The Importance of Smart Packaging within HP

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Mgr, ISS Packaging Eng, HP
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My role today

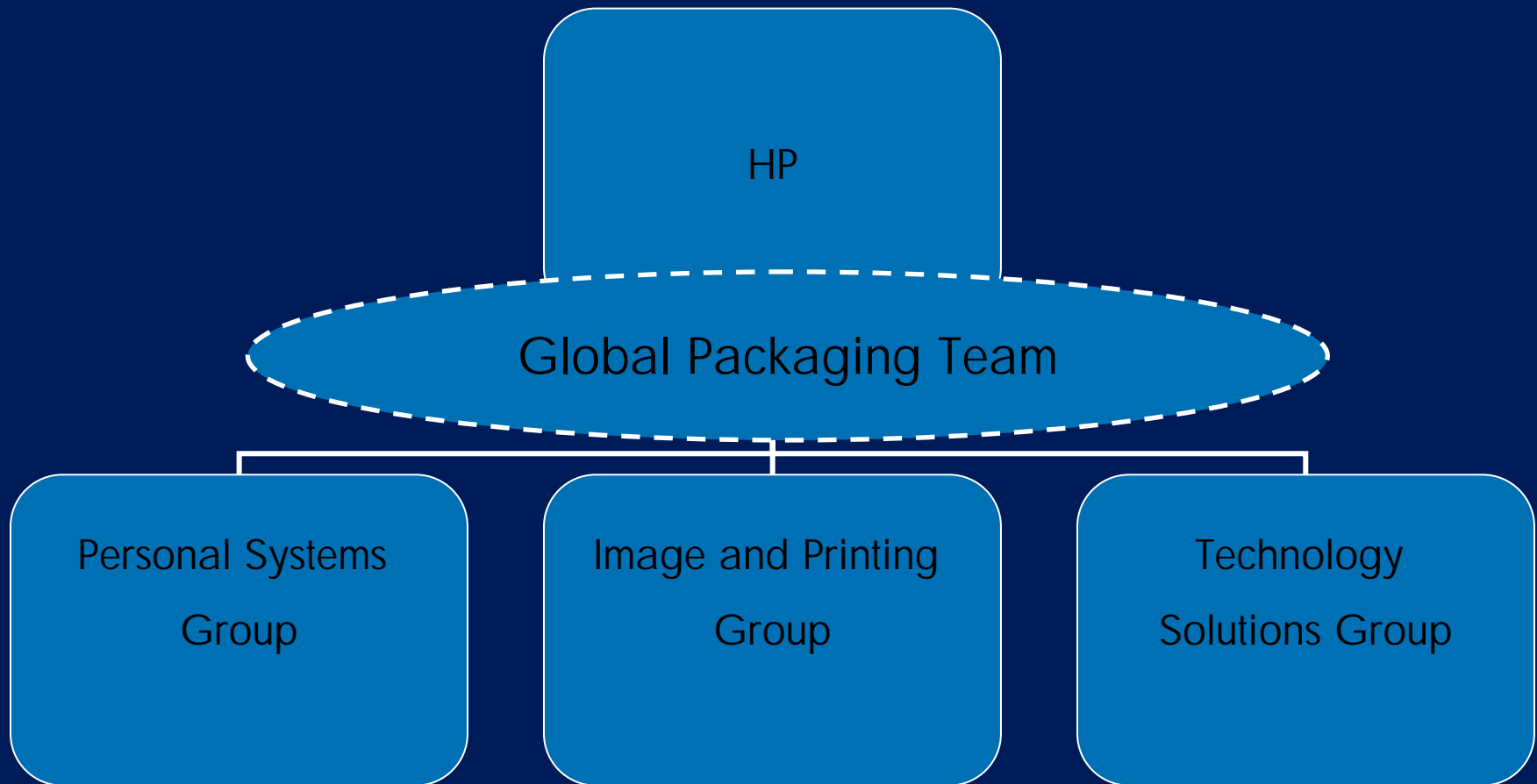- Member of Institute of Packaging Professionals

- A Packaging Engineering Manager with Hewlett-Packard
- A user of Smart Packaging

Outline of Conference Sessions

The two-day keynote Conference Program will be split into 4 key sessions

- Session 1 – Brand owner/end-user requirements for smart and intelligent packaging throughout the manufacturing & supply chain.

- Session 2 – A review of pack protection solutions – counterfeit deterrence, retail theft, tamper-resistance/tamper-evidence.

- Session 3 – Pack authentication & verification requirements in processing, manufacturing, transit & usage.

- Session 4 – Current requirements & solutions within the fields of supply chain management, including RFID, smart labels, etc.

HP Packaging Organization

HP

Global Packaging Team

Personal Systems Group

Image and Printing Group

Technology Solutions Group

Agenda

- Our need for Smart Packaging

- How HP is applying Smart Packaging

- What developments we would like to see in Smart Packaging

The Need for Smart Packaging

The Need for Smart Packaging

- Remember the early Eighties?

Early Lot/Inventory Control

- You might have seen…
  - Green dot – certain revision of a motherboard
  - Red dot –hard drive was screened for defective lot
  - Etc.

- No serious database

- And then we started bar coding…

CONDOR 3 - PVT1-J11

Bar Coding in the factory

- We were scanning at the component level

- Early MRP systems were limited

After Years with Bar Coding…

- Notice the number of bar codes?

- Constraints
  - Database access
  - Restricted Fields
  - Scanner limitations

- Tracking material lots is still very manual intensive

- An unfulfilled promise… but there is a difference
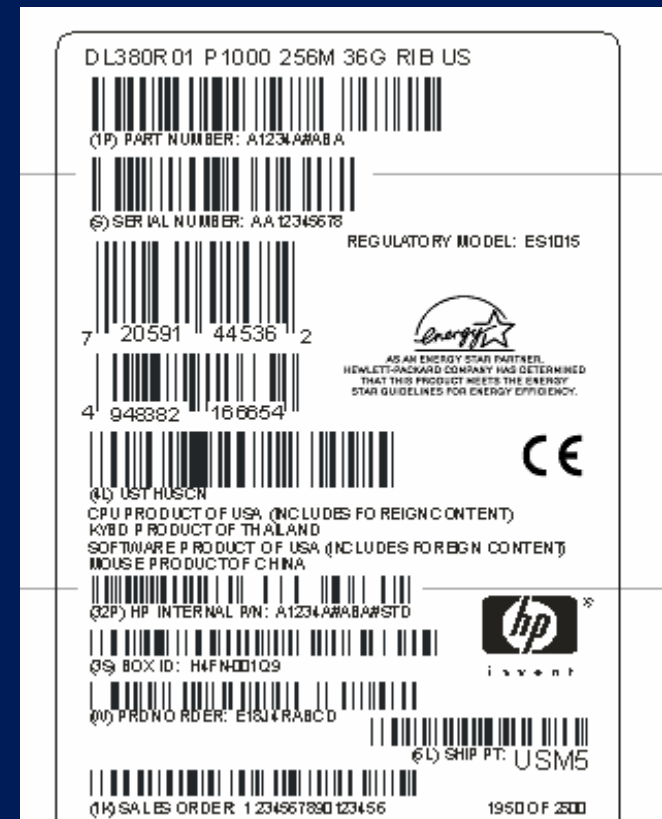
HP's Drivers for Smart Packaging

- Broad and diverse product line
  - Targets for theft and counterfeit

- Size of HP's Supply Chain

- Changes to our distribution environment
  - More Direct distribution
  - More focus on customization to customer needs (CTO)
  - More outsourcing activity
  - More regional focus

Need for Regionalization

HP's Drivers for Smart Packaging

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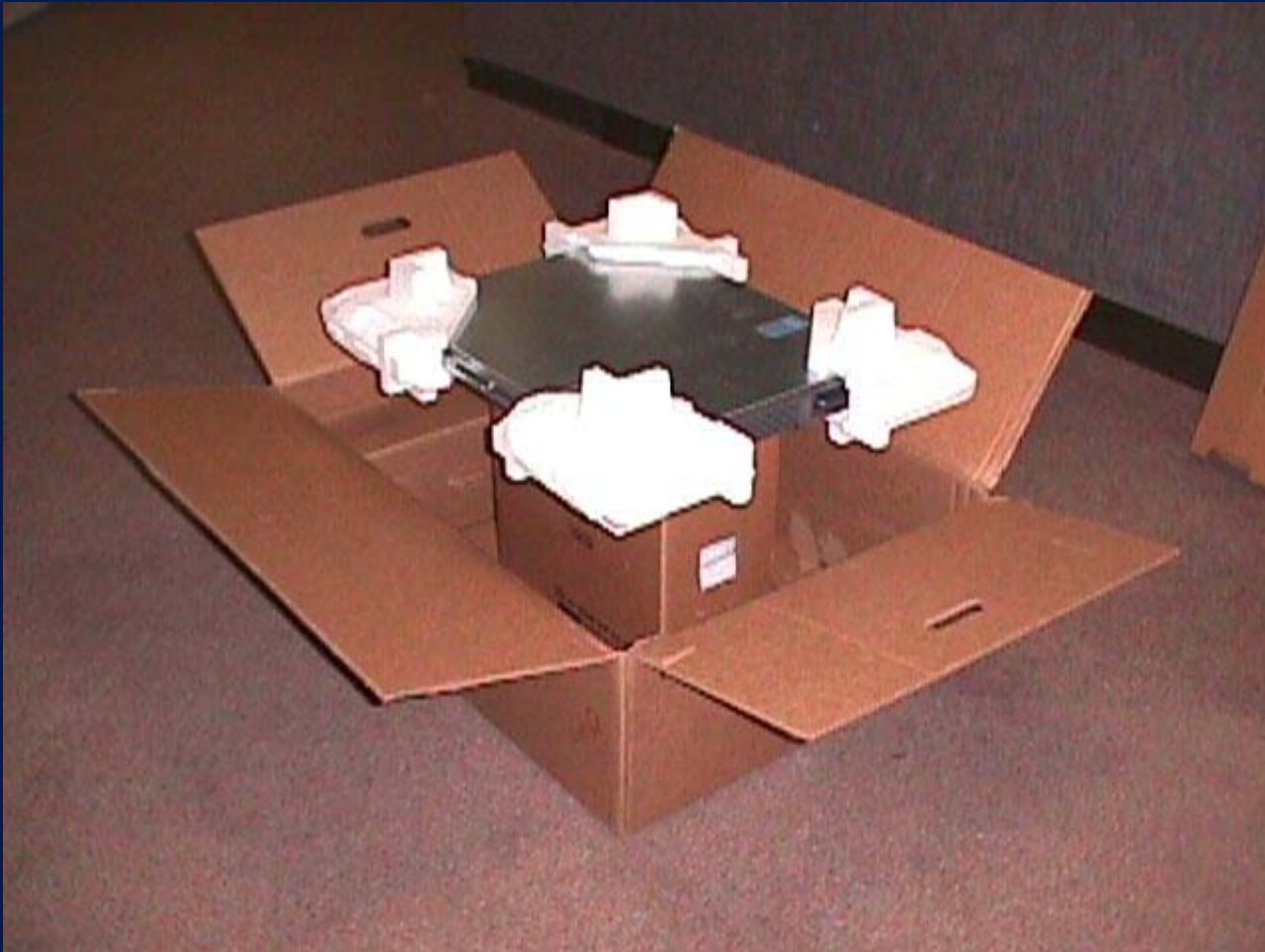 - More regional focus

- Cost benefits

HP as a User of Smart packaging

HP as a User of Smart Packaging

- Protective Packaging

- Graphics/ Specialized Printing

- RFID

Smart Packaging Can Be Efficient Packaging

Smart Packaging Can Be Clever Marketing

HP's Marketplace Presence
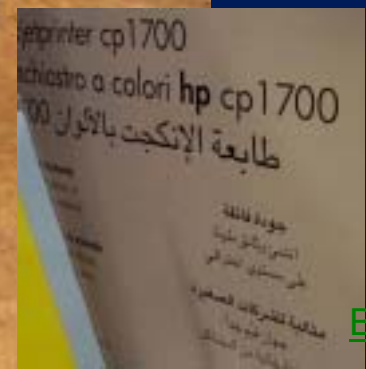
Smart Print in Packaging

- On-line, on-demand Ink Jet printing

- Pixel densities are getting interesting

Smart Print in Packaging

- T I J Printing on blister packs

Above photo shows how three TIJ print heads are arranged around one of the cylinders through which lidstock must pass prior to being heat-sealed to tablet-filled blisters.

Smart Print in Packaging

- Homework assignment:

- What is LEP – Liquid Electrophotography ?

Smart Print in Packaging

- DERIVATIVE LABEL

- Regionalization
- Print On-Demand
- All volatile text
- Changes via print files
- New derivatives via print files for OS, 3rd Party Logos, etc.
- No scrap!!

Contents:
- HP Scanjet 2200c colour scanner
- CD-ROM including:
  - HP Precisionscan LTX scanning software with fully integrated Optical Character Recognition (OCR) capability
  - HP Scanjet Copy Utility
  - HP Share-to-Web software scans images to photo-sharing Web sites
  - Adobe® ActiveShare™ image editing, photo management software
- Set-up poster
- USB cable
- Power cable

Specifications:
- 600-dpi optical resolution
- 600 x 1200-dpi hardware resolution
- 9600-dpi enhanced resolution
- 42-bit colour (internal hardware)
- USB interface
- Maximum document size: 8.5" x 11.7" (216 mm x 297 mm)
- HP Customer Care, including free 24-hour electronic support via the Web at www.hp.com/go/support

Minimum System Requirements:
- PC with Pentium® processor
- Microsoft® Windows® 98, Me, 2000 Professional or XP
- 32 MB RAM or more
- 130 MB available disc space
- VGA monitor (16-bit colour at 800 x 600)
- USB port

Print on Demand Issues

- Integration of Shop Floor Systems

- Download times for artwork

- Versatile label application equipment

RFID at HP

RFID at HP
Business Drivers

HP RFID
VALUE INTEGRATION ENABLER

SUPPLY CHAIN

VALUE
CHAIN

OPERATIONAL
EFFICIENCY

less work

less time

less risk

less cost

components

low cost
structures

information
network

Customer

Supply
Chain
synergy

strategic partner
integration

CM / ODM
value add

sourcing

outbound

manufacture

completion
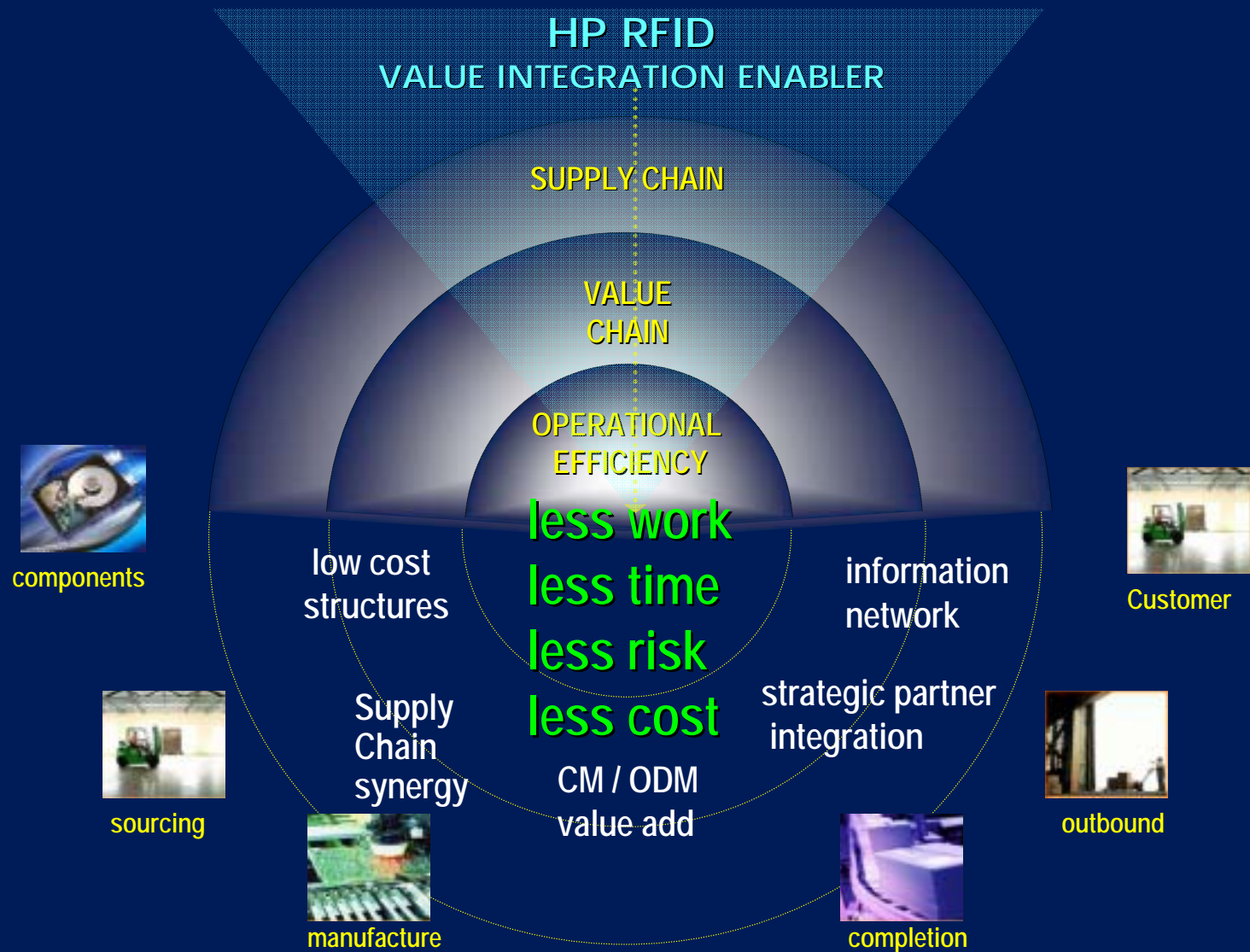
RFID at HP
Business Drivers

The Wal-Mart Requirement

1 EPC tag per carton – 100% read on conveyor

1 EPC tag per pallet – 100% read at Inbound dock

Conveyor speed of up to 600 feet per minute

3 Texas Distribution Centers

By January 2005

RFID at HP
Business Drivers

Other customers of interest…

If you're thinking "but there's no roof"

look closer – there's no floor either !!!

"Here's one of our cross-docking operations… "

Geographic Scope

RFID impacts businesses, operations and Customers in all Regions. Therefore program scope is global and pan HP in nature

Commercial sites

Retail sites

And that's just for goods delivered into the USA !

HP's RFID Profile

- RFID Pilot Programs

The Memphis Pilot

Tagging pallets & cases with EPC Class 1 Standard tags

Chester Plant Pilot

Includes systems changes to Shop Floor Control and WMS

Chester receives inkjet cartridges in bulk and packages them for different markets and Customers
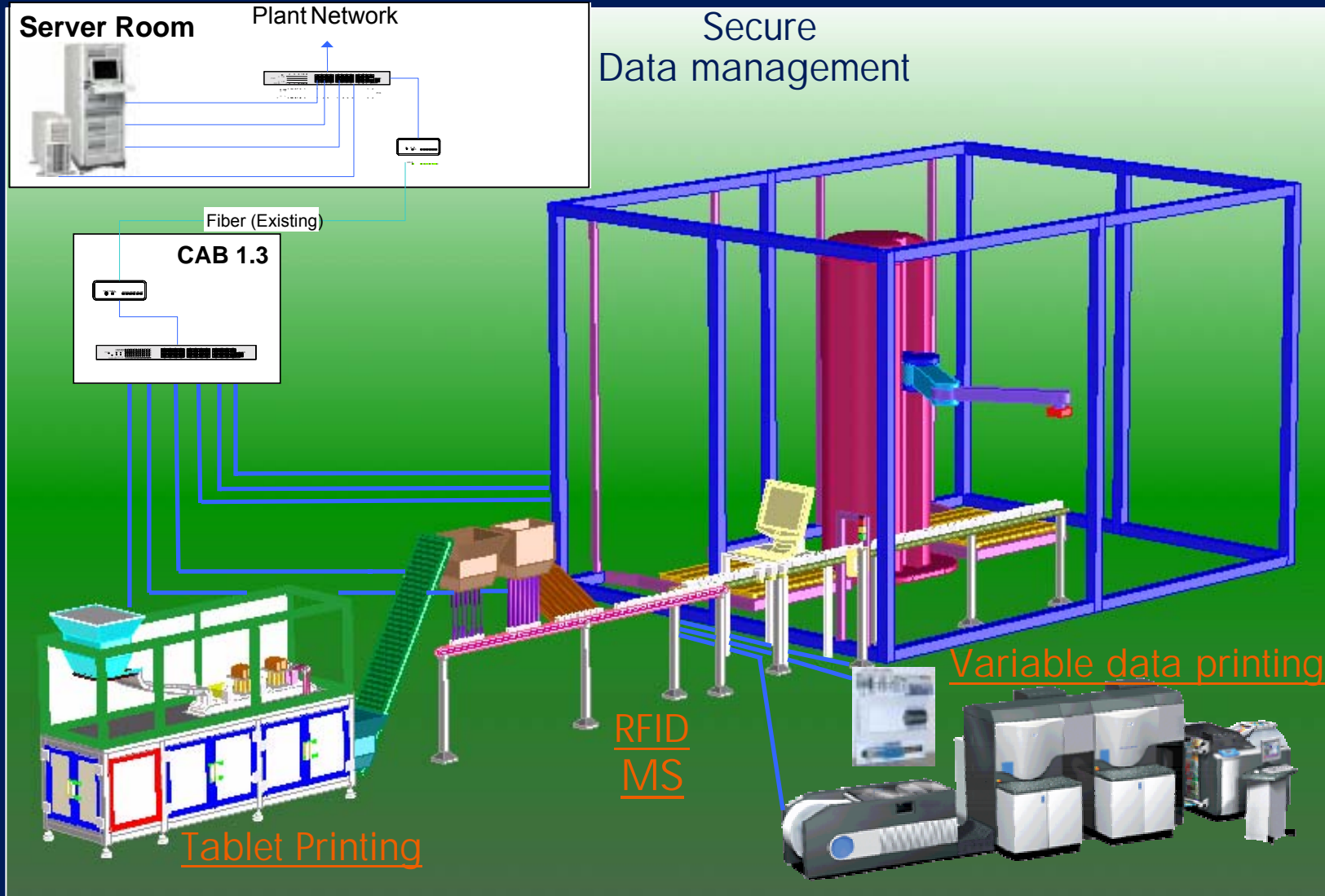
Sao Paulo Printer Plant

Tags will be used to carry quality & control data thru the process with the unit as it is built

Servicing the Latin America Region

HP's RFID Profile & Initiative

- IF
    - We are a technology company with a long solid reputation for innovation
    - Our hardware and software offerings range from handhelds to the world's most powerful clusters
    - We ship products to all of the world's major retailers
    - Deep experience in Consulting & Integration services
    - We are implementing RFID in our own manufacturing & distribution operations

- THEN
    - We are in an excellent position to offer a complete package of RFID consulting and integration services.

Example of one of the Centers of Excellence to investigate product tracking and authentication technologies

Server Room

Plant Network

Secure
Data management

Fiber (Existing)

CAB 1.3

Variable data printing

RFID
MS

Tablet Printing

Low Tech Smart Packaging

- Logo Tape
  - Originally a legal requirement
  - Continues to offer a low-tech, tamper-evident element
  - Customers are resistive to its elimination

Where Smart Packaging Could Go

Effectuate RFID

- Get down to the component level

- Deal with the privacy issue

- Drive the middleware

- Realize the Security and Anti-counterfeit benefits

Component Level Bar Code Tracking

- Scanning of subassemblies is part of our standard methods practice
  - Limited to BOM verification
  - EPC promises more!
  - Meanwhile…

Bar Coding gone crazy

Component Level RFID Tagging

- …is happening:

- The IPG is already using RFID technology in the Inkjet Cartridge manufacturing process

- HP is working with our component suppliers to assess potential savings

HP's RFID Tagging Policy on Privacy

- Inform the customer of presence

- Make tag removable

- This is a problem at a component level…

PRIVACY CONCERNS

PRIVACY CONCERNS

Newspaper clipping from the Houston Chronicle, International Business section, dated 7/15/04.

Microchips watch over Mexico

■ Top official says implants allow secure access to corruption unit

By WILL WEISSERT
ASSOCIATED PRESS

MEXICO CITY — Security has reached the subcutaneous level for Mexico's attorney general and at least 160 people in his office. They have been implanted with microchips that get them access to secure areas of their headquarters.

It's a pioneering application of a technology more widely used in animals than humans.

Mexico's top federal prosecutors and investigators began receiving chip implants in their arms in November in order to get access to restricted areas inside the attorney general's headquarters, said Antonio Aceves, general director of Solusat, the company that distributes the microchips in Mexico.

Attorney General Rafael Macedo de la Concha and 160 of his employees were implanted at a cost to taxpayers of $150 for each rice-grain-size chip.

KEEPING TRACK: Antonio Aceves, general director of a company that distributes microchips in Mexico, shows the tiny implant he says more than a hundred government employees are using for secure access.

JOSE LUIS MAGANA / ASSOCIATED PRESS

Security/ Anti-Counterfeit Benefits

- Remember the middleware?

Counterfeiting

...

HP Ink-Jet Counterfeit

AP – Completed Counterfeit Ink Products
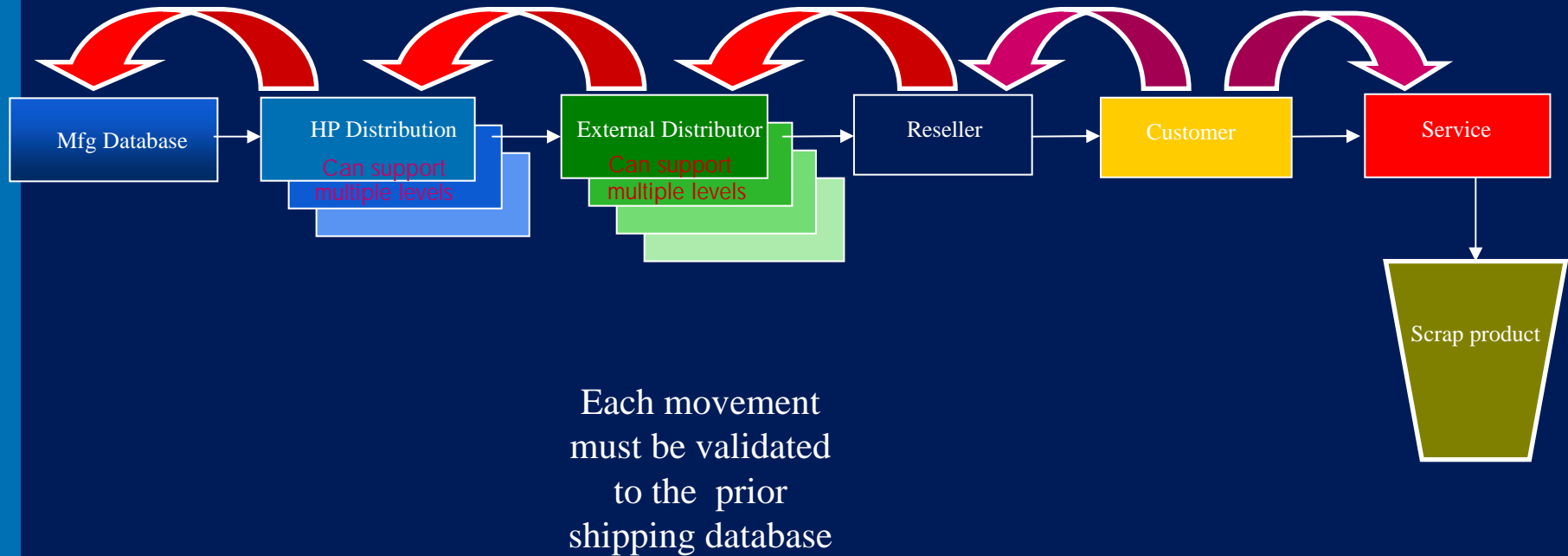

EMEA – Counterfeit Boxes

AP – Ink Used in Counterfeit Pens

EMEA – Packaged Product Ready to Go

RFID use in Validation of Product Movement in the Channel

Mfg Database	HP Distribution	External Distributor	Reseller	Customer	Service

Can support multiple levels

Can support multiple levels

Scrap product

Each movement
must be validated
to the prior
shipping database

The improved ability to track and trace

- **Enhances accountability for security**

- **Deters counterfeit product from entering bona fide channels**

Supply Chain, Product and Brand Security

Printing Deterrents

- Overt
  - Observable by naked eye, feel, smell
  - Colors, details, alignments, pictures, micro printing
  - Holograms, color-shifting inks, visible watermarks, odors
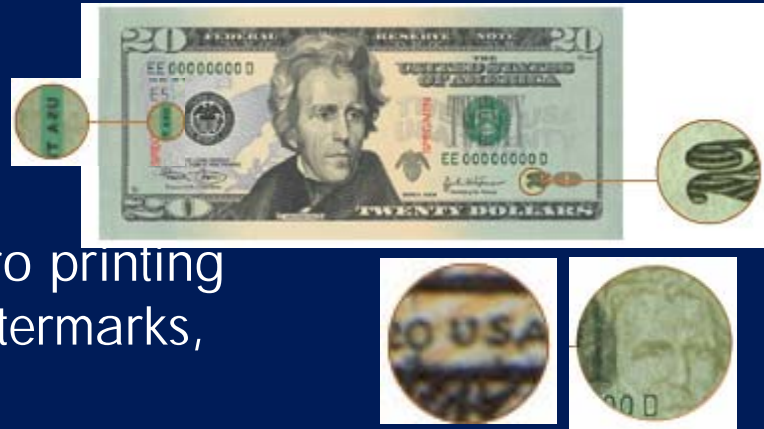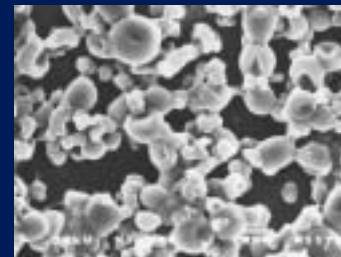

- Covert
  - Machine readable or hidden from naked eye
  - Invisible inks, fluorescence, magnetic printing
  - Special media
  - Hidden patterns, encrypted codes, hidden overprinting, micro-displacements of glyphs, metal fibers,
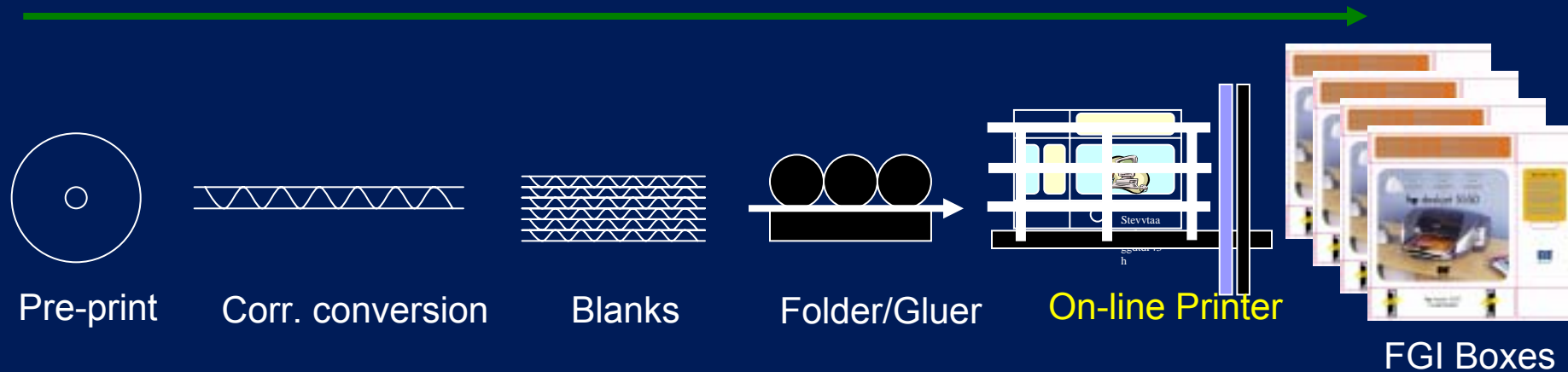

- Forensic
  - Laboratory required for checking
  - Chemical compositions

Scratch and Sniff glass capsules, 1000X

- **VDP can increase effectiveness**
- **Reader education issue**

Flexible Manufacturing

Pre-print   Corr. conversion   Blanks   Folder/Gluer   On-line Printer

FGI Boxes

Long Term Stuff

- Nanotechnology
  - Low cost miniaturized sensors
  - Built into arrays for dynamic measurements

- And all the futuristic stuff we hear about
  - IDTechEx Publications

- Huge Potential

The Promise of the Moment

- Opportunity
  - Technology
  - Realize immediate benefits

- The Packaging Community
  - Unique in its openness
  - Sense of collaboration

Capture the Moment!

- Engage

- Enjoy

- Effectuate

Q & A