Best Practices & Trends in Rail Freight Information Technology

Steven Murray – Solutions Consultant
Agenda

- Generational Development
- Drivers & Change Trends
- Some Current Best Practices
- Financial Model Example
- Challenges
- RMI Background
Freight Rail IT -- Generational Characteristics

1st Generation
- Mainframe, large data centers
- Basic Inventory & Revenue Processes
- Distributed Work Entry, Private Communications Networks

2nd Generation
- Midrange computers, same basic functional processes
- Smaller data centers, some shared development
- Centralization of work entry processing

3rd Generation
- Mini computers, continued centralization
- Shortline & EDI development in N. America
- Restructuring & Commercialization

4th Generation
- Internet & Shared Services Computing
- Communications cost reduction
- Flexible user information delivery, configuration, security

Prepared by: Steven Murray
Harnesses transformative technologies to enable significant systemic business process and structural change.

- Visibility – GPS, RFID,
- Internet & Connectivity Architecture,
- Cloud -- Shared Services Computing,
- Portals & Collaboration,
- Data Warehousing/Mining,
- Handheld – Mobile Computing,
- Open systems, platform neutral.
Drivers & Change Trends

- Internet
- Multimodal view
- Customer centric systems
- End to End Visibility
- Computing Advances
- Handhelds/Hardware

Prepared by: Steven Murray
Sample Best Practices

- “Cloud” or Shared Software Computing
- Graphical Interfaces – Graphical Yard
- Multimodal Management -- ShipperConnect
- GPS Integration -- GeoRailTrace
- Intermodal Terminal Operations -- OASIS
- Handhelds
- Business Intelligence
- Process Methodology

Prepared by: Steven Murray
Shared or “Cloud” Computing

Impacts
Cloud/SSC/Integration

Measure it

Decide it

Do it

Information

Customers

Terminals

Carriers’ TMS
Graphical Interfaces

Impacts
Multimodal Management

Impacts
Add New Car Order - OXBOX XXX

Pattern ID: COKE LONGB

Road ID:

Station  | City       | State  | Days in Advance
---------|------------|--------|-------------------
          | RICHMOND   | CA     |

Commodity: 2951340 PET. COKE

Maximum Number of Cars Allowed: 10

Car Type: J311

Car Kind: J

Alternate Car Type: 

Alternate Car Kind: J

Track: 

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 28</td>
<td>Jun 29</td>
<td>Jun 30</td>
<td>Jul 01</td>
<td>Jul 02</td>
<td>Jul 03</td>
<td>Jul 04</td>
</tr>
<tr>
<td>Jul 05</td>
<td>Jul 06</td>
<td>Jul 07</td>
<td>Jul 08</td>
<td>Jul 09</td>
<td>Jul 10</td>
<td>Jul 11</td>
</tr>
<tr>
<td>Jul 12</td>
<td>Jul 13</td>
<td>Jul 14</td>
<td>Jul 15</td>
<td>Jul 16</td>
<td>Jul 17</td>
<td>Jul 18</td>
</tr>
</tbody>
</table>

Submit  | Back to Order List
Action Selection

Please select an action that you would like to perform by clicking on the following link or choosing from the above menu.

<table>
<thead>
<tr>
<th>Action</th>
<th>L</th>
<th>E</th>
<th>Total</th>
<th>Haz</th>
<th>Net Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>En Route (Cars En Route To Railroad)</td>
<td>10</td>
<td>15</td>
<td>25</td>
<td>0</td>
<td>808</td>
</tr>
<tr>
<td>Inbound (Cars On Serving Railroad)</td>
<td>0</td>
<td>Z</td>
<td>Z</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>On Hand (Cars At Your Facility)</td>
<td>1</td>
<td>25</td>
<td>25</td>
<td>0</td>
<td>75</td>
</tr>
<tr>
<td>Outbound Billed (Cars Pulled and Billed)</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>175</td>
</tr>
<tr>
<td>Outbound not Billed (Cars Pulled and not Billed)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>All Shipments (All RRs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pending Actions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-Railtrace</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action Code</td>
<td>Date: 6/18/2009</td>
<td>Time: 00:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>307</td>
<td>075287</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>071459</td>
<td>079565</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>070331</td>
<td>002670</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GREAT LAKES TRANSPORTATION

User: GLTXJJ

Road: BESSEMER & LAKE ERIE

Please make your selections from the dropdown menus above.
### Inventory Transaction Log Detail

<table>
<thead>
<tr>
<th>City Code</th>
<th>Zone Code</th>
<th>Location Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Point</td>
<td>CON</td>
<td>LOWER</td>
</tr>
<tr>
<td>To Point</td>
<td>CONNEAUT</td>
<td>DOCK3L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transfer Date</th>
<th>Time</th>
<th>Waybill Ctrl No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/30/2002</td>
<td>22:36</td>
<td>87942</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transfer Type</th>
<th>Sequence No.</th>
<th>Car Init</th>
<th>Car No.</th>
<th>Waybill No.</th>
<th>Consignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RULD</td>
<td>1</td>
<td>BLE</td>
<td>1654</td>
<td>809231</td>
<td>EAGLE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Direct/Indirect</th>
<th>Batch Number</th>
<th>Quantity</th>
<th>Burn Type</th>
<th>Permit Number</th>
<th>Dust Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDIRECT</td>
<td>634</td>
<td>98,0000</td>
<td>NT</td>
<td>401391</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reclaim Ind.</th>
<th>On/Off Ind.</th>
<th>Frozen Ind.</th>
<th>Train ID</th>
<th>Vehicle Type</th>
<th>Billed Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>V96728</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trucking Co.</th>
<th>Trucking Co. Addr</th>
<th>Scale Ticket</th>
<th>Consignee</th>
<th>Vessel/Trucking ID</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Load Rail Cntd</th>
<th>Rail Equip Init</th>
<th>Rail Equip No.</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modified By</th>
<th>Modified Date</th>
<th>Modified Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>01/01</td>
</tr>
</tbody>
</table>

---
Vessel ETA

Destination: DULUTH

Dock Spot: SLE

Customer: USSMIN DOD

Scheduled: 03 22 2006

Arrival Date: mm dd yyyy

Vessel Name: EDWIN H GOTT

Vessel Destination: GARY

Arrival Time: 17 00

Inbound Type: EMPTY

Location: SLE

Product Group: MOO FLUX PELLET

Customer Product Group: 

Quantity: 55,000,000 GT

Submit  Inventory  Cancel

Estimated to Actual
GPS Integration

Impacts
Intermodal Terminal Operations

Impacts
# Intermodal Terminal Operations -- OASIS

| Gate processing and flow control | Parking control and inventory management | Work order assignment and oversight | Train loading and unloading |

- Gate processing and flow control
- Parking control and inventory management
- Work order assignment and oversight
- Train loading and unloading
Optimized Railcar Loading
Optical Character Integration
Wide Span / Gantry Crane
Mobile Computing

Impacts
**mCrew™ On-board remote computing**

Rugged tablet or hand-held computers enable crews to update car movement information near real time.
Business Intelligence

Impacts
Process Methodology

Impacts
Customerspecific diagnostic scan to identify and quantify supply chain opportunities and define a results-based implementation plan to deliver a significant improvement in business performance in a short period.

- Customer needs-driven rather than feature/function push
- Define clear timeline & deliverables in “Business Implementations” that deliver benefits while minimizing risks and identifying potential obstacles
- Target key problem areas and quantify identified opportunities
- Develop plans to deliver quantum leap impact within 3-5 months
Understand the structure and operation of the Strategic Goals and Objectives

Understand current operational and financial performance

Identify and quantify improvement opportunities

Develop implementation deliverables, timing, and resource requirements

Perform gap analysis and develop integration plan

End Product

End Products

- Clearly define the scope of study
- Document the Strategic Goals and Objectives
- Document the planning / scheduling processes and systems
- Document performance levels and performance aspirations
- Understand the customer’s most pressing Strategic issues
- Perform root cause analysis
- Quantify benefits from applying solutions
- Define business releases with deliverables, activities, timing and resource requirements
- Incremental discounted cash flow analysis

Roadmap for the implementation of products and services

1. Quantification of benefits and payback analysis
2. Implementation plan to deliver maximum impact in a short time while minimizing risk

1-6 Weeks in Duration
General Freight Railway in Chile handling approximately 250,000 carloads a month.

Replace existing 10 year old Transportation System.

Add GPS Integration, Internet Customer Interface, Business Intelligence.
## Example Investment

<table>
<thead>
<tr>
<th>Category</th>
<th>Costs (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 Investment (Includes license, implementation, customization, hosting fees, etc.)</td>
<td>$2,618,770</td>
</tr>
<tr>
<td>Continuing Annual Fees (maintenance &amp; hosting)</td>
<td>$510,000</td>
</tr>
<tr>
<td><strong>5 Year Average Annual Cost</strong></td>
<td>$934,154</td>
</tr>
</tbody>
</table>
Example Return on Investment

Customer Service & Work Event Automation $550,000
Improved Management Metrics $150,000
Streamlined Waybill Processes $88,800
Implementation of Customer Demurrage $936,038
Reductions in Train Delay $530,400 to $2,850,000

**TOTAL VERIFIABLE ANNUAL SAVINGS** $2,255,238 TO 4,574,838
Example Project Financials

**Project Economics over 5 years**

- **NPV**: $3,433,400
- **MIRR**: 27%
- **Payback**: 2.7 years

**Key Assumptions:**
- Bottom range of benefit potential (worst case) used for calculation
- Benefits realized as follows:
  - 30% in first year (N)
  - 50% in year (N+1)
  - 100% in year (N+2)
- 16.4% reinvestment rate
- 10% finance rate
Challenges

Security
Place of IT in non vertically integrated railways
Localization costs
Business process alignment
Change resistance

Prepared by: Steven Murray
RMI Background
• Over 30 years in business; 160 employees

• Technology manages nearly 90% of all carloads processed by Class 2 and 3 railroads in North American

• TOS manages 90 intermodal terminals

• North America - US, Canada, & Mexico (including the Mexico City Terminal complex)

• Average annual investment in our systems= $10 million

• Provide TMS to over 350 Short Lines, Regional Railroads, and Terminal/Switching companies
RMI History

1979 RMI begins operations as manager of rail equipment

1999 RMI begins providing software in SaaS environment

2008 RMI purchases Optimization Alternatives

1989 RMI introduces Transportation Management System for Railroads

2007 Carlyle partners takes a majority stake in RMI

2009 RMI purchases 10East
<table>
<thead>
<tr>
<th>Company</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union Pacific</td>
<td>8,916,000</td>
</tr>
<tr>
<td>DB Schenker</td>
<td>8,400,000</td>
</tr>
<tr>
<td>BNSF</td>
<td>8,167,000</td>
</tr>
<tr>
<td><strong>RailConnect TMS®</strong></td>
<td><strong>7,456,000</strong></td>
</tr>
<tr>
<td>CSXT</td>
<td>7,118,000</td>
</tr>
<tr>
<td>Norfolk Southern</td>
<td>6,625,000</td>
</tr>
<tr>
<td>SNCF</td>
<td>3,900,000</td>
</tr>
<tr>
<td>Canadian National</td>
<td>3,796,000</td>
</tr>
<tr>
<td>Canadian Pacific</td>
<td>2,447,300</td>
</tr>
</tbody>
</table>
Global Experience

• **Africa**
  - Full system translation
  - Unique accounting and currency requirements
  - Challenging working environment

• **Mexico**
  - Full system translation
  - Completely custom EDI system
  - Extensive governmental regulatory requirements

• **Argentina**
  - Unusual train operations
  - Multiple system interfaces
  - Different dialect translation
RMI Services

Intermodal Terminal Operations  OASIS

Rail Transportation Management

Rail Fixed Asset Management
SAS70 Audited/Certified
TMS Key Features

• Real-Time Perpetual Inventory System
  • Wagons
  • Locomotives
• Train and Wagon Management
• Work Order and Service Scheduling
• Shipping Instructions (Waybill) Mgt
• Automated Customer Billing
  • Freight Billing
  • Ancillary Charges Billing
• Master Files and Extensive Tables
• Event Repository for Mgt Reporting
• Multi-Lingual and Multi-Measure and Multi-Currency
Unique Characteristics of RMI’s Solutions

• Complete integrated railway system
• Extensive rich functionality
• SaaS or license delivery models
• Scalable
• Flexible
• Real-Time
• Unparalleled intermodal and railway domain knowledge
RMI enables best practices for the global freight rail market

Steven Murray – Solutions Consultant