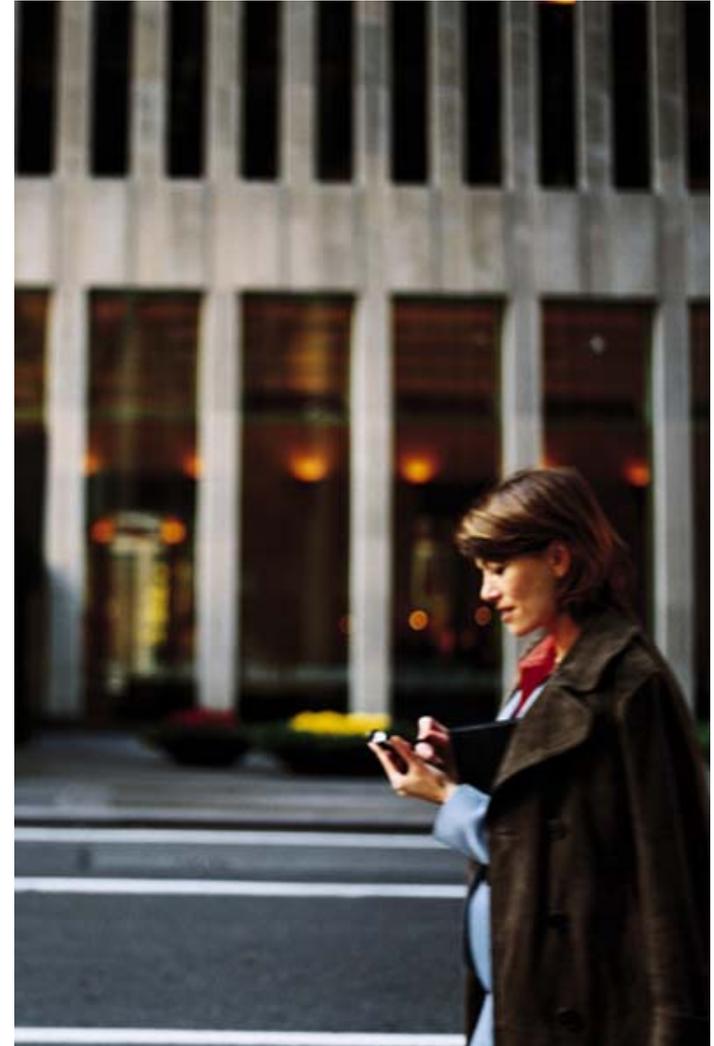
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What's driving change?

Three big shifts

- All processes and content will be transformed from physical and static to digital, mobile, personal and virtual
- The demand for simplicity, manageability and adaptability will change how customers work and organize, buy and use technology
- It's a horizontal, heterogeneous, networked world. Standards are about connection and common language



Today's challenge: precision supply chain management is becoming an imperative



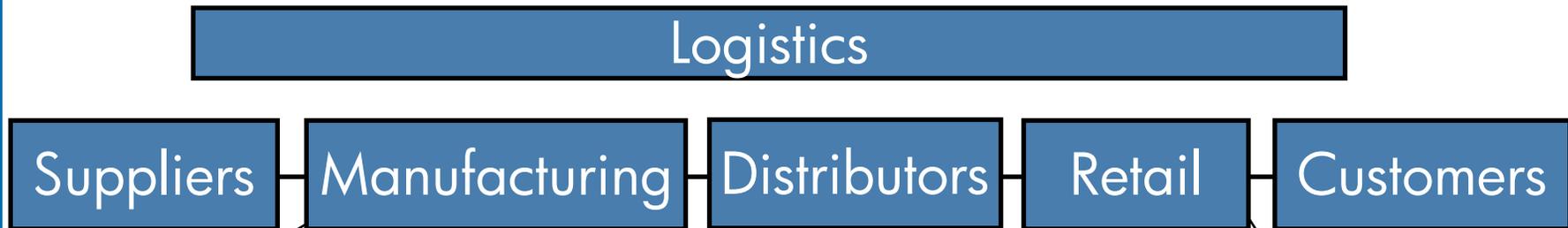
Most of these processes still require human intervention

Visibility

- proper inventory balance
- perishable goods management
- tracking of regulated commodities
- high waste and write-offs
- counterfeiting and theft
- archiving and security inefficient
- decisions based on static and inaccurate data
- retailer/distributor requirements

Velocity

Impact on the Cash to Cash Cycle



APPLICATION	KEY DRIVERS	OPERATIONAL IMPACT	FINANCIAL IMPACT
INVENTORY MANAGEMENT	<ul style="list-style-type: none"> - Increased Inventory Accuracy - Increased Inventory Visibility downstream and upstream - Improved Customer Service - Customer Requirements 	<ul style="list-style-type: none"> - Reduced Labor and touches - Increased Inventory Turns - Reduced Obsolescence - Improved Service Levels - Enables pull based replenishment 	<ul style="list-style-type: none"> - Reduced Working Capital - Reduced COGS - Increased Sales

APPLICATION	KEY DRIVERS	OPERATIONAL IMPACT	FINANCIAL IMPACT
INVENTORY MANAGEMENT	<ul style="list-style-type: none"> - Inventory Visibility and Accuracy across the Supply Chain 	<ul style="list-style-type: none"> - Reduced cycle/physical count - Improved in Stock 	<ul style="list-style-type: none"> - Decrease in Working Capital - Reduced Labor Costs

The CIO's balancing act



Maximize return:

- Improve business results; grow revenue and earnings, cash flow, reduced cost-of-operation

Increase agility:

- Enable the business organization and operations to adapt to changing business needs

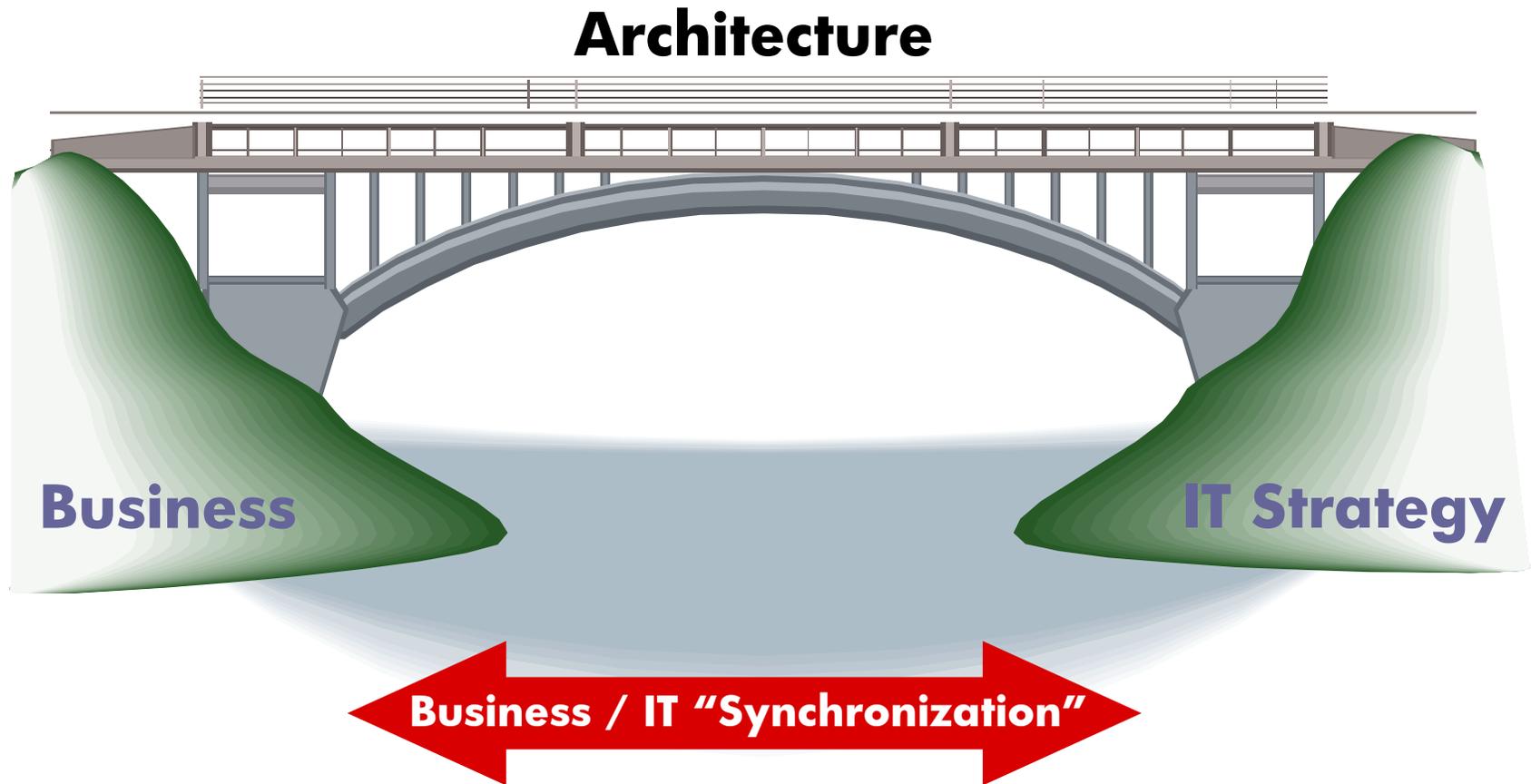
Mitigate risk:

- Ensure security and continuity of internal business operations, while minimizing exposure to external risk factor

Improve performance:

- Improve business operations performance end-to-end across the enterprise
- Increase customer and employee satisfaction

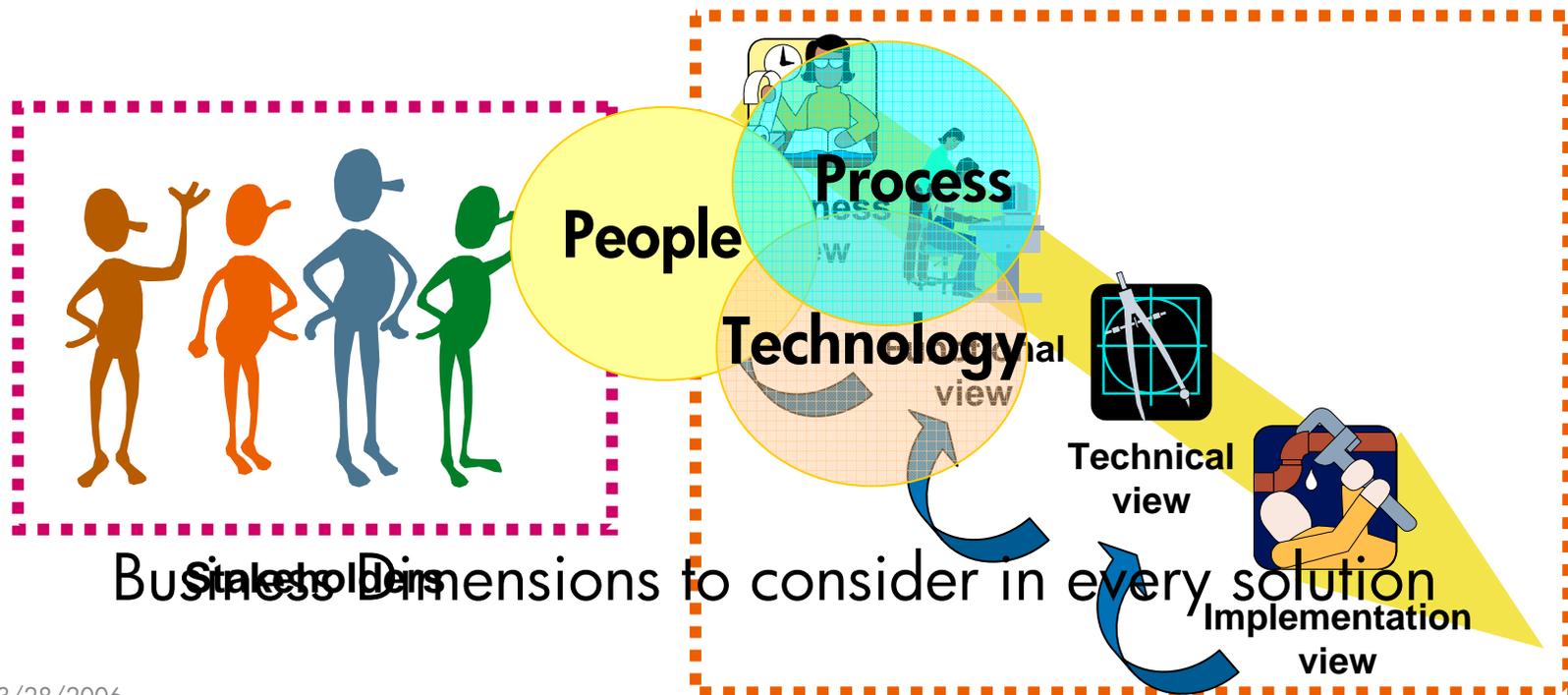
Bridging the business and IT gap



HP approach to solution architecture



- The HP Global Methodology for IT Strategy and Architecture (ITSA) is:
 - Based on stakeholder participation
 - Organized as a set of four fundamental views



House building analogy

Business view

Why do I want a new house?

Sponsor

Functional view

What features should the new house provide?

User

Technical view

How will the house be built?

Builder

Implementation view

With what will the house be built?

Deployer



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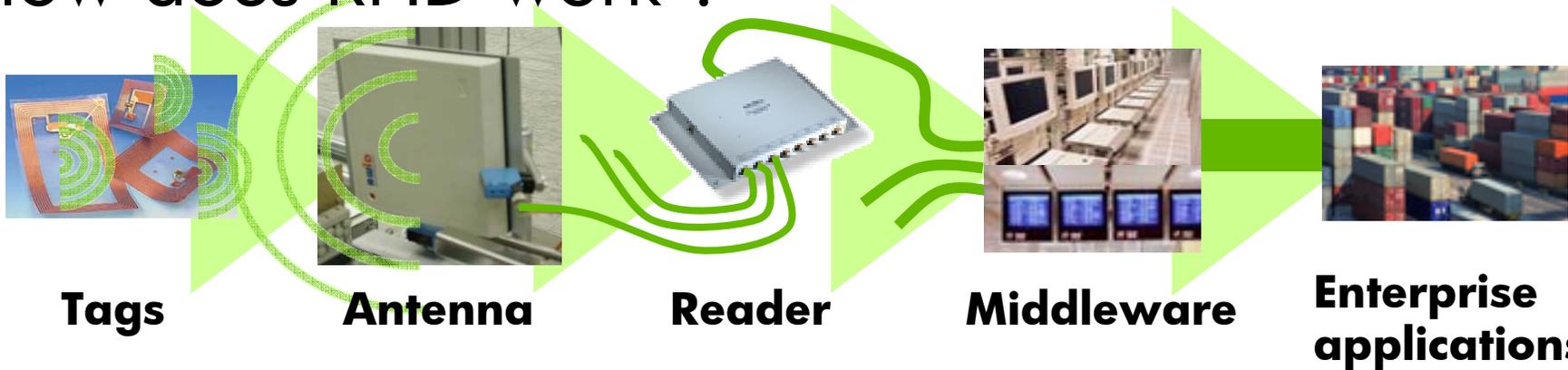


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Overview of RFID

How does RFID work ?



Items have tags attached or embedded

Tags are energized by the reader and transmit their ID

Coil of wire optimized for delivery of power and commands to tag and for receiving ID's transmitted by the tags.

In many cases read ranges are short so antenna placement is critical

Readers can typically work with 4-8 antennas to optimize coverage

Detects presence of RFID tags. Tag ID's are sent on to middleware

Controls readers and processes information (buffering and filtering)

Introduces product associations, location, aggregation of assets. Creates business objects that applications can handle.

Backend SCE or ERP systems receives Information

Examples of SCE:

- Updates inventory
- Notifies shipment arrival
- Triggers procurement

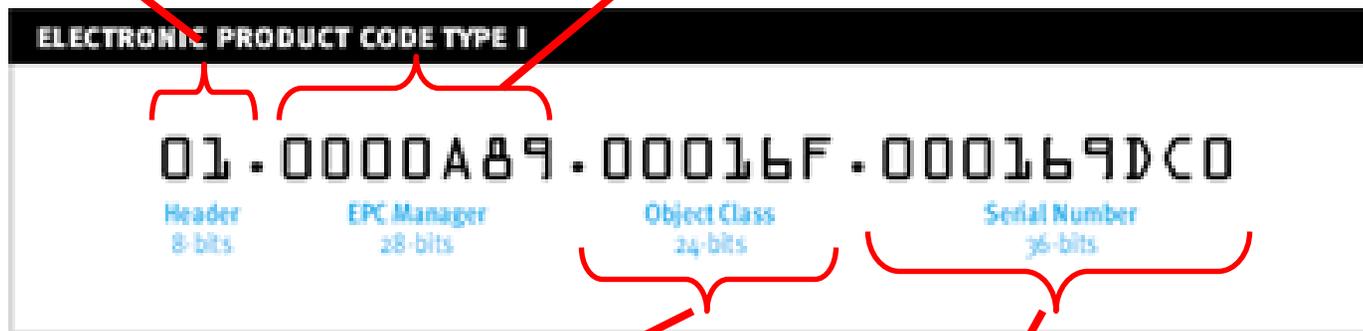
Overview of RFID

EPC Code Data Management



Header – Identifies which version of EPC is being used

EPC Manager – used to identify manufacturer and even plant. Capacity for **268 million** companies
E.g. HP (Not defined by HP) or Company code



Object Class – identifies the unique product family and item. Capacity for **16 million** objects.
E.g. Product# D1188A

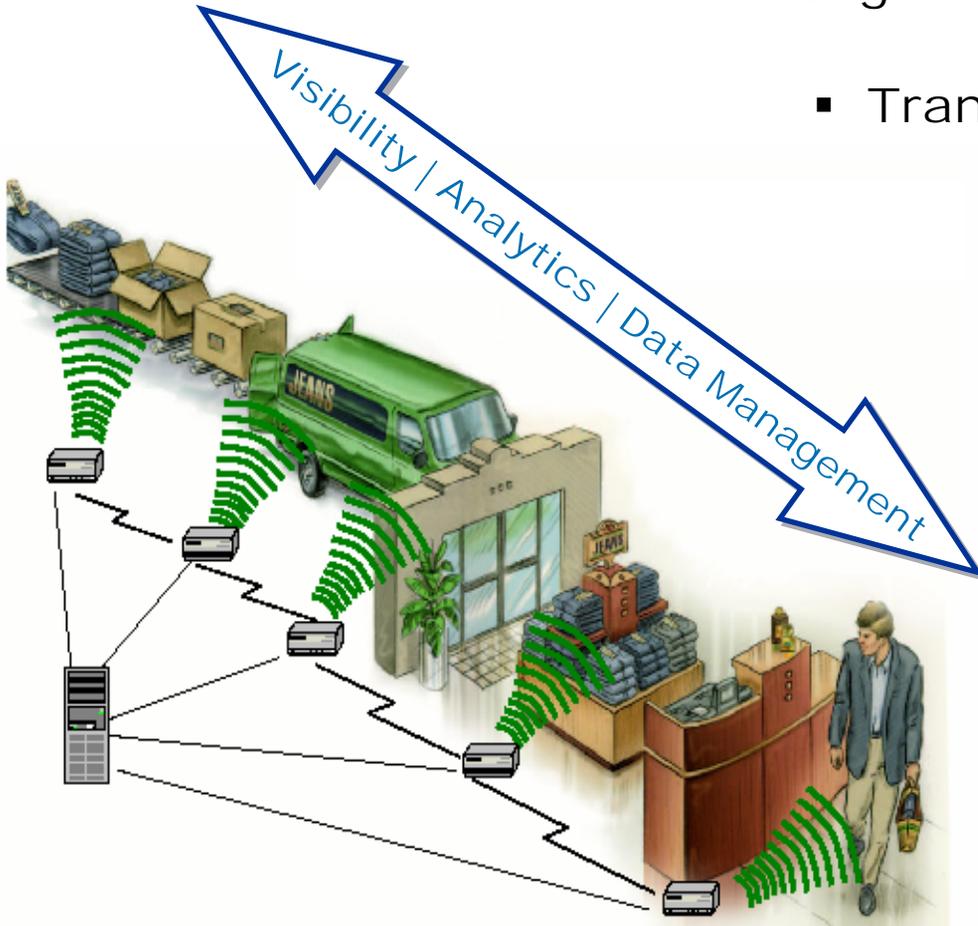
Serial Number – uniquely identifies the specific physical item being read.
Capacity for **68 billion** serial numbers

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Where Can It Be Used In The Supply Chain?



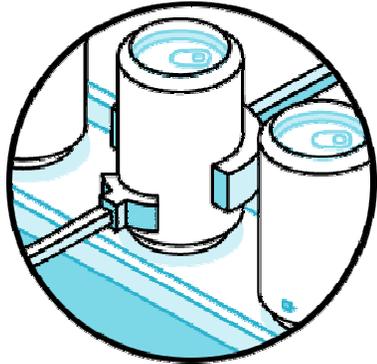
- From Production
 - Through Distribution
 - Transportation
 - Into a Store's Back Room Inventory
 - On the Shelf
 - At the Cash Register
 - Out the Door as an anti-theft device



How to use RFID in the supply chain?

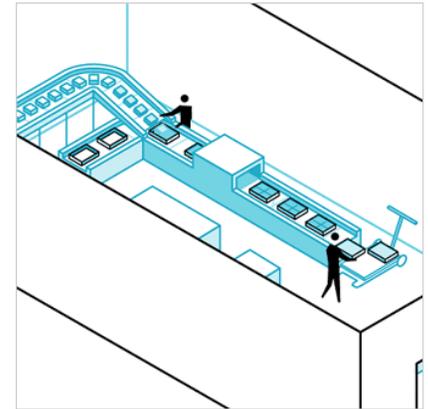


Add Identity to product

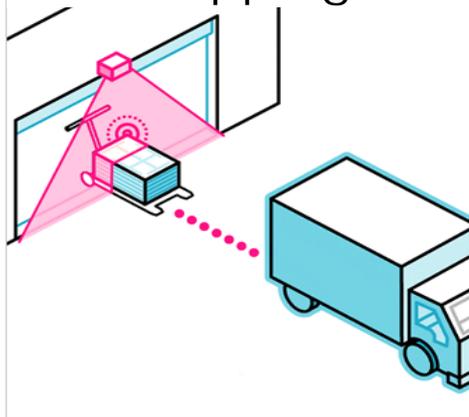


- Automate inventory transactions
- Real-time reporting of inventory
- Product tracking @ manufacturing

Adding Identity to Cases



Receiving / Shipping



- Material tracking

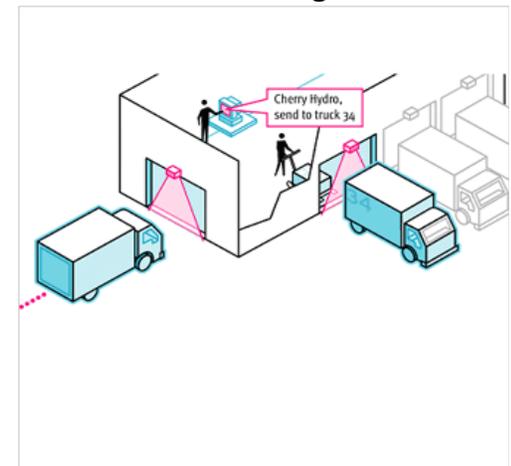
- Product recall

- Product warranty

- Electronic batch record

- Cold Chain Management

Distribution Efficiency



RFID Challenges ...

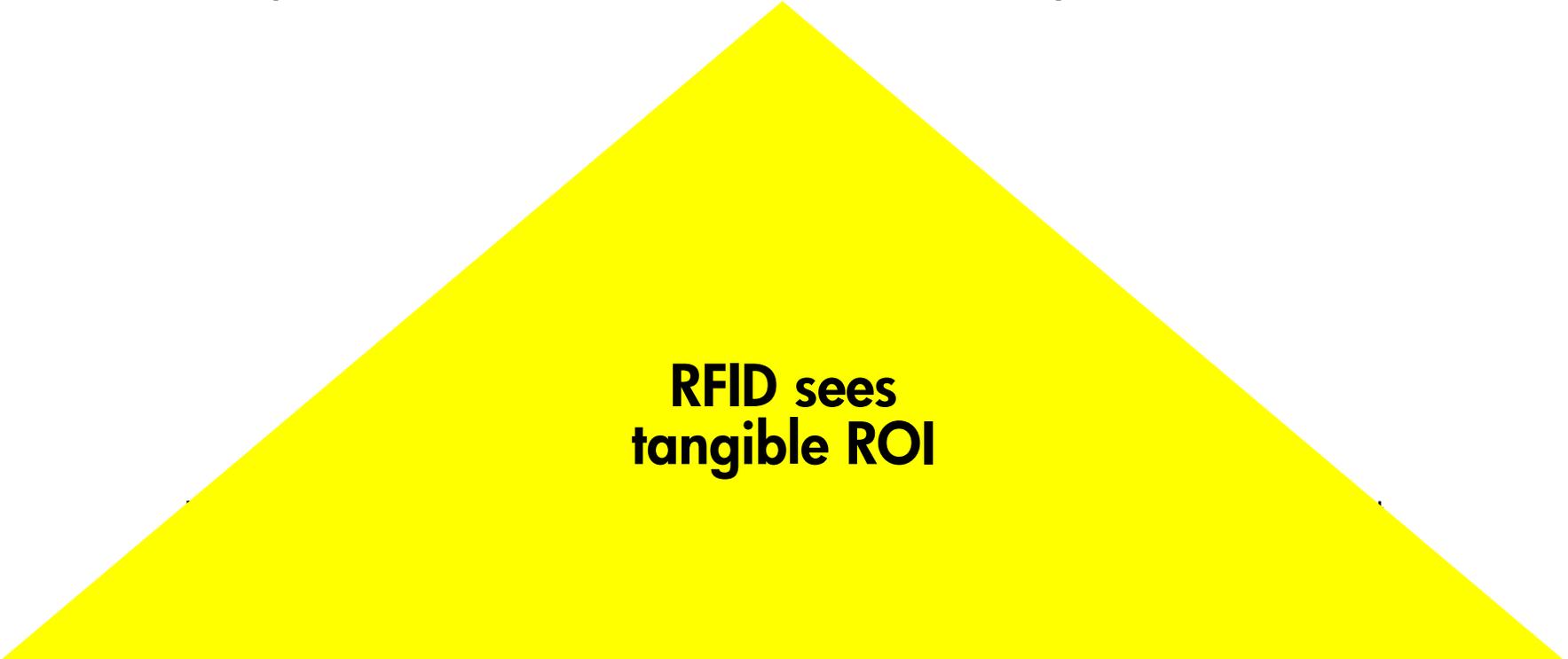


- Agreement on Standards
- Costs
- Infrastructure
- Tag Readability
- Creating a new supply-chain environment

RFID Benefits



- Increased visibility into the global supply chain
- Reduced cost and increased velocity
- Revenue protection and increased security

A large yellow triangle is centered on the slide, pointing upwards. Inside the triangle, the text "RFID sees tangible ROI" is written in a bold, black, sans-serif font.

**RFID sees
tangible ROI**

Experience from our HP's RFID Implementation
Source: Ian Robertson
Global Director – Pan HP RFID Program

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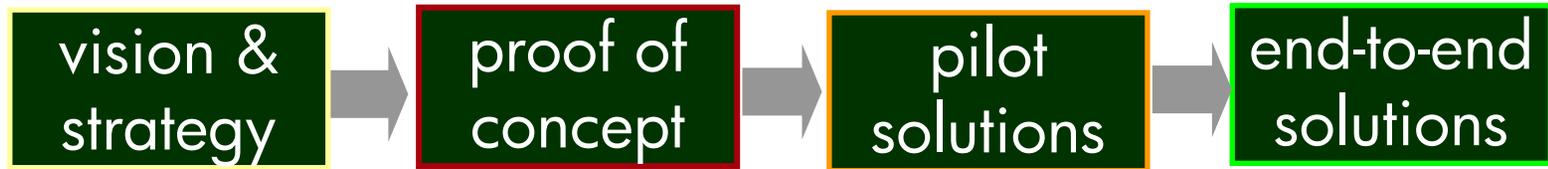
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Scope is pan HP and global



Enabling end-to-end Solutions



Detailed Activities and Tasks

Services and Deliverables

HP RFID Value Proposition

Five Pillars



Service provider

Consultancies & integration services to customers who wish to implement RFID

User

Implement RFID into HP's own operations

Innovation

HPLabs research and innovation in products, software and data management

Market provider

Provide HP's customers with goods that are RFID enabled

Standards leader

Influence development & ratification of international standards

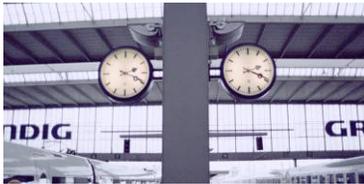
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Today's customer pain points



Counterfeiting / Product Diversion

The level of pharmaceutical counterfeiting is approximately 5-10% of world trade. This represents a direct revenue loss of \$24-\$49B for the industry



Regulatory Compliance

FDA expects widespread adoption of track & trace technologies by 2007. Growing number of customers are starting to demand adoption of track & trace technologies for tagging at pallet, case as well as item level



Supply Chain Management and Visibility

Pharma experiences \$2B in returns annually. The estimated typical percentage of a facility's total monthly Rx volume returned by customers is 4% for distributors and 2% for manufacturers.



Improving Quality of Care

Increasing FDA concern about loss of life from contaminated or ineffective products. 60% of counterfeits did not contain any active ingredients; 19% contained a wrong dosage and 16% contained inappropriate agents.



Supply Chain Compliance

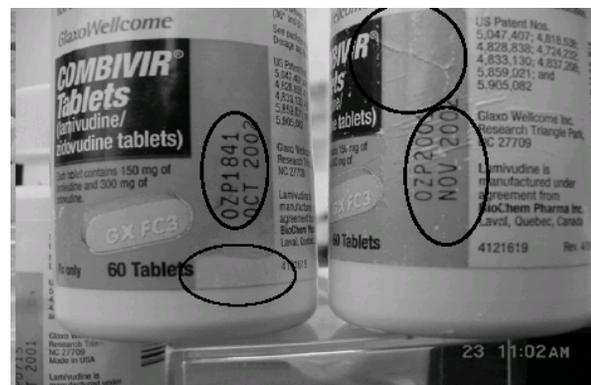
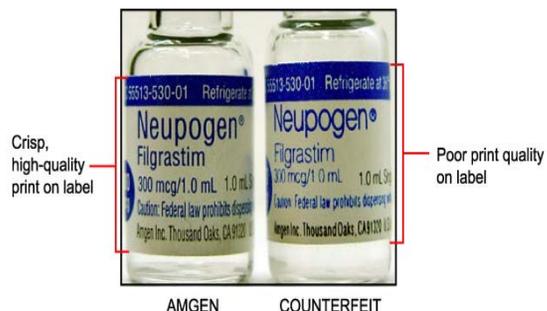
Growing number of chain stores, like Wal-Mart and Metro Group, and government agencies like the US DoD have demanded adoption of track & trace technologies for tagging at pallet, case as well as item level

Counterfeit drugs come in multiple forms - No "magic bullet" exists to eliminate the problem



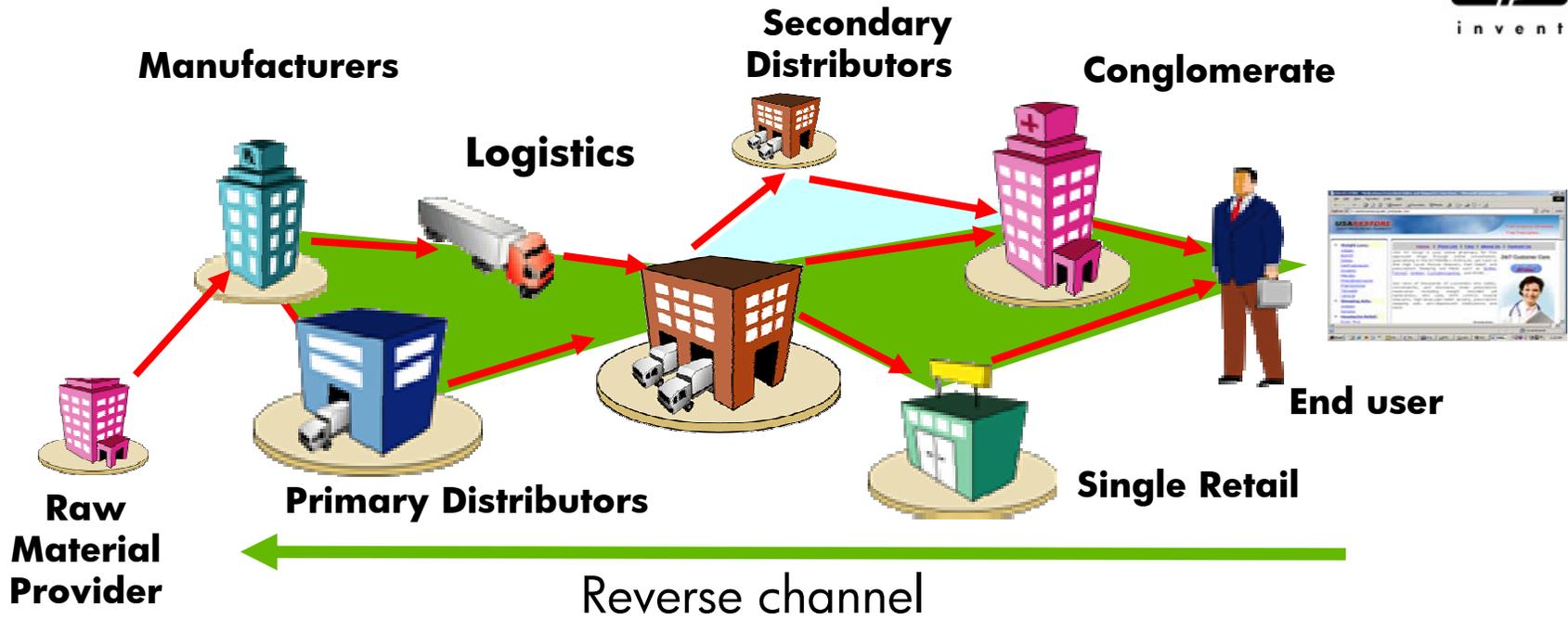
	Type	Description
Fake Drugs	Drugs without APIs	<ul style="list-style-type: none"> • Drugs missing active ingredients
	Diluted Drugs	<ul style="list-style-type: none"> • Diluted products
	Accurate Knock-offs	<ul style="list-style-type: none"> • Drugs with accurate compositions made through reverse engineering
	Contaminated Drugs	<ul style="list-style-type: none"> • Drugs with unintentional, lethal impurities • Drugs with intentional, lethal contaminants
Fake Labels	Fake Labels	<ul style="list-style-type: none"> • Labels with wrong drug name • Labels misrepresenting product potency • Labels extending the expiration dates
	Diverted	<ul style="list-style-type: none"> • Parallel trading due to differential pricing and/or drug shortages in certain regions <ul style="list-style-type: none"> - drugs intended for export to foreign charitable organizations - samples

- Neupogen, a cancer drug, containing only saline solution (2001)
- Fake Viagra (considered to be the most counterfeited drug)
- Combivir labels placed on Ziagen tablets and vice versa (2002)



Ronsonol lighter fluid and heat gun used to remove Labels (label damaged)

Opportunities across the supply chain



Manufacturers

- Save time in assembly
- Automate lower-level receiving and part tracking

Distributors

- Inventory control
- Proper FIFO
- Product completion improvement
- Shipping automation

Shipping

- Theft control
- Shipment tracking
- Counterfeit protection

Retail

- Shrinkage
- Shelf stock out

Post-sale

- Returns to dealer
- Link to warranty database
- Recycling

Integrated, Scalable Product Tracking & Authentication (PT&A) Solution



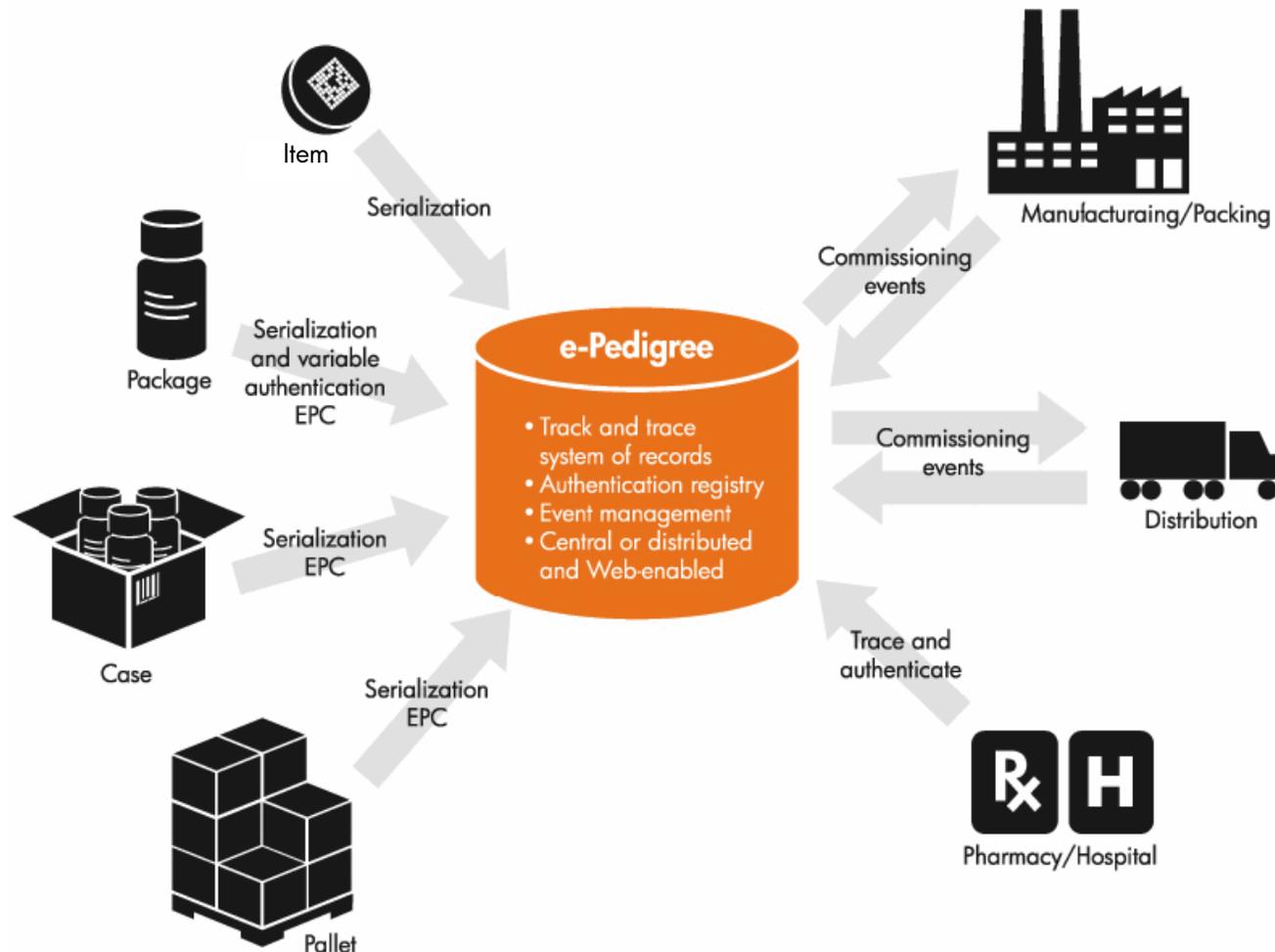
Key Challenges

- Counterfeiting
- Product diversion
- Regulatory compliance
- Retaining customers
- Supply chain optimization
- Recall management

PT&A Solution Components

- Security Printing & Publishing
- Radio Frequency Identification (RFID)
- Tablet Identification
- Supply Chain Transformation Services

Integrated, scalable PT&A Solution



PT&A Center of Excellence

Tablet Printing



PT&A Center of Excellence

Digital Variable Printing Secure Printing and Publishing

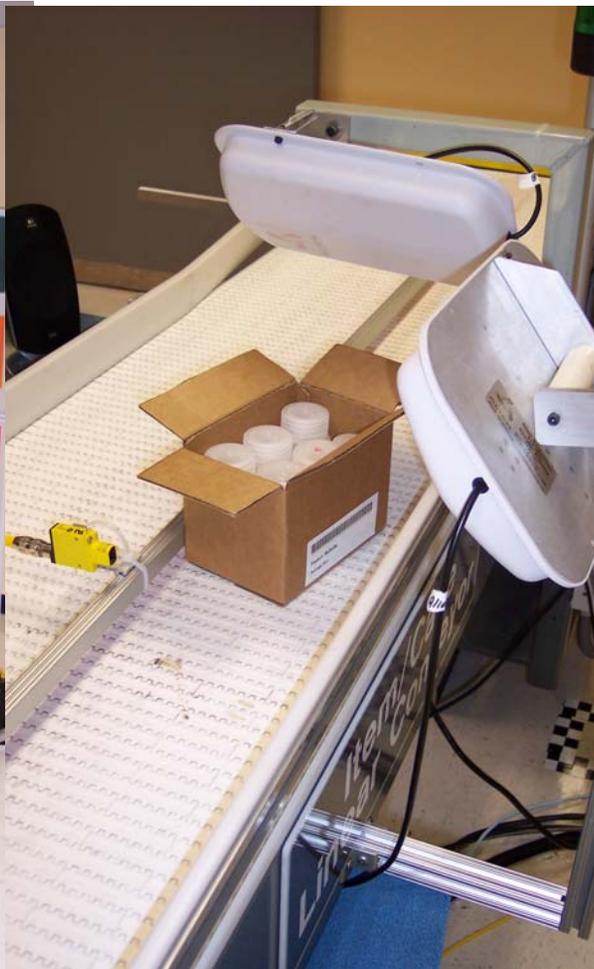


PT&A Center of Excellence

Radio Frequency Identification



Item level



Shipping Case level

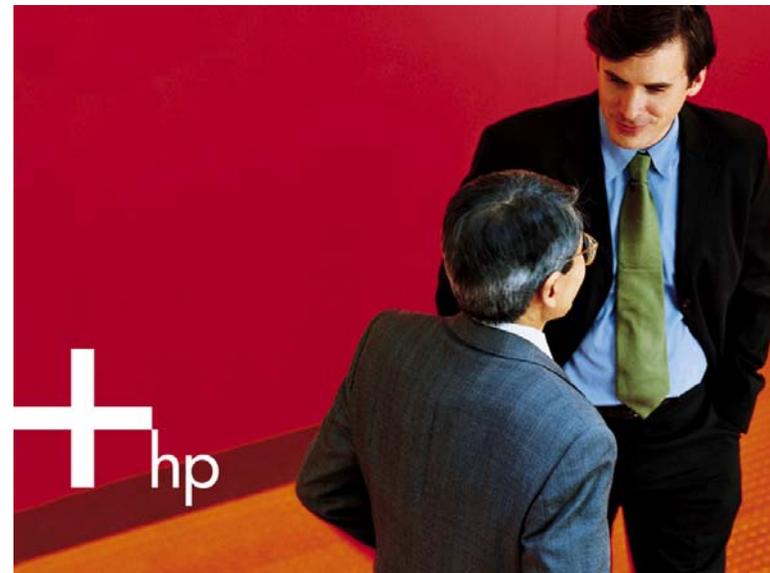


Pallet level

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<http://www.hp.com/go/manufacturing/rfid>

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