RFID in the supply chain: Opportunities and Lessons

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John Wiley & Sons
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Opportunities:
Can you answer YES to any of these?

• Interested in knowing who returns product versus who purchased?
• Do you experience Grey-Market Sales?
• Are any of your products pirated?
• Might you be giving credit for Gratis, Comps or Evaluation copies?
• Would you like to:
  – only credit customers at the supplied purchase price?
  – credit correctly when customers return components of a set when supplied a set?
  – Improve your picking accuracy?
  – Validate inbound product and only pay for what you received?
Wiley’s Business Drivers

- Re-importation/Grey Market
- Piracy identification
- Gratis, comp or evaluation returns for full credit
- Purchased from wholesaler returned from retailer to publisher
- Complete set supplied – component returned
- Returns policy enforcement
- WileyPlus ™ registration code management
- What is on the Retailers shelf
- Improved business intelligence
Solution – RFID Tagging

• What is an RFID Tag?
  – Data transmission device (transponder)
  – Can be Active, Semi-Passive, Passive
  – Operates in LF, HF and UHF band spectrums
  – Major chip manufacturers: NXP, MONZA, HIGGS, INPINJ
  – Common data sizes: 64, 96, 240 bits of data

• Most Common Uses:
  – Asset Management/Tracking
  – Closed Loop Internal Proprietary Systems
  – Inventory/Retail Shelf Management
  – Safety/Recalls/Sell By
  – Security/Theft Protection
  – Quality Control
  – Piracy Protection
Solution – RFID Tagging

• Most Common Users:
  – Department of Defense
  – Transportation
  – Pharmaceuticals
  – Retail

• Most Common Chips:
  – Passive, UHF, 240 bits

• How do they work?
  – Active tags are powered while passive tags receive power via RF
  – Reader sends RF signal, instruction
  – Tag wakes, interprets instruction, sends data as backscatter
Retail Tag Applications

• How are Tags being used

Pallet Level
Relates all cartons to specific pallet

Carton Level
Relates all items to a specific carton

Item level
Creates a unique identity of a item

• Wiley Application is at item and carton Level using AD-224 and AD-824 passive tags with TID
RFID Data Encoding Standards/Contents

- **EPCglobal/GS1:**
  - EPCglobal is leading the development of industry-driven standards for the Electronic Product Code™ (EPC)

- **Electronic Product Code**
  - EPC is constructed as a **Serialised Global Trade Item Number** *(SGTIN)* by combining a GTIN product identifier with a unique serial number
  - Publishing EPC has been slightly modified to include a commissioner code as part of the serial number
  - Still allows for 1.6 billion unique books for an EAN
  - No other data is encoded in the tag
Wiley High-Level RFID Process Flow

Printers
- Encode & Embed RFID Tags in Books

US Distribution
- Associate RFID Tags to Outbound Order

Returns Center
- Compare Customer on Return Invoice to Customer on Outbound Order per RFID Tag

Wiley Asia

Asia Customer

Wiley UK

EMEA Customer

Gratis, Comp Eval Copies

Americas Customer

<table>
<thead>
<tr>
<th>Line Type</th>
<th>Use Case</th>
<th>Potential Business Action</th>
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<tbody>
<tr>
<td>Standard</td>
<td>- No action required.</td>
<td></td>
</tr>
<tr>
<td>Product Reimportation</td>
<td>- Refuse credit for returns not associated to outbound order from same customer. - Stop selling to customers (bookstores/wholesalers) outside U.S. if reimporting product into U.S.</td>
<td></td>
</tr>
<tr>
<td>Comp Copy Resale</td>
<td>- Refuse credit to bookstores who return comp copies - Contact Professor to whom returned comp was given</td>
<td></td>
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Publishing Printing Support

• U.S. Suppliers:
  – R.R. Donnelly (2 plants)
  – Courier (2 Plants)
  – IPAQ
  – Quad (formerly Quebecor) (2 Plants)
  – Hamilton Printing
  – Malloy

- Singapore Suppliers:
  - Markono
  - CraftPrint (summer 2011 installation)
Publishing System Integrator MobileXe

• Pave Software – Printer and Publisher
  – Print, Apply, Verify & Exchange
  – Multi-publisher & Multi-site
  – EPCglobal Compliant

• Custom hardware:
  – Tunnel Readers
  – Quality assurance tables
  – Packaging equipment

• Custom Software:
  – To suit specific environments
Supply Chain Drivers

• Improved Receiving
  – Verify quantities via carton tags
• Improved Full Carton Picking
  – Carton picking verification
• Improved Loose Product Picking
  – Carton content inspection
• Faster Returns Processing
• Improved Inventory Accuracy
  – Tracking At Pallet/Carton level
Lessons Learned

• Define Objectives
  – Create business drivers – Pilot
  – Identify reasonable scope

• Involve Print Suppliers from the start

• Source an Integrator
  – Need specific RFID item level experience
  – Don’t be their science project

• Identify your Internal Issues
  – Develop integrated workflow
  – Identify distribution workflow changes
  – Don’t underestimate effort!
Lessons Learned

• Use Readily Available Components
  – Use off the shelf RFID tags
  – Use proven RFID hardware
• Use Industry Standards
  – Implement EPC data structures
• Don’t Over Engineer
• Test....Test.....then Test again
Findings

• Market is fully aware of Wiley’s program and have been creative in trying to circumvent it
  – Ripping tags off paperbacks
  – Cutting out tags from hardbacks and applying new end sheet

• Piracy
  – Tearing off paperback covers from ISVs and adding hardback covers

• Grey Market
  – May not be where one would expect

• Business policies must be enforced
RFID Tunnel
Shrink Tunnel
Singles Packaging Machine
Quality Control Station
Questions?