Helping Business Navigate

Presentation to

Military Logistics Conference

Secure Mobile and pRFID Technology

Turning logistics data into Actionable Logistics Intelligence

Presented by
Jack Rhyne
Recognition for the team!

The contractor team of Main Sail, CACI and Software A.G. has worked together supporting the Navy in creation of these cutting edge solutions for the last 8+ years.

None of what was accomplished would have been possible without strong synergy with the Navy Supply Systems Command (NAVSUP) team.
Key Issues and Challenges

- Secure Deployment of Mobility Solutions into the supply chain and beyond
- Deploying I.T. applications as Enterprise solutions
- Gaining improved logistics performance from technology on reduced budgets
- Inserting new technology (like pRFID) into current and future AIS’s
Three Cutting Edge Capabilities

Combined to produce

**Actionable Logistics Intelligence (ALI)**

(2012)

  - 1st pRFID in Navy Warehouses

- **RFID Asset Visibility Enterprise Project (RAVE)** (2008)
  - 1st Enterprise pRFID ever

  - 1st Navy MDM Solution

The Navy has been at the forefront of AIT (Automated Identification Technology), mobility and logistics innovation for the past 8+ years.

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Logistics Data Happens at the Edge of the Enterprise

Global Logistics Vision:

Data only becomes Actionable Logistics Intelligence when compiled at the Enterprise

The challenge = Manage Devices + Apps + Data

Enterprise Global Asset Visibility Cloud Servers

Smart Phones

Tablets

RFID & Bar Code Handheld

RFID Portals

GPS Data + Asset Data Can be in every transaction

Windows Phone

RFID & Bar Code Handheld

RFID Portals

Satellite Phones

Telecom Satellite

RFID Portals

RFID Portals

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GOAL: Actionable Logistics Intelligence (ALI)

- Capture Close to the source
- Deliver data in Real Time
- Delivered reliably and securely
- Enables Decision-makers “connect the dots”
- Able to impact business processes in real time
- Provide Information, not just data

Reduction of Data To Decision Time

Using COTS devices
Over any available net. (SAT, CDMA, GSM, 802.11….)
Absolutely Secure end-to-end connections

Guiding Principles:

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DoD Inventory-Warehouse Management Solution Drivers

GSA Studies Known Inventory Management Problems
- Slow receipt validation process
- Slow labor intensive stowing
- Lost goods in warehouse and in transit
- Duplicate orders
- Excessive Investment
- Show Picking Process
- No visibility into inventory
- Lack of trust in supply chain
- Loss of material custody chain
- Customer hoarding

Technology Toolset
- Active RFID
- Passive RFID
- Handheld bar code readers
- Wireless networks
- Wireless printers
- Wireless repeaters
- RFID Portals readers
- ERP – Inventory and warehouse management

Warehouse – Inventory Management Benefits
- Advanced Shipping Notices from DLA
- Automatic receipt validation
- Immediate stow & visibility of locations
- Full warehouse asset visibility
  - Lost goods found
  - Duplicate goods eliminated
- Faster customer order picking
- Reduction in out of stocks

Resulting In
- Faster customer order response time
- Increased trust in supply chain
- Reduced material losses
- Reduction in hoarding
Where it all started

What the Navy has accomplished with Main Sail support:

- First full production site to receive ASN data and tagged material from the Defense Logistics Agency (DLA).
- First such project implemented inside the Navy’s NMCI (Navy Marine Corps Internet) network environment
- First Navy project to operate pRFID equipment over the NMCI WAN.
- First Navy implementation of SAP ERP based Warehouse Management. The BRE solution is used to manage over 300,000 SF of warehouse space in multiple buildings at the Bangor, Washington site.
- First Navy implementation of wireless AIT mobile handhelds using cellular CDMA technology
Early First Adopter of pRFID
The Navy Partnered with DLA

The Logistics Site
Trident Nuclear Submarine base Bangor, WA

The Data Center
Mechanicsburg BSC

The DoD Enterprise

The Logistics Site
Trident Nuclear Submarine base Bangor, WA

Link & Sync
Bar Code Only

The Data Center
Mechanicsburg BSC

The DoD Enterprise

DLA Advance Shipping Notices (ASN’s)
Legacy Automated Info System (U2)

The Logistics Site
Trident Nuclear Submarine base Bangor, WA

pRFID Automated Receiving Line
RFID Tagged Material received from DLA (DDJC)

The Data Center
Mechanicsburg BSC

The DoD Enterprise

DLA Transaction Services (DLATS)

The Logistics Site
Trident Nuclear Submarine base Bangor, WA

Link & Sync
Bar Code Only

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The DoD Enterprise

DLA Advance Shipping Notices (ASN’s)
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The Logistics Site
Trident Nuclear Submarine base Bangor, WA

Link & Sync
Bar Code Only

The Data Center
Mechanicsburg BSC

The DoD Enterprise

DLA Transaction Services (DLATS)

Legacy Automated Info System (U2)
Early First Adoption of Secure Wireless and handheld pRFID

The Logistics Site
Trident Nuclear Submarine Base
Bangor, WA

Wireless Mobile Handhelds

Read Bar Codes For Warehouse Moves

RFID Tagged Material received from DLA (DDJC)

Handheld pRFID Replaced Conveyor

The Data Center
Mechanicsburg BSC

Cellular Net to NIPRNET to DISA GIG

BRE SAP And Web Methods Servers

AIS Specific AIT/pRFID Server

The DoD Enterprise

DLA Transaction Services (DLATS)

DLA Advance Shipping Notices (ASN’s)

Legacy Automated Info System (U2)

The DoD Enterprise: DLA Transaction Services (DLATS)

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RFID Provides Positive Performance Metrics... and Huge Potential Savings

<table>
<thead>
<tr>
<th>Metric</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASN Processing Rate</td>
<td>99%</td>
</tr>
<tr>
<td>Tag to ASN Matching Rate</td>
<td>89%</td>
</tr>
<tr>
<td>pRFID Receipt Posting Rate</td>
<td>98%</td>
</tr>
<tr>
<td>Receipt to Storage Time</td>
<td>1.56 days</td>
</tr>
<tr>
<td>- Improved by 3.6 days</td>
<td></td>
</tr>
<tr>
<td>Average Customer Wait Time</td>
<td>11.2 days</td>
</tr>
<tr>
<td>(ACWT) - Improved by 3.6 days</td>
<td></td>
</tr>
<tr>
<td>ROI based on $1.15M costs</td>
<td>2.37 Years</td>
</tr>
<tr>
<td>versus $485K savings/year</td>
<td></td>
</tr>
</tbody>
</table>

Potential for pRFID Enablement In an E2E Repairable Supply Chain

<table>
<thead>
<tr>
<th>Metric</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repairable Spare Parts Inventory</td>
<td>$11B</td>
</tr>
<tr>
<td>Inventory In-Transit Annually</td>
<td>$25B</td>
</tr>
<tr>
<td>Material savings For every .01%</td>
<td>$25M per year</td>
</tr>
<tr>
<td>Inventory Accuracy Improvement</td>
<td></td>
</tr>
<tr>
<td>Average Cost per part</td>
<td>$2000</td>
</tr>
<tr>
<td>Average Annual Receipt Transactions</td>
<td>12.5M per year</td>
</tr>
<tr>
<td>Receiving Efficiencies help improve</td>
<td>Significant</td>
</tr>
<tr>
<td>processing times</td>
<td>Savings</td>
</tr>
</tbody>
</table>

Even .01% better accuracy Saves more than enough to Pay for RAVE

TAV & ITV improvements are gained by linking pRFID to AIS’s
Navy ERP adopted BRE WM architecture (100+ sites in FY12)

At the Site:
- No servers onsite
- Only Readers, printers
- Wireless mobile devices don’t touch existing network.
- Cellular repeaters installed where cell signal is low
- Added CAC login process for mobile handhelds
- Approved for HAZMAT (Class I, Div2)

The Navy ERP WM Solution:
- Similar to BRE WM solution
- Uses WEB technology to present transactions to handheld
- Deployed to several types of warehouse facilities
- Replaced several legacy WM systems
- Nuclear and munitions tracking capable (Future)

RFID Interface with RAVE:
- RFID = Asset Visibility Enterprise
- Receipt in Process (RIP) to SAP planned
- Facilitates tracking and reporting of receiving backlog.
- Immediate visibility of material arrival on-site
Wireless Handheld Technology
Business Process Improvements

Wireless impacts these areas:

- Receiving
- Pick & Put Away (Stow)
- Stock Transfers
- Physical Inventory
- Inquiries' (Item, Bin, Empty Bin list etc.)

Advantages of Real Time Wireless Operation

- Transactions exist for virtually all common floor operations
- Feedback to the operator is immediate. Errors corrected immediately enforcing best business processes.
- No custom code loaded on the handheld. User is interacting directly with the ERP system. Data is updated immediately. No synch between devices required.
- Work can be automatically “pushed” to handheld users.
- Sets the stage for elimination of most paper material movement documents.

Drives up Bin Inventory Accuracy and Provides Productivity Gains
What the Navy has accomplished with Main Sail support:

- The first implementation of an Enterprise architecture for pRFID processing ever.
- Eliminated need for on-site servers to control RFID equipment with huge cost savings.
- Cleared the way for an economical approach improve your supply chain and implement the OSD pRFID mandate.
- Fully IA certified solution operating in a DISA hosted facility.
- A Joint design capable of operating across DoD and Federal agencies.
Evolution to the RAVE
Enterprise RFID Solution

The Logistics Site
- No servers onsite
- Only Readers, printers
- Don’t touch existing network
- Installs in days not months
- pRFID can be inserted into any site to track arrivals and departures

Data Center
- Secure IA approved
- Directs transactions to AIS’s
- Manages RFID hardware
- Sends Asset Visibility data to DoD
- Standardizes business processes
- Front end and back end independent
- A Technology Insertion platform for legacy AIS’s

DoD Enterprise
- Retrograde Management System
- Navy ERP
- Army LMP
- DISA Asset Tracking
- Air Force Systems

Cellular Net to NIPRNET to DISA GIG

At the Site:
- No servers onsite
- Only Readers, printers
- Don’t touch existing network
- Installs in days not months
- pRFID can be inserted into any site to track arrivals and departures

The Net:
- Secure IA approved
- Uses cellular, or 802.11 or DISA end points
- CDMA routers to connect hardware to net
- Mobile HHD’s with build in cellular cards

Enterprise RFID Server
- Directs transactions to AIS’s
- Manages RFID hardware
- Sends Asset Visibility data to DoD
- Standardizes business processes
- Front end and back end independent
- A Technology Insertion platform for legacy AIS’s

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Enterprise Architecture vs. Site Based
Removing Obstacles to pRFID Deployment

Enterprise pRFID makes mass deployment of pRFID now, rapid, sustainable and cost effective.

Site Based Architecture

$ $ $ $ $
- Servers at every site
- pRFID to local server interfaces
- I.T. on-site support required
- Every site requires IA Approval

RAVE Enterprise Architecture

$ $
- pRFID Direct to enterprise
- Remotely managed from one location
- One enterprise IA approval
**Enterprise Asset Tracking**

**For All Agencies Now**

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**Joint Asset pRFID Tracking Vision:**

- **Air Force Base Receiving**
  - RFID Portals
  - pRFID and Bar Code Handhelds

- **Army Maintenance Depot**
  - RFID Portals
  - pRFID and Bar Code Handhelds

- **USMC MALS Site**
  - RFID Portals
  - pRFID and Bar Code Handhelds

- **Navy RMS Site**
  - RFID Portals
  - pRFID and Bar Code Handhelds

- **Commercial Repair Site**
  - RFID Portals
  - pRFID and Bar Code Handhelds

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**Benefits of Joint Enterprise pRFID:**

- pRFID equipment & status managed centrally
- Joint view of asset movements & issues
- Enables pRFID technology anywhere very quickly
- Joint pRFID and logistics metrics and KPI’s
- EXISTS NOW – huge cost savings by leveraging

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Typical Enterprise pRFID Tracking Functions

1. Receipt In Process
2. Receiving and Asset Tagging
3. “Choke Point” Observations In and out of rooms
4. Real Time Location Tracking (RTLS Interface)
5. Manifesting, Shipment Staging, and carton/pallet tagging
6. Ship and send 856s ASN to target location

Arrival Reporting
Departure Reporting
Create Asset Tag
Create Carton and Pallet Tags
Location Changes +/- 3 ft.
Room Changes In Building

In/out of Warehouse Storage
Into Work Areas

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Enterprise RFID Tracking Architecture

**Fixed Readers**
- Receiving Door - In
- Shipping Door - Out

**Mobile Tracking**

**Tagging & Printing**
- Write RFID Tags

**WebMethods Integration Process Server**
- Business Process Engine
- Alerts and Notifications
- Device Management Logic
- KPI Monitoring
- Business Analytics

**RFID Device and Tag Data Database**

**User Interfaces**

**Legacy Adapters**
- ERP Book of Record
- Legacy AIS’s

**DoD Adapters**
- Advanced Shipping Notices (856s)
- USTRANSCOM Asset Visibility Tracking
- OSD Metrics Reporting

**Desktop Web Interface**

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Global RFID Enterprise Visibility and Status Monitoring - with Real-Time Alerting
Secure Enterprise Mobile

Mobile Device Management (MDM) Enables Mobility Goals

What the Navy has accomplished with Main Sail support:

- Meets all requirements for IA and GIG Waiver Board certified solution.
- First Mobile Device Management implementation for the Navy.
- Implemented to provide mobile wireless technology in support of Navy ERP Warehouse Management, RAVE sites and other agencies.
- Supports devices on cellular networks – soon to support 802.11 and OCONUS.
- Moving to a DISA hosting facility for FY13.
- Available as a subscriber service from the Navy for any DoD or Federal Agency.
Enterprise Mobility Goals

Managing Enterprise Mobility from the cloud

- Reduce deployment time
- Eliminate individual application IA approvals
- Standardize the architecture
- Reduce deployment support staff
- Standardize applications development
- Share applications widely
**Trend Change:** COTS software and devices now drive technology advancements. Technology will change faster than custom DoD devices can be built.

**Effect:** Requiring DoD Custom built devices could cause us to fall behind our enemies.

**Answer:** Secure COTS technology - not custom building is the new requirement to stay current.
Mobile Handhelds Need to be Managed by the Enterprise

The Logistics Site and beyond . . .

- Windows Mobile
- iPad
- iPhone
- Android

The Device
- IA compliant
- Communicates to an application and . . .
- Managed by MDM Over the Air (OTA)
- Entire device locked or . . .
- Compartments are secured

The Net:
- Any cellular network can be used
- End-to-end FIPS 140-2 encryption secures the connection and device
- Bridge back to NIPRNET or SIPRNET

MDM Server:
- Manages 1000’s to 100,000’s of devices
- Supports Windows Mobile, iOS, Android, and RIM Operating Systems
- Controls all device functions remotely
- Manages apps presence and access
- Supports BYOD policy if implemented

Cellular Net to NIPRNET to DISA GIG

Enterprise Mobile Device Management (MDM) Server

Enterprise Mobile Applications Server

There’s an App for that?

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# High Level MDM Requirements fulfillment

Main Sail uses a 200+ item checklist to evaluate MDM vendor compatibility. Closest vendor in all areas is Air Watch with 1 million user across all operating systems.

### Functionality | Description
--- | ---
Group Management and provisioning | Automated provisioning and group creation. Applying policies by group.
Service Management and Reporting | Visibility into device and network performance.
Mobile Application Management | Visibility of installed apps, and ability to whitelist / blacklist apps.
Mobile Operating Platform Support | Support for Android, iOS, and windows Mobile operating systems
Policy and Security Management | Application of policies beyond basic ActiveSync functionality
Role-base Management | Customizable views of the management interface, depending on role.

<table>
<thead>
<tr>
<th>Security Category</th>
<th>Apple</th>
<th>Android</th>
<th>MS Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications control</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Configuration Control (Secure)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MDM FIPS 140-2 Communication</td>
<td>P</td>
<td>P</td>
<td>X</td>
</tr>
<tr>
<td>Content FIPS 140-2 Security</td>
<td>P</td>
<td>P</td>
<td>X</td>
</tr>
<tr>
<td>Remote Control FIPS 140-2</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Secure email</td>
<td>P</td>
<td>P</td>
<td>X</td>
</tr>
<tr>
<td>CAC/Smartcard Access</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

1. No one has the capability to fulfill the entire matrix alone.
2. Several COTS security components in an integrated solution are required
3. A DoD customized mobile device solution that will be expensive to procure and will be obsolete in 18-24 months.
What you can do with this information?

✔ Discuss our teams’ experiences in implementation of a **Mobile Device Management (MDM) solution** and consider leveraging the Navy’s existing secure NMC system which is offered as a fee-for-service to other DoD agencies.

✔ Discuss our teams’ experience in implementation of **enterprise level pRFID asset tracking**, and consider subscribing to the Navy’s RAVE (RFID Asset Visibility Enterprise) system to process pRFID reads for logistics movements and eliminate any currently redundant pRFID servers you may be paying for.

✔ Discuss our team’s experiences in implementing an enterprise wide **Warehouse Management and Material tracking Solution** with secure wireless handhelds and pRFID automated receiving and shipping.

✔ **Drop by the Main Sail, SAG, CACI booth** and discuss the concepts presented in this presentation.
Recognition for the team!

The contractor team of Main Sail, CACI and Software A.G. has worked together supporting the Navy in creation of these cutting edge solutions for the last 8+ years.

None of what was accomplished would have been possible without strong synergy with the Navy Supply Systems Command (NAVSUP) team.
Questions?

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