Item Level RFID Tracking – IT Architecture
An RFID solution has several components, namely:

- **Hardware** - comprising readers, handhelds, tags etc

- **Network infrastructure** which connects these devices to the system

- **Local site middleware** (residing on a separate server or embedded on the device itself) that communicates with the devices to collect data

- **Legacy Enterprise Applications** like WMS, POS etc

- **Exchange infrastructure** that enables communication between the middleware and enterprise applications
RFID in the Supply Chain

1. **Place Orders**
2. **Supplier** ships raw-material on RFID-tagged pallets/totes, sends (Electronic Product Code Information Service) EPCIS-ASN
3. **Plants** receive raw-material, reconcile with Advance Shipment Notice (ASN), create finished goods
4. **Distribution-center/warehouse** stores goods
5. **Retail Store**
6. **Retailer’s Warehouse/DC** receives finished-goods on RFID-tagged pallets/carts, reconcile ASN

*Internal and end-to-end asset management*
Why integrate to other systems?

• Many retailers are implementing RFID to enable real-time inventory reports and dashboards – but RFID provides far greater awards when coupled with process automation.

• While reports can be useful, store managers must be actively involved in knowing what’s going on in their stores, and must ensure that real-time inventory information is integrated with store processes.

• For eg, knowing where retail inventory is located is a helpful timesaver, but it doesn’t go far enough. Without automated processes, store associates may still end up on inefficient scavenger hunts to pick, pack and fulfil omni-channel orders, leaving the door open for a poor customer experience.

• Many larger retailers have integrated inventory, merchandising and product information from multiple systems into mobile apps for store associates. Doing so, they have been able to create to-do lists based upon dynamic inventory movement, allowing them to focus on hot sellers, instead of slow movers.
Don’t Wait for Enterprise Systems Integration

• Connecting RFID to automated processes avoids inventory silos – and disappointed customers. For example, inventory can and should be connected to loyalty apps so retailers can make useful recommendations and offers based upon in-stock inventory, as well as assortment planning.

• But it’s a common misconception that all legacy systems must be fully integrated to benefit from RFID. To create a seamless customer experience, retailers can start by updating their data in existing systems of record with RFID. For example, a customer may be browsing online and want to know what is available in her favourite local store — and what can be shipped to her home. That doesn’t require full system integration, but rather requires that inventory data informs multiple systems.

• The good news is that while it may take time to integrate legacy systems, it’s not that difficult for retailers to use this data to inform multiple systems at once, whether the systems themselves are fully integrated or not. Data mapping and web services integration enables retailers to deliver most of what they need immediately: meeting customer expectations and creating efficiencies in their omni-channel operations.
Improving Process Automation

What are the next steps retailers may wish to take to improve their process automation? Consider these best practices:

• Make it easy for store staff to perform repetitive tasks with in-store mobile devices. Consider first your core work processes (e.g. omni-channel order fulfillment, shelf replenishment) that are manual and most prone to error.

• Full integration with large systems of record could take months or longer. If that is holding you back, then consider first integrating RFID with mobile devices and existing mobile apps.

• Socialize work processes with employees. Smart store operations and logistics and inventory control store managers have taken to living a “day in the life” of an associate so they can test and refine processes in a real-world environment.

• Set the stage for continuous improvement. In the dynamic retailing world, it’s important to stay flexible and incorporate change management into store operations.
RFID Processes

Retail Head Office

Systems
- ERP
- Retail Management System
- POS
- Merchandise Systems

Data
- Store/Zone Inventory Table
- Product Catalog
- Store Template
- Product Catalog Reporting

• Shipping & Box/Order Auditing
• Mobile Device Receiving
• Mobile Device Cycle Count & Search/Find & Transfers
• Manual Sales Floor Fill
• Web Inventory Reports
• Order Floor Replenishment
## RFID Processes

<table>
<thead>
<tr>
<th>Market Driven Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Mfg</td>
</tr>
<tr>
<td>Receiving (Fixed or Handheld)</td>
</tr>
<tr>
<td>Shipping (Fixed or Handheld)</td>
</tr>
<tr>
<td>Cycle Counting (Handheld)</td>
</tr>
<tr>
<td>Geiger Counter/Search (Handheld)</td>
</tr>
<tr>
<td>Box Auditing (Fixed &amp; Handheld)</td>
</tr>
<tr>
<td>Enterprise System Integration (WMS)</td>
</tr>
<tr>
<td>Web Inventory Reports</td>
</tr>
<tr>
<td>Point-of-Sale (Fixed)</td>
</tr>
</tbody>
</table>
# Example data flows

<table>
<thead>
<tr>
<th>ERP</th>
<th>To</th>
<th>Locafi</th>
<th>Data Transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock Transfer request / PO generated in ERP</td>
<td>=&gt;</td>
<td>Locafi creates equivalent ‘order’ for tracking items in transfer / PO</td>
<td>All required data to create the order i.e. To, From, Sku’s, Quantities, etc</td>
</tr>
<tr>
<td>Inventory Master Records</td>
<td>=&gt;</td>
<td>Create new Sku in Locafi</td>
<td>As new skus are added to the ERP these also need to be created in Locafi so that items of these skus can be tracked.</td>
</tr>
<tr>
<td>Current Location Stock</td>
<td>=&gt;</td>
<td>Locafi uses this to ‘guide’ users as to when the stocktake is complete</td>
<td>Count of the current stock in the requested/each location</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locafi</th>
<th>To</th>
<th>ERP</th>
<th>Data Transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items allocated to transfer / PO order</td>
<td>=&gt;</td>
<td>Adjust quantities in transfer / PO</td>
<td>Count of the items actually allocated to each line item in the order</td>
</tr>
<tr>
<td>Order Dispatched</td>
<td>=&gt;</td>
<td>Update transfer / PO status</td>
<td>Status update</td>
</tr>
<tr>
<td>Transfer / PO order Receipt</td>
<td>=&gt;</td>
<td>Update transfer / PO status and receipted quantities</td>
<td>Count of the items actually received for each line item in the order, and update order status</td>
</tr>
<tr>
<td>Location Stocktake</td>
<td>=&gt;</td>
<td>Update stock for Sku’s in given location to provided values</td>
<td>Actual count of items in the store (quantity per sku) to override the master stock records for that store in the ERP system. There should also be some form of sanity checking done there on the ERP and so that any large discrepancies are flagged for review so that store staff error doesn’t affect the records in the system.</td>
</tr>
</tbody>
</table>
Example – Pack stations

- Items at the packing tables are moved across the RFID antenna and automatically flagged as packed
- EPCs are published into the ASN for the store to receive against
Once the order is delivered to the store the box is placed on a reader and the full contents are read and compared to the ASN. If items are needed on the sales floor with urgency, the system flags those items.

Any unexpected items (items not listed on an ASN) are also flagged.
Enterprise Class Deployment Lessons Learned

- **Pre-RFID Inventory/Process Metrics Are Inaccurate**
- **Tight Linkage with Source Tagging Strategy & Partners**
- **Encoding Is Required Across Item Life Cycle**
- **Robust Installation / Supportability Strategy & Technology**
- **Plan For Solution Users To Find New Ways To Extract Value**
- **Flexibility For Enterprise System Integration Required**
- **Catalogue Errors Are The Root Of Much Pain**
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