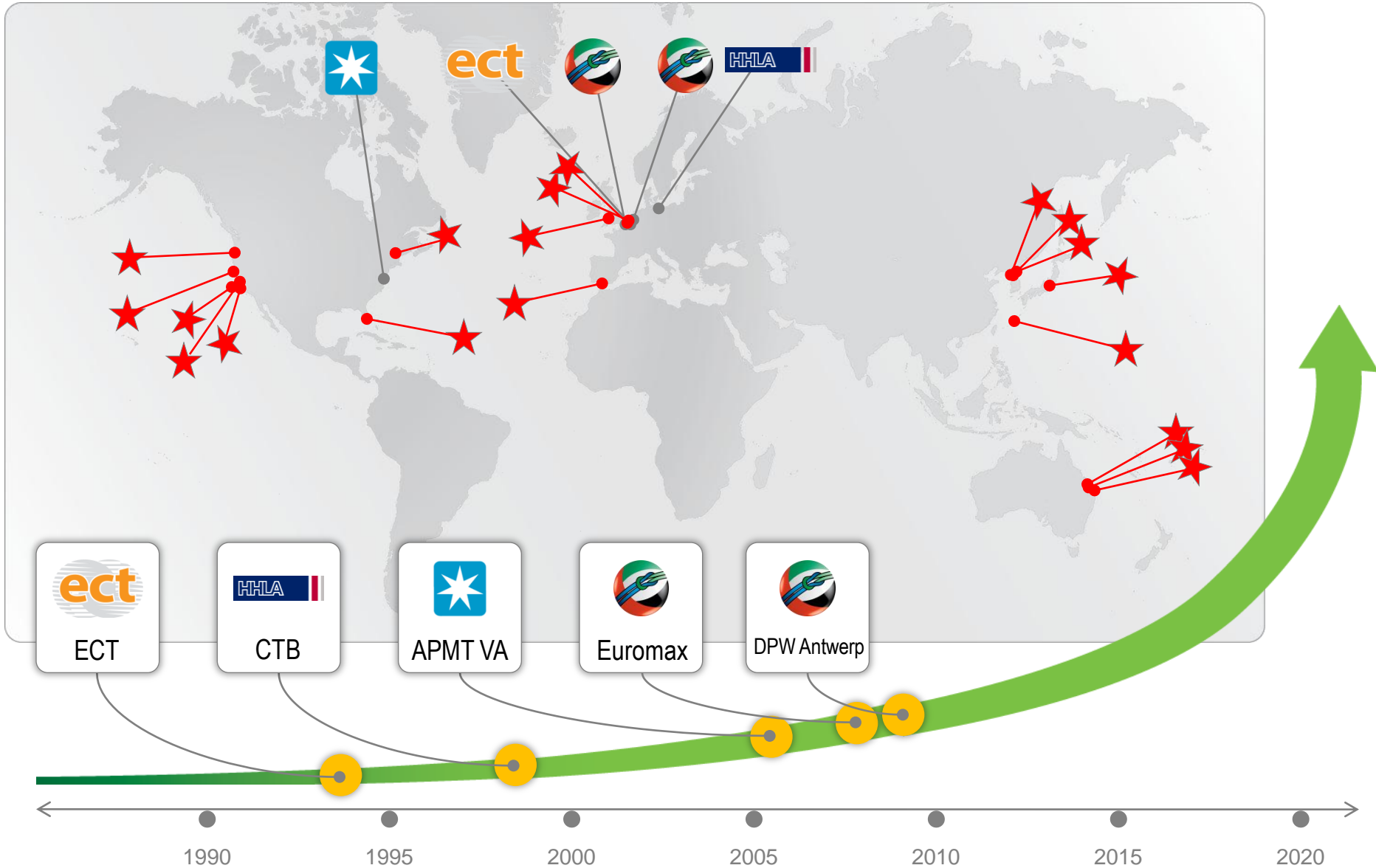




# Terminals of the Future – “Incremental Steps toward Automation”

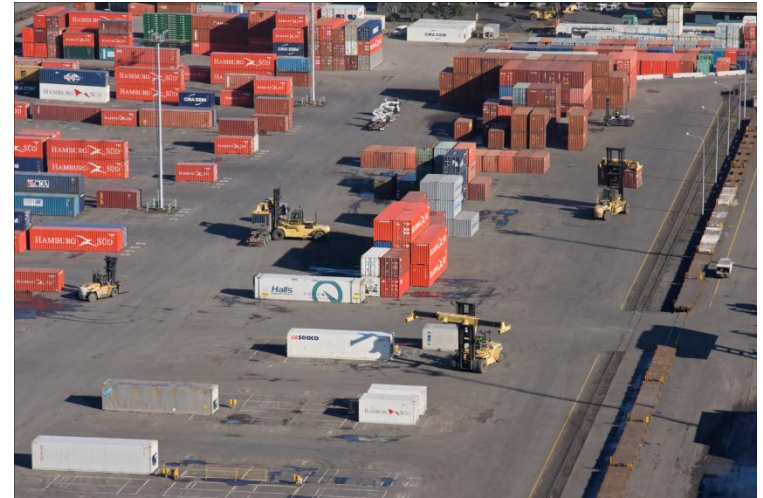
Charles Gerard  
Navis

# Impending Wave of Automated Terminals



# Automation Reality – “Incremental”

- Majority of new and existing terminals will NOT fully Automate (particularly low labor cost regions)



- **HOWEVER -**

➤ Many terminals will introduce **Incremental Automation** with the following objectives:

- ❖ Improve Productivity: Real-time data exchanges / NO keypads
- ❖ Drive down costs: Reduce Personnel/Reduce Carbon Footprint
- ❖ Improve Safety: Remove Personnel from Ops areas
- ❖ Optimize resources: Equipment, Land and Personnel

# Agenda

- Automation at the GATE
- Automation in the YARD
- Automation at the QUAY
- State of the Industry
- What to Expect & What to Look For

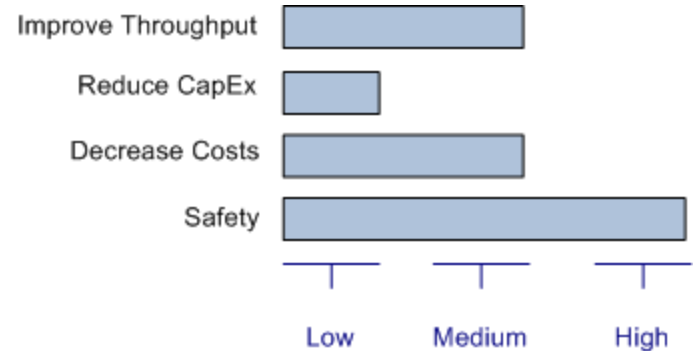


# Gates – Moving into the Future



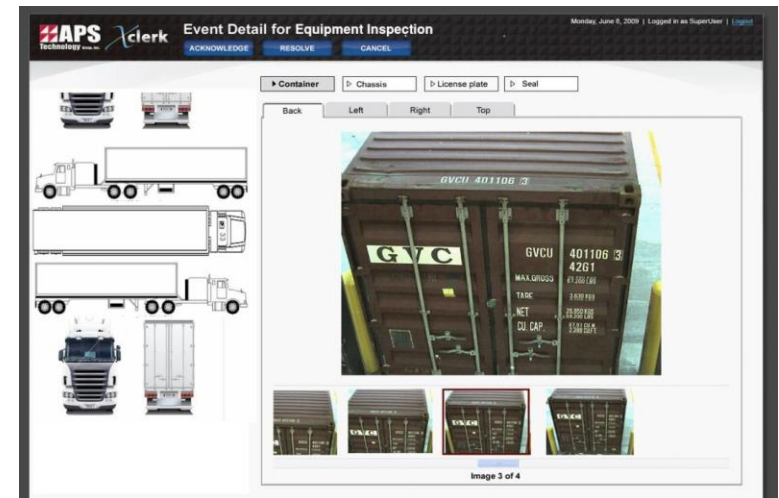
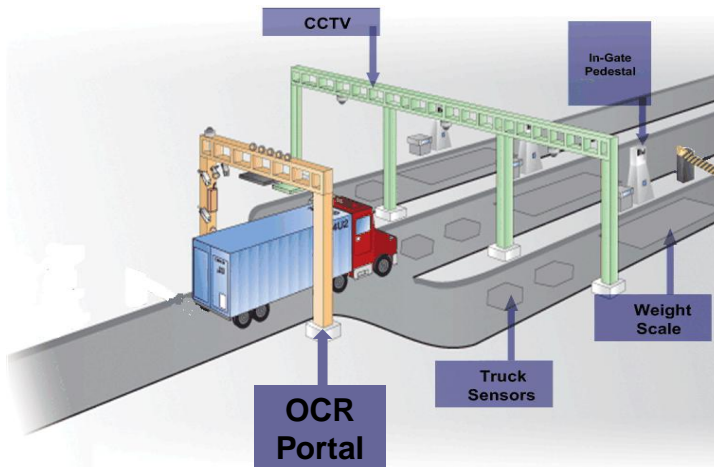
# Automation at the Gate

- Technology Can Automate:
  - Auto ID and Record Truck License
  - Auto ID and Record Container No.
  - Auto ID and Record Haz Placard
  - Auto ID and Record Genset No.
  - Damage Inspection by exception
- Providing Cost Benefits of:
  - No manual data entry / errors
  - Faster Processing
  - No Personnel in Gate Lanes



# Automated Gate Technologies

- Option #1 OCR (Optical Character Recognition)
  - Automatically Read: Container No. / Truck Lic. / Hazard Placard
  - Damage Inspection: For Exception Handling Damage Claims
  - Seal In Tact – (but not seal number)
  - Advantages
    - ❖ 95+% Accuracy
    - ❖ Speed and Increase Throughput
    - ❖ Cargo Security



# Automated Gate Technologies

- Option #2 RFID

- Automatically Read:

- ❖ RFID Tagged Trucks

- Advantages

- ❖ Speed and Throughput

- ❖ 95+% Accuracy

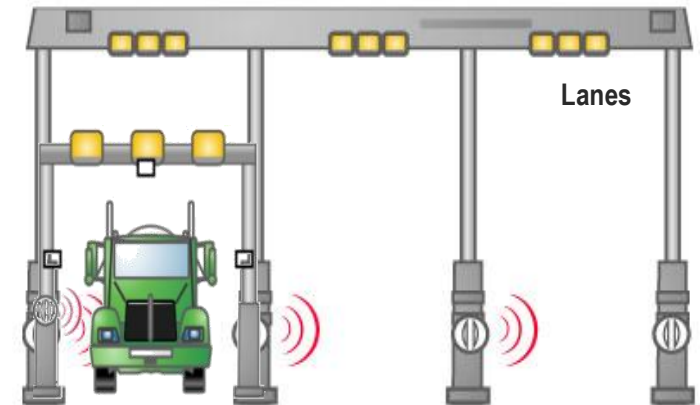
- ❖ Utilize RFID inside the Terminal

- ❖ Community wide truck management program (i.e. PierPass)

- Disadvantages

- ❖ No Damage Inspection or Seal inspection

- ❖ Cost, distribution and Management of Tags to Community Trucks



Exciter at Gate Lanes allows association of OCR info with truck at pedestal

# Yard Operations – Moving into the Future

Manual Job Stepping



Vs. Automated Job Stepping



# Yard Operations – Moving into the Future

## Manual Cargo Hand-Off



## Vs. Automated Container Hand-Off



# Automating Yard Operations

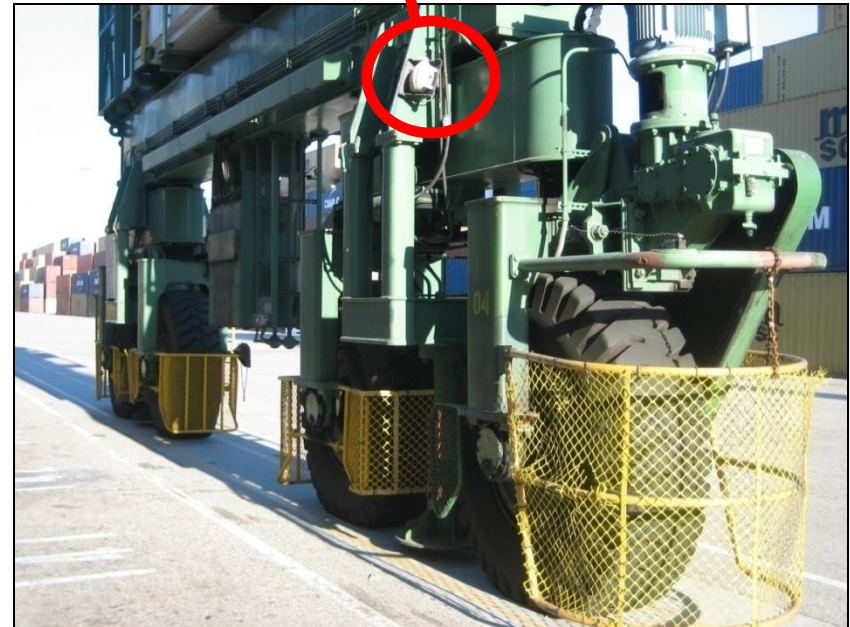
- Technology Can Automate:

- Automated Container Hand
- Automated Job Stepping – in (i.e. PrimeRoute)
- Automated Inventory
  - Real time update of containers
  - 100% Yard Accuracy

- Providing the Cost benefit:

- Higher Yard Productivity
- Optimized Job Dispatch
- Reduced Yard Personnel
- Increased Safety

Replacing manual/key pad entry with real-time, RFID updates



# Automating Yard Ops - Technologies

- **RFID**
  - Opportunity to Capitalize on RFID Tags used for Gates
  - Locate throughout yard and under cranes
- **D-GPS Devices**
  - Can tag CHE and Internal Trucks
  - How to use on External / Community Trucks?
  - Challenges with “reads” under the Quay Cranes
- **LPR – Local Positioning Radar**
  - Highly accurate and flexible
  - Works under Cranes
  - Can work with inertial navigation systems in high-stack areas

# Vessel Ops – Moving into the Future

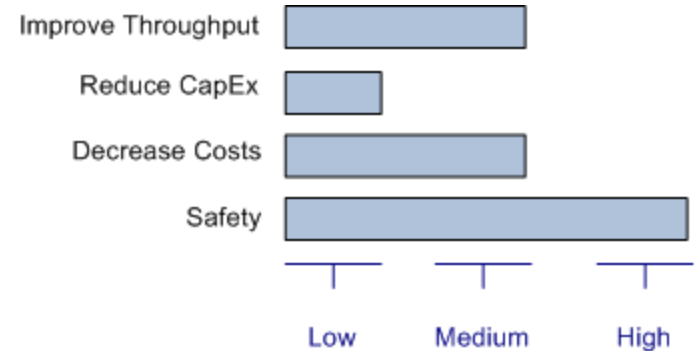


Manual Vessel Loading  
Vs.  
Automated Vessel Loading



# Automating QC Operations with OCR

- Technology Can Automate:
  - Load and Discharge Operations
  - Marriage of Container & Trucks
  - “Sure Stow” for Accurate Load Positions
- Providing the Cost Advantages:
  - One resource covers several Cranes
  - Safety (less people) on the Apron
  - Velocity – no manual delays / errors
  - Accurate Stowage Record



# Consider a “rough” analysis

- Assume average 3 second delay in truck dispatch
  - Across 500,000 TEU per year
    - This equates 1,500,000 seconds of delay
      - This equates to 416 hours of delay
        - This equates to 17 days of delay
- Change to average 1 second delay in truck dispatch
  - This equates to 5.8 (~6) day delay per year per 500k TEU.

5861008

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Load

...

Fastest



es

Time

Duration

# Current State of the Industry

- Variety & Increasing number of technologies / devices
- New equipment delivered with increasing levels of technology and capabilities
- Point based solutions, customized to meet specific needs
- Proprietary technology / solutions
- Open playing field.... And open risks

# What to Expect and Look For

- What to Expect....
  - Cascading of Technology from fully Automated Sites
  - Increasing Integration of Equipment (hardware) and Software
  - The need for different skill sets among terminal Operations and IT management / staff.
- What to look for....
  - Proven Solutions and Integration Capabilities
  - Expansion potential of base technology (added uses and returns)
  - Purpose Built devices for marine terminal environment
  - Products, not Projects
  - Hybrid Solutions Utilizing Different Technologies / Benefits

# And to Close ....

We'll continue to see many changes and advances, but some aspects of the industry will remain the same....





# Thank You!

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