RFID Implementation: 

Rx Processing
Background

- ACME Health launched a mail order prescription drug program to reduce operating costs.
- Current facility in Florida
- Plans to build a much larger facility in Wyoming (Q4 ’08)
Current Process

- 90% generic drugs
  - Made in-house
- Build-to-sell
- Components
  - Receiving/shipping
  - Inventory management
  - Manufacturing
  - Fulfillment
Current Process

- Supplier Deliveries
- Storage
- Purchase Order Generated
- Materials Request
- Materials Pulled for Production
- Production Request
- Fill Order
- Manufacture
- In stock
- Out of stock
- Materials unavailable
- Materials available
- Ship
Florida Facility

- Processes about 3 million orders a year
- Demand much greater than expected
- Constantly trying to keep up with work
Future Projections

- 10 million Rx orders in 2009
- 10% order growth in following years
  - Aging population
  - Increasing demand for lifestyle drugs
- Increasing industry pressure to reduce costs
Business Problems

- Production/fulfillment capacity
  - Un-fulfillment rate of 22%
  - Revenue lost: $4.84 per unfulfilled order
- Inventory management
- Operating costs
- Forecasting
Goals

- Learn from current issues
- Develop a more effective and efficient facility in Wyoming
- Revamp inventory management processes at Florida facility
Business Metrics

- Reduce un-fulfillment rate to less than 2%
- Decrease stock shortages by 20%
- Reduce holding costs by 15%
- Improve space allocation by 10%
- Eliminate 10% from labor costs
Potential Solution

RFID
# Tangible Benefits (1st Five Years)

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved fulfillment</td>
<td>$14,520,000</td>
</tr>
<tr>
<td>Holding costs (Inventory)</td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Customer Service Overhead</td>
<td>$1,603,000</td>
</tr>
<tr>
<td>Labor Savings</td>
<td>$2,008,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$20,531,000</strong></td>
</tr>
</tbody>
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Intangible Benefits

- Improved customer satisfaction
- More effective organization of floor space
- Increased operating efficiencies
- Reduction in processing/storage errors
## Estimated Costs – One Time

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag applicators</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Door readers</td>
<td>$800,000</td>
</tr>
<tr>
<td>Forklift readers</td>
<td>$100,000</td>
</tr>
<tr>
<td>Handheld readers</td>
<td>$600,000</td>
</tr>
<tr>
<td>Conveyors</td>
<td>$70,000</td>
</tr>
<tr>
<td>Controllers</td>
<td>$30,000</td>
</tr>
<tr>
<td>Integration</td>
<td>$2,100,000</td>
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<tr>
<td>Software</td>
<td>$600,000</td>
</tr>
<tr>
<td>Training/Consultants</td>
<td>$350,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$5,650,000</strong></td>
</tr>
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</table>

Numbers altered to protect the guilty.
## Estimated Costs – Ongoing
*(First 5 years)*

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tags</td>
<td>$5,250,000</td>
</tr>
<tr>
<td>Readers maintenance</td>
<td>$135,000</td>
</tr>
<tr>
<td>Software maintenance</td>
<td>$60,000</td>
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<tr>
<td>System maintenance</td>
<td>$1,500,000</td>
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<tr>
<td>Data management</td>
<td>$170,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$9,715,000</strong></td>
</tr>
</tbody>
</table>

Numbers altered to protect the guilty.
Bottom Line

For the first 5 years:
Benefits: $20,531,000
Cost: $15,365,000

**NET:** $5,166,000
Team – Core

- RFID project manager
- IT
- Logistics
- Facilities
- Shipping
- Consultants
Team – Extended

- Program manager
- Project Champion/Sponsor
- Pharmaceuticals
- Customer service
- Finance
- Suppliers
- Distributors
Business Strategies

- Complimentary
  - Initiative to reduce costs through technology
  - Easing burden on customers/trading partners

- Competing
  - Delays to Wyoming facility “Go-Live”
  - Better operating practices
Strategic Considerations

- Transforming business processes
- Replacing existing systems
- Creating in-house knowledge
- Remaining a market leader than become a market follower
- Identify the problem and then find the technological solution
RFID or Bust

TECHNOLOGY
Minor Housekeeping

- Pay Eric Woods handsome retainer
  - Before work begins
  - Prior to project launch
  - Preceding any deliverables
RFID Frequencies

- UHF received on incoming raw materials
- HF applied to prescription finished goods
- HF applied to warehouse locations/bins
Hardware

- UHF readers for receiving portals
- UHF readers for forklifts
- HF readers for shipping portals
- HF portable readers
- Digital cameras
Software

- New WMS/ERP to include production and inventory control
- Middleware to manage readers
Legacy Technologies

- RF portable devices with integrated scanners (and RFID readers)
- Bar codes!!!
Application of Technology

- Use UHF RFID to:
  - Receive raw materials through portal
  - Move/put away raw materials in warehouse

- Use HF RFID to:
  - Track locations
  - Move/put away finished goods in warehouse
  - Cycle count/physical inventory finished goods
  - Pick orders
  - Confirm shipment of finished goods
Approach

- Phase I – Preparation
- Phase II – Testing
- Phase III – Pilot in Florida
- Phase IV - Implementation
Pilot Program
background and assumptions

- In order to evaluate the new WMS package, define the building blocks for the RFID implementation, and train the technical staff, a pilot program is going to run in the Florida operation, utilizing one of the three receiving docks.

- If deemed successful and based on other criteria ACME may consider switching the current system in Florida to the new application even before deploying in Wyoming.
ACME is looking into utilizing RFID throughout the entire operation – from warehousing raw material, through drug production and finally - fulfilling customer’s orders for finished goods.

Initially ACME will test/rollout RFID implementation in the receiving docks, warehouse(s) and the end of the production lines – bottling operation
In the docks and warehouse ACME is going to use the UHF tags that their suppliers are going to apply on the shipped raw material.

Once the finished products are bottled, they will receive a HF tag.

For the purpose of this paper we will only cover the process through the testing phase
Phase I – Preparation

- Selecting a steering committee, Project lead, cross function team members.
- Training the above
- Identify and interview stakeholders
- Select a consultant/integrator
- Informing suppliers – they will ship UHF GEN 2 RFID tagged products. Solicits feedback and setup time tables for testing their goods
- Choosing hardware suppliers for door readers/portals (UHF), Forklift readers (HF/UHF), hand held readers (HF/UHF), controllers, and host computers.
- Choosing Software application suppliers.
Phase II – Testing

Receiving dock

- Setting up the docking portal system – hardware, software and integration with application
- Testing – work with raw material suppliers to test their shipped products.
- Optimizing our system
- Providing feedback to suppliers regarding optimal tag selection/placement
Testing:
- Portal
- Forklift reader
- Application:
  - Raw material visibility
**Warehouse**

- ACME will incorporate portal, portable RFID readers, forklift mounted RFID readers as well as use HF RFID tags to assigned “bins” in the warehouse.

- Each time product moves from the receiving dock to the warehouse (through a portal), its accurate location in the warehouse will be captured using the HF tags.
Warehouse - continue

- Install warehouse portal system
- Install hardware on assigned forklift
- Tag assigned aisles using the HF tags
- Testing:
  - Portal
  - Forklift reader
  - Location system utilizing HF tags
- Application:
  - Raw material visibility
  - Material availability
  - Generating accurate pick lists
EVALUATION – DOCK & WAREHOUSE

- Criteria/Improvements in the following areas
  - Raw material visibility
  - Material availability
  - Generating accurate pick lists

- IF OK – make decision on rollout in Florida and/or Wyoming.
End of manufacturing area – Bottling system

- Once finished product is bottled, it will have a HF tag applied. The finished goods will be stored in a separate area of the warehouse. Hand-held Barcode readers will be deployed for picking purposes. Assigned Bin location will be tagged with HF tags
End of manufacturing area – Bottling system - continue

- Install HF RFID bottle tag printer/applicator
- Install warehouse portal system
- Tag assigned aisles using the HF tags
- Testing:
  - Bottle tag Printer/applicator
  - Portal/tunnel HF reader
  - Handheld Reader Bar-code/HF
- Application:
  - Finished goods visibility
  - Finished goods availability
  - Generating accurate pick lists
EVALUATION – BOTTLING SYSTEM

- Criteria/Improvements in the following areas
  - Finished goods visibility
  - Finished goods availability
  - Generating accurate pick lists
  - Reduce unfulfilled orders

- IF OK – make decision on rollout in Florida and/or Wyoming.