Marine Terminal Management Training Program

The Positive and Pervasive Role of IT – Enhancing Management and Operational Efficiencies

Technology Options

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Introduction

➢ Technology is an essential part of managing and running a container port / terminal.

➢ A wide variety of options are available to terminal management and IT management:
  ■ Technologies
  ■ Products
  ■ Vendors

➢ What’s best for your terminal?

➢ How do you decide?
The Role of Information Technology Role in today’s modern container terminal?

Manage the Business
- Administrative Systems (email, word processing, spreadsheets, presentation tools, PowerPoint, etc.)
- Financial Systems & Human Resource Systems
- Sales / Marketing Systems (PIERS, Lloyds List, Compair Data)
- Security / Access Control / TWIC

Run the Operations
- Inside the Terminal
- Outside the Terminal
Run the Operation – Inside the Terminal

➢ Terminal Functions
   ▪ Gate Systems
   ▪ Terminal Operating Systems (TOS) - Yard & Vessel

➢ Terminal Technology (examples)
   ▪ OCR
   ▪ RFID
   ▪ DGPS

➢ Vendors (examples)
   ▪ CAMCO Technologies – Gate Systems
   ▪ Hi-Tech Solutions – OCR / Image Processing
Terminal Automation - Areas of Concentration

- **Gate / Pre Gate**
  - Pre advice / appointment systems
  - Web portals / appointment systems
  - Gate pedestal
  - OCR
  - Driver ID Card Readers
  - Fully integrated systems – GEM

- **Yard**
  - Automated terminal equipment
  - Equipment monitoring (reefer temperature, CHE fuel levels, tire pressure, etc.)
  - Container Optimization (Allocation filters, Simulation tools, etc.)

- **Vessel**
  - Limited, primarily crane stability and positioning tools
  - Currently mainly EDI (stowage plans, load lists, discharge lists)
Gate Systems

- Many Gate System Vendors offering a variety of applications
- All use basically the same technologies
- The Vendors
  - TOS Vendors (NAVIS, TideWorks, RBS, JADE, etc.)
  - Specialist Vendors
    - Embarcadero Systems Corporation
    - TideWorks GateVision
  - Technology Vendors
    - OCR
    - Pedestals
    - Cameras
- Gate Entry Management (GEM)
Gate Entry Management (GEM)

What does GEM do?

- Provides trucking companies with a web interface tool to:
  - make time-slot bookings.
  - ensure data for exports and imports is “clean” before the truck arrives at the terminal.

- Provides integration platform linking:
  - AM Radio
  - Portal OCR technology (SAIC)
  - Pedestal technology (LA King)
  - Terminal operating system (NAVIS or CERES)
  - Transponder technology (TransCore)
The Companies - Terminal Operating Systems (TOS)

- Carriers / Terminal Operating companies began developing for own use in the late 1970s
- First commercial product introduced 1988
- First versions nothing more than tools to record yard and vessel activities, provide reports and communicate activity.
- Later versions introduced planning and productivity modules
- Current versions offer efficiency tools for container stacking and yard planning / routing.
- Latest versions offer complex integration tools for gate
- Automation of cargo handling equipment
- Operations simulation
Standard TOS Architecture

Graphical Container Planning, Monitoring and Control System
- Operations Management and Control, Graphical Planning, Management, Automation, CHE Interface
- Main Vendors
  - NAVIS – SPARCS
  - TideWorks – Spinnaker
  - RBS - TOPX

Foundation System
- Container Data Processing, Break-bulk Data Processing, Vessel Process, Truck Processing, Billing, EDI, Reference Data
- Leading Vendors
  - NAVIS – EXPRESS
  - TideWorks – MainSail
  - RBS - TOPO
# TOS Systems – Vendors

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Product</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advent Inc.</td>
<td>Terminal Management Systems (TMS)</td>
<td>Offer source code</td>
</tr>
<tr>
<td>COSMOS N.V.</td>
<td>Various Modules</td>
<td>Limited US Experience</td>
</tr>
<tr>
<td>CyberLogitec Co. Ltd.</td>
<td>OPUS</td>
<td>Subsidiary of Hanjin</td>
</tr>
<tr>
<td>Trans-I Technologies</td>
<td>TransTerminal</td>
<td>Not Actively Marketing</td>
</tr>
<tr>
<td>JADE</td>
<td>JadeMaster</td>
<td>New Zealand</td>
</tr>
<tr>
<td>NAVIS</td>
<td>Express &amp; Sparcs</td>
<td>Market Leader</td>
</tr>
<tr>
<td>Portek</td>
<td>Container Terminal Management System</td>
<td>Missing some US Requirements</td>
</tr>
<tr>
<td>Realtime Business Solutions Pty.</td>
<td>TOPO &amp; TOPX</td>
<td>Innovation Leader</td>
</tr>
<tr>
<td>TideWorks Technology</td>
<td>Mainsail &amp; Spinnaker</td>
<td>Part of Carrix / SSA Terminals Company</td>
</tr>
<tr>
<td>Total Soft Bank Ltd.</td>
<td>CATOS</td>
<td>Experienced Vendor</td>
</tr>
</tbody>
</table>
TOS Complimentary Technologies

- Satellite Telemetry
  - Container Position Detection
  - Vehicle Location Tracking
  - Fuel Monitoring and Refuel Management

- RFID - Radio Frequency Identification
  - Technology based on radio waves.
  - A reader communicates with a tag, which holds digital information in a microchip.
  - The tag picks up signals from and sends signals to a reader.

- OCR - Optical Character Recognition (OCR)
  - The process where a scanner reads printed characters
  - The software interprets the number and passes to a computer application
  - Some Common Applications
The Technologies OCR (cont)

- Many vendors: Hi-Tech, CAMCO, etc.
- Technology becoming common place around the world
TOS Complimentary Technologies

➢ Wireless LANs
  ▪ Handhelds
  ▪ Belt Printers
  ▪ Vehicle Mount

➢ GPS - Global Positioning System & DGPS - Differential Global Positioning System
  ▪ Applications Include: Container yard location, Yard equipment location (straddles, RTGs, RMGs, hostlers, etc.), Truck / Cab location
  ▪ Vendors include: Savcor – Container Positioning Technology, SAIC
Automated Terminals

- HHLA – Container Terminal Altenwerder, Germany, CTA
  - Hamburg Port Consulting IT Group
  - Production since 2003
  - Terminal Automation
  - Crane “drivers” in Kitchen
  - Terminal Operating System - TERMINALSTAR
  - Cargo Handling Automation / Advancements
  - Laser / Cameras
- APMT – Norfolk, VA
Run The Operation – Outside the terminal

- Off Dock Yards
  - Primarily used for empty containers or chassis.
  - Frees up storage space in terminals for loaded moves.
  - Critical Success Factors: Real-time integration with ocean carriers and marine terminals operating systems.

- Chassis Pools
  - Multiple Vendors: DCLI, TRAC Leasing, OCEMA CCM
  - Pool results have been very successful.
  - Increased equipment utilization.
  - Decreased chassis fleet size.
  - Freed storage space for other equipment
  - Critical Success Factors: Strong IT systems to track activity
Run The Operation – Outside the terminal

➢ Virtual Container Yards (VCYs)
  ❘ AKA Street Turns or Street Interchanges
  ❘ Most current programs for international cargo are port sponsored (Oakland, LA/LBC, Virginia, NY/NJ).

➢ Traffic Mitigation Fees / Extended Gate Hours
  ❘ PierPASS is a Traffic Mitigation Fee.
  ❘ Generated a forum for other port-wide initiatives such as RFID Truck Tag Security Program and TWIC Testing

➢ Truck Appointment Systems
  ❘ Seen as way to comply with environmental legislation to reduce truck engine idle time.
  ❘ Programs at Ports of Vancouver, Oakland, Los Angeles, Long Beach and Napoleon Yard at New Orleans. Coming in NY/NJ
  ❘ Motor carriers prefer a single port-wide system over multiple systems.
The INTERNET

- A world wide electronic network of computers with the ability to communicate with one another.

- Common Internet applications include:
  - Truckers viewing queues at terminal (web cameras)
  - Trucker appointments
  - Trucker delivery information
  - Cargo availability
  - Shipper inquiries
Port Community Systems

- A web portal designed to facilitate information flow between parties.
- Requires a powerful EDI engine to facilitate data exchanged between parties.
- Web based inquiry and update tools for truckers, freight forwarders, brokers, shippers and consignees.
- Managed by the port authority or third party.
- Critical Success Factors:
  - Up front Port Community commitment a MUST.
  - Requires participation by all major stakeholders.
  - Single web site for port wide initiatives (PierPass, Trucker Registration, etc.).
  - Not for profit but self funding.
What’s best for your terminal?

- The Good News and The Bad News – You have OPTIONS
  - Vendors
  - Products
  - Services
  - Technologies

- Ask Yourself
  - What Technology is appropriate for my terminal?
  - What Vendor is appropriate for my terminal?
  - Do we have an internal IT Staff? And what are their capabilities?
How do you decide?

- Look at Technology like any other business issue.
- Involve all the stakeholder groups in the process.

Gather Requirements

Prioritize Requirements

Evaluate Objectively

<table>
<thead>
<tr>
<th>#</th>
<th>Area</th>
<th>Requirements / Feature</th>
<th>Weight: 1=Optional 2=Nice to Have 3=Absolutely Required</th>
<th>Vendor 1</th>
<th>Vendor 2</th>
<th>Vendor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WEB PORTAL</td>
<td>Provide configurable access by User Group, Security Role, and view or update status.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>WEB PORTAL</td>
<td>Allow trucking company (dispatchers) to make trucker appointments to pickup or drop-off a container</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>WEB PORTAL</td>
<td>Create ad-hoc appointments for unscheduled trucker arrival</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>WEB PORTAL</td>
<td>Allow Line users to assign a trucker to a freight or exam container.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>WEB PORTAL</td>
<td>Provide an interface to remove container holds</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6</td>
<td>WEB PORTAL</td>
<td>System shows holds for each of the following categories: Customs, USDA, Freight, Demurrage, Carrier</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>WEB PORTAL</td>
<td>Allow users to get terminal specific information such as contact information, directions, local rules.</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>WEB PORTAL</td>
<td>Ability for User to select parameters for automatic email, fax, or SMS of container notification changes.</td>
<td></td>
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<tr>
<td>9</td>
<td>WEB PORTAL</td>
<td>Provide daily message to the users</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>WEB PORTAL</td>
<td>Provide configurable system notifications</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>WEB PORTAL</td>
<td>Allow users to identify and pay demurrage or guarantee demurrage fees</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12</td>
<td>WEB PORTAL</td>
<td>Allow users to identify and pay or guarantee tariff fees for terminal services.</td>
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</tbody>
</table>
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Thank You

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