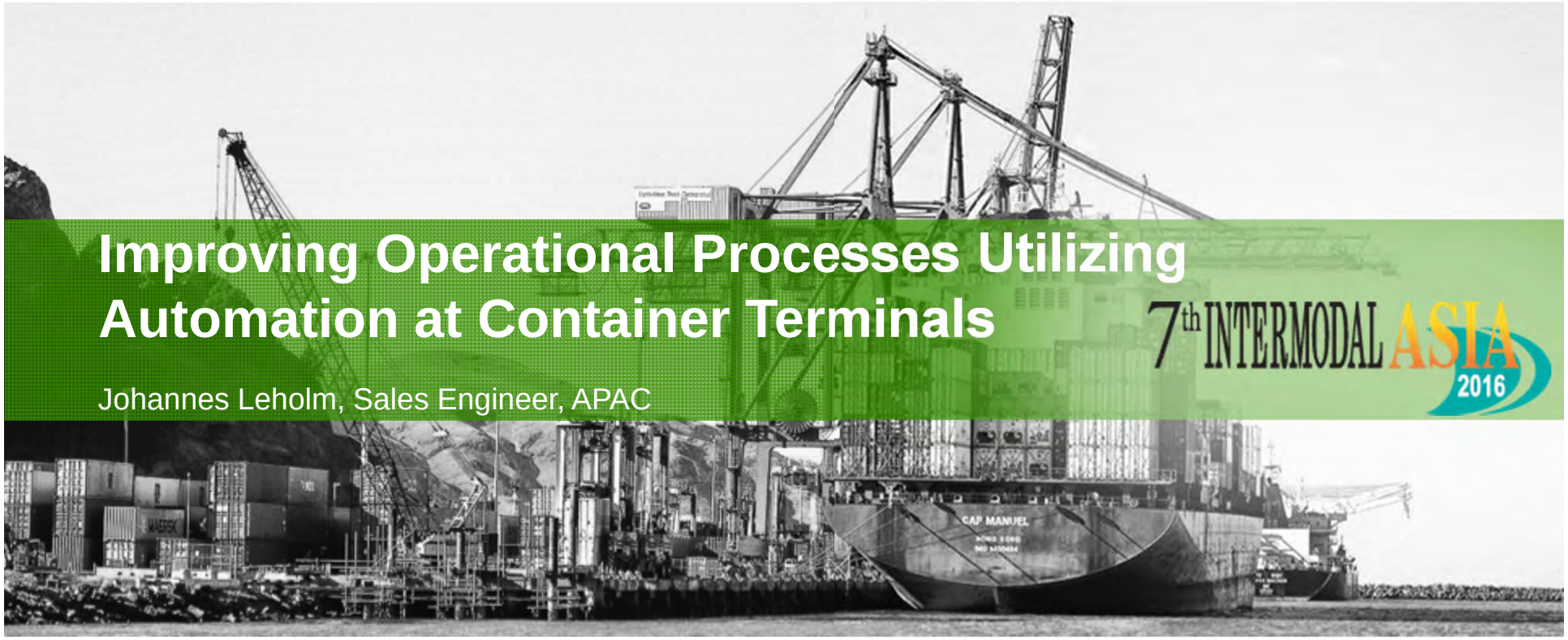
# Improving Operational Processes Utilizing Automation at Container Terminals




Johannes Leholm, Sales Engineer, APAC

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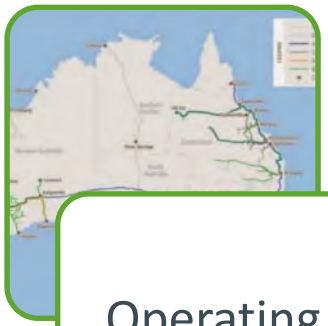
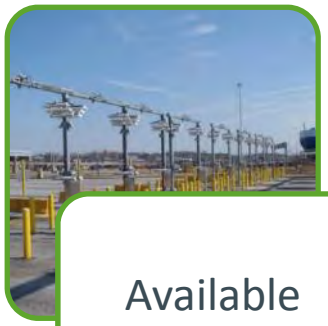
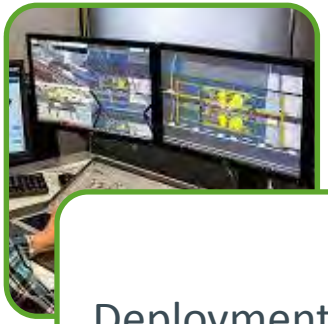
# Optimal Route



Operating Trends



Available Automation Solutions



Deployment Strategies

The Future of Automation at the Port

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## Port productivity is not improving

**Peter Tirschwell, Senior Director, Content, IHS Maritime a**

Print

The fundamental industry problem identified as soon as mega-ships of 10,000 TEUs and above started hitting the waves remains alive and well — and wholly unresolved.

That is the problem of productivity. There has been little progress in carriers' and terminals' ability to get these ships quickly worked and sent back out to sea, resulting in delays to cargo and added costs for carriers. Maersk Line made a point of mentioning the issue in its full-year earnings release on Thursday and CEO Soren Skou discussed it in an interview with JOC.com

"We continue to build ships that are bigger and bigger and if we can't get the containers off faster the whole thing will come to a grinding halt," Skou said on Thursday.

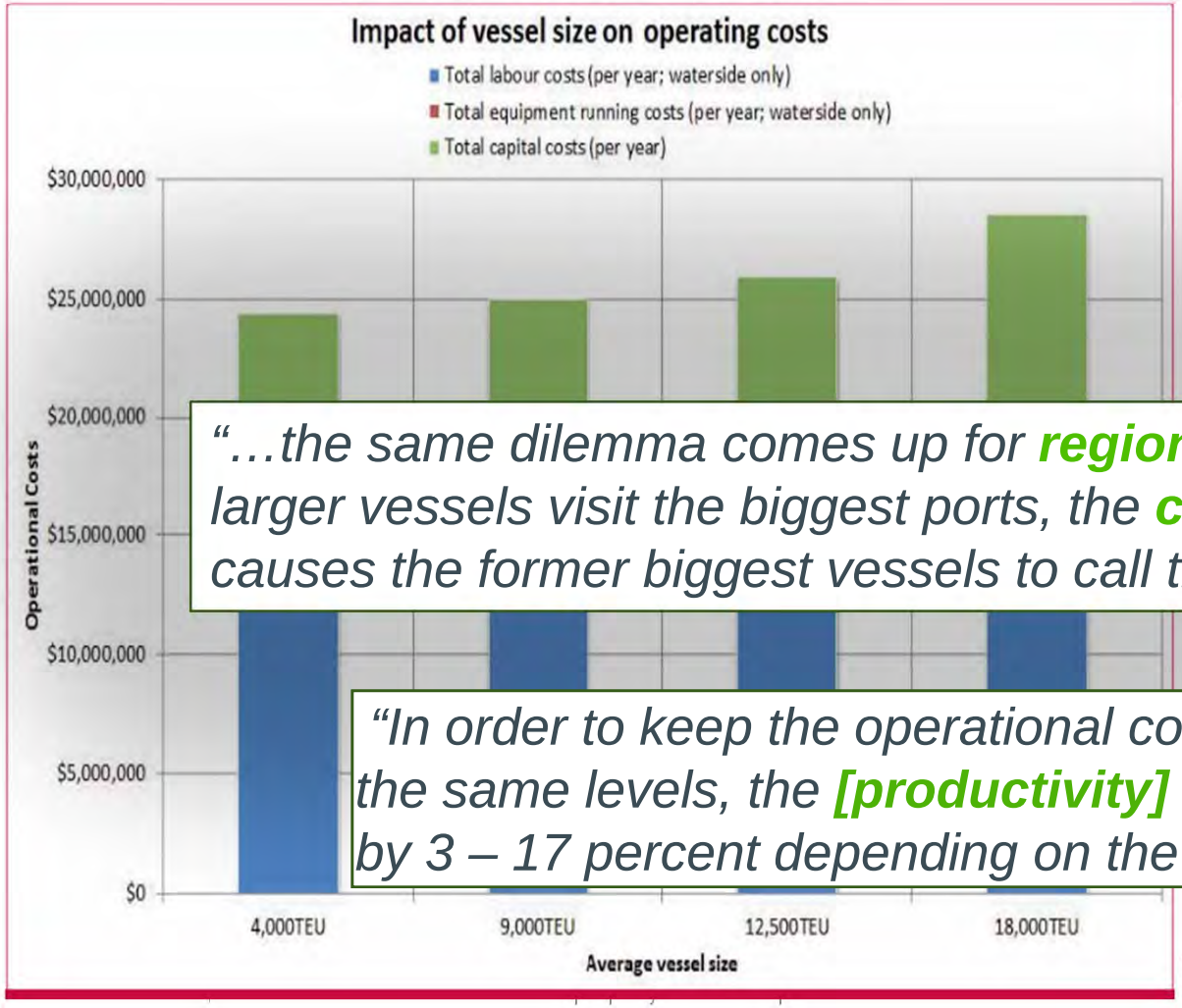
"Since 2007 the ship size in the Asia-Europe trade has effectively doubled. We used to have 6,500 TEUs being the workhouse, now it's the 13,000-TEU ships, which are the workhorses. Our point is simply that port productivity has not doubled since then. While there has been improvement in productivity, we are spending more time in port because of bigger ships."

*"While there has been improvement in productivity, we are **spending more time** in port because of **bigger ships**."*

Soren Skou

*"What I always ask terminal operators is, 'what are they doing to make a **leap frogging move in productivity**?"*

Source: Port productivity is not improving, Maersk CEO says, Peter Tirschwell, Senior Director, Content, IHS Maritime and Trade

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*"…the same dilemma comes up for **regional ports**. As the larger vessels visit the biggest ports, the **cascading effect** causes the former biggest vessels to call the regional ports."*

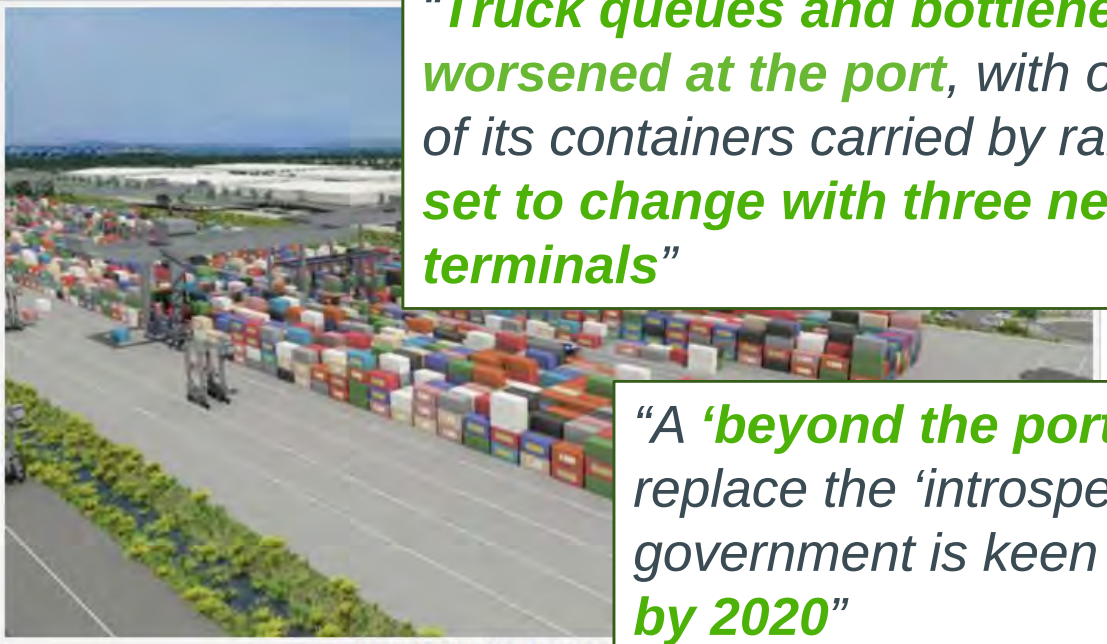
*"In order to keep the operational costs at the same levels, the **[productivity] rates need to increase** by 3 – 17 percent depending on the increase in vessel size."*

Source: Dr Yvo Saanen "Mega ships: positive asset or terminals' worst nightmare?"

## Australia's Port Botany uses holistic approach to battle congestion

**Zoe Reynolds, Special Correspondent** | Dec 03, 2015 9:50AM EST

Print



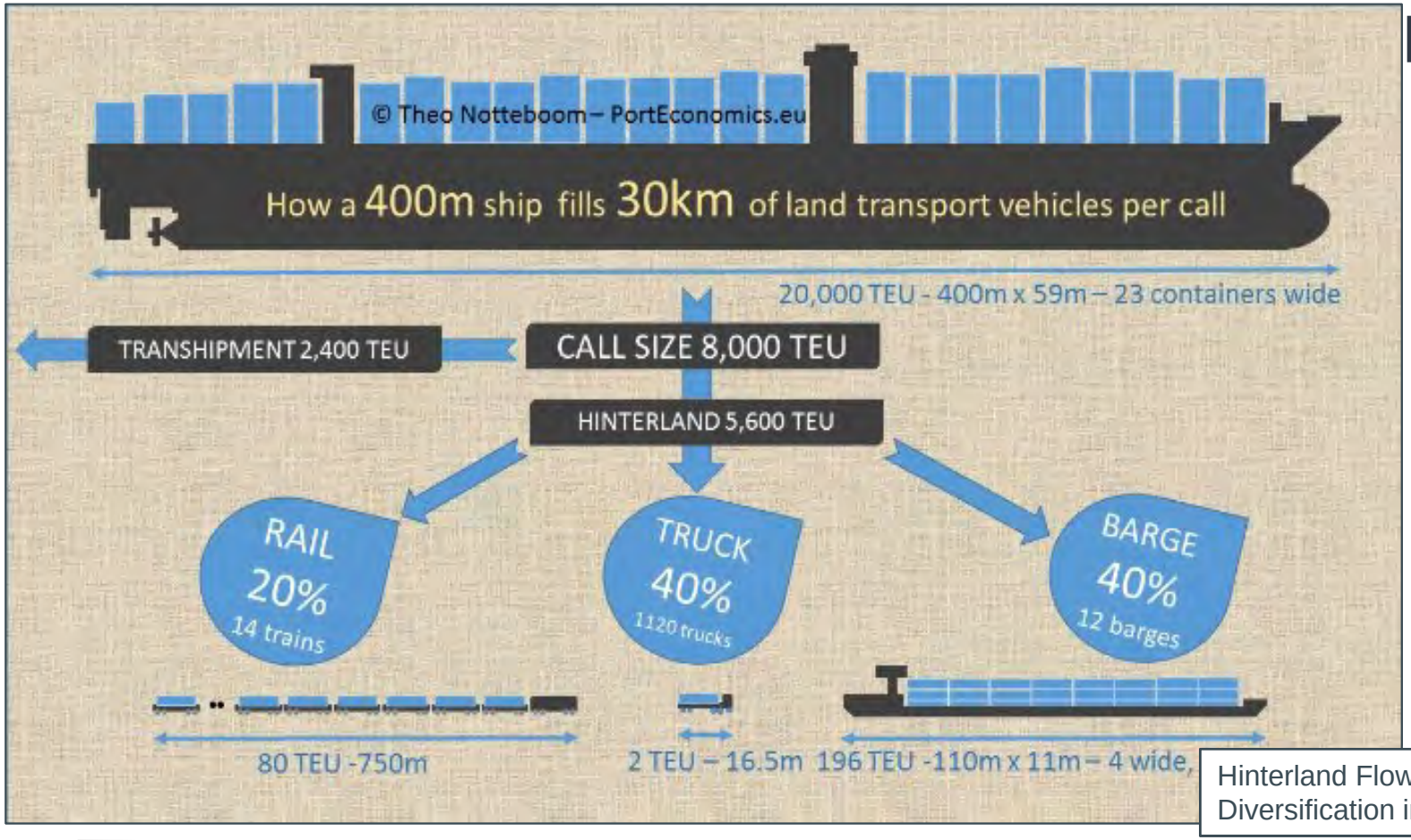
An artist's rendering of the Mooreban

New intermodal terminals in Australia reflect the more holistic approach toward port capacity and productivity that some observers say will be needed as volumes grow and mega-ships discharge larger and larger loads of cargo.

*"**Truck queues and bottlenecks have worsened at the port**, with only a fraction of its containers carried by rail. **But this is set to change with three new intermodal terminals**"*

*"A **'beyond the port' methodology** must replace the 'introspective' approach… the government is keen for **rail use to hit 28% by 2020**"*

Source:Journal of Commerce, Australia Port Botany uses holistic approach to battle congestion Dec 03 2015




Hinterland Flow Diversification in Europe

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## Australia promotes food exports after commodity boom ends

**Zoe Reynolds, Special Correspondent** | Sep 19, 2015 8:00AM EDT

Print

Australia is trying to boost its containerized food exports after a world commodity glut halted a boom in shipments of the nation's top three export commodities, iron ore, coal, and liquefied natural gas.

*"Wine exports to Japan increased by 57% this year, while **beef exports rose by 31%.** Horticulture exports to South Korea have nearly doubled."*

Source:Journal of Commerce, Australia promotes food exports after commodity boom ends, Sep 19 2015

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## The SOLAS Container Weight Verification Requirement

***January 2015***

The International Maritime Organization (IMO) has amended the Safety of Life at Sea Convention (SOLAS) to require, as a condition for loading a packed container onto a ship for export, that the container has a verified weight. The shipper is responsible for the verification of the packed container's weight. This requirement will become legally effective on July 1, 2016. After that date, it would be a violation of SOLAS to load a packed container onto a vessel if the vessel operator and marine terminal operator do not have a verified container weight.

The SOLAS amen
determine the contain
requirement will apply
operators will all need
this regulatory change.

Because there hav
are, the World Shipp
requirement.

**Basic Principles Under the SOLAS Requirement**

*"…will become **legally effective July 1**… after that date, it would be a violation of SOLAS to load a packed container onto a vessel if the vessel operator and marine terminal operator do not have a **verified container weight**"*

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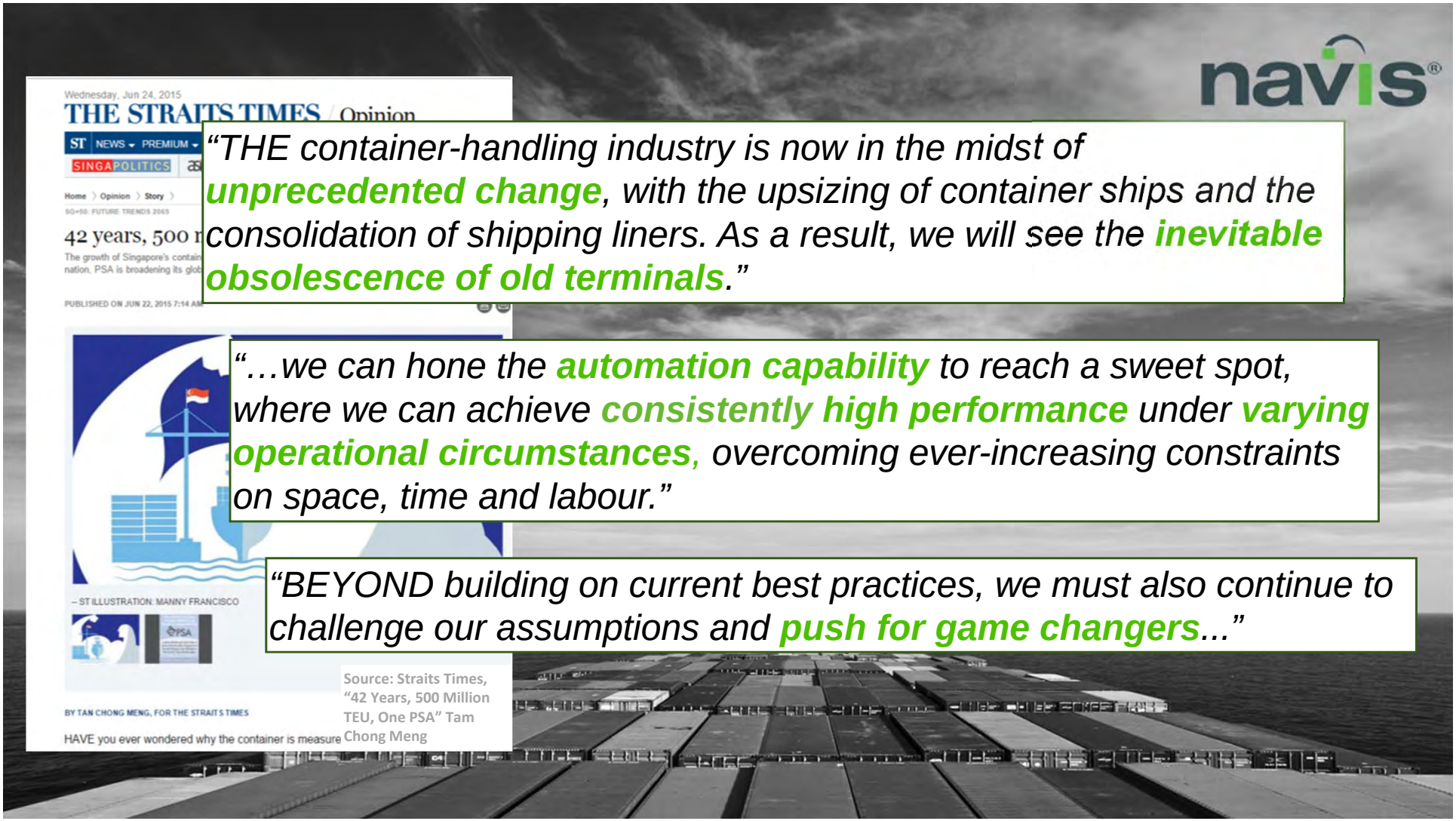
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Wednesday, Jun 24, 2015
THE STRAITS TIMES / Opinion
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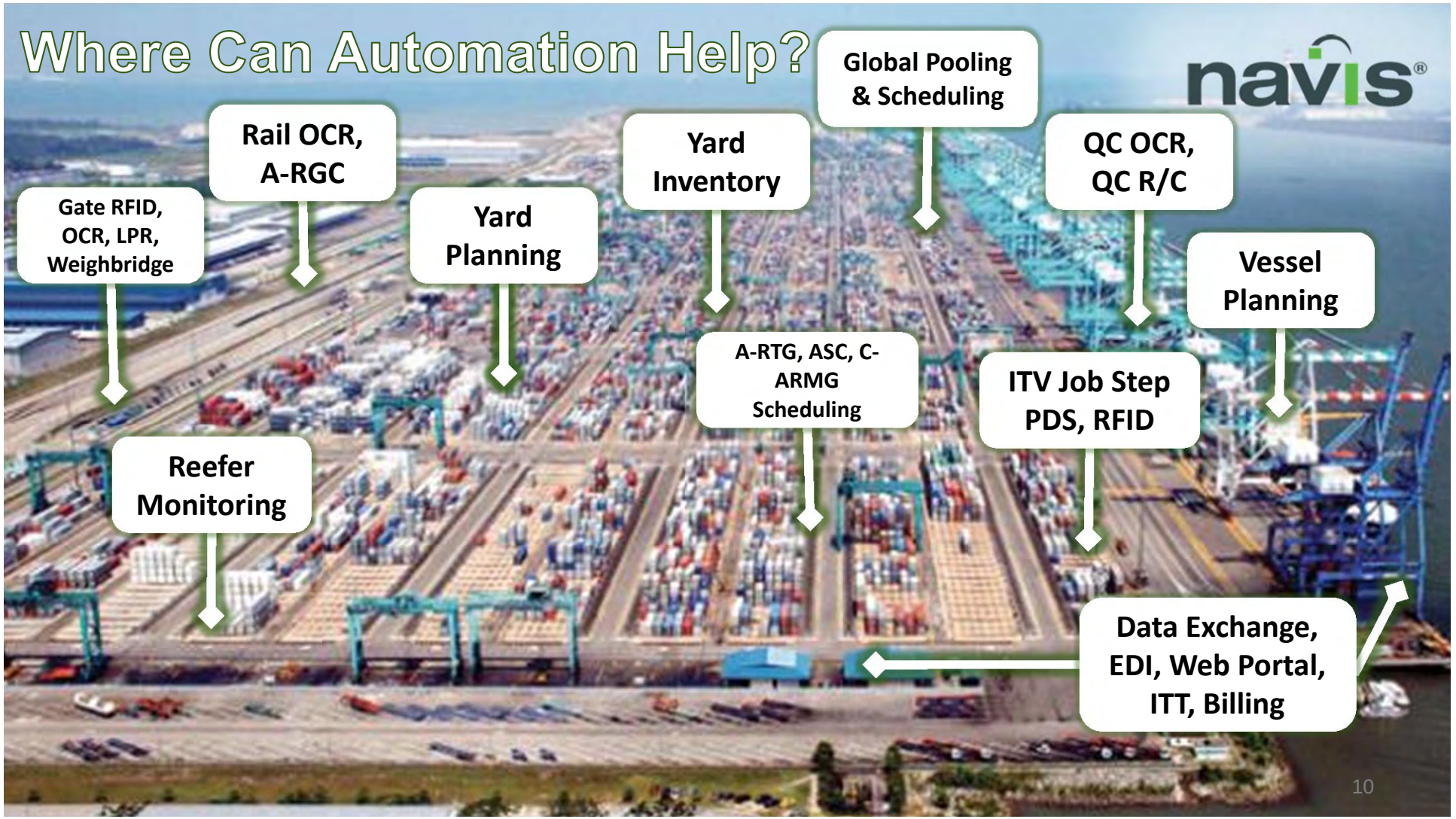
42 years, 500 m
The growth of Singapore's contain
nation, PSA is broadening its glob
PUBLISHED ON JUN 22, 2015 7:14 AM
– ST ILLUSTRATION: MANNY FRANCISCO
BY TAN CHONG MENG, FOR THE STRAITS TIMES
HAVE you ever wondered why the container is measure
"THE container-handling industry is now in the midst of unprecedented change, with the upsizing of container ships and the consolidation of shipping liners. As a result, we will see the inevitable obsolescence of old terminals."
"…we can hone the automation capability to reach a sweet spot, where we can achieve consistently high performance under varying operational circumstances, overcoming ever-increasing constraints on space, time and labour."
"BEYOND building on current best practices, we must also continue to challenge our assumptions and push for game changers..."
Source: Straits Times, "42 Years, 500 Million TEU, One PSA" Tam Chong Meng


Where Can Automation Help?
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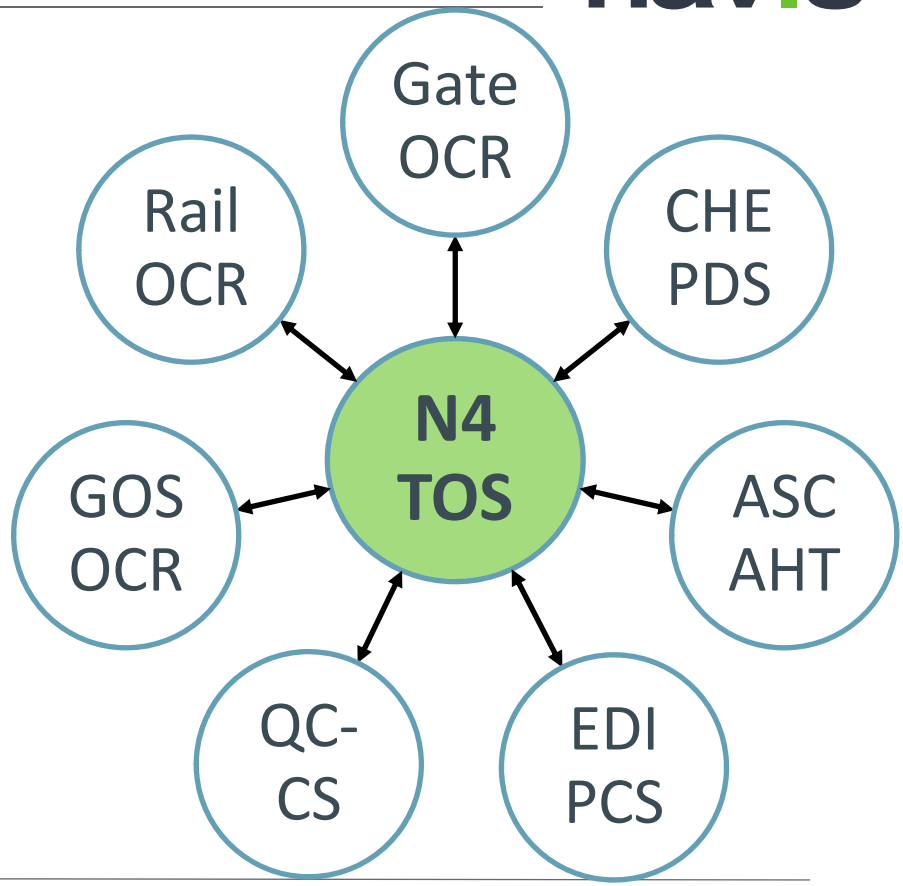
Global Pooling & Scheduling
Rail OCR, A-RGC
Yard Inventory
QC OCR, QC R/C
Gate RFID, OCR, LPR, Weighbridge
Yard Planning
Vessel Planning
A-RTG, ASC, C-ARMG Scheduling
ITV Job Step PDS, RFID
Reefer Monitoring
Data Exchange, EDI, Web Portal, ITT, Billing

# Understand Vendor Roles and Responsibilities

- Can the TOS support selected automated solutions?
- Is there a well-defined API that specifies system roles and interactions?
- Are exception cases handled with alerts and steps to resolution?
- How are partnerships managed for future releases?

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# Automation Technologies: Gate, Rail, Yard

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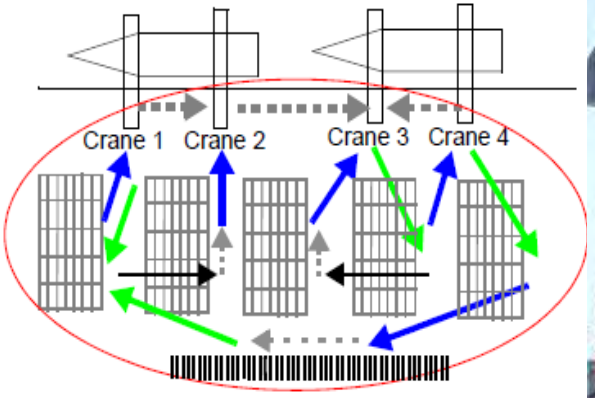
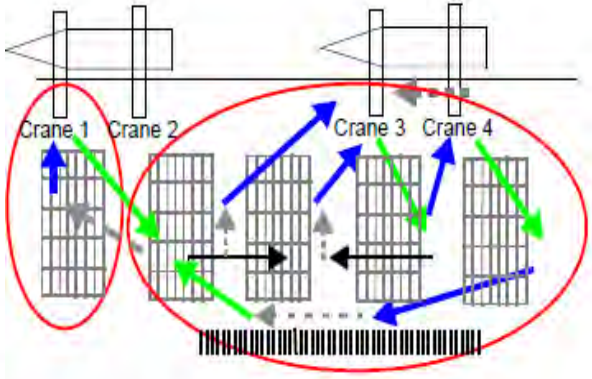
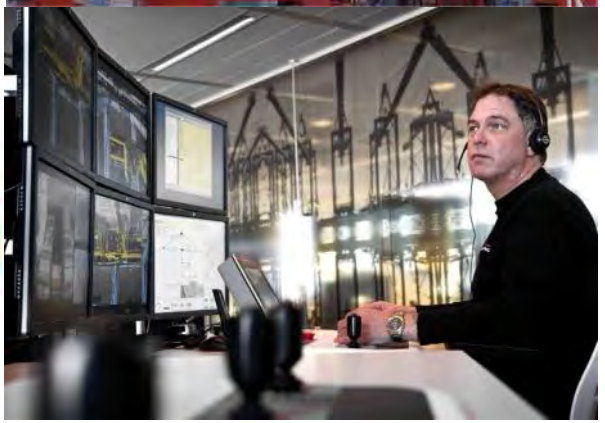
# Automation Technologies: Yard, ITVs, QC





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# Automation Technologies: Automatic CHEs

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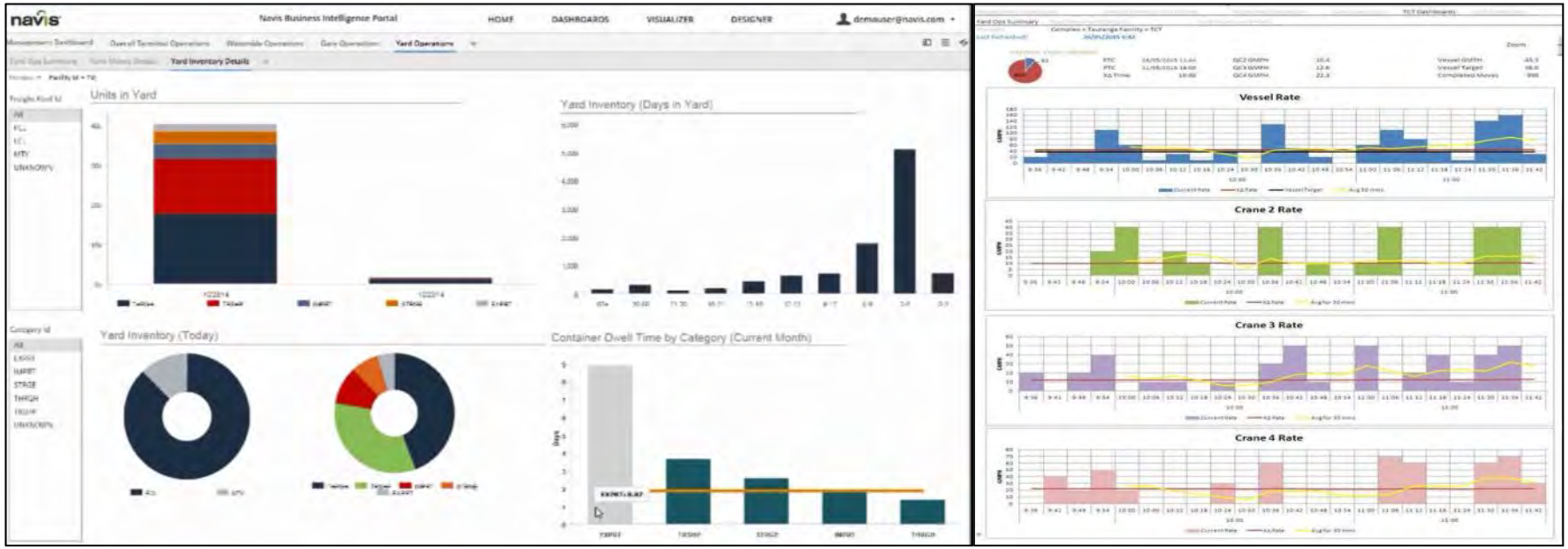
# Unlock Terminal Data to Drive Decisions




## Analyze Operations to Find Bottlenecks and Inefficiencies to Prioritize Improvement Investments

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# Vendor Solutions and Experience

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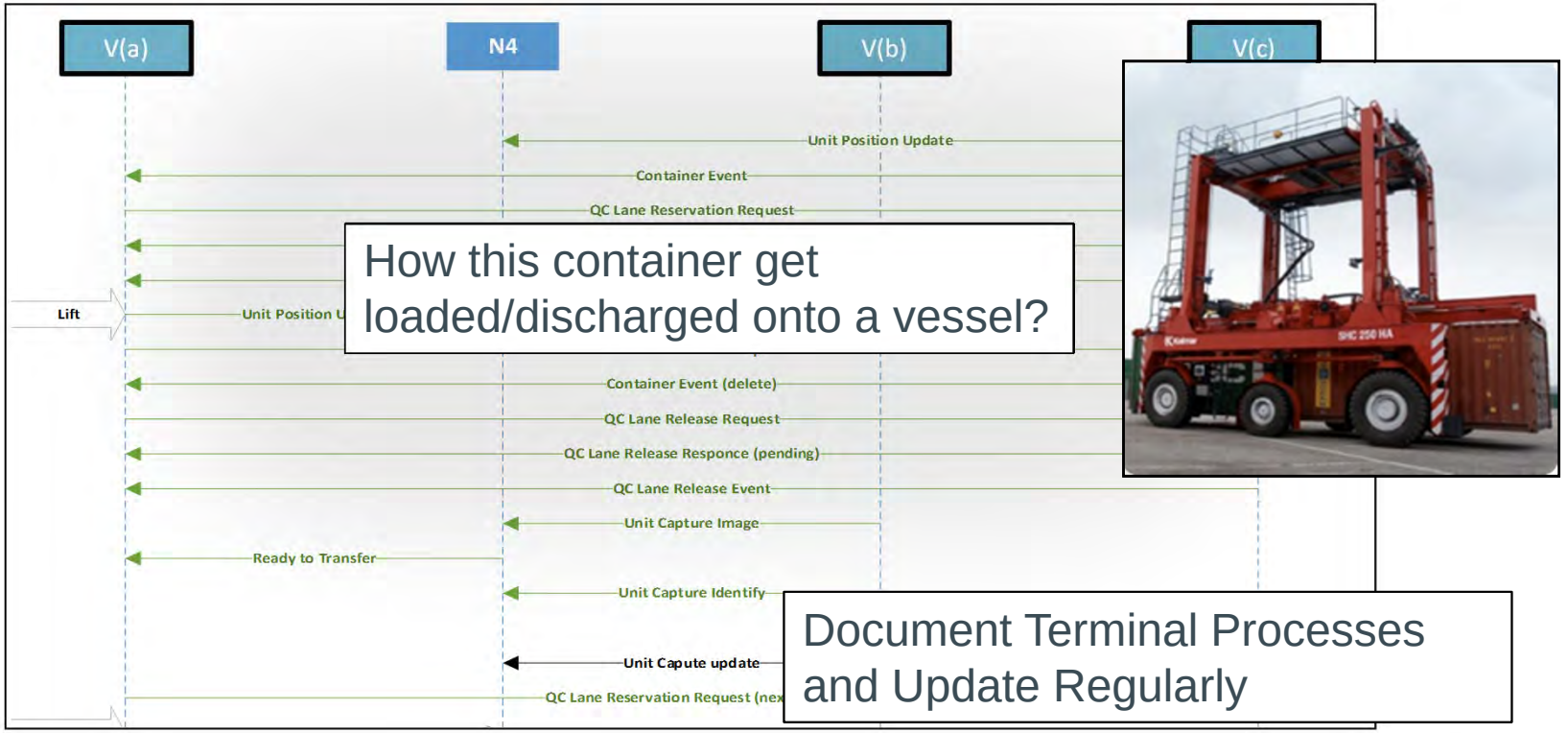
# Documenting Automated Communications

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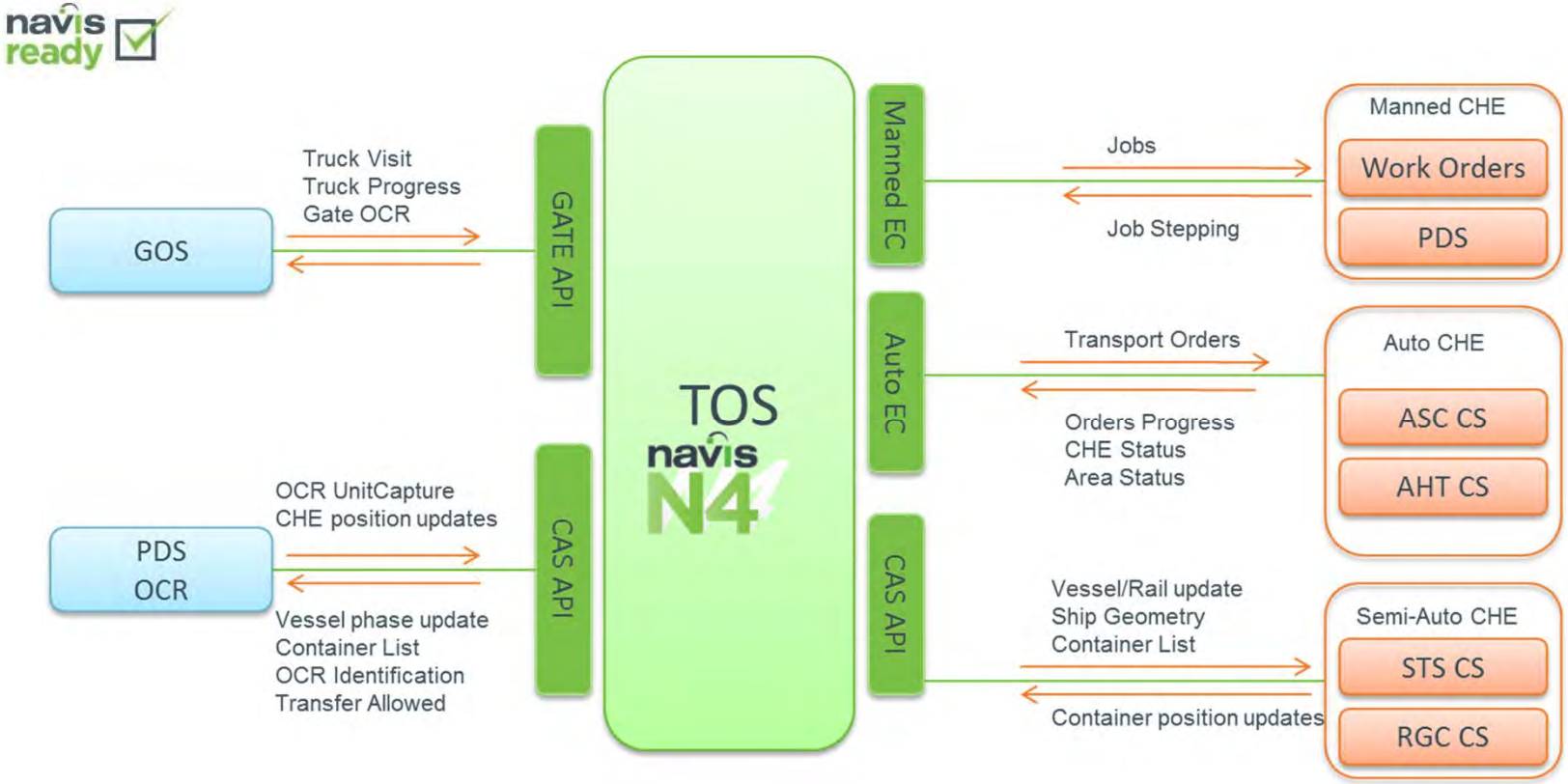
# N4 Integration Partner Platform

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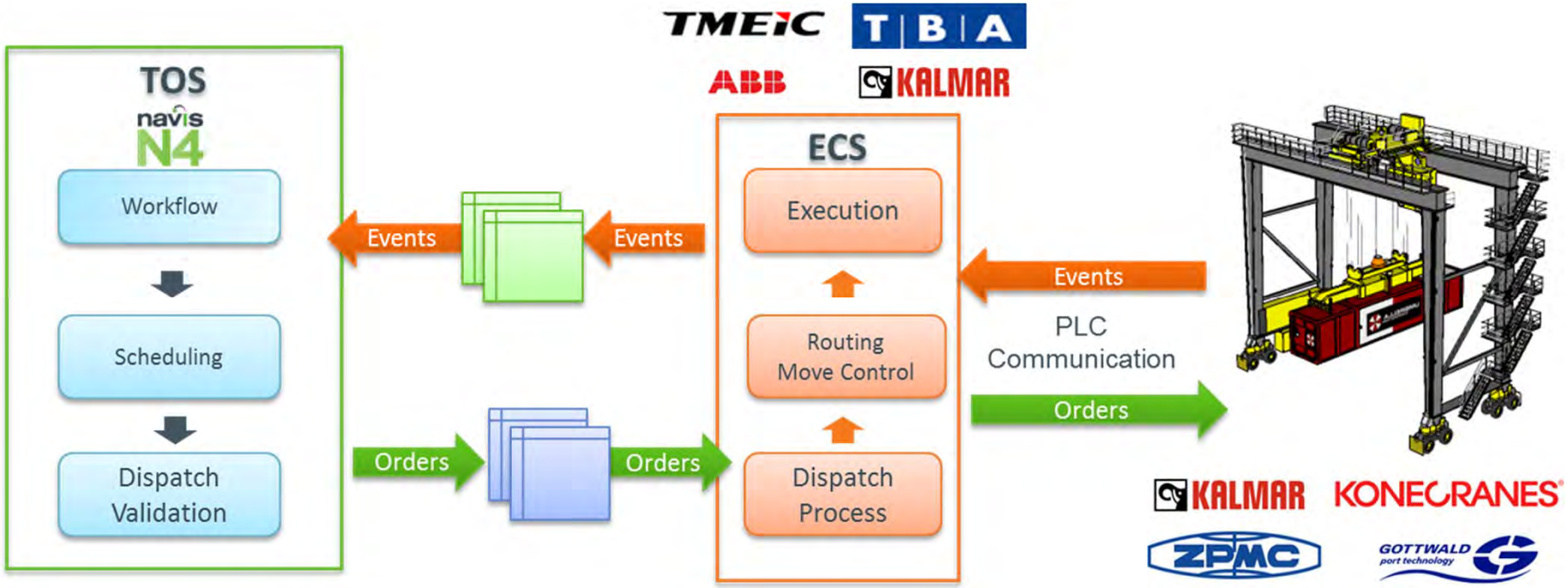
# N4 Readiness Provides Integration Reliability

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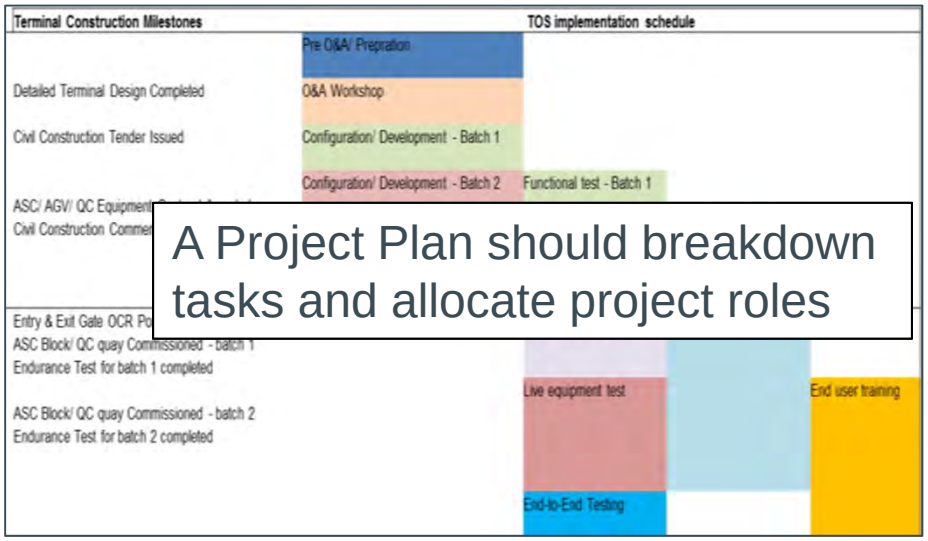
# Project Planning and Risk Management

- Greenfield vs. Brownfield risk profile
- Resource Roles
- Project Milestone Definition
- Experience
- User Acceptance and Training
  - Integration Testing
  - Functional Testing
  - Volume Testing
  - Operational Testing

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# User Engagement is Critical to Success

# Terminal Monitoring: Alerts

| Exception | Description | Affected Work Instruction | Work Queue | Work Assignment | Move Purpose |
|---|---|---|---|---|---|
| Abort by ASC11W | Error on spreader | BBCU2204074 | yard-Admin | 13615 | INTRASTACK |
| Dispatch validation failed | ASC OUTBOUND DISPATCH YET AGV NOT DISPATCHED | TEST9245431 | yard-Admin | 14597 | INTRASTACK |
| Dispatch rejected | Transfer zone not available | TEST9452143 | yard-Admin | 14567 | INTRASTACK |

Dispatching

Decking

Validations

Priority promotions

Scheduling

Gate

…and more +

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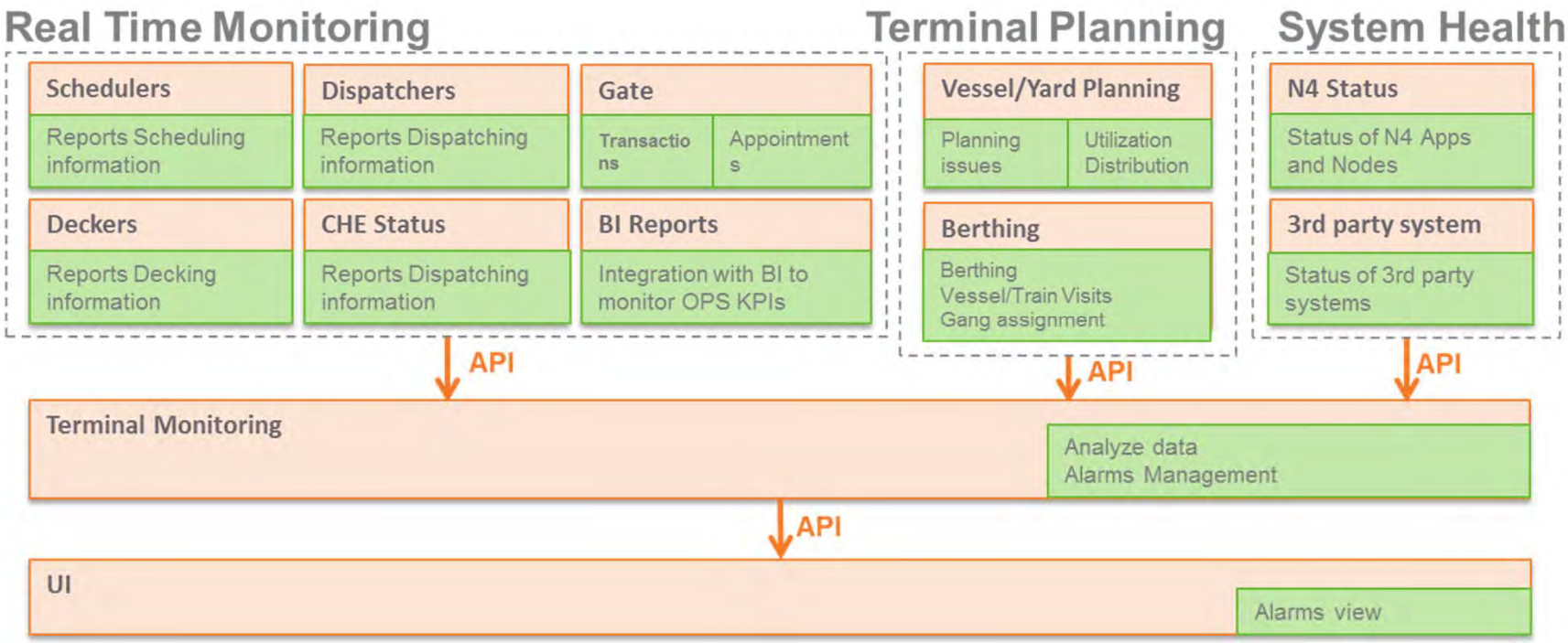
# N4 Platform for Operational Monitoring & Planning

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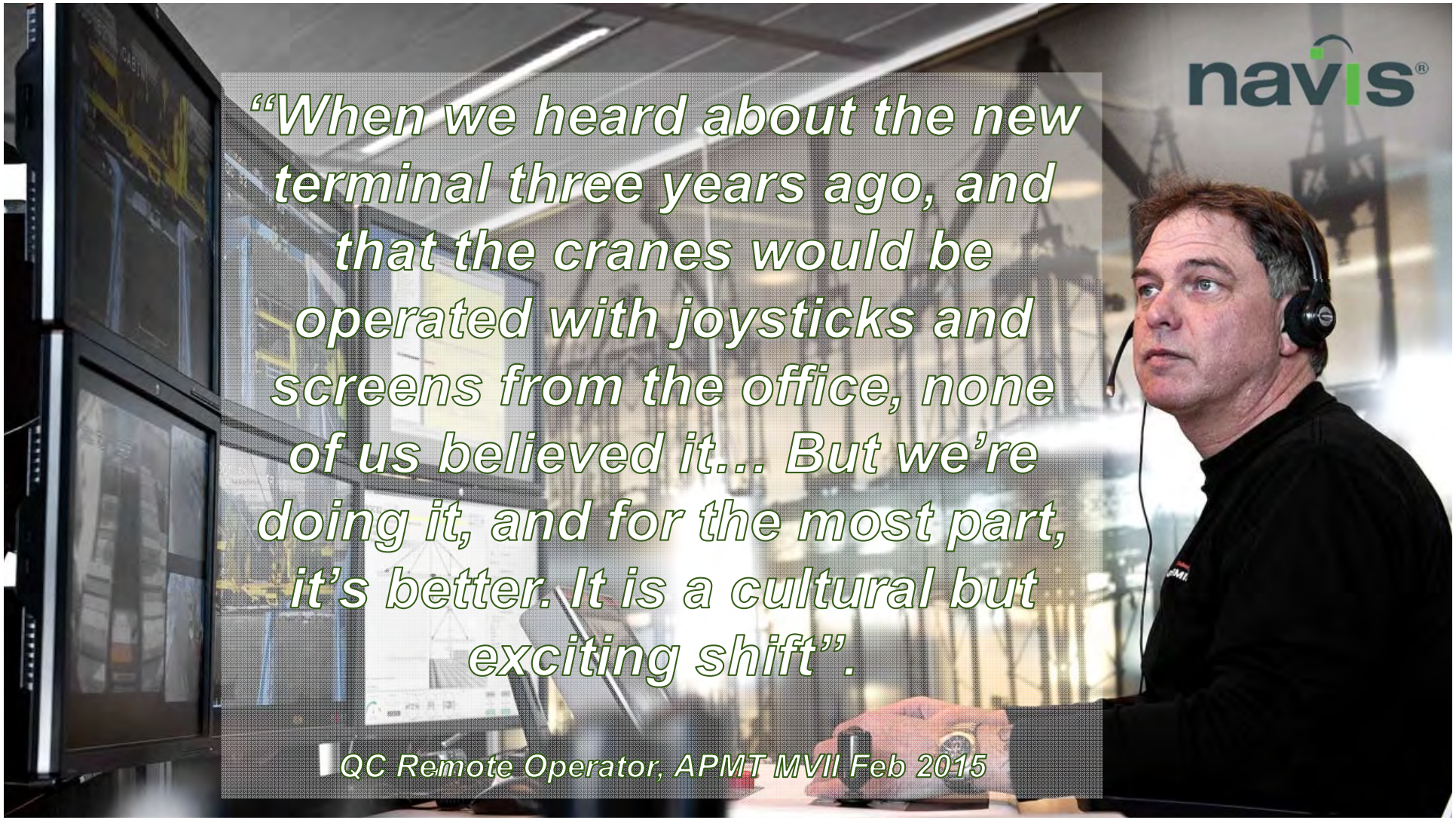
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“When we heard about the new terminal three years ago, and that the cranes would be operated with joysticks and screens from the office, none of us believed it… But we’re doing it, and for the most part, it’s better. It is a cultural but exciting shift”.
QC Remote Operator, APMT MVII Feb 2015

# The World is Adopting Automation Processes

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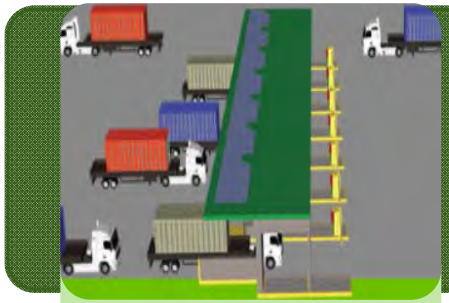
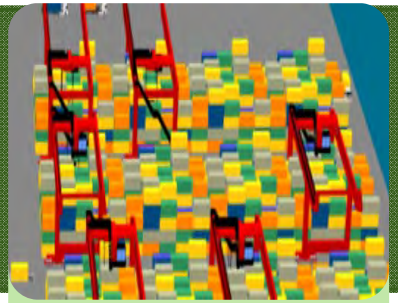
# Navis Automation Modules and Experience



## N4 Gate

- Gate Appointments
- Gate OCR/LPR
- Gate RTLS

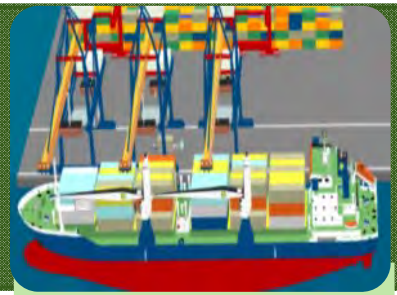


## N4 Yard

- PDS/RTLS
- GeoFencing
- Auto Yard Stowage
- Advanced RTG
- ARMG
- ECS
- AGV
- AGV Racks
- AutoShuttle
- PM Pooling

## N4 Rail

- Remote RGC
- Rail Crane OCR
- Rail Portal OCR
- Auto Rail Stowage



## N4 Vessel

- Remote QC
- ECS
- Second Trolley
- Tandem / Quad
- Vessel OCR
- Flexible Loading
- Auto Vessel Stowage

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25 Years
250 Installed Base
54 Countries
120 N4 Live
200+ N4 Committed
425 Employees
6 Offices
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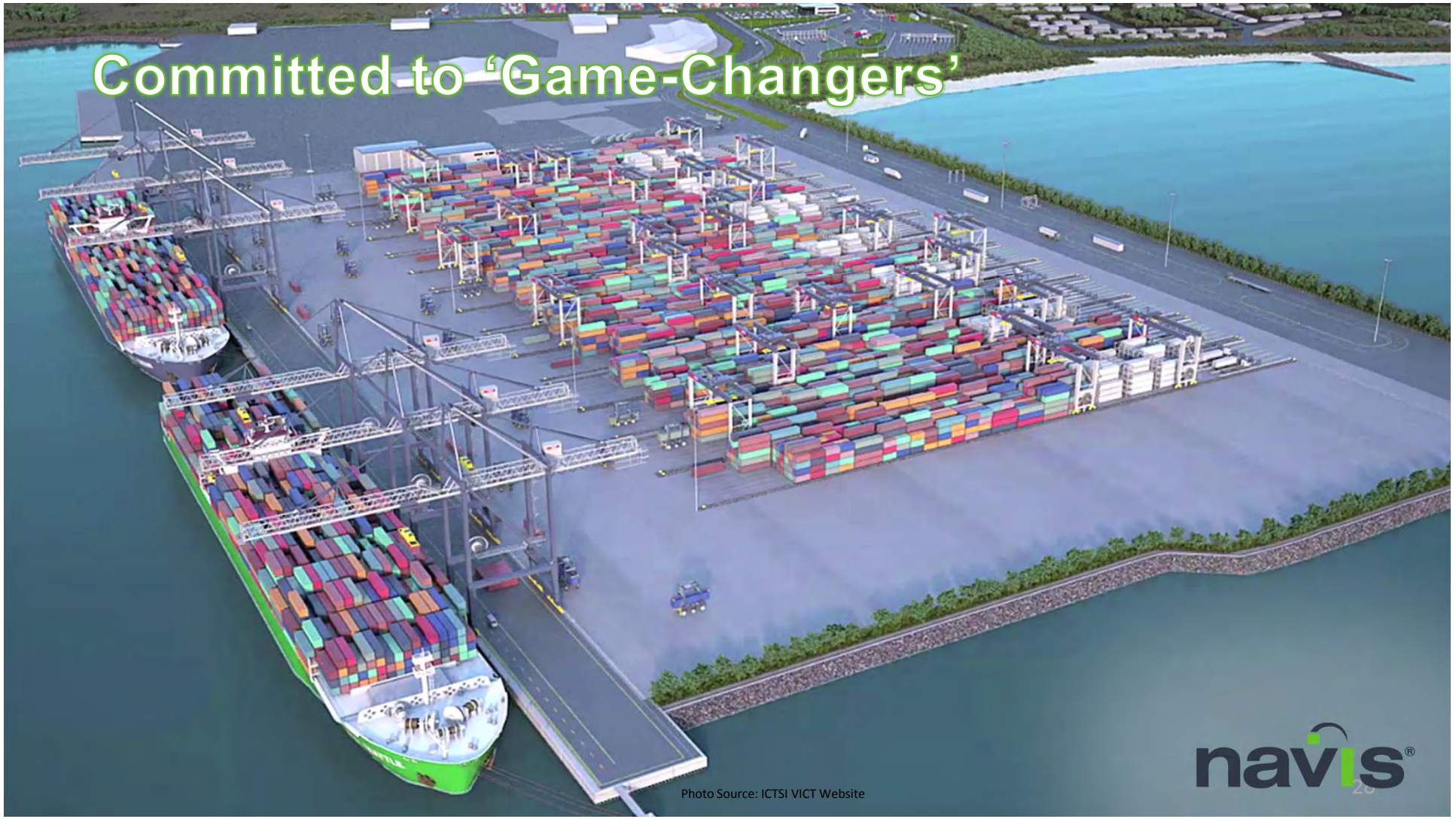
Committed to 'Game-Changers'
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# Improving Operational Processes Utilizing Automation at Container Terminals

Johannes Leholm
Sales Engineer, APAC
johannes.leholm@navis.com

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