navis®

SUPERCHARGING NEXT GEN PORTS WITH AI AND CLOUD COMPUTING

17th ASEAN PORTS & SHIPPING 2019

WHERE ARE PORTS INVESTING?

SKILLED WORKFORCE

ADVANCED INFRASTRUCTURE

AUTOMATED EQUIPMENT

SMART SOFTWARE ECOSYSTEM

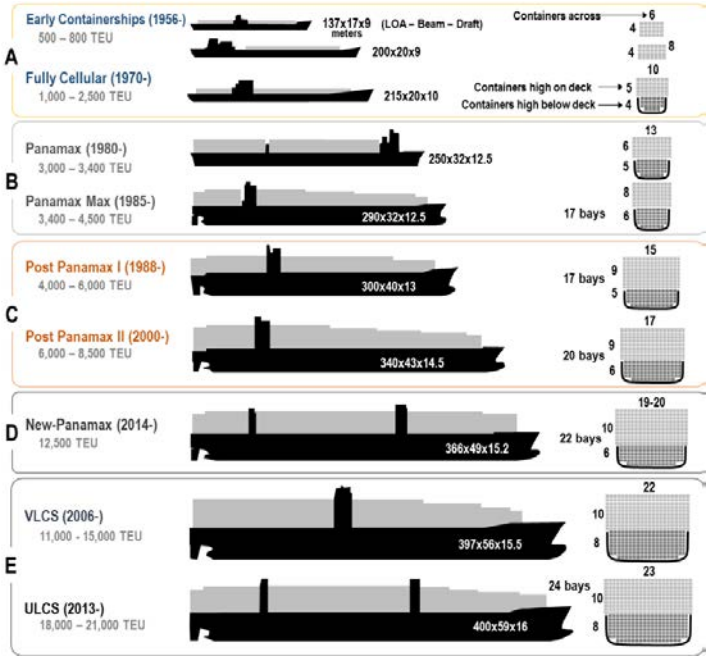
PORT TECHNOLOGY ADOPTION

How ports have use technology to manage growth

navis®

PORT TRENDS: VESSEL SIZE

4,600
TEU



22,000
TEU
~5x

SHIP SIZE INCREASE

Source: https://transportgeography.org

1988

navis founded

2018

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PORT TRENDS: GLOBAL THOUGHPUT

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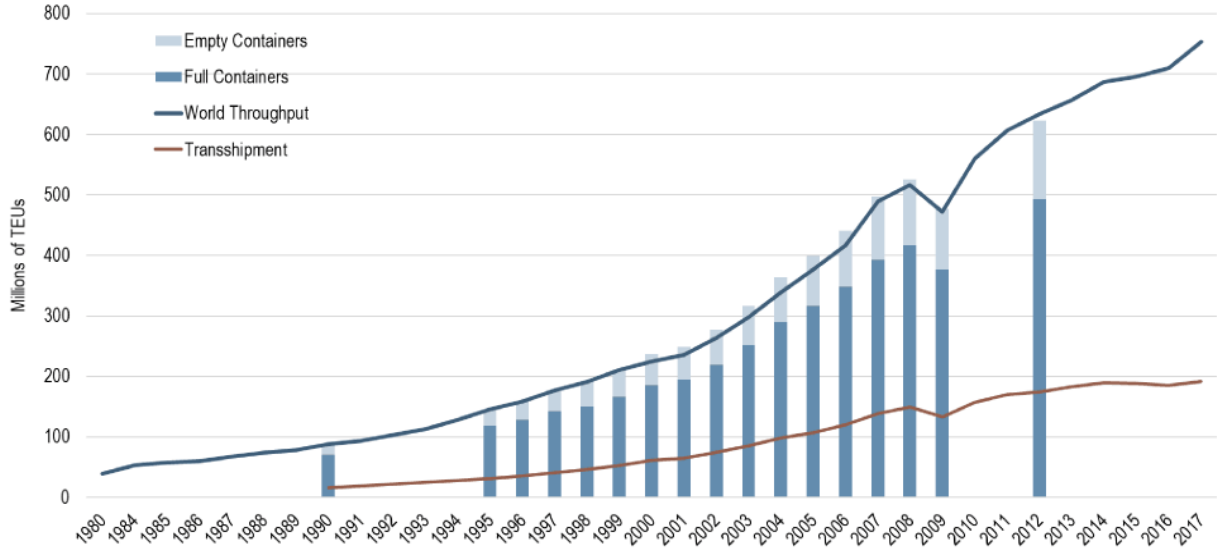
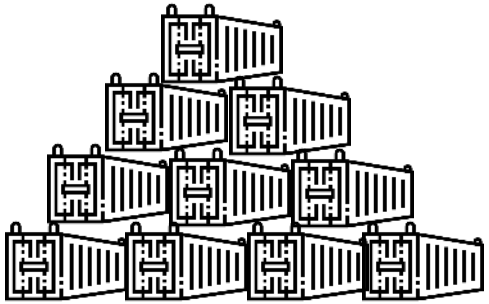
75m TEU



GLOBAL THROUGHPUT (million TEU)

Source: Drewry's

784m TEU ~10x



1988

navis™ founded

2018

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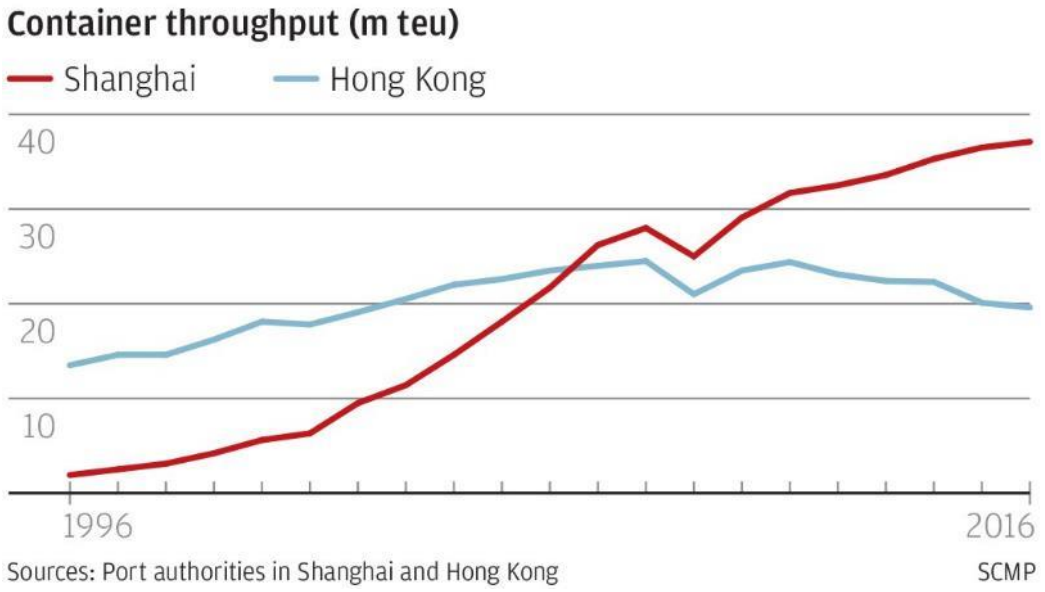
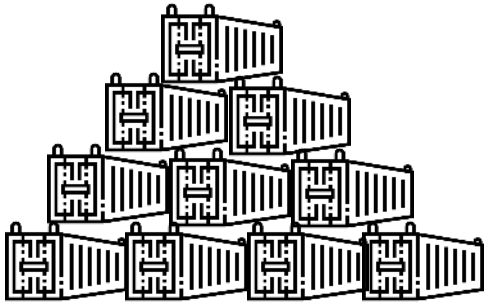
PORT TRENDS: WORLD'S LARGEST PORT

HONG KONG
4mTEU



SHANGHAI
42.01mTEU
~10x



PORT OF SHANGHAI THROUGHPUT

Source:SCMP

1988
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2018

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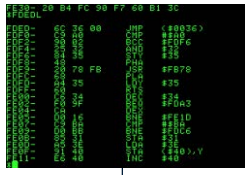
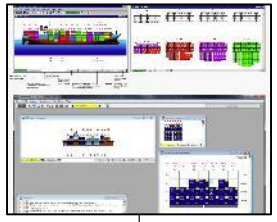
PORT TECH EVOLUTION

Inventory Digitization /EDI

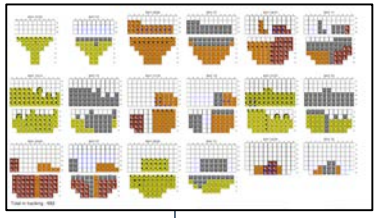


Graphical Vessel Planning



Truck Control Job Dispatch

AutoStow / PowerStow



Multi Terminal

1988

navis founded

Graphical Yard Planning

PrimeRoute

Expert Decking

Automation

2018

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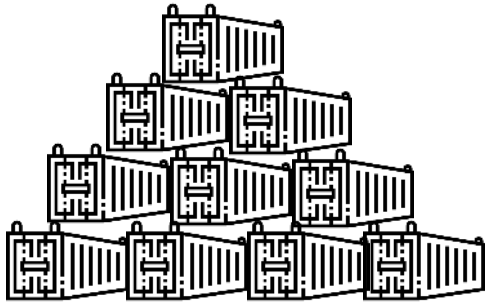
THE NEXT GENERATION



Smarter Software

?

2018

Infrastructure, Equipment, People

2048

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octopi

TOS CLOUD SERVICES WITH OCTOPI

Cloud platform for terminals starting digitalization

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SMALL TO MEDIUM SIZED MIXED MODE TERMINALS

octopi

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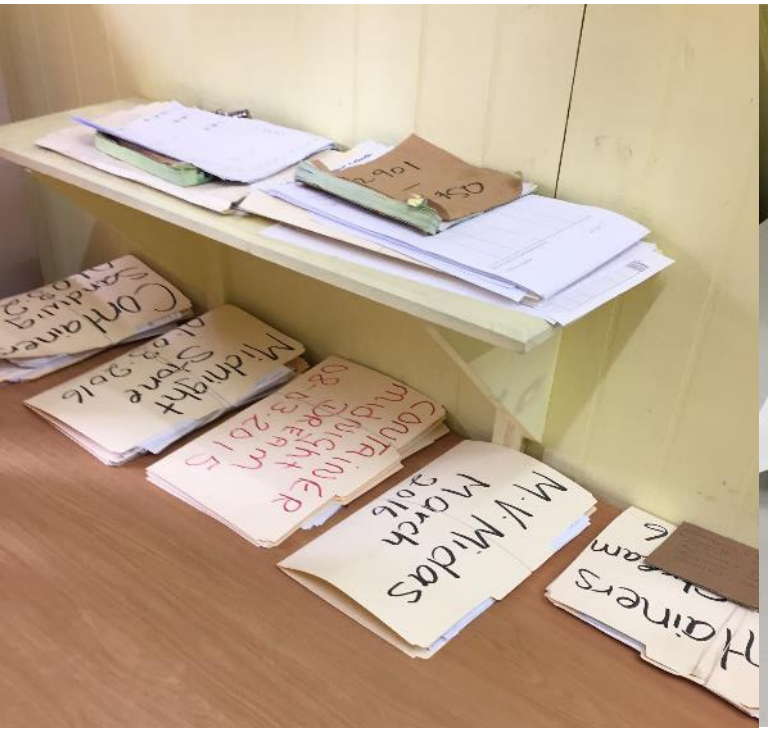
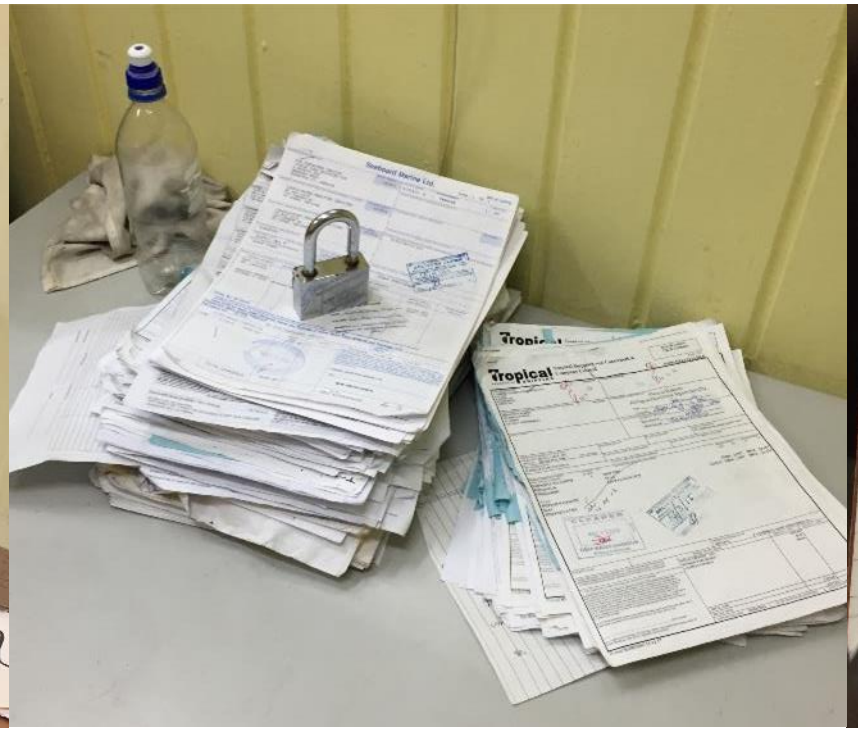
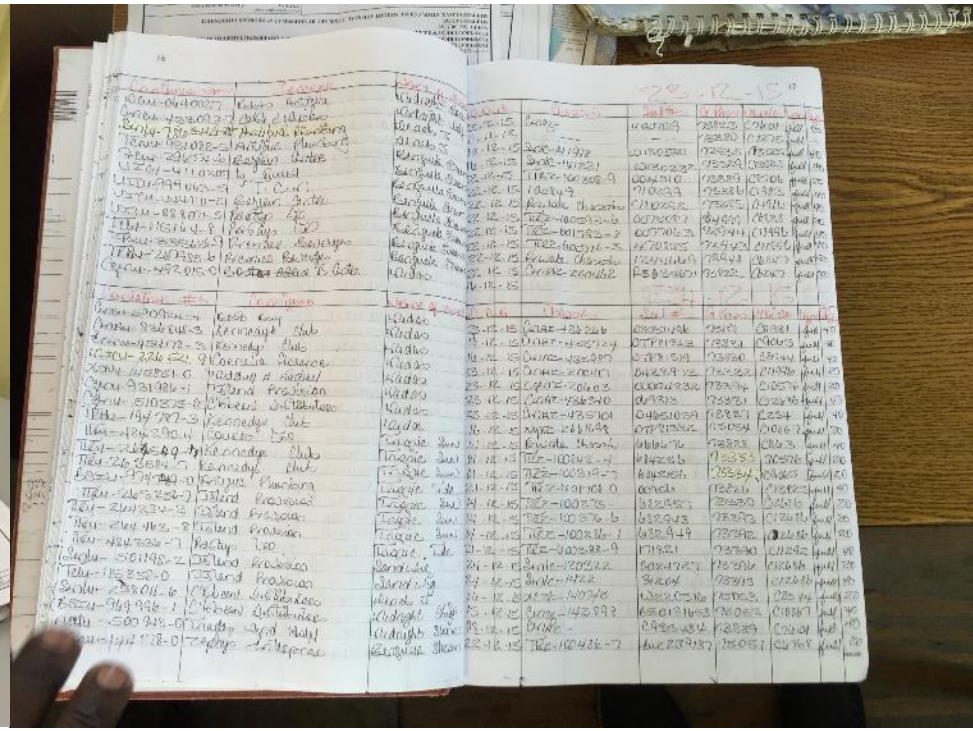
MANUAL PAPER PROCESSES







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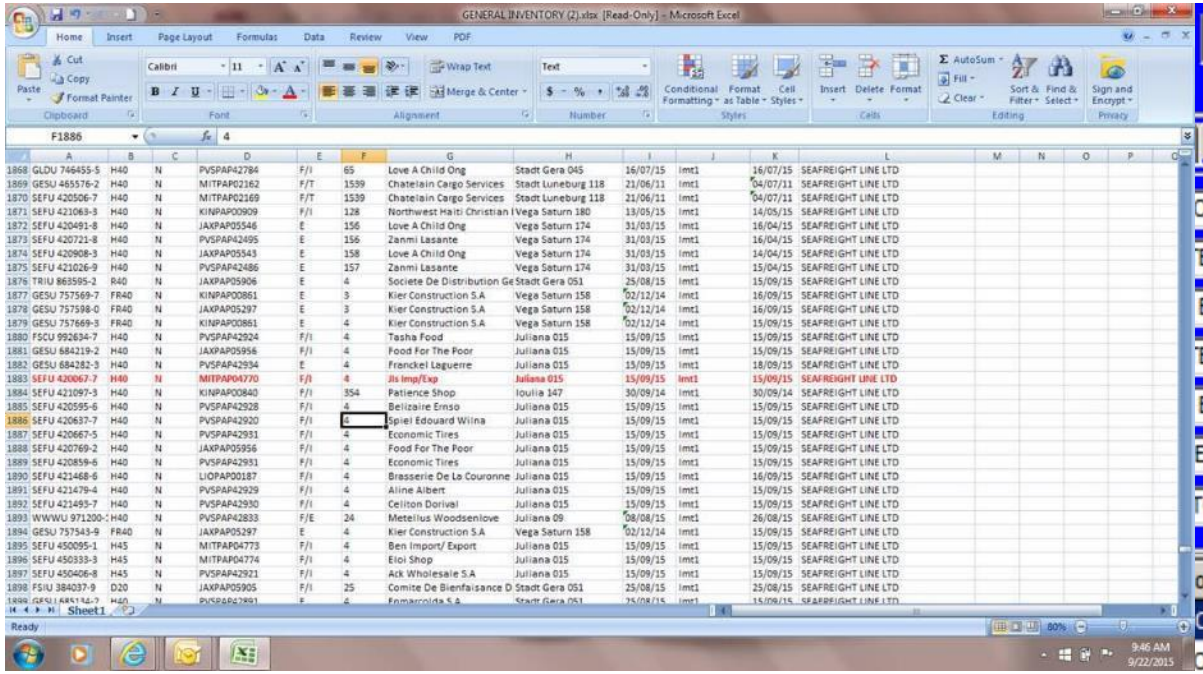
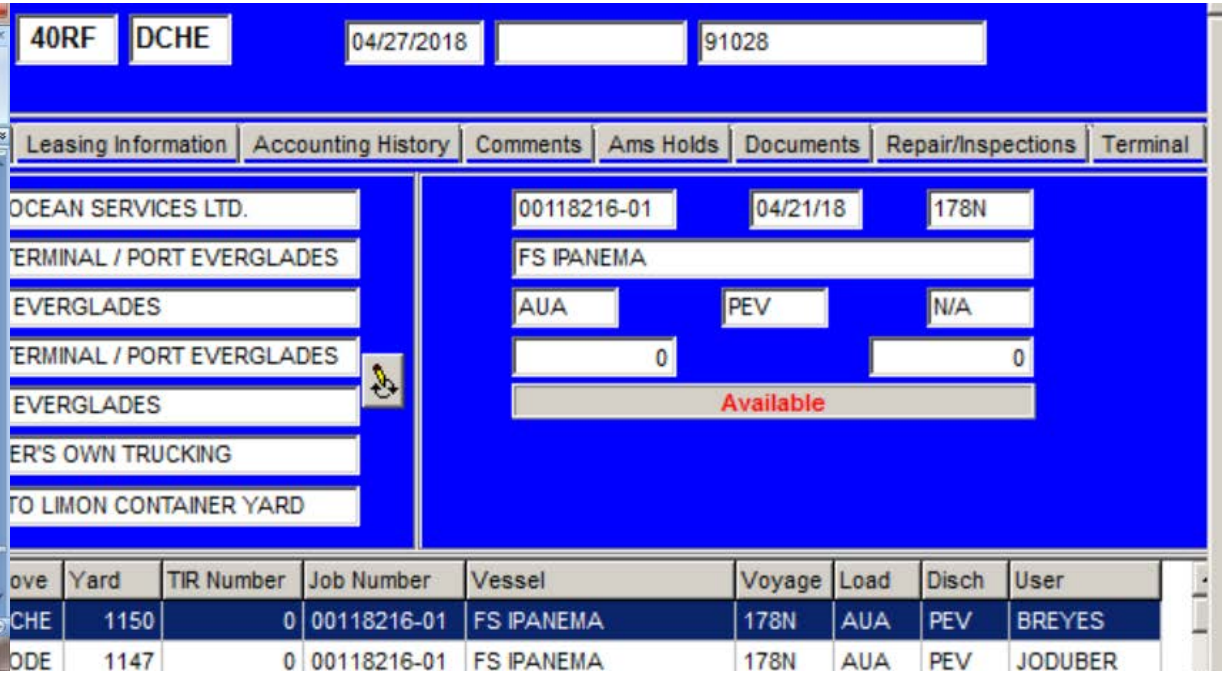
AND HARD TO MAINTAIN SOFTWARE SYSTEMS





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CHALLENGES OF MIXED CARGO TERMINALS

- Handle range of cargo type
- Long Truck Lines
- Accounting integration with TOS
- Measuring productivity
- Monitoring reefer containers
- Keeping customers happy
- Monitor operations in real-time
- Training employees
- Yard Planning
- Vessel Planning
- Maintenance & Repair
- Break Bulk & CFS Management
- Too much paper!
- Timely reports
- Electronic Data Interchange (EDI)
- Manage TOS Data Center
- Data Backups & Recovery
- Business Continuity Plan
- Berth Requests & Scheduling
- Hire, train, and retain IT staff
- Stripping & Stuffing Containers
- Cybersecurity
- Physical safety & security
- Handling Hazardous Cargo

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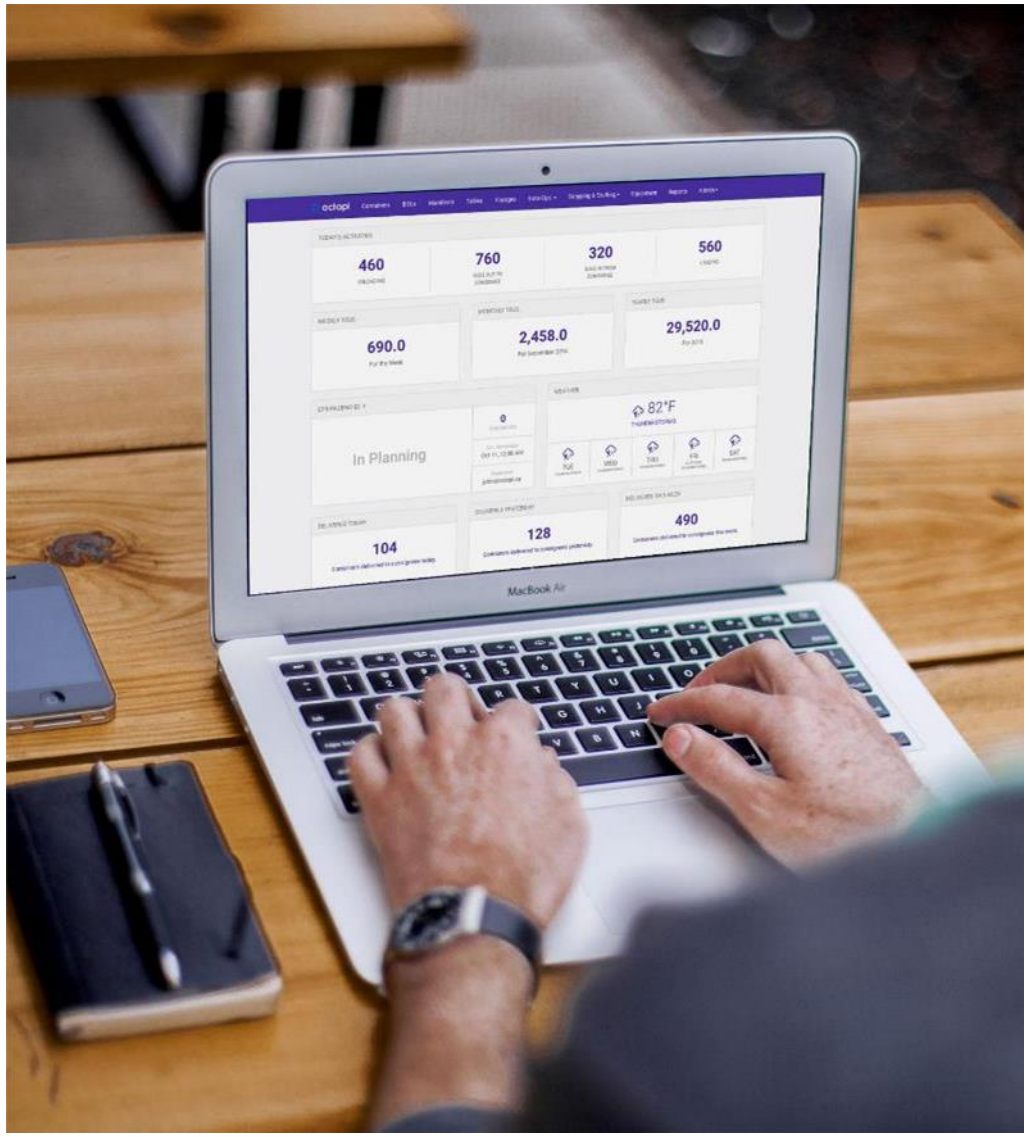
INTRODUCING A CLOUD SOLUTION

octopi

A web-based SaaS Terminal Operating System (TOS) that cargo terminals can use to easily track cargo and manage operations



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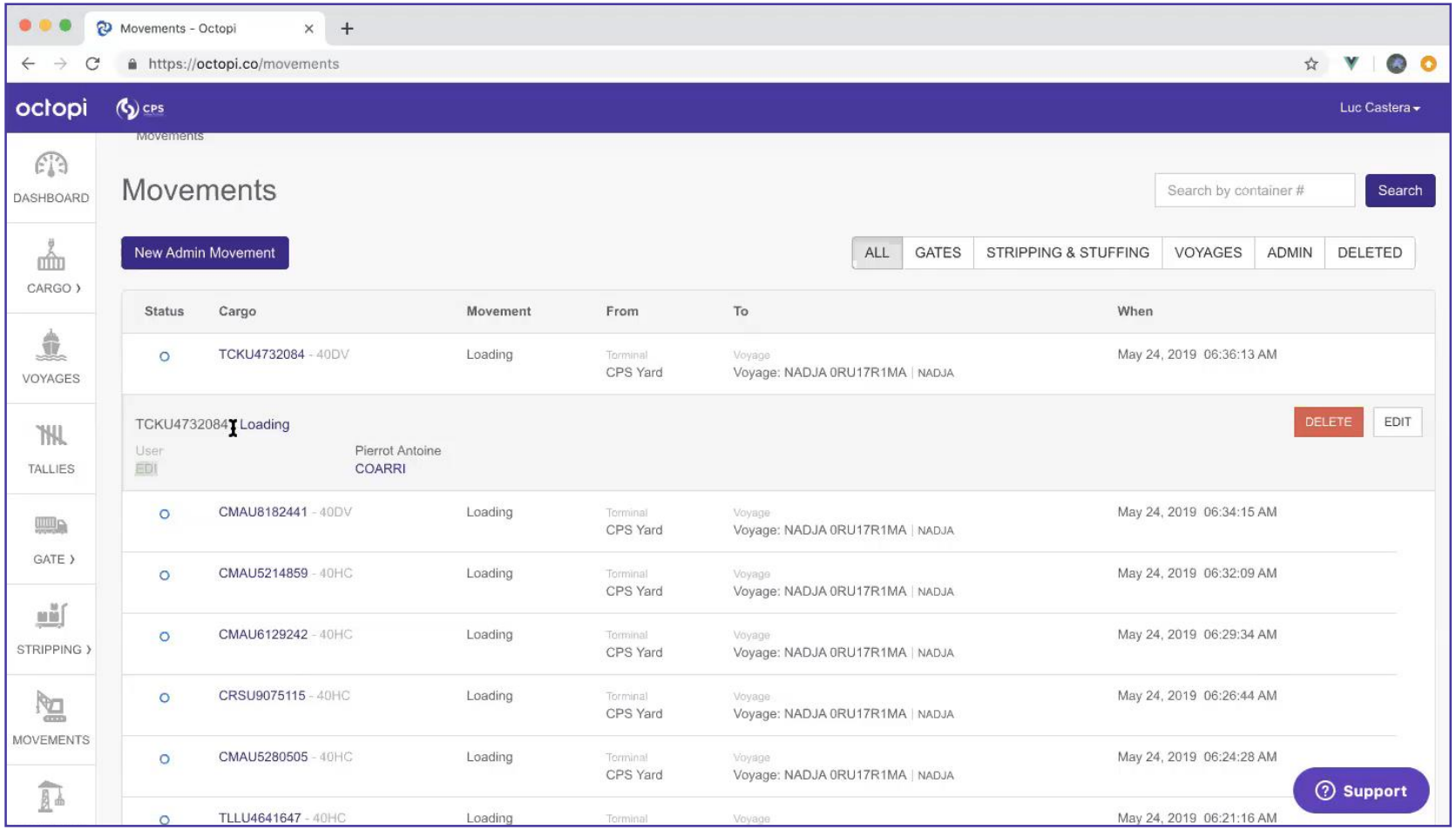
CARGO TRACKING & VISIBILITY



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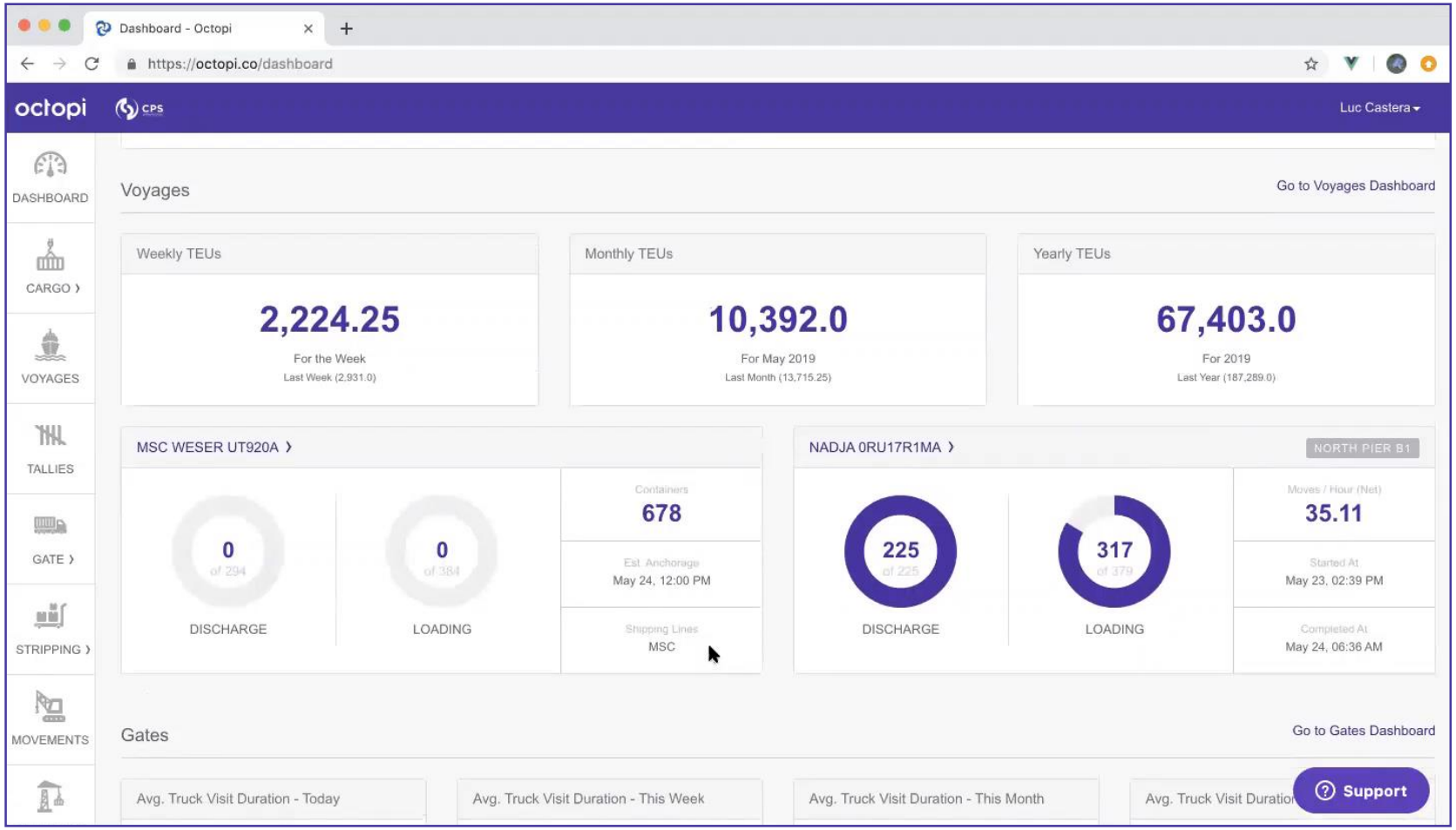
WORKFORCE ACCOUNTABILITY



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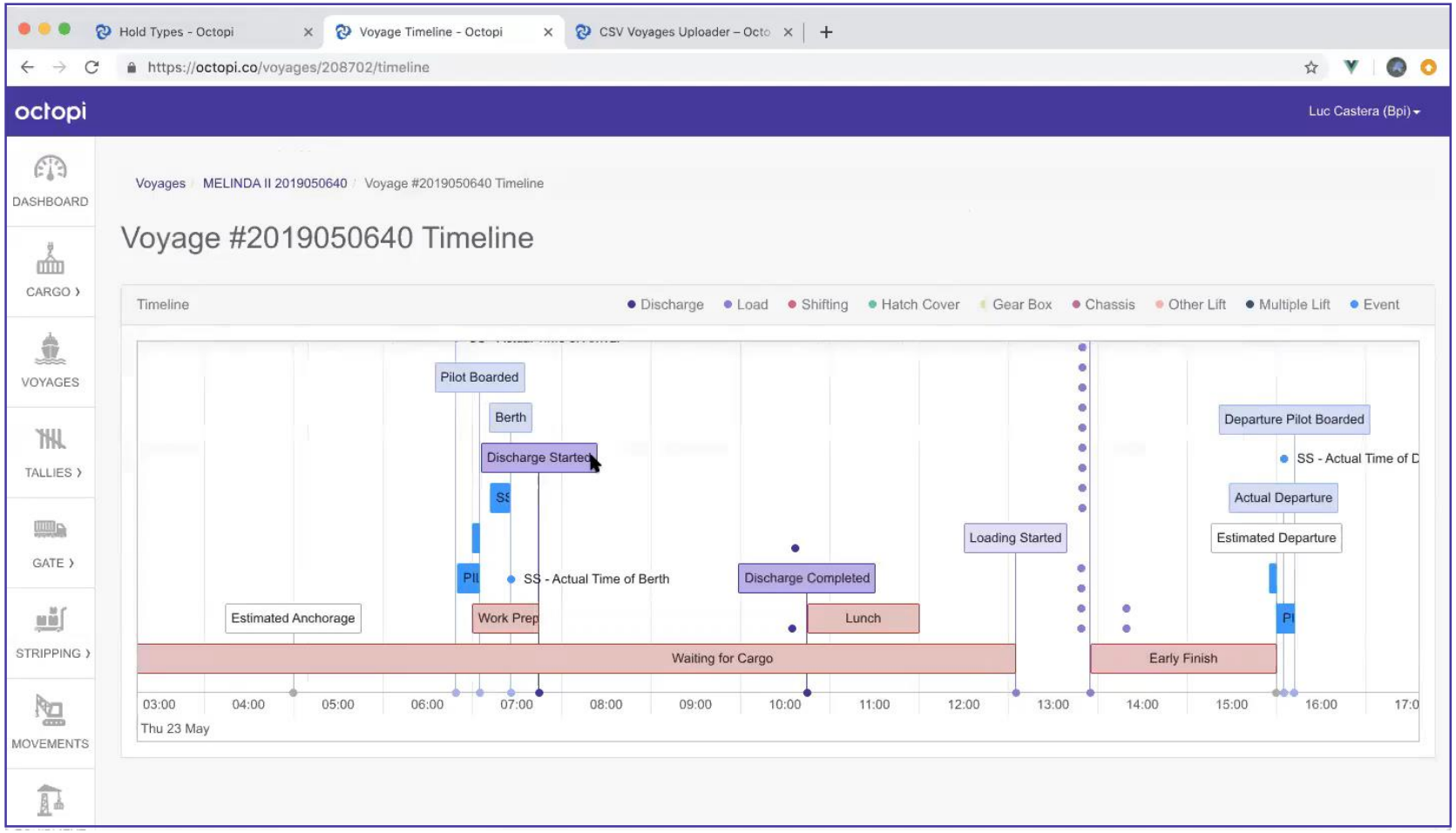
TROUBLESHOOTING & AUDITING



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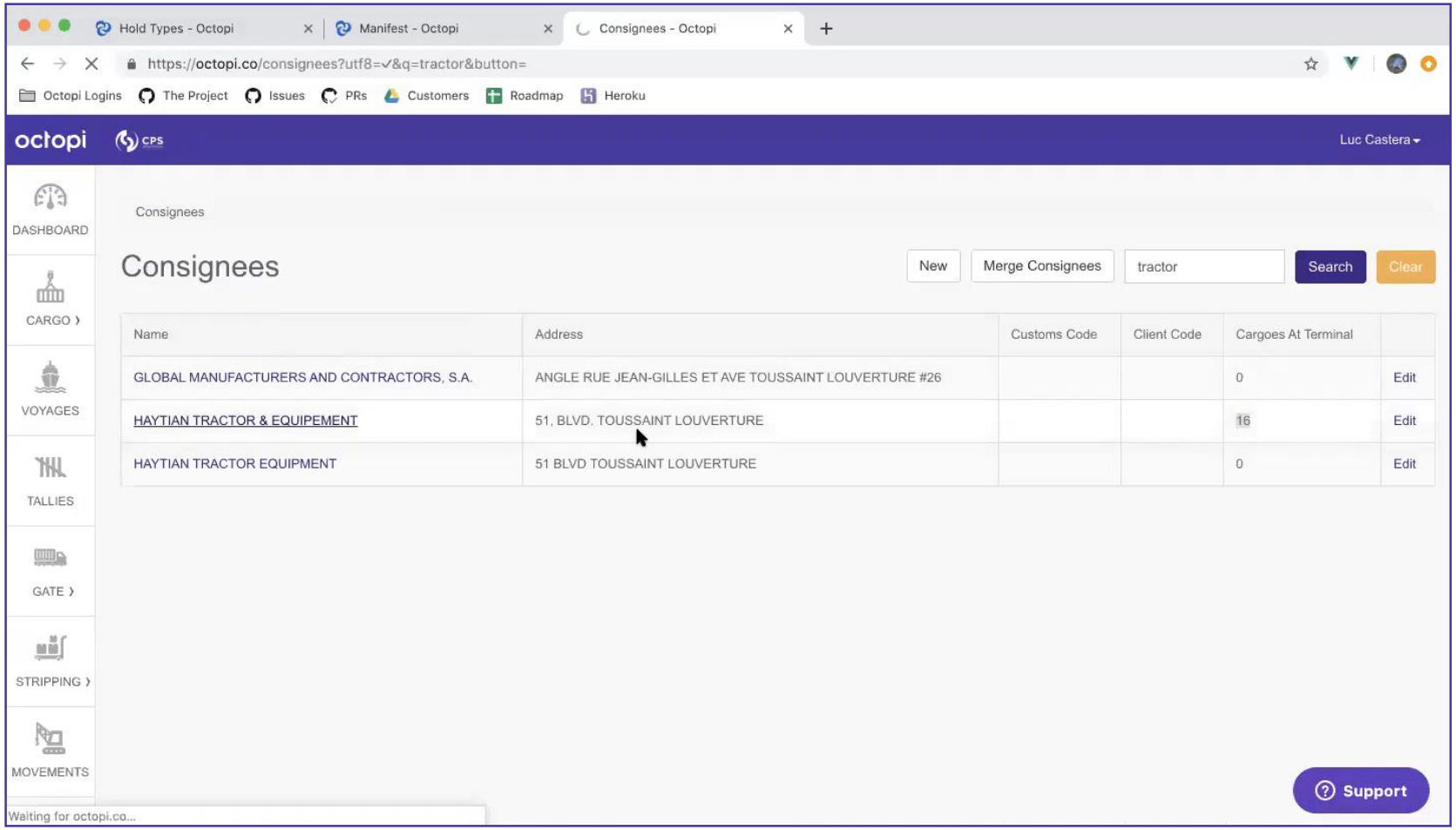
FEE & PAYMENT TRANSPARENCY



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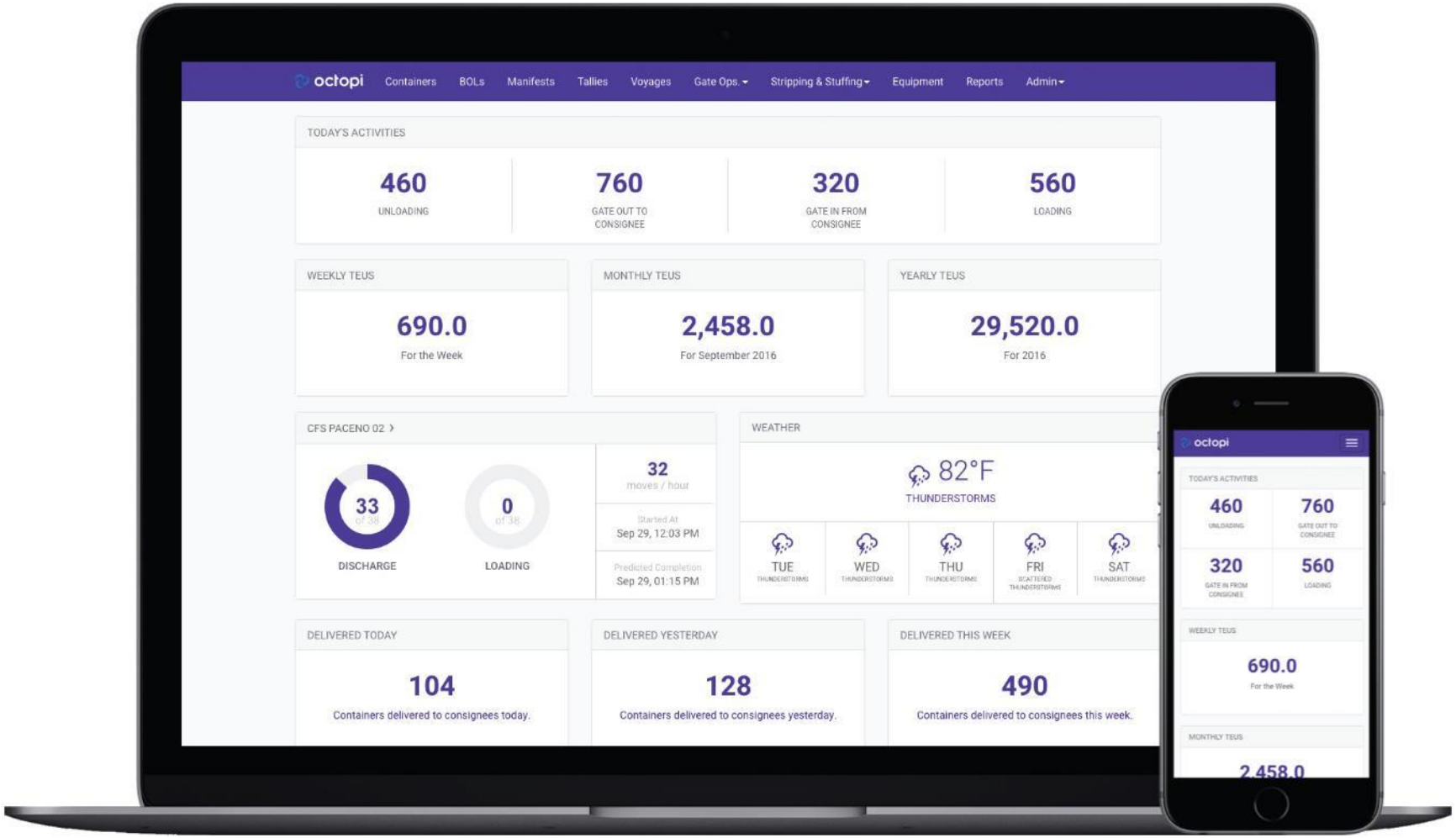
EASE OF ACCESS



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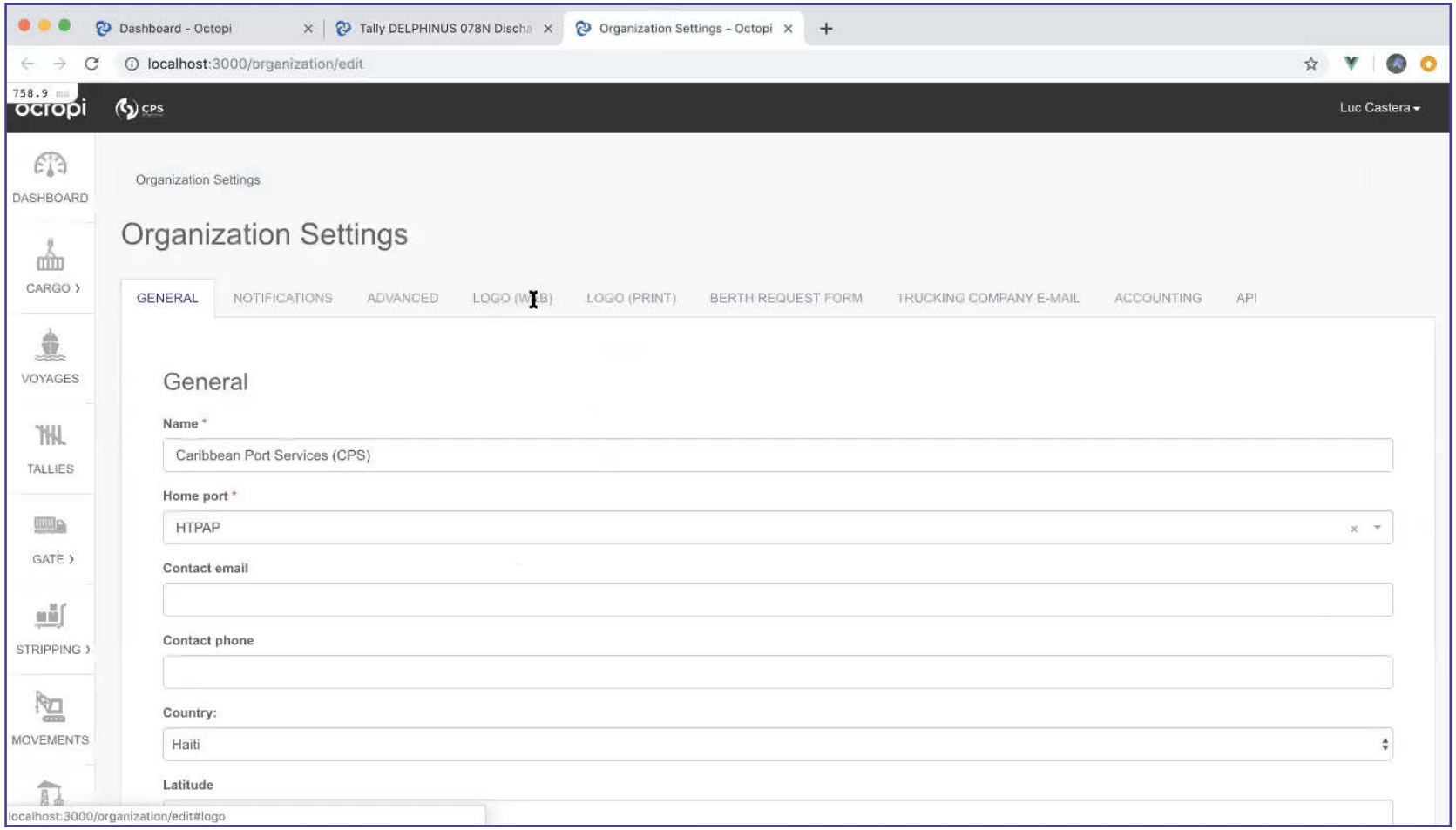
EASY CONFIGURATION



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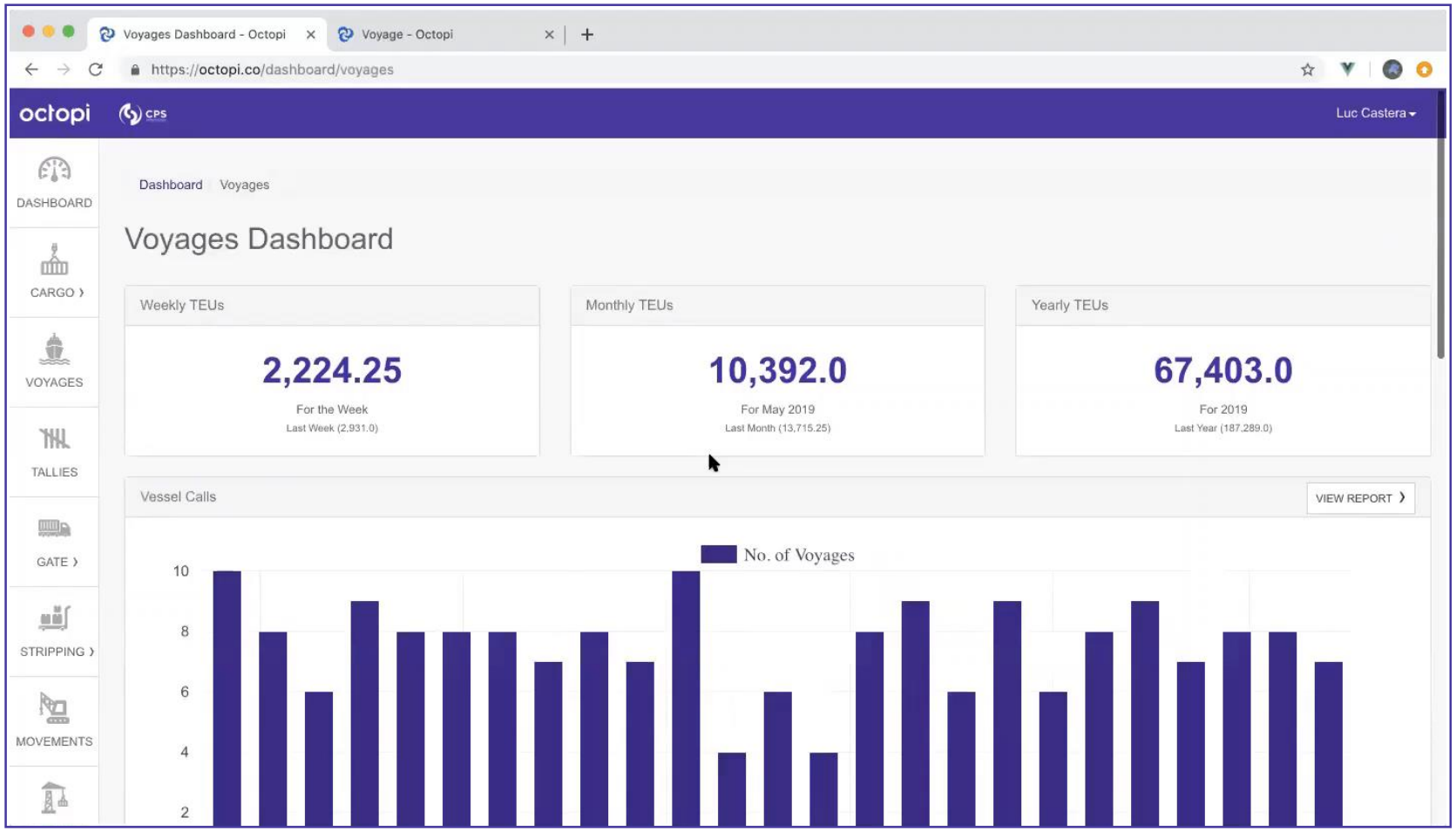
QUICK USER ONBOARDING



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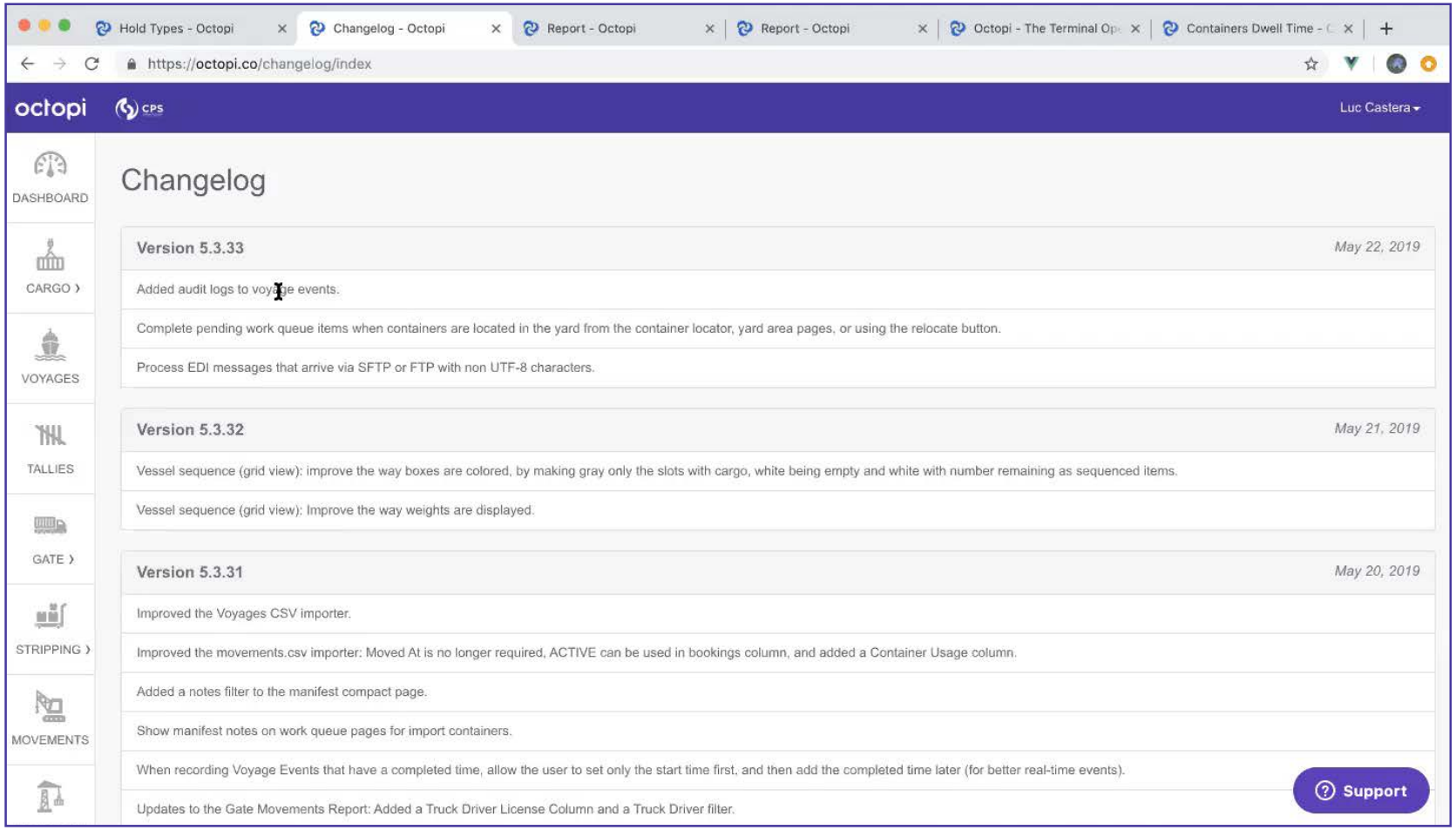
AVOID HIDDEN COSTS



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CASE STUDY: CARIBBEAN PORT SERVICES, HAITI

octopi

octopi.co

CASE STUDY: CARIBBEAN PORT SERVICES, HAITI

50% WITH **100%**

Productivity INCREASE

UPTIME Since October 2015

(Including through Hurricane Matthew)

octopi

octopi.co

ARTIFICIAL INTELLIGENCE AT THE PORT

Will machine learning be useful for ports?

navis®

COMBINATORIAL EXPLOSION

$8*10^{67}$

>

10^{50}

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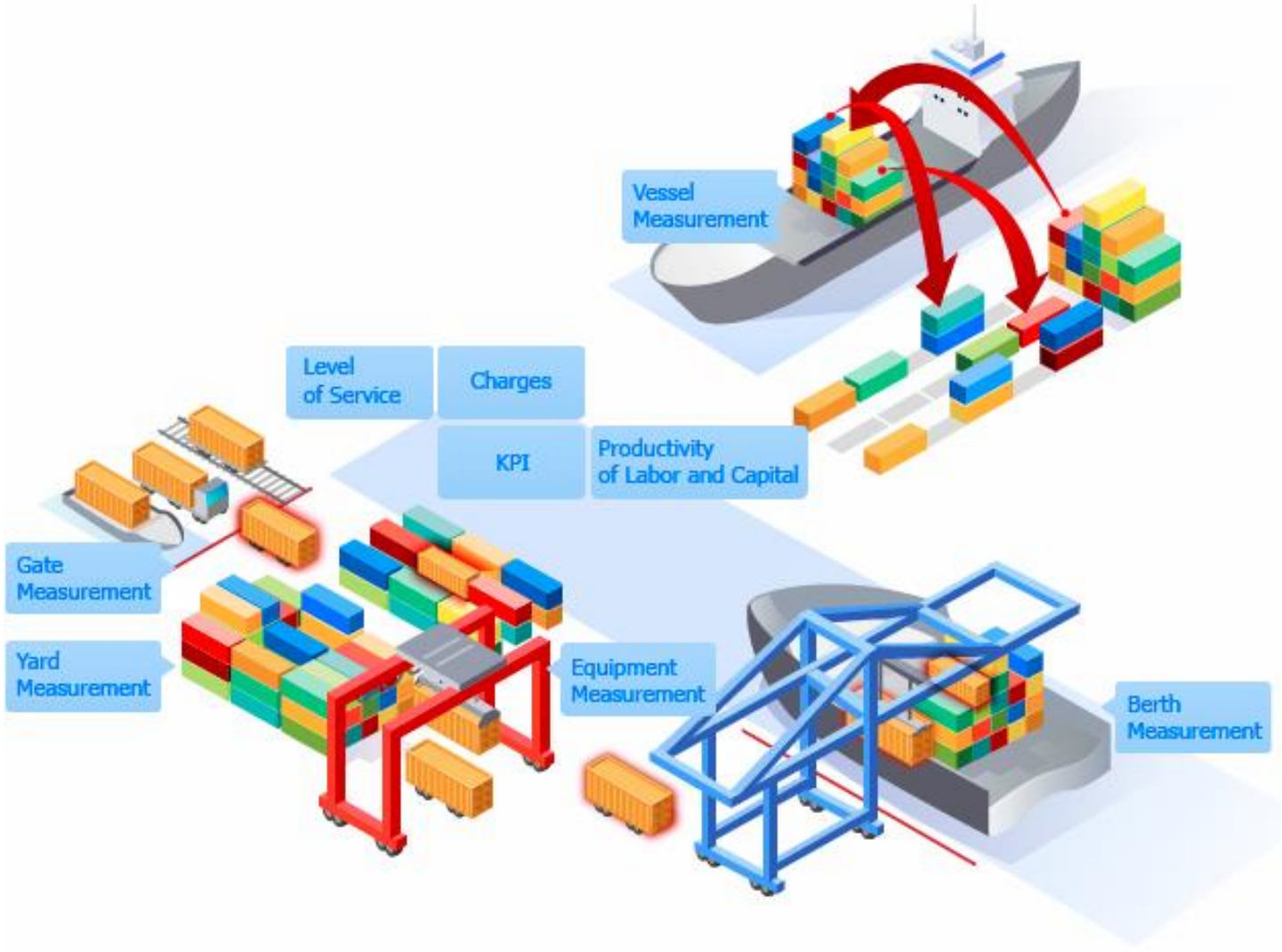
TERMINAL DECISIONS



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TERMINAL DECISIONS

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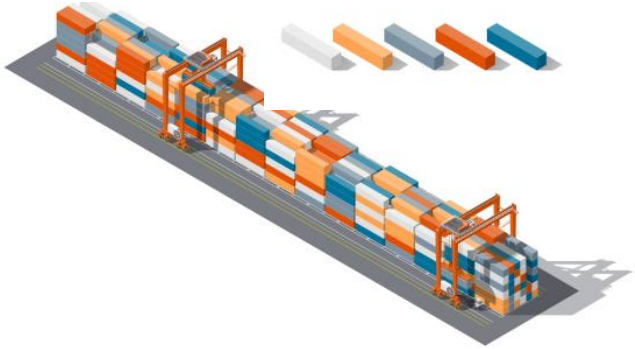
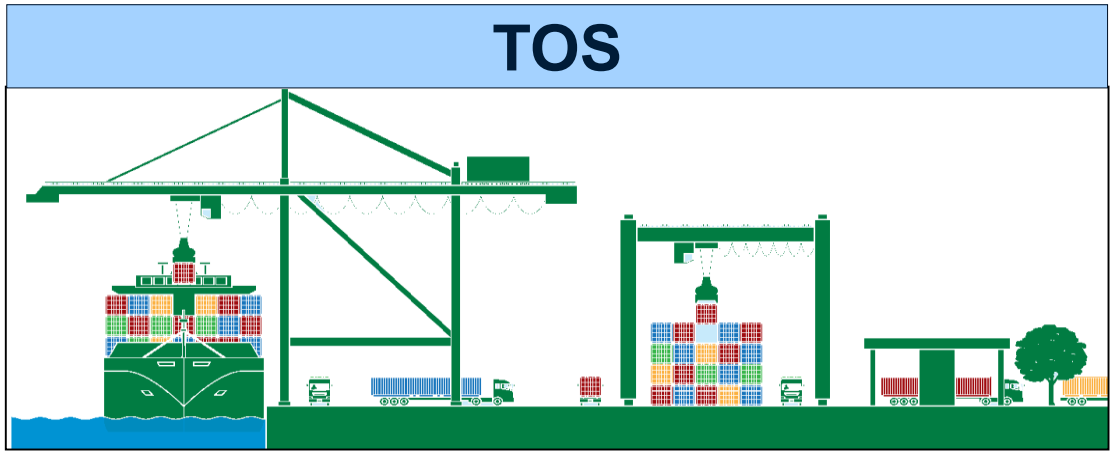
Vessel Planning

Equipment Scheduling



Yard Planning &
Container Inventory

Berth Planning



Gate Management

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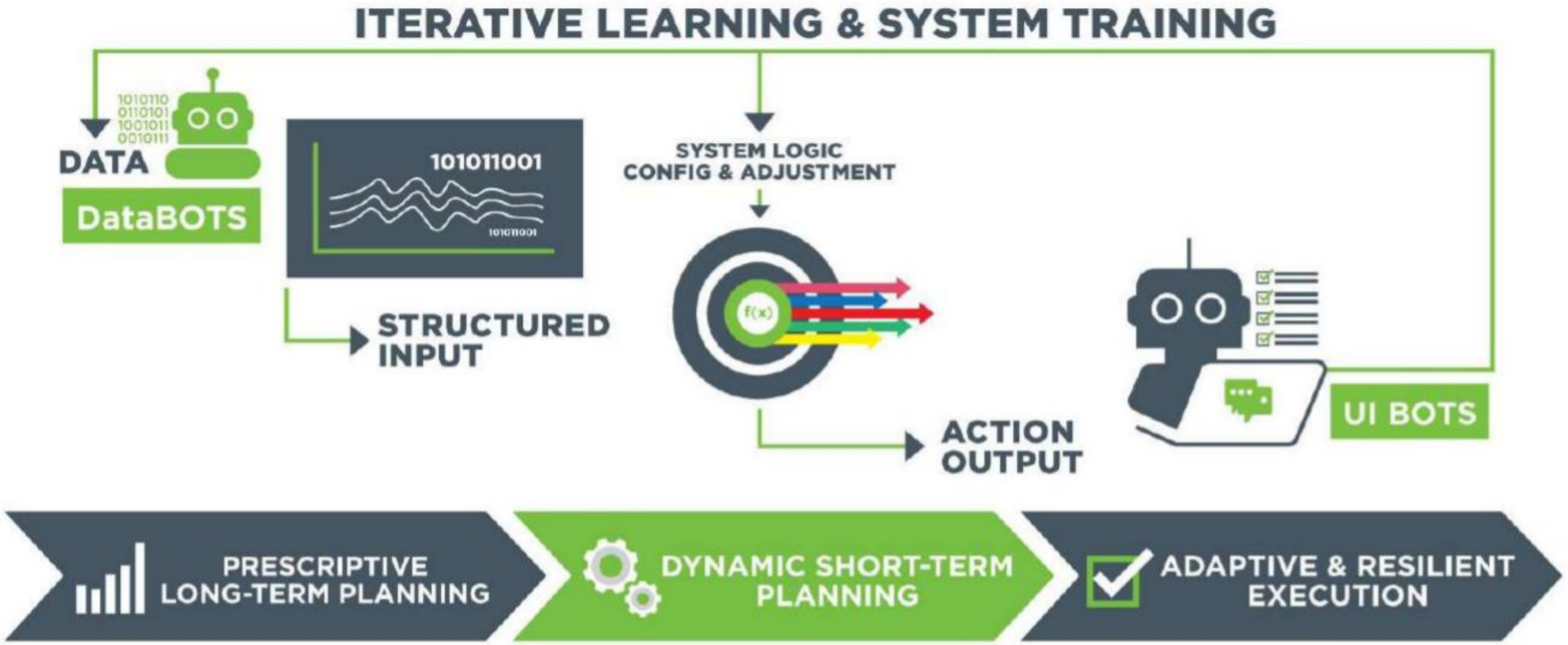
MACHINE LEARNING CAN HELP



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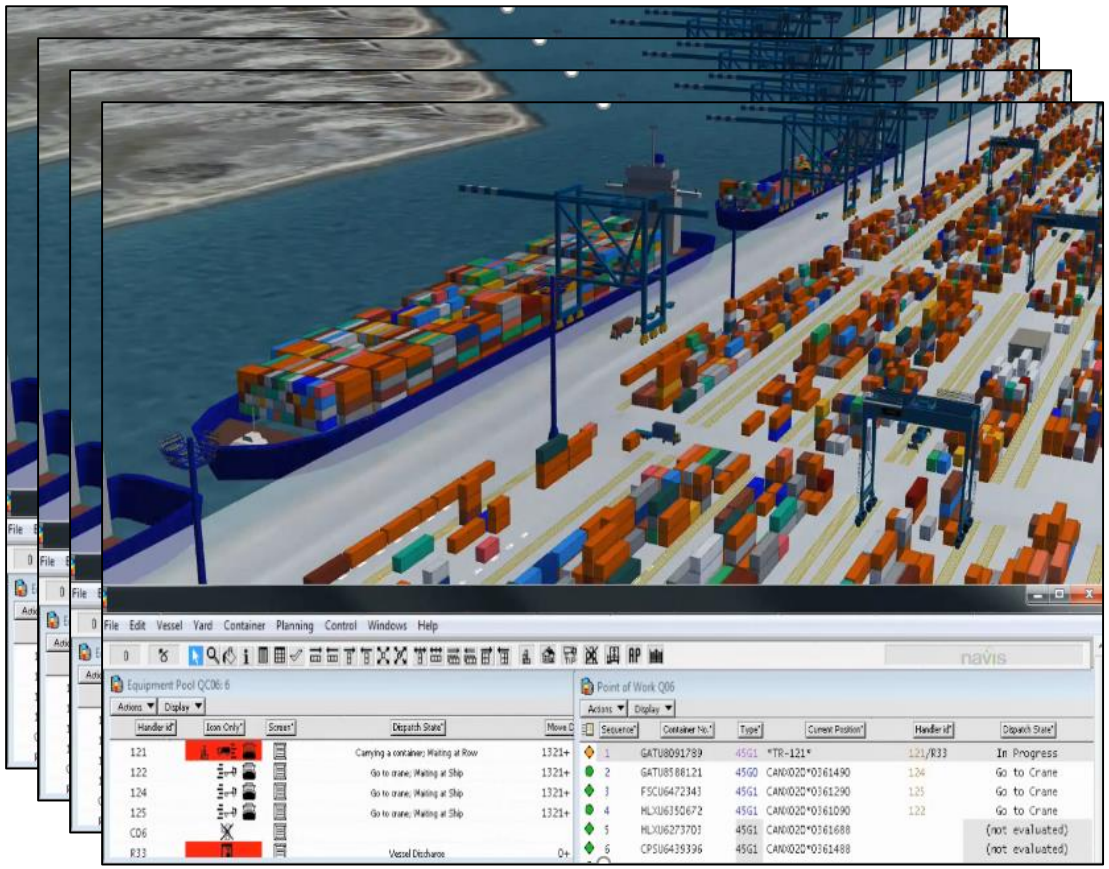
TERMINAL VIRTUALIZATION WITH ML

ML + LOWER OVERHEAD + BETTER MODELS =



HIGHER QUALITY FEEDBACK MORE DATA

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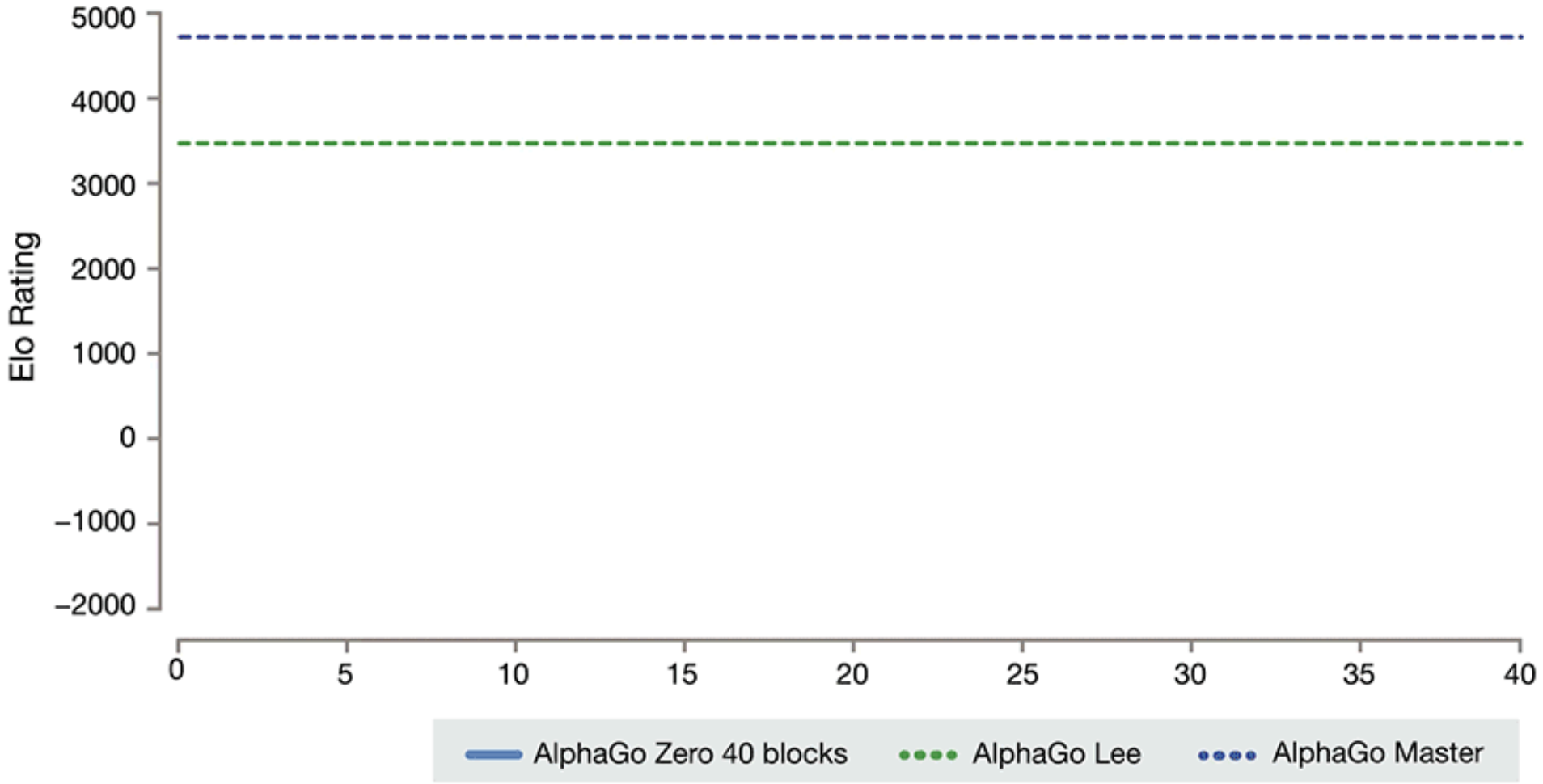
WITH PRACTICE COMES MASTERY



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INSTANT AND COMPLETE KNOWLEDGE

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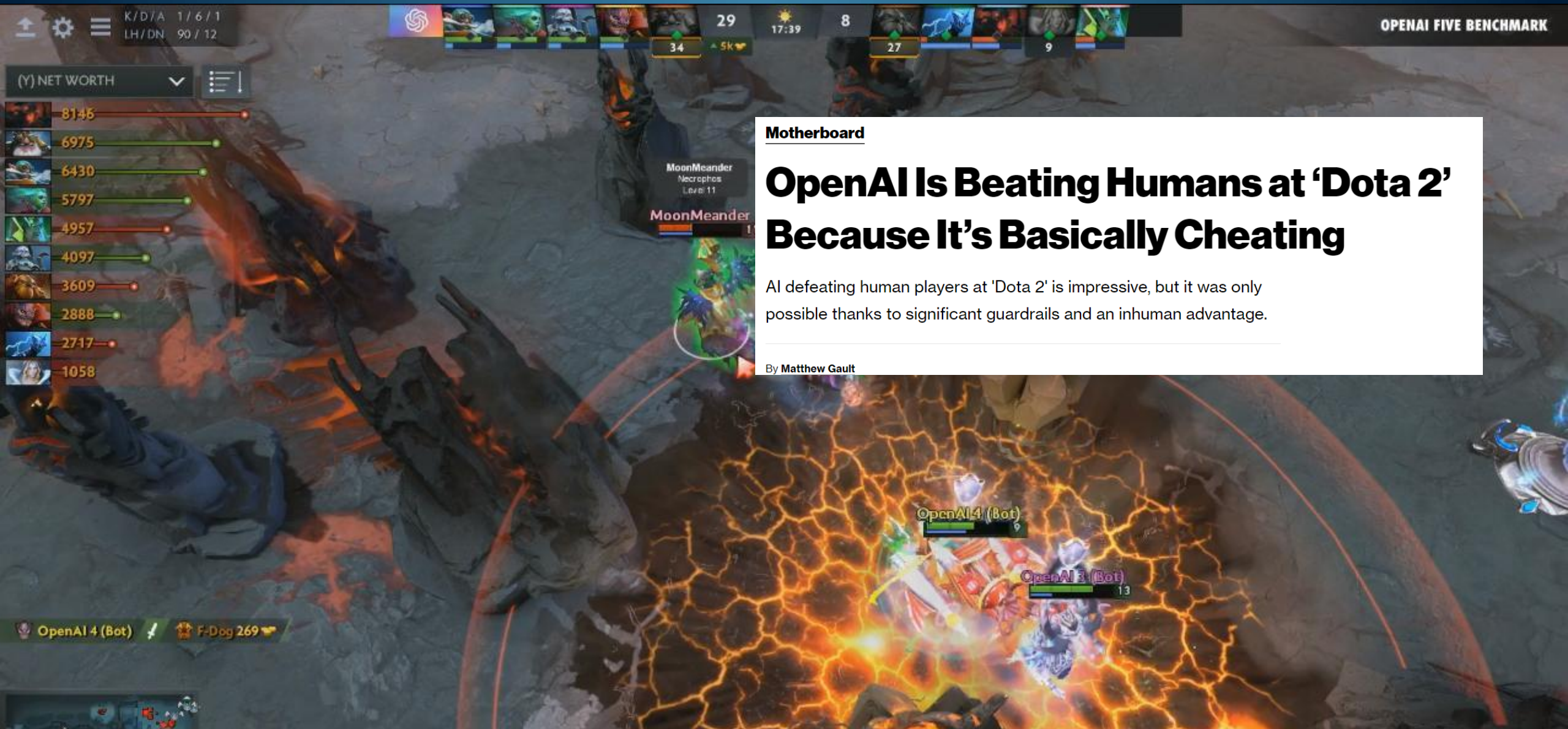

Motherboard

OpenAI Is Beating Humans at 'Dota 2' Because It's Basically Cheating

AI defeating human players at 'Dota 2' is impressive, but it was only possible thanks to significant guardrails and an inhuman advantage.

By **Matthew Gault**

INTRODUCING NAVIS SMART

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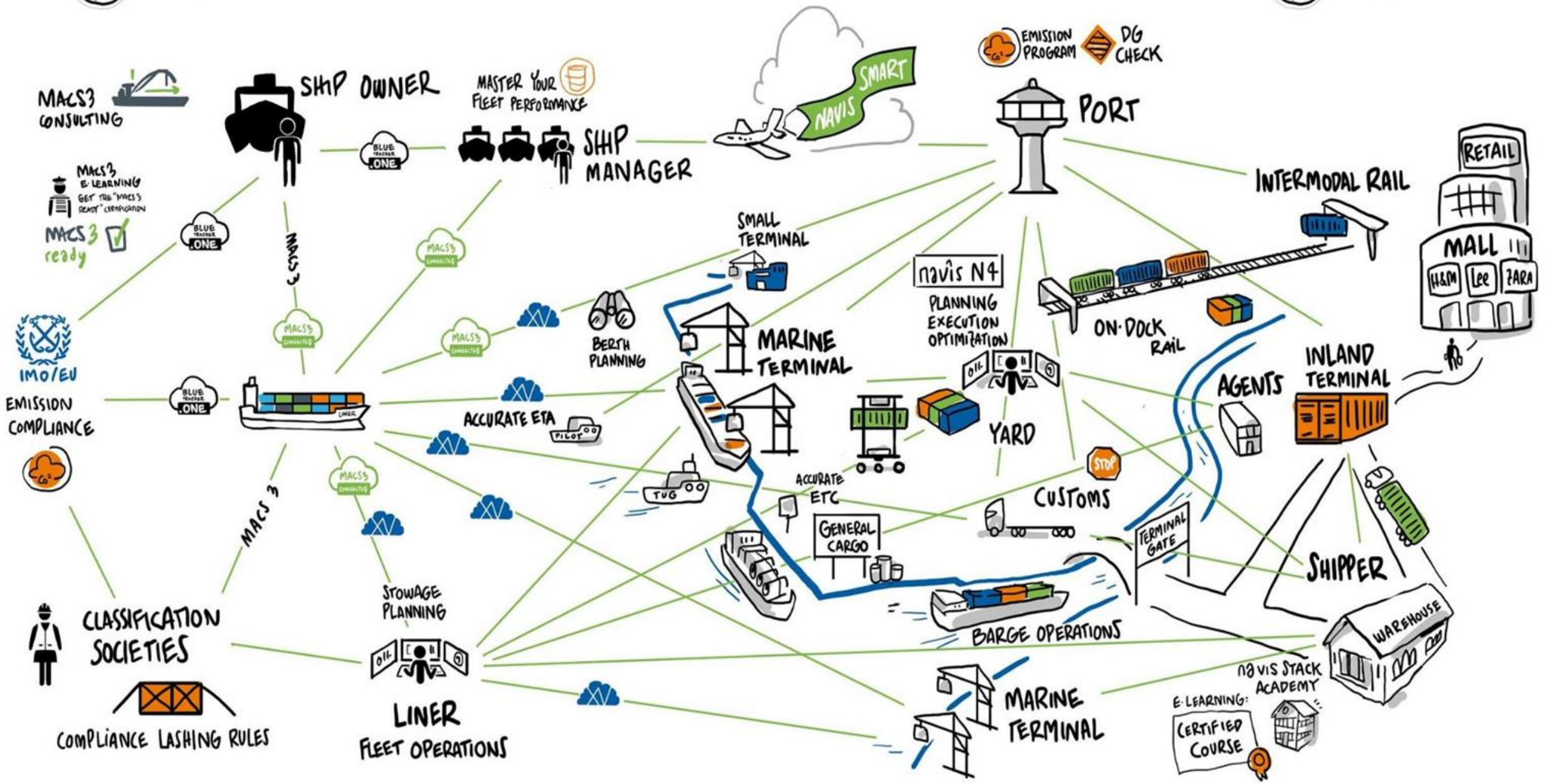
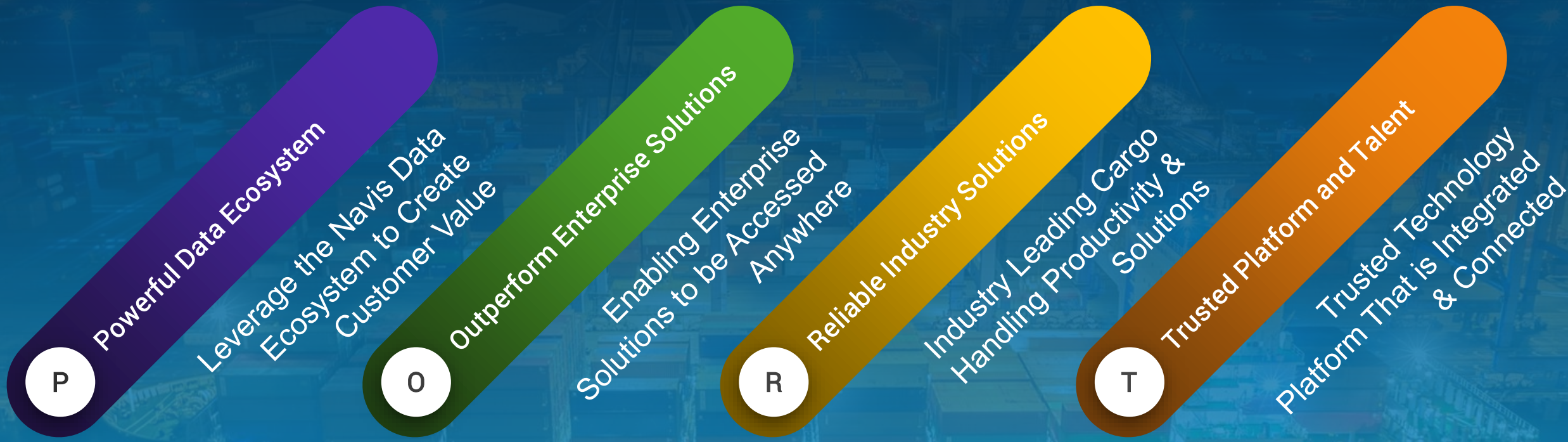
navis WORLD 19

CONNECTED ECOSYSTEM

navis WORLD 19



PORT Strategy Pillars



Navis Smart

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3rd Party Integration | Analytics | Customs | Predictive Diagnosis

Berth Window Management | Compass Visual Planning | XVELA | Truck Appointment System

Apps and Services

What Services and Apps do you need?

AI Enabled Learning System

Templates & Ecosystem

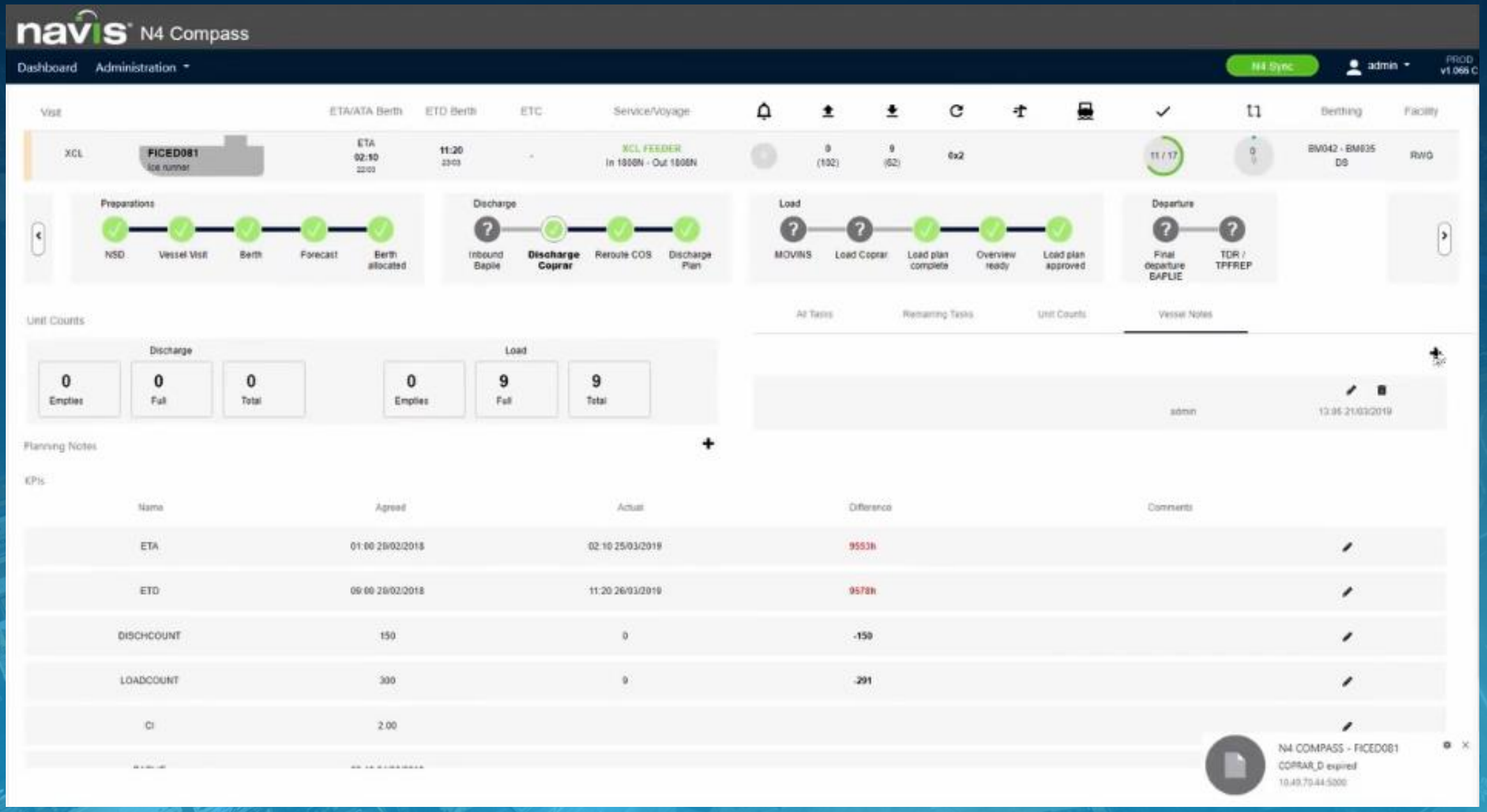
What data creates a value chain?

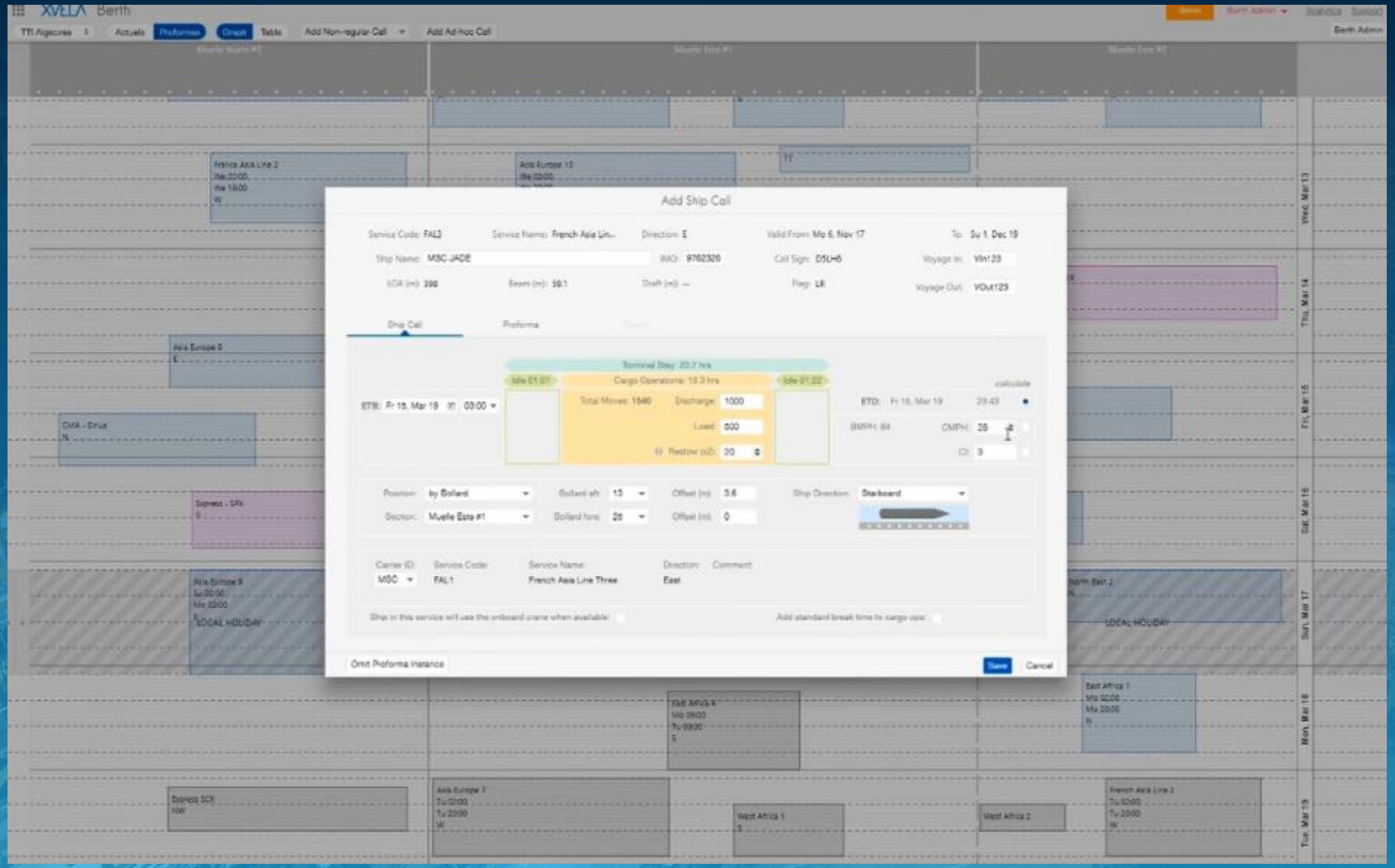
N4 Platform TOS Engine

Build on the investment without jeopardizing operational reliability

What core capabilities are important to your business?

On-Premise/Cloud/Hybrid


navis N4 Compass
Dashboard
Administration
N4 Sync
admin
Visit
ETA/ATA Berth
ETD Berth
ETC
Service/Voyage
Berthing
Facility
XCL
FICED081
ETA
02:10
11:20
XCL FEEDER
In 1808N - Out 1808N
BM042 - BM035
DS
RWG
Preparations
NSD
Vessel Visit
Berth
Forecast
Berth allocated
Discharge
Inbound Baplie
Discharge Coprar
Reroute COS
Discharge Plan
Load
MOVINS
Load Coprar
Load plan complete
Overview ready
Load plan approved
Departure
Final departure BAPLIE
TDR / TPFREP
Unit Counts
Discharge
0
Empties
0
Full
0
Total
Load
0
Empties
9
Full
9
Total
All Tasks
Remaining Tasks
Unit Counts
Vessel Notes
admin
Planning Notes
KPIs
Name
Agreed
Actual
Difference
Comments
ETA
01:00 28/02/2018
02:10 25/03/2019
ETD
09:00 28/02/2018
11:20 26/03/2019
DISCHCOUNT
150
0
-150
LOADCOUNT
300
9
-291
CI
2.00
N4 COMPASS - FICED081
COPRAR_D expired


Berth
Actuals
Proforma
Omit
Table
Add Non-regular Call
Add Ad-hoc Call
Add Ship Call
Service Code: FAL3
Service Name: French Asia Lin...
Direction: E
Valid From: Mo 6, Nov 17
To: Su 1, Dec 19
Ship Name: MSC JADE
IMO: 9762326
Call Sign: D5LH6
Voyage In: Vin123
LOA (m): 299
Beam (m): 59.1
Draft (m): --
Flag: LR
Voyage Out: VOut123
Ship Call
Proforma
Terminal Stay: 20.2 hrs
Idle 01.01
Cargo Operations: 18.3 hrs
Idle 01.22
ETB: Fr 15, Mar 19 03:00
Total Moves: 1540
Discharge: 1000
Load: 600
Restow (x2): 20
ETD: Fr 15, Mar 19 23:43
GMPH: 84
CMPH: 28
Cl: 3
Position: by Bollard
Bollard aft: 15
Offset (m): 3.6
Ship Direction: Starboard
Section: Muelle Este #1
Bollard fore: 25
Offset (m): 0
Carrier ID: MSC
Service Code: FAL1
Service Name: French Asia Line Three
Direction: East
Comment:
Ships in this service will use the onboard crane when available:
Add standard break time to cargo ops:
Omit Proforma Instance
Save
Cancel
Wed, Mar 13
Thu, Mar 14
Fri, Mar 15
Sat, Mar 16
Sun, Mar 17
Mon, Mar 18
Tue, Mar 19

Navis Smart Apps

Blue Tracker One

MACS3 Connected

BERTH Window Planning

Compass Visual Planning

XVELA Stowage Collaboration

Control Room

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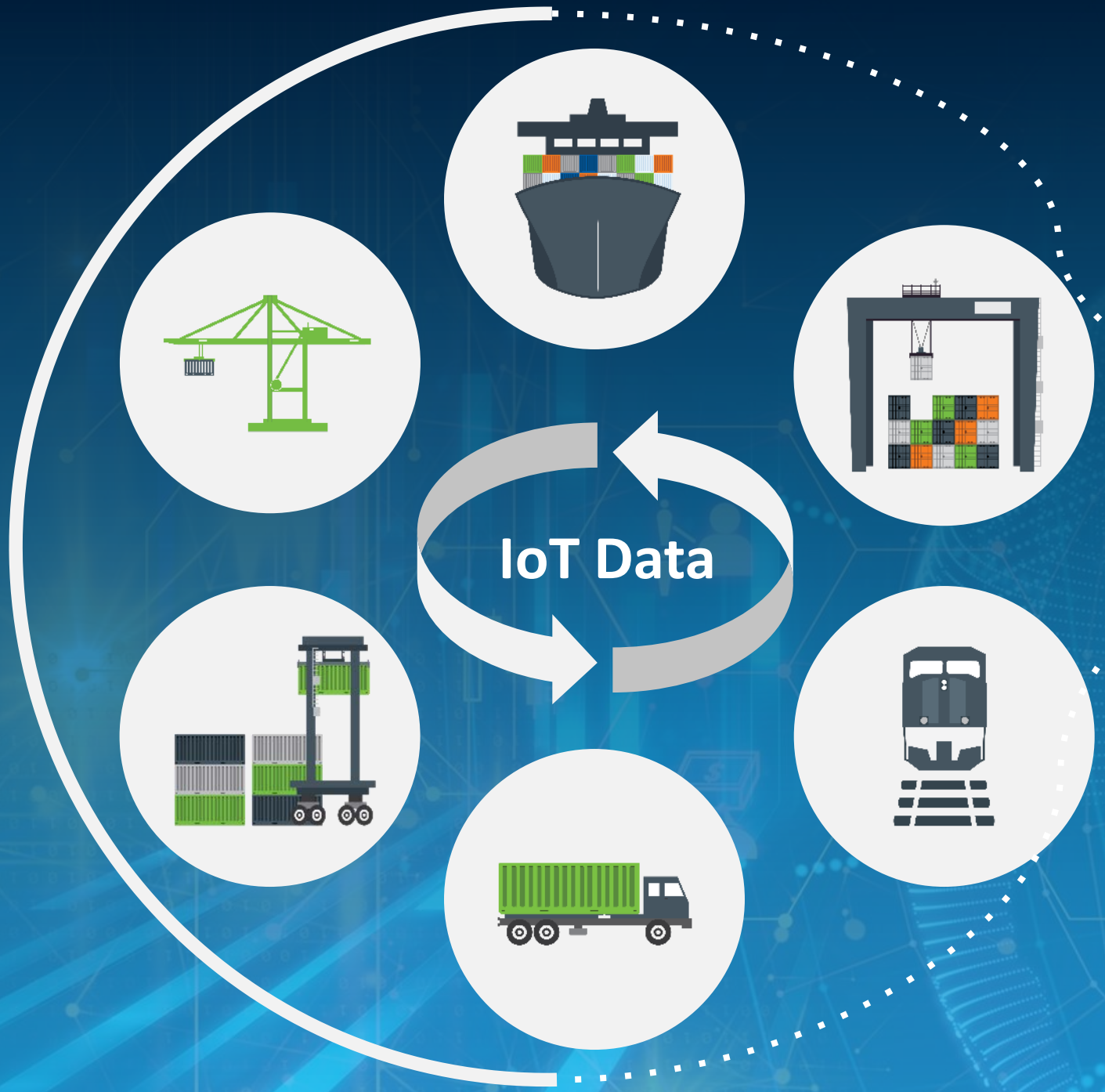

Machine Learning Capabilities with Navis Smart

- Dynamically Set Software Parameters
- Predict Cargo Volume, Mode, Timing, Cost/Revenue
- Augment Decision Making With Data
- Recommend Actions for The Control Room

Let’s take a look at an example of how data is being used to make decisions every second.

navis
West Front Street
East Front Street
East Front Street
North Main Street
Avenue A
Avenue B
Avenue C
BR02
BR03
BR04
BR05
BR07
BR08
BR09
BR10
BR12
BR13
BR14
BR15
BR17
BR18
BR19
BR20
BR21
BR22
BR23
BR24
West Broadway
East Broadway
Admin
South Main Street
Entry Way
Trackfront Stret
East Broadway
OCR Out
Gate In
Gate Out
OCR In
Carlos St
Navis Way

Key Takeaways

Navis Smart is the Ecosystem behind the Next Generation TOS.

Navis Smart enables its users to leverage artificial intelligence and machine learning to provide insights that were not possible before.

2019 集装箱码头自动化推进与技术交流会
Container Terminal Automation Promotion and Technology Seminar

主办单位：中国港口协会集装箱分会 | 招商局港口集团股份有限公司 | 中国港口杂志社

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