

# SUPERCHARGING NEXT GEN PORTS WITH AI AND CLOUD COMPUTING

**17<sup>th</sup> ASEAN**  
PORTS & SHIPPING  
2019



**SKILLED WORKFORCE**



**ADVANCED INFRASTRUCTURE**



## **WHERE ARE PORTS INVESTING?**



**AUTOMATED EQUIPMENT**



**SMART SOFTWARE ECOSYSTEM**



# PORT TECHNOLOGY ADOPTION

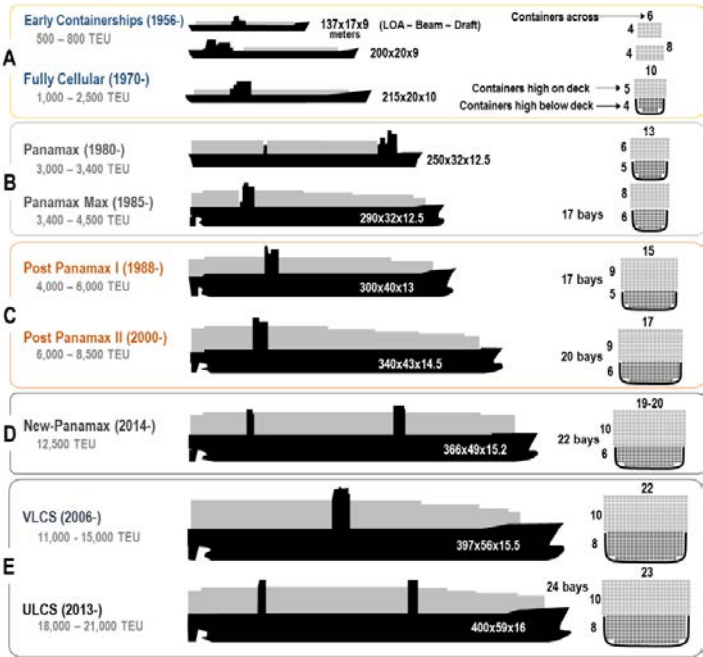
How ports have use technology to  
manage growth





# PORT TRENDS: VESSEL SIZE

4,600  
TEU



22,000  
TEU  
~5x



SHIP SIZE INCREASE  
Source: <https://transportgeography.org>

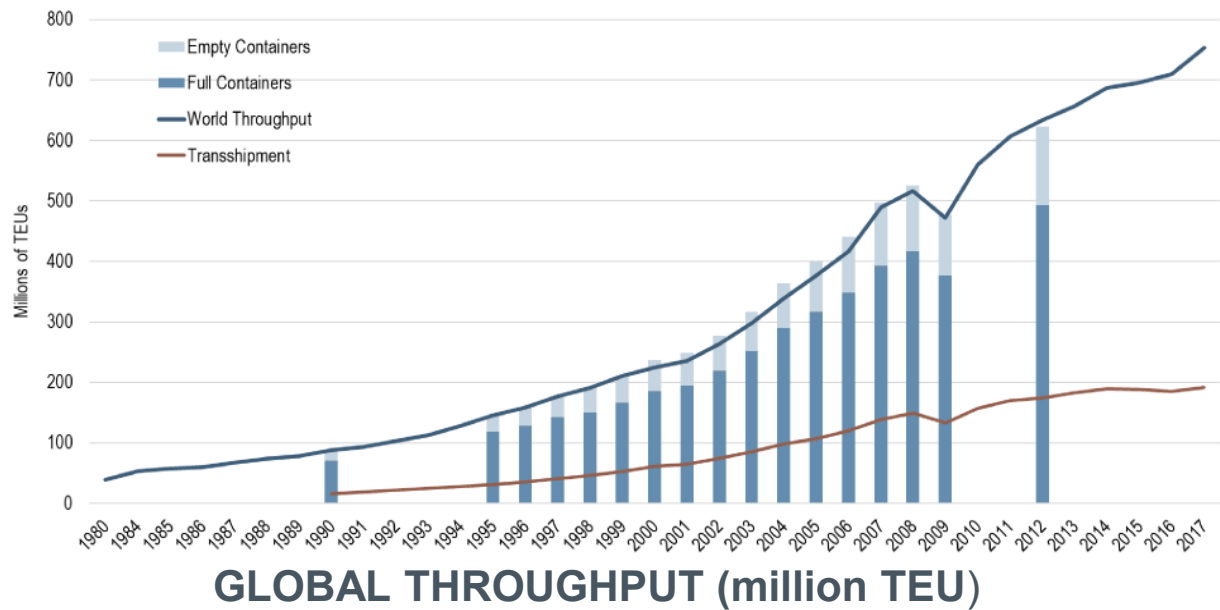
1988  
navis founded

2018



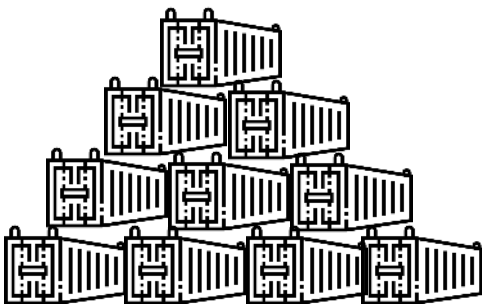
# PORT TRENDS: GLOBAL THROUGHPUT

75m  
TEU



Source: Drewry's

784m  
TEU  
~10x



1988

navis founded



2018

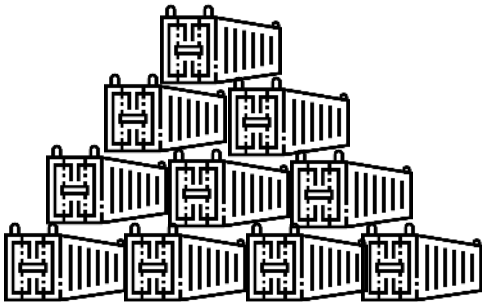


# PORT TRENDS: WORLD'S LARGEST PORT

HONG KONG  
4mTEU



SHANGHAI  
42.01mTEU  
~10x



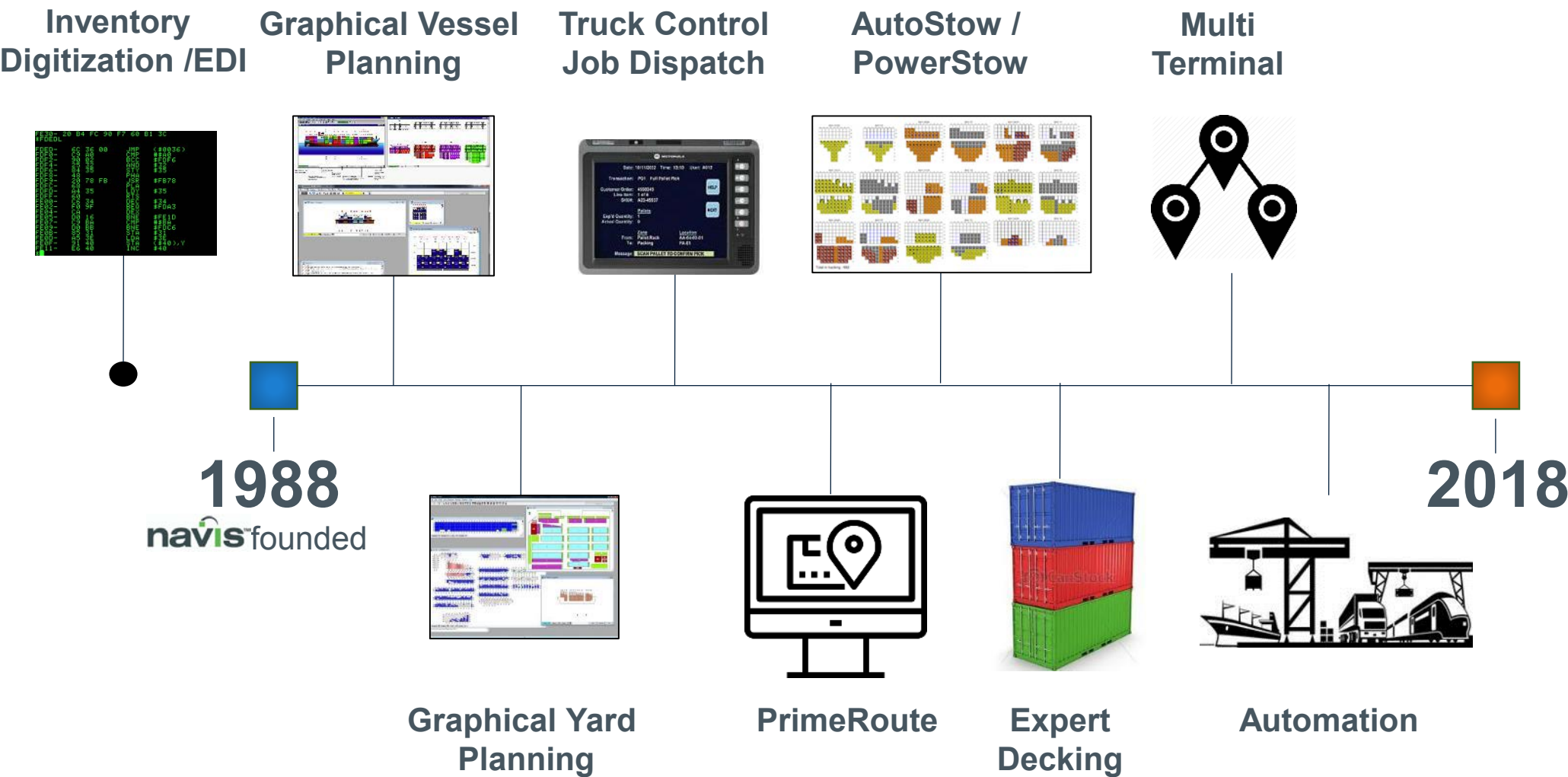
PORT OF SHANGHAI THROUGHPUT  
Source:SCMP

1988  
navis founded

2018

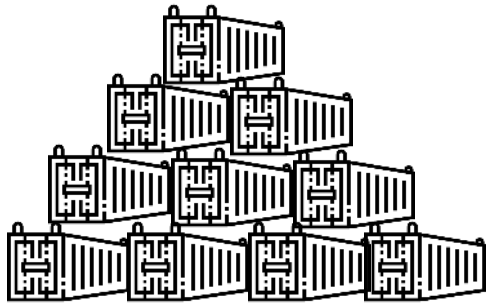



# PORT TECH EVOLUTION





# THE NEXT GENERATION




  
**2018**

**Smarter  
Software**

Infrastructure,  
Equipment,  
People



  
**2048**





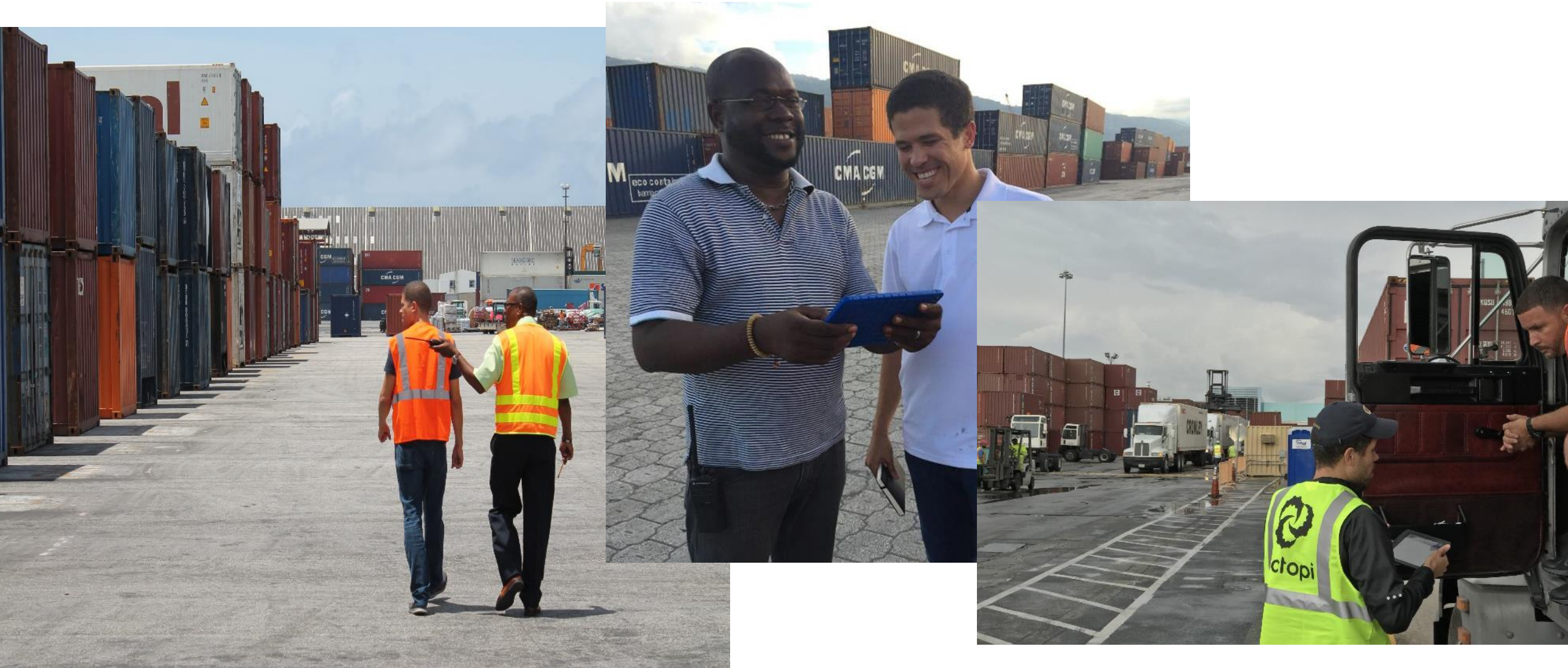
# TOS CLOUD SERVICES WITH OCTOPI

Cloud platform for terminals starting  
digitalization



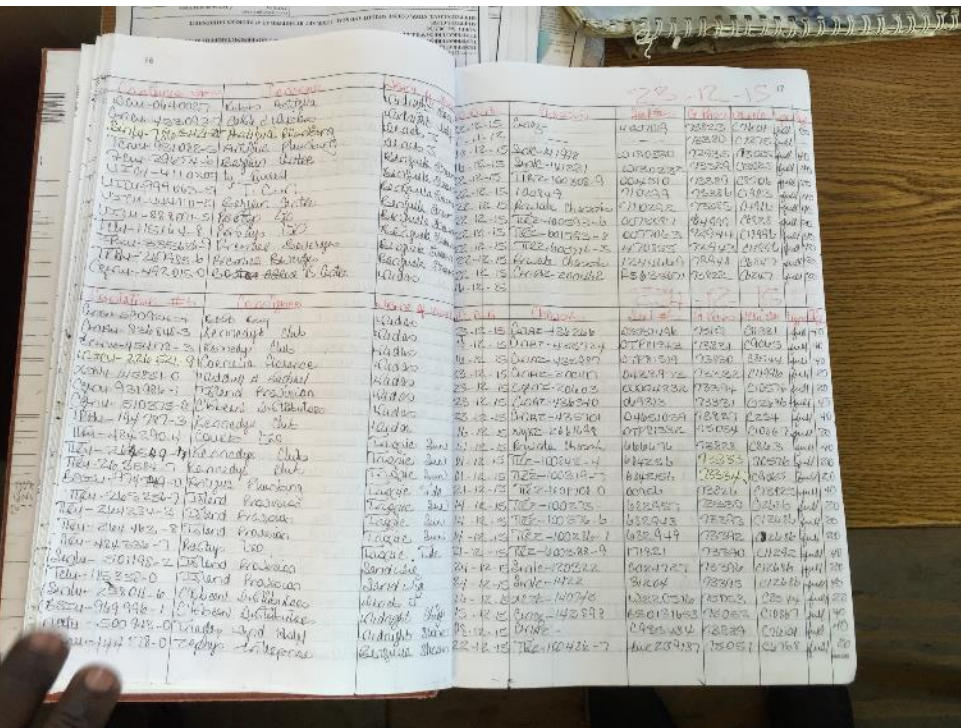
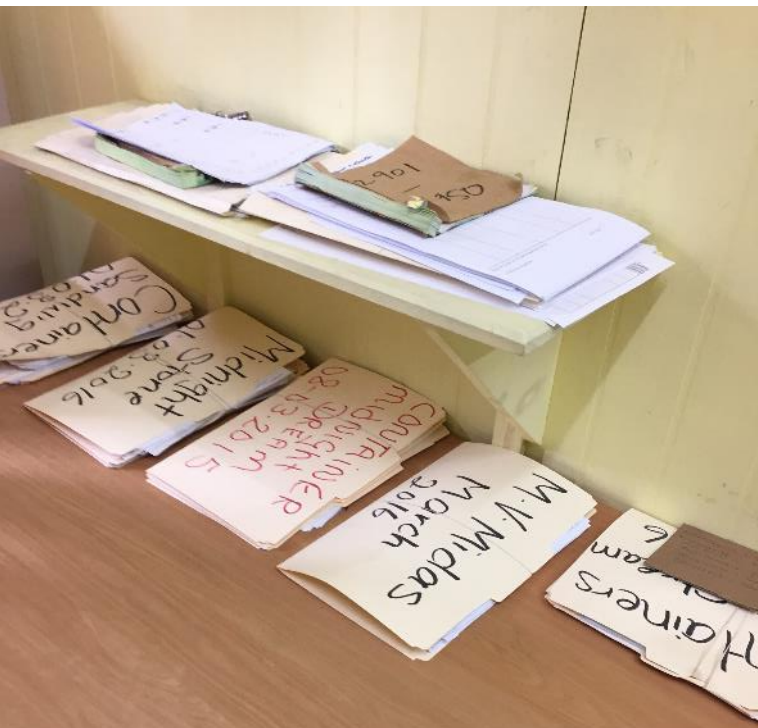


# SMALL TO MEDIUM SIZED MIXED MODE TERMINALS



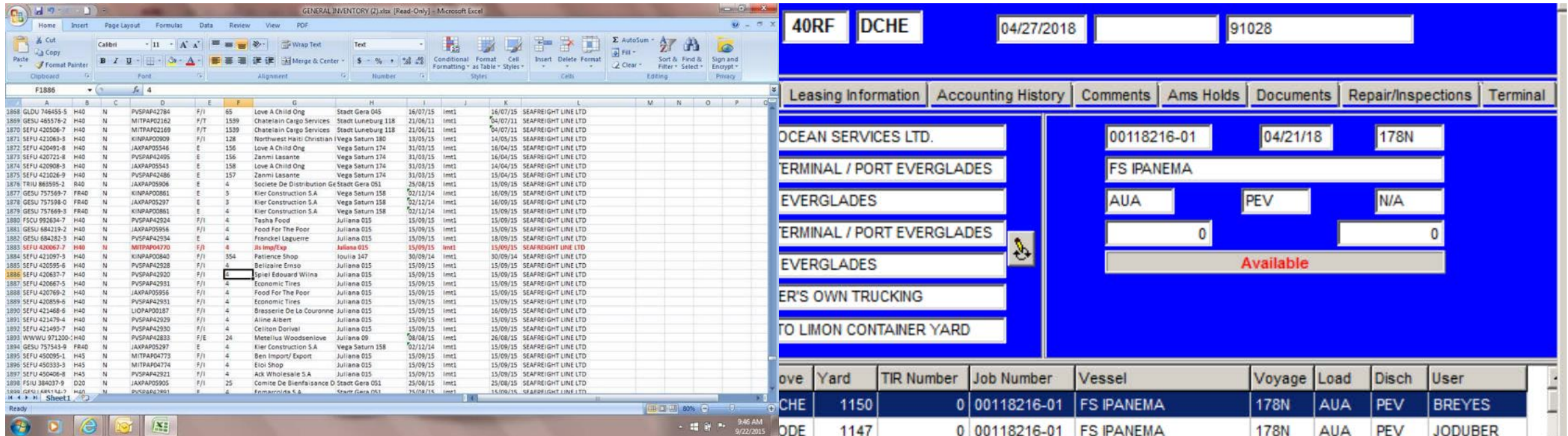


# MANUAL PAPER PROCESSES





# AND HARD TO MAINTAIN SOFTWARE SYSTEMS



GENERAL INVENTORY (2).xlsx [Read-Only] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View PDF

Calibri 11 A Font Text Wrap Text Merge & Center

Clipboard Paste Copy Format Painter Clipboard Font Alignment Number Styles Cells

Conditional Formatting Styles Cells Insert Delete Format AutoSum Fill Sort & Find & Select Sign and Encrypt

Editing Privacy

F1886 4

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1868	GLDU 746455-5	H40	N	PVSPAP42784	F/I	65	Love A Child Ong	Stadt Gera 045	16/07/15	Imct1	16/07/15	SEAFREIGHT LINE LTD			
1869	GESU 465576-2	H40	N	MITPAP02162	F/I	1539	Chatelein Cargo Services	Stadt Luneburg 118	21/06/11	Imct1	04/07/11	SEAFREIGHT LINE LTD			
1870	SEFU 420506-7	H40	N	MITPAP02169	F/I	1539	Chatelein Cargo Services	Stadt Luneburg 118	21/06/11	Imct1	04/07/11	SEAFREIGHT LINE LTD			
1871	SEFU 421064-8	H40	N	KINPAP09009	F/I	128	Northwest Haiti Christian	Vega Saturn 180	18/05/15	Imct1	14/05/15	SEAFREIGHT LINE LTD			
1872	SEFU 420491-8	H40	N	JAKPAP05546	E	156	Love A Child Ong	Vega Saturn 174	31/03/15	Imct1	16/04/15	SEAFREIGHT LINE LTD			
1873	SEFU 420721-8	H40	N	PVSPAP42495	E	156	Zanmi Lasante	Vega Saturn 174	31/03/15	Imct1	16/04/15	SEAFREIGHT LINE LTD			
1874	SEFU 420908-3	H40	N	JAKPAP05543	E	158	Love A Child Ong	Vega Saturn 174	31/03/15	Imct1	14/04/15	SEAFREIGHT LINE LTD			
1875	SEFU 421026-9	H40	N	PVSPAP42486	E	157	Zanmi Lasante	Vega Saturn 174	31/03/15	Imct1	15/04/15	SEAFREIGHT LINE LTD			
1876	TRIU 863595-2	H40	N	JAKPAP05906	E	4	Societe De Distribution Ge	Stadt Gera 051	25/08/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1877	GESU 757569-7	FR40	N	KINPAP08061	E	3	Kier Construction S.A	Vega Saturn 158	02/12/14	Imct1	16/09/15	SEAFREIGHT LINE LTD			
1878	GESU 757598-0	FR40	N	JAKPAP05297	E	3	Kier Construction S.A	Vega Saturn 158	02/12/14	Imct1	16/09/15	SEAFREIGHT LINE LTD			
1879	GESU 757669-3	FR40	N	KINPAP08061	E	4	Kier Construction S.A	Vega Saturn 158	02/12/14	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1880	FSCU 992634-7	H40	N	PVSPAP42924	F/I	4	Tasha Food	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1881	GESU 684219-2	H40	N	JAKPAP05956	F/I	4	Food For The Poor	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1882	GESU 684282-3	H40	N	PVSPAP42934	E	4	Franckel Laguerre	Juliana 015	15/09/15	Imct1	16/09/15	SEAFREIGHT LINE LTD			
1883	SEFU 420667-7	H40	N	MITPAP04070	F/I	4	Jls Imp/Exp	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1884	SEFU 421097-3	H40	N	KINPAP08040	F/I	354	Pattence Shop	Ioulia 347	30/09/14	Imct1	30/09/14	SEAFREIGHT LINE LTD			
1885	SEFU 420559-6	H40	N	PVSPAP42920	F/I	4	Bellazine Dins	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1886	SEFU 420637-7	H40	N	PVSPAP42920	F/I	4	Spiel Edouard Wilna	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1887	SEFU 420667-5	H40	N	PVSPAP42931	F/I	4	Economic Tires	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1888	SEFU 420769-2	H40	N	JAKPAP05956	F/I	4	Food For The Poor	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1889	SEFU 420859-6	H40	N	PVSPAP42931	F/I	4	Economic Tires	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1890	SEFU 421468-6	H40	N	LIOPAP00187	F/I	4	Brasserie De La Couronne	Juliana 015	15/09/15	Imct1	16/09/15	SEAFREIGHT LINE LTD			
1891	SEFU 421479-4	H40	N	PVSPAP42929	F/I	4	Aline Albert	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1892	SEFU 421497-7	H40	N	PVSPAP42930	F/I	4	Celton Dorival	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1893	WWUW 971200-H40	N	PVSPAP42933	F/E	24	Mereilus Woodsenlowe	Juliana 09	26/08/15	Imct1	26/08/15	SEAFREIGHT LINE LTD				
1894	GESU 757543-9	FR40	N	JAKPAP05297	E	4	Kier Construction S.A	Vega Saturn 158	02/12/14	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1895	SEFU 450095-1	H45	N	MITPAP04773	F/I	4	Ben Import/Export	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1896	SEFU 450393-3	H45	N	MITPAP04774	F/I	4	Eloi Shop	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1897	SEFU 450406-8	H45	N	JAKPAP42921	F/I	4	Ask Wholesale S.A	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			
1898	FSUJ 384037-9	D20	N	JAKPAP05905	F/I	25	Comite De Bienfaisance D	Stadt Gera 051	25/08/15	Imct1	25/08/15	SEAFREIGHT LINE LTD			
1899	GESU 421497-7	H40	N	PVSPAP42931	E	4	Ben Import/Export	Juliana 015	15/09/15	Imct1	15/09/15	SEAFREIGHT LINE LTD			

Ready 9:46 AM 9/22/2015

40RF DCHE 04/27/2018 91028

Leasing Information Accounting History Comments Ams Holds Documents Repair/Inspections Terminal

OCEAN SERVICES LTD. 00118216-01 04/21/18 178N

TERMINAL / PORT EVERGLADES FS IPANEMA

EVERGLADES AUA PEV N/A

TERMINAL / PORT EVERGLADES 0 0

EVERGLADES Available

ER'S OWN TRUCKING

TO LIMON CONTAINER YARD

Yard	TIR Number	Job Number	Vessel	Voyage	Load	Disch	User
CHE 1150	0	00118216-01	FS IPANEMA	178N	AUA	PEV	BREYES
ODE 1147	0	00118216-01	FS IPANEMA	178N	AUA	PEV	JODUBER



# CHALLENGES OF MIXED CARGO TERMINALS

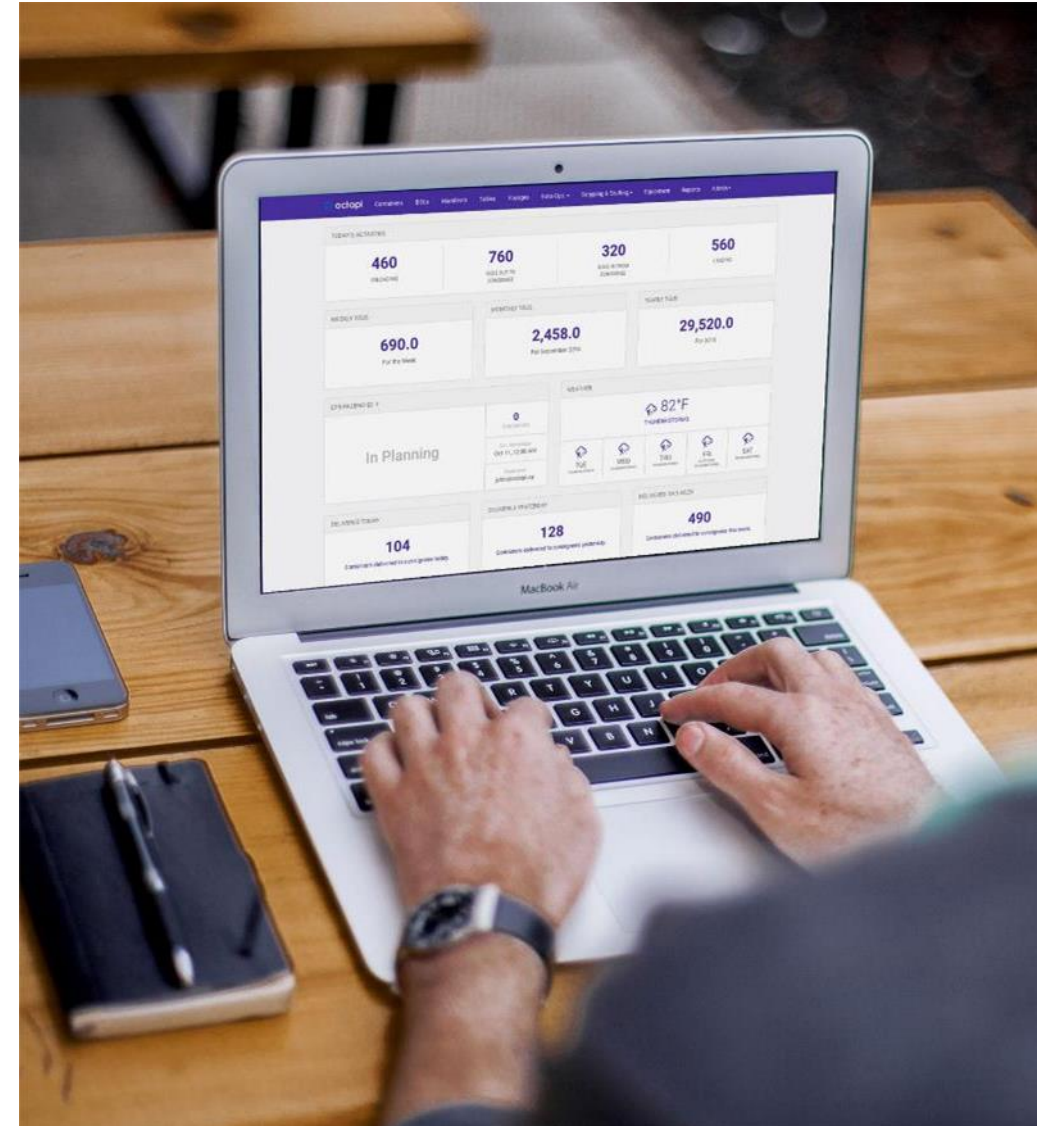
- Handle range of cargo type
- Long Truck Lines
- Accounting integration with TOS
- Measuring productivity
- Monitoring reefer containers
- Keeping customers happy
- Monitor operations in real-time
- Training employees
- Yard Planning
- Vessel Planning
- Maintenance & Repair
- Break Bulk & CFS Management
- 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



# INTRODUCING A CLOUD SOLUTION



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





# CARGO TRACKING & VISIBILITY



DASHBOARD

CARGO >

VOYAGES

TALLIES

GATE >

STRIPPING >

MOVEMENTS

octopi

cps

Luc Castera ▾

Movements

Search by container #

New Admin Movement

ALLGATESSTRIPPING & STUFFINGVOYAGESADMINDELETED

Status	Cargo	Movement	From	To	When
<div></div>	TCKU4732084 - 40DV	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:36:13 AM
<div>TCKU4732084 Loading</div> <div><div>User</div><div>Pierrot Antoine COARRI</div></div>					<div>DELETE</div> <div>EDIT</div>
<div></div>	CMAU8182441 - 40DV	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:34:15 AM
<div></div>	CMAU5214859 - 40HC	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:32:09 AM
<div></div>	CMAU6129242 - 40HC	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:29:34 AM
<div></div>	CRSU9075115 - 40HC	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:26:44 AM
<div></div>	CMAU5280505 - 40HC	Loading	Terminal CPS Yard	Voyage Voyage: NADJA 0RU17R1MA   NADJA	May 24, 2019 06:24:28 AM
<div></div>	TLLU4641647 - 40HC	Loading	Terminal	Voyage	May 24, 2019 06:21:16 AM

?

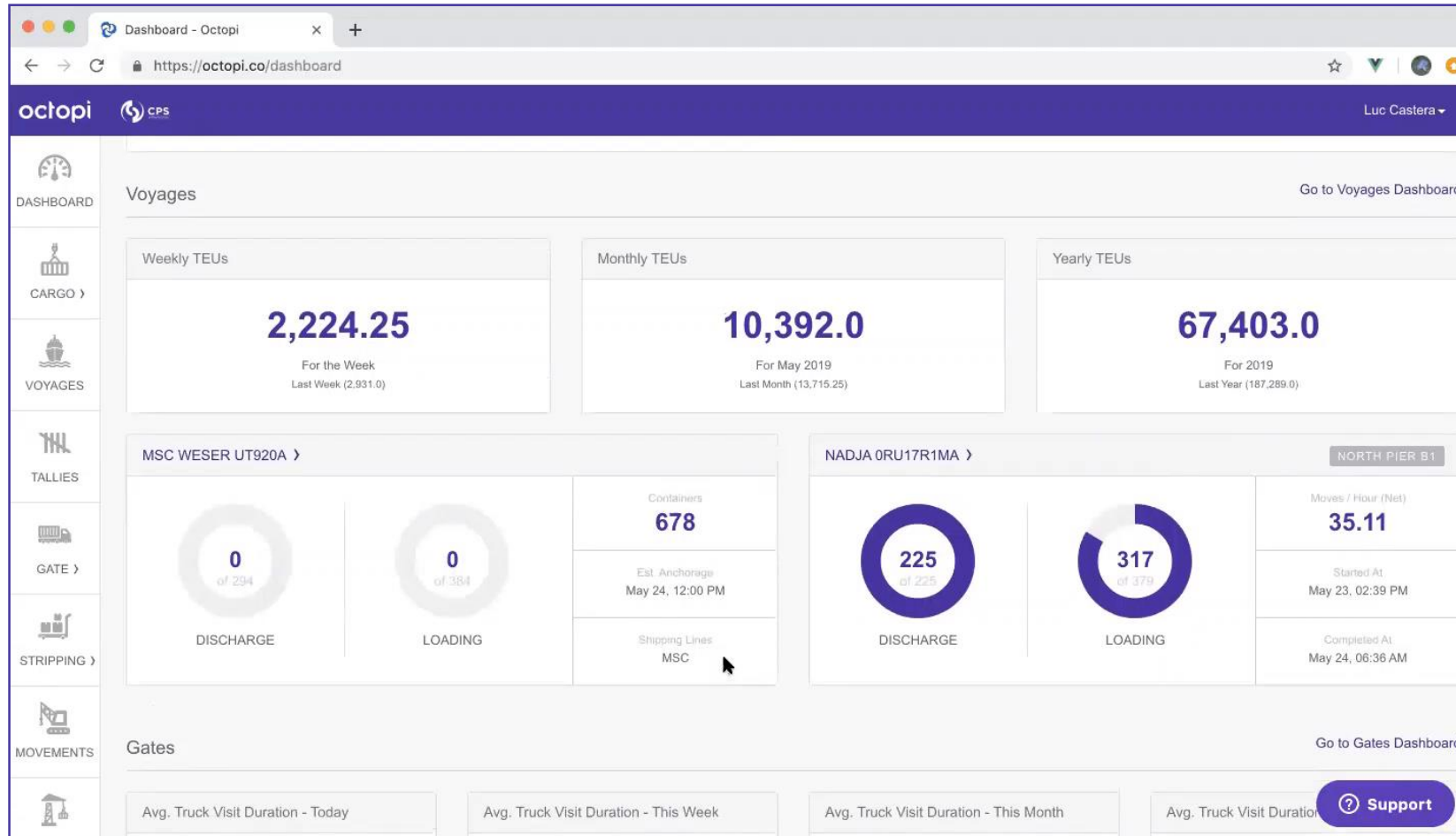
Support

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15

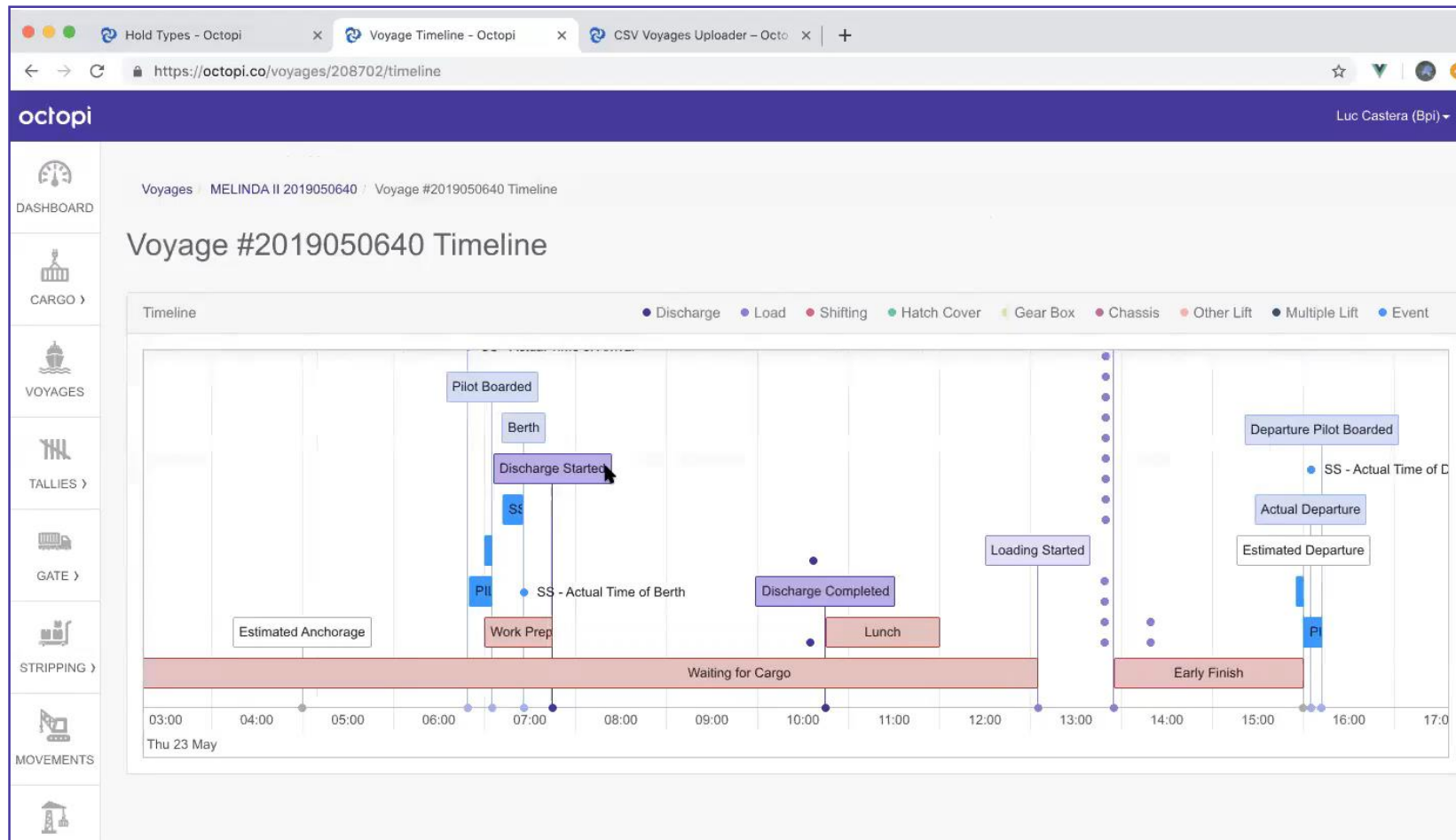


# WORKFORCE ACCOUNTABILITY



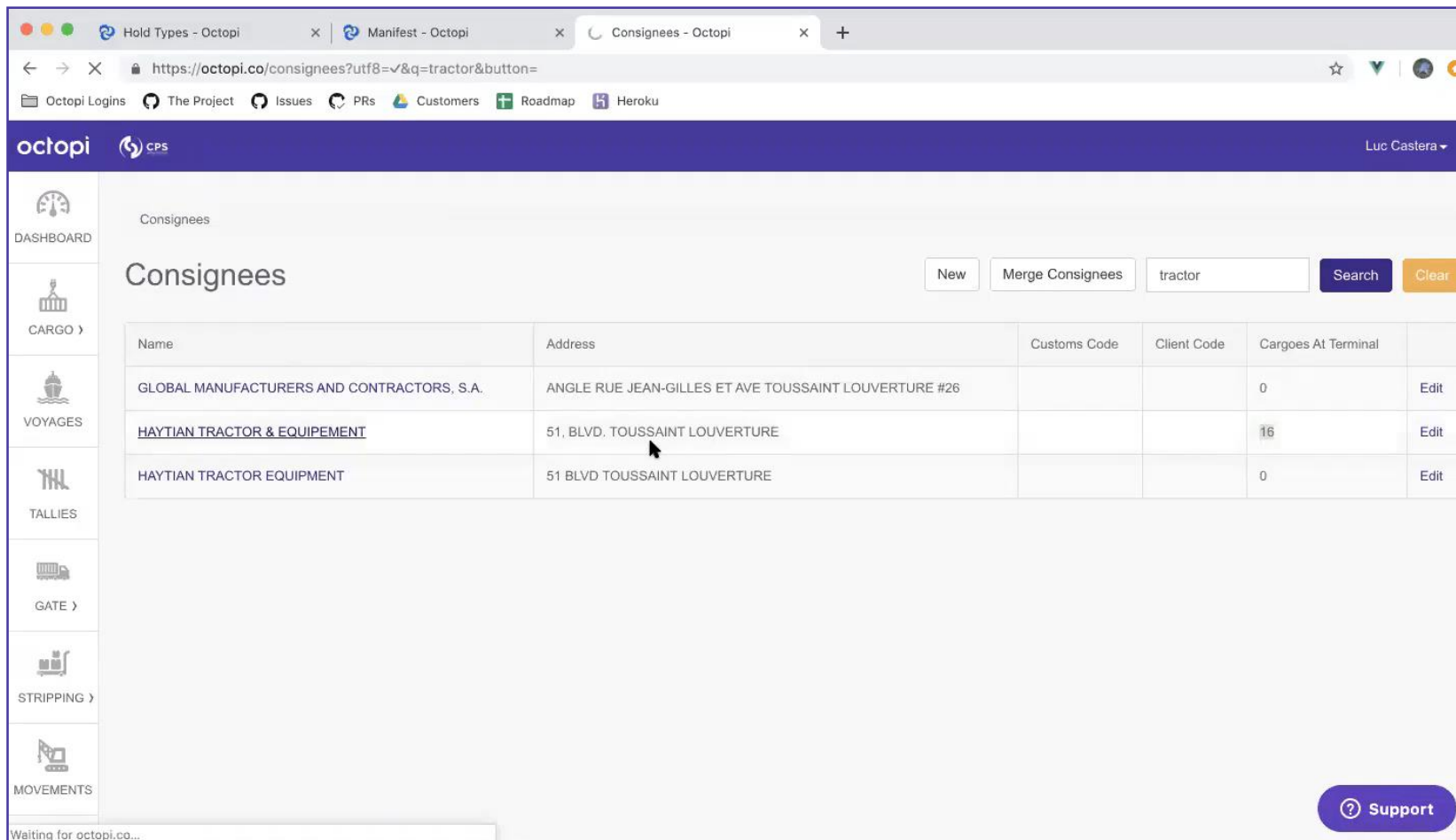


# TROUBLESHOOTING & AUDITING





# FEE & PAYMENT TRANSPARENCY



Consigees

Consigees

New Merge Consigees tractor Search Clear

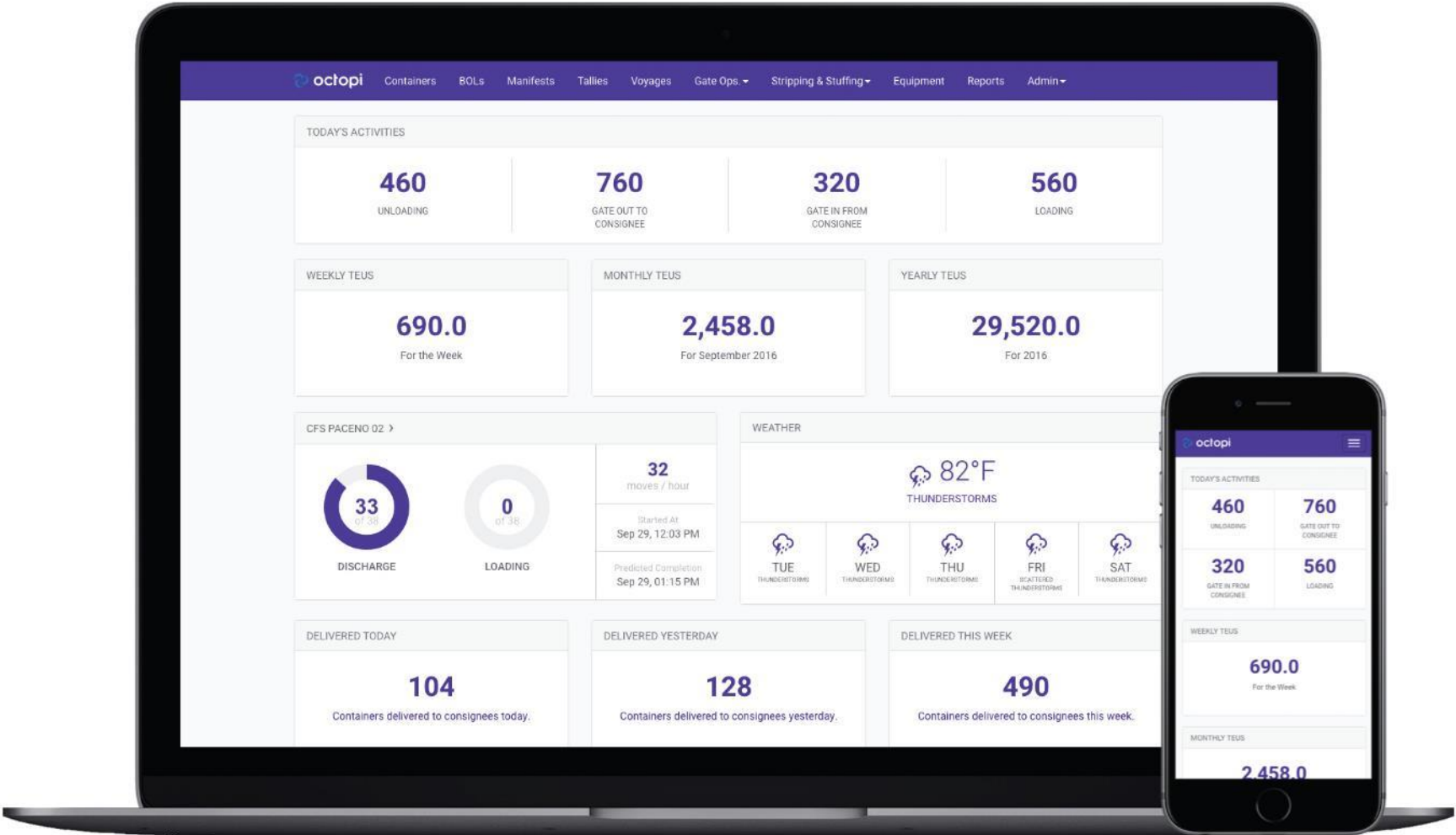
Name	Address	Customs Code	Client Code	Cargoes At Terminal	
GLOBAL MANUFACTURERS AND CONTRACTORS, S.A.	ANGLE RUE JEAN-GILLES ET AVE TOUSSAINT LOUVERTURE #26			0	Edit
<u>HAYTIAN TRACTOR &amp; EQUIPEMENT</u>	51, BLVD. TOUSSAINT LOUVERTURE			16	Edit
HAYTIAN TRACTOR EQUIPMENT	51 BLVD TOUSSAINT LOUVERTURE			0	Edit

Waiting for octopi.co...

Support

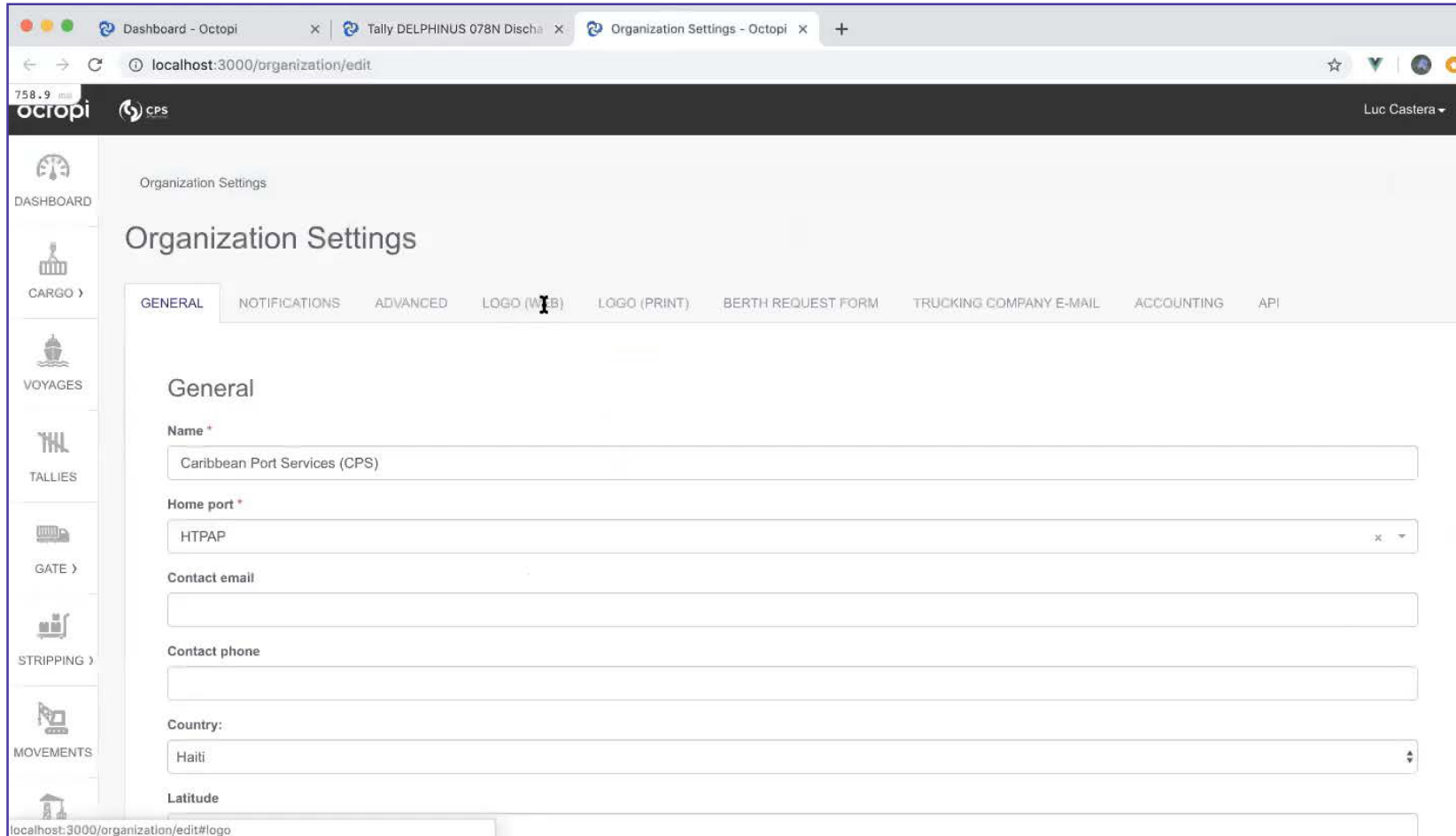


# EASE OF ACCESS





# EASY CONFIGURATION



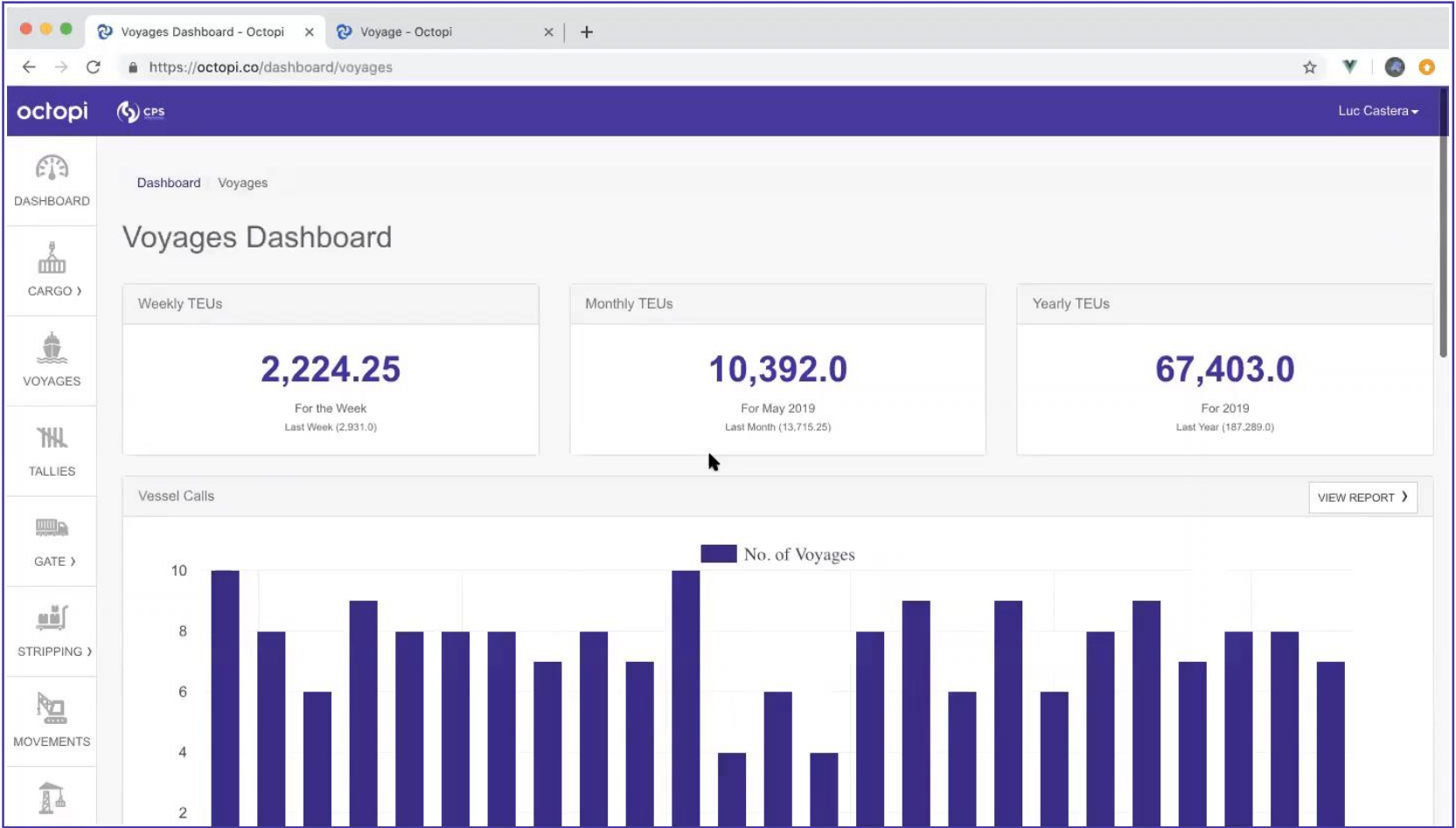
The screenshot shows a web browser window with three tabs: 'Dashboard - Octopi', 'Tally DELPHINUS 078N Discha', and 'Organization Settings - Octopi'. The address bar shows 'localhost:3000/organization/edit'. The page header includes the 'octopi' and 'cps' logos, and the user name 'Luc Castera'. A sidebar on the left contains icons and labels for 'DASHBOARD', 'CARGO', 'VOYAGES', 'TALLIES', 'GATE', 'STRIPPING', and 'MOVEMENTS'. The main content area is titled 'Organization Settings' and features a tabbed interface with 'GENERAL' selected. The 'General' tab contains the following fields:

- Name \***: Text input field containing 'Caribbean Port Services (CPS)'.
- Home port \***: Text input field containing 'HTPAP' with a dropdown arrow on the right.
- Contact email**: Text input field.
- Contact phone**: Text input field.
- Country:**: Dropdown menu showing 'Haiti'.
- Latitude**: Text input field.

The browser's status bar at the bottom shows 'localhost:3000/organization/edit#logo'.

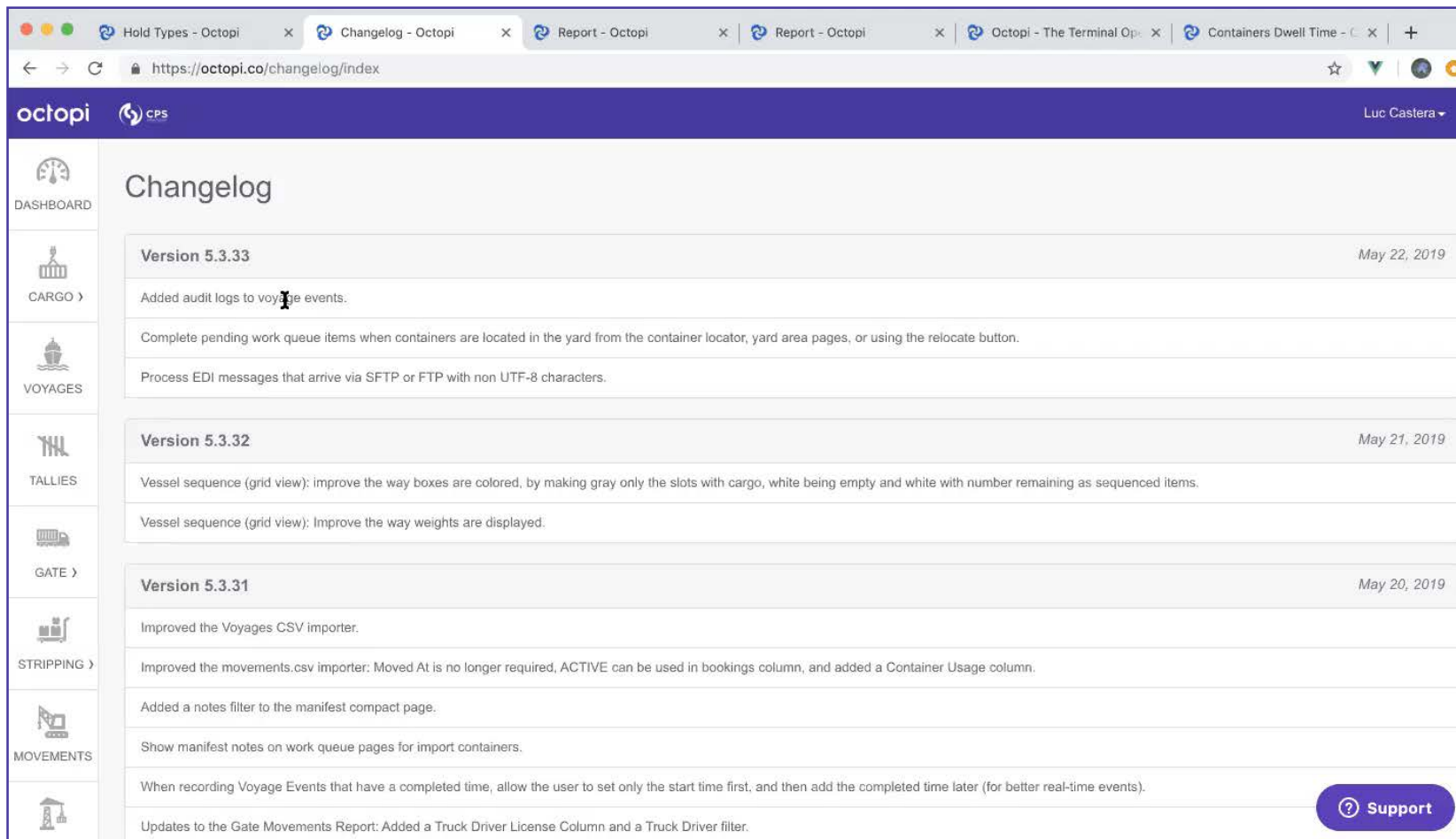


# QUICK USER ONBOARDING





# AVOID HIDDEN COSTS



The screenshot shows a web browser with multiple tabs open, including 'Hold Types - Octopi', 'Changelog - Octopi', 'Report - Octopi', 'Report - Octopi', 'Octopi - The Terminal Op...', and 'Containers Dwell Time - C...'. The active tab is 'Changelog - Octopi', displaying the URL 'https://octopi.co/changelog/index'. The page features a purple header with the 'octopi' logo and 'cps' on the left, and the user name 'Luc Castera' on the right. A left sidebar contains navigation icons for 'DASHBOARD', 'CARGO', 'VOYAGES', 'TALLIES', 'GATE', 'STRIPPING', and 'MOVEMENTS'. The main content area is titled 'Changelog' and lists updates for three versions: 5.3.33 (May 22, 2019), 5.3.32 (May 21, 2019), and 5.3.31 (May 20, 2019). Each version entry includes a list of changes. A 'Support' button is located in the bottom right corner of the changelog section.

**Version 5.3.33** May 22, 2019

- Added audit logs to voyage events.
- Complete pending work queue items when containers are located in the yard from the container locator, yard area pages, or using the relocate button.
- Process EDI messages that arrive via SFTP or FTP with non UTF-8 characters.

**Version 5.3.32** May 21, 2019

- Vessel sequence (grid view): improve the way boxes are colored, by making gray only the slots with cargo, white being empty and white with number remaining as sequenced items.
- Vessel sequence (grid view): Improve the way weights are displayed.

**Version 5.3.31** May 20, 2019

- Improved the Voyages CSV importer.
- Improved the movements.csv importer: Moved At is no longer required, ACTIVE can be used in bookings column, and added a Container Usage column.
- Added a notes filter to the manifest compact page.
- Show manifest notes on work queue pages for import containers.
- When recording Voyage Events that have a completed time, allow the user to set only the start time first, and then add the completed time later (for better real-time events).
- Updates to the Gate Movements Report: Added a Truck Driver License Column and a Truck Driver filter.

[Support](#)



# CASE STUDY: CARIBBEAN PORT SERVICES, HAITI





# CASE STUDY: CARIBBEAN PORT SERVICES, HAITI

**50%** WITH **100%**

**Productivity  
INCREASE**

**UPTIME  
Since October 2015**

**(Including through Hurricane  
Matthew)**



# ARTIFICIAL INTELLIGENCE AT THE PORT

Will machine learning be useful for  
ports?

navis®



# COMBINATORIAL EXPLOSION



$8 \cdot 10^{67}$

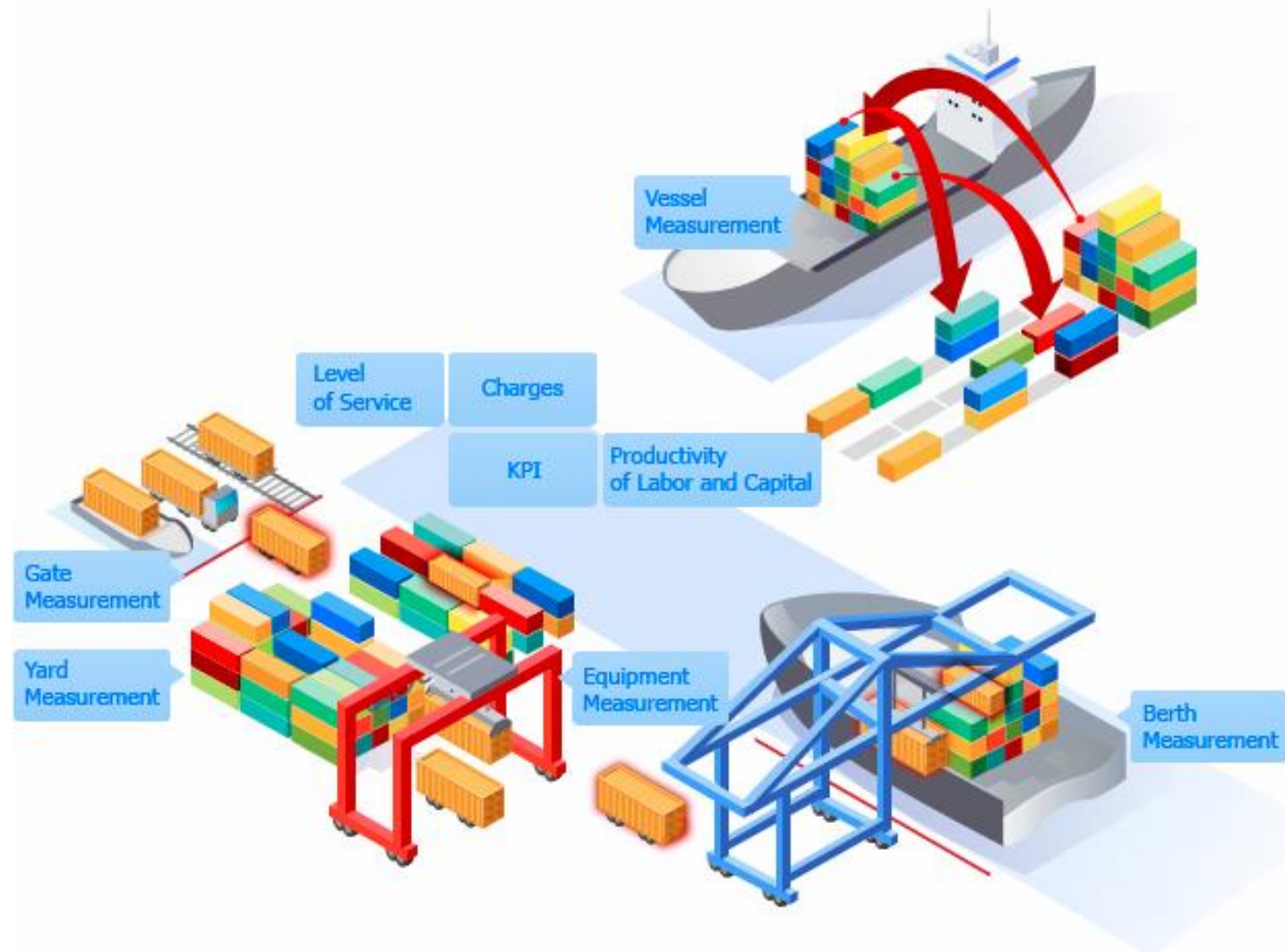
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$10^{50}$



# TERMINAL DECISIONS





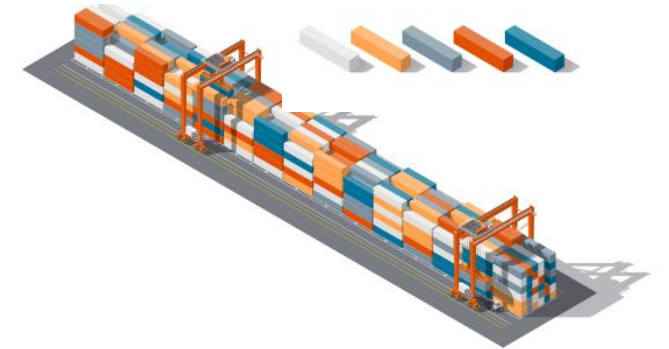
# TERMINAL DECISIONS



Vessel Planning



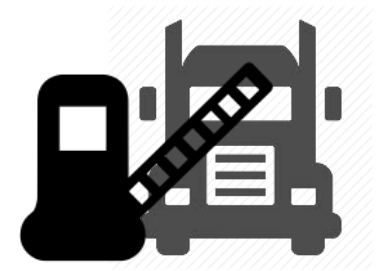
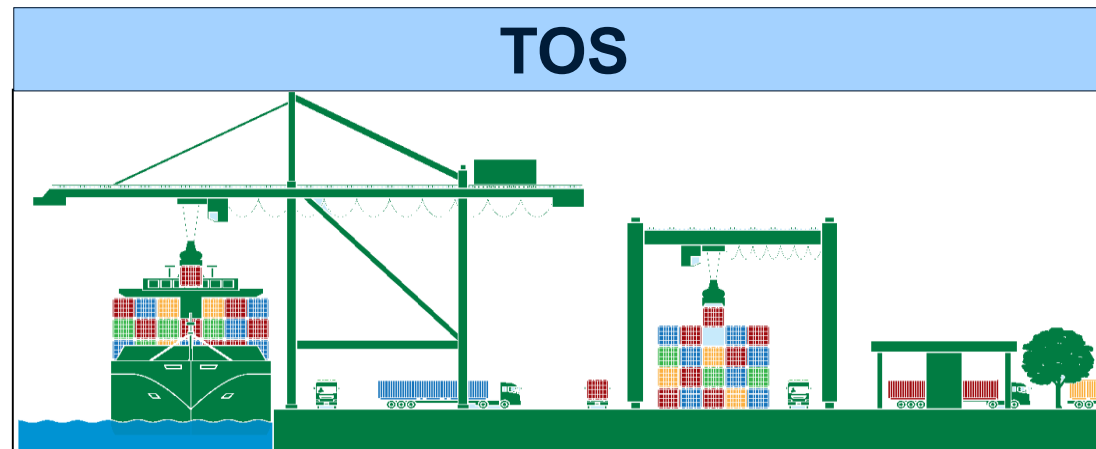
Equipment Scheduling



Yard Planning &  
Container Inventory



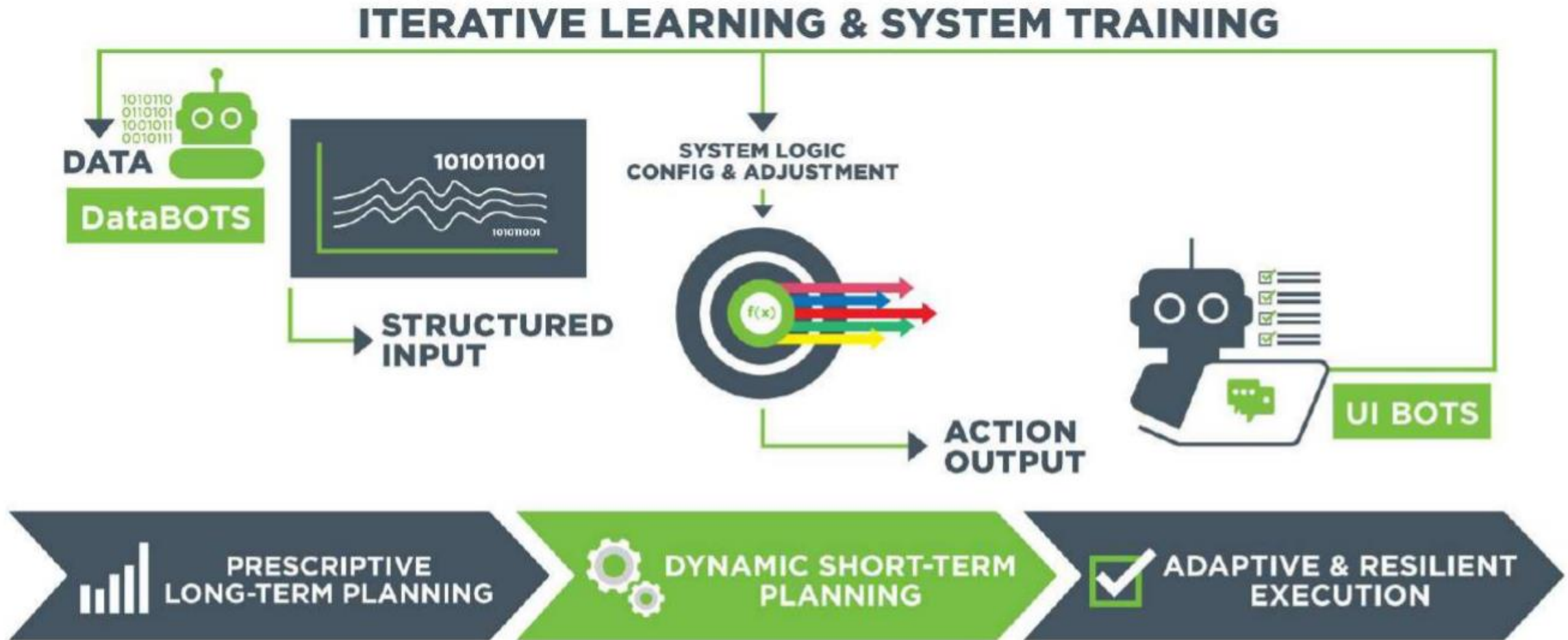
Berth Planning



Gate Management

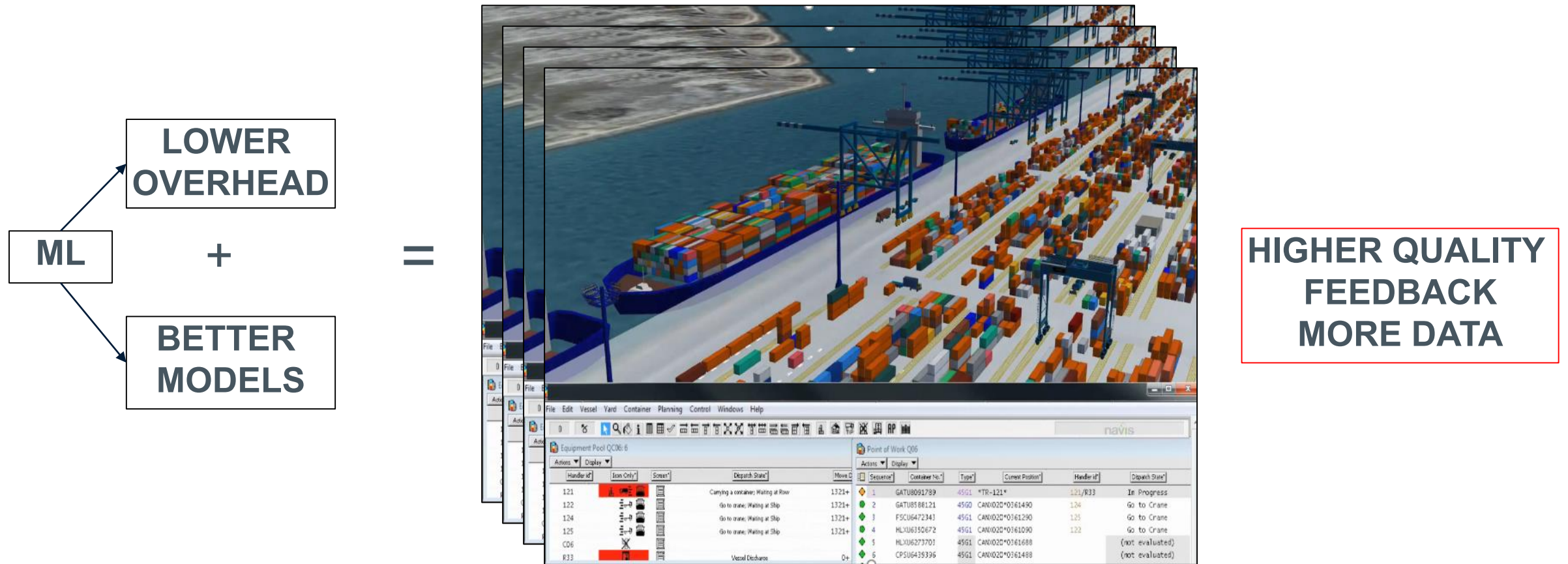


# MACHINE LEARNING CAN HELP



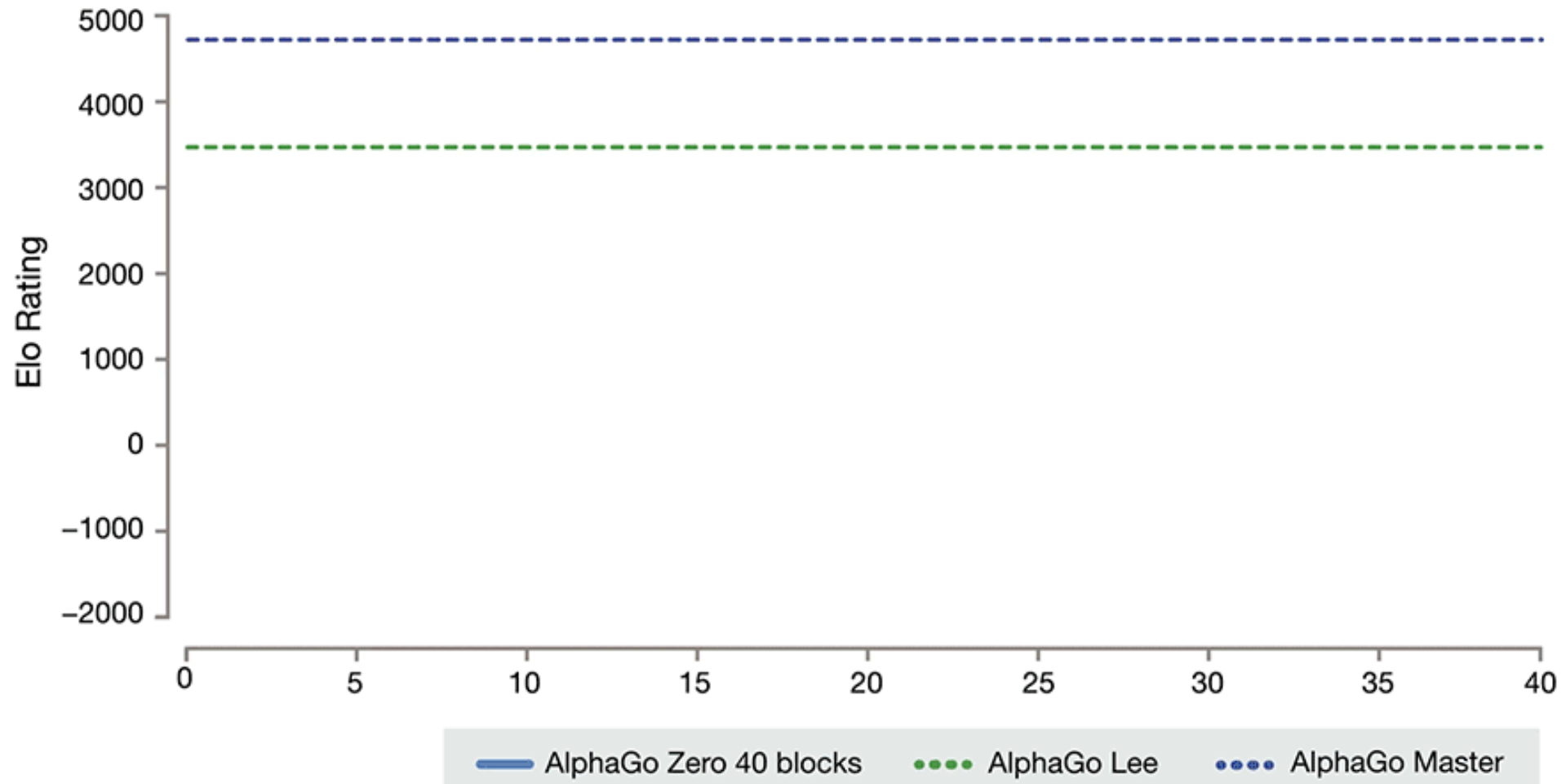


# TERMINAL VIRTUALIZATION WITH ML

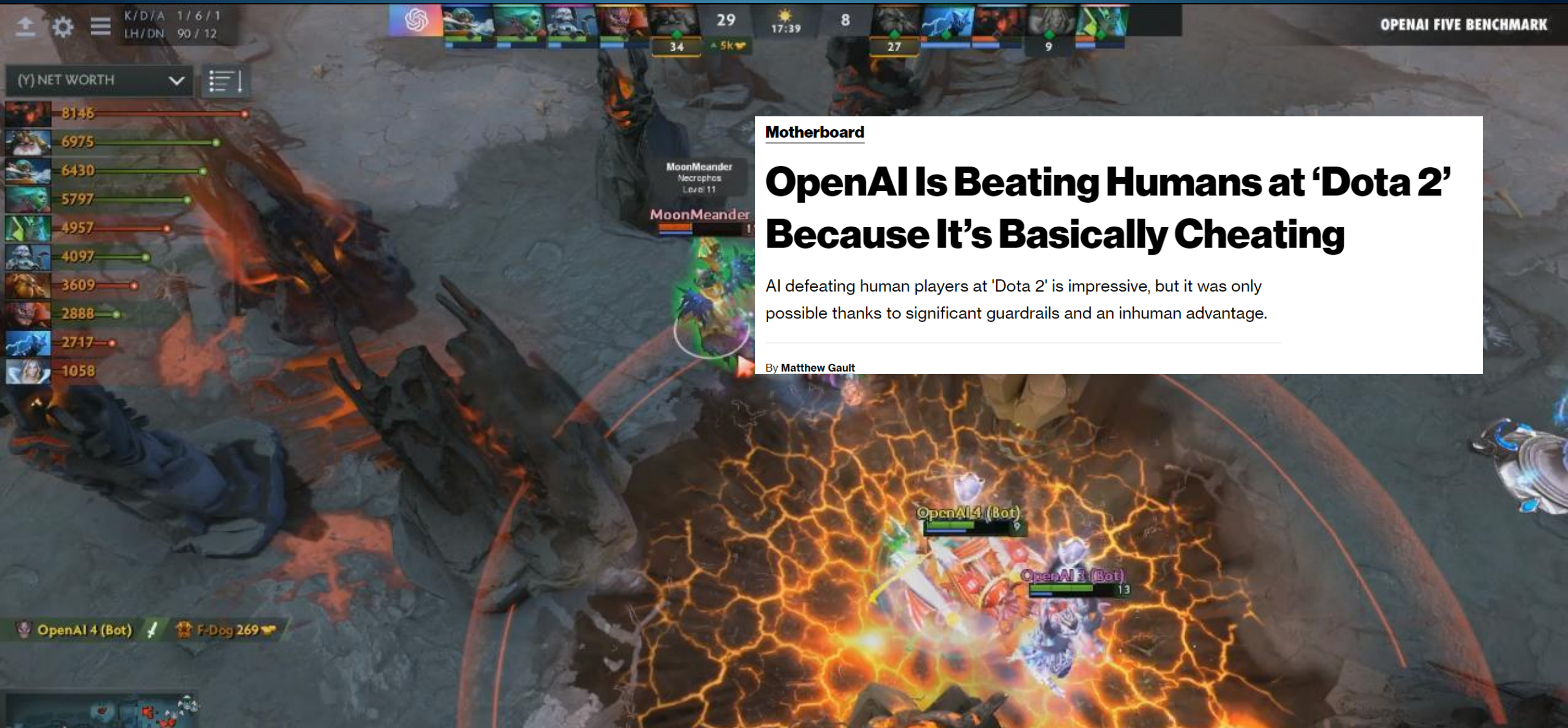




# WITH PRACTICE COMES MASTERY







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



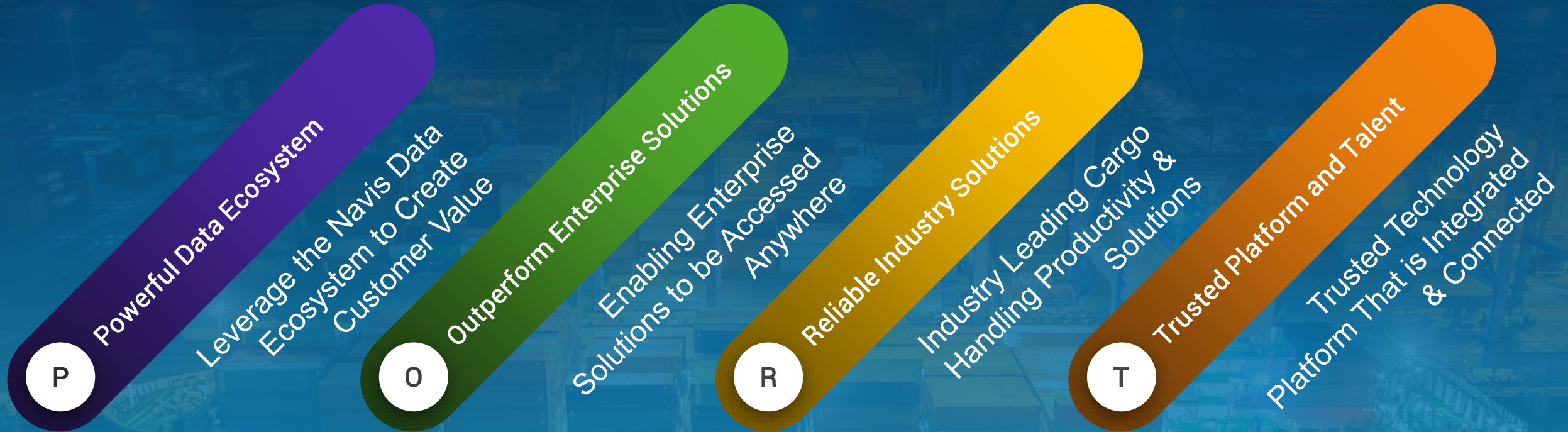
# INTRODUCING NAVIS SMART



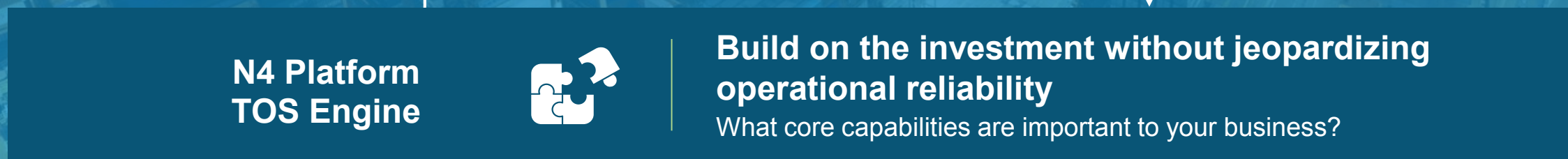
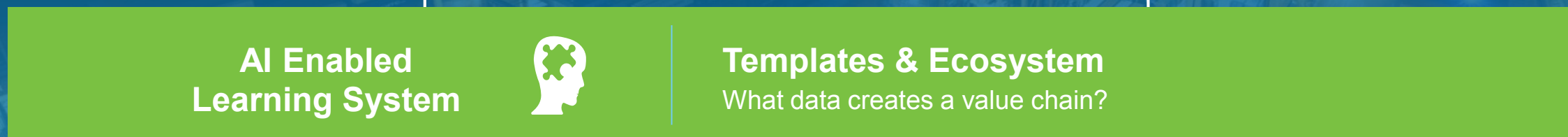
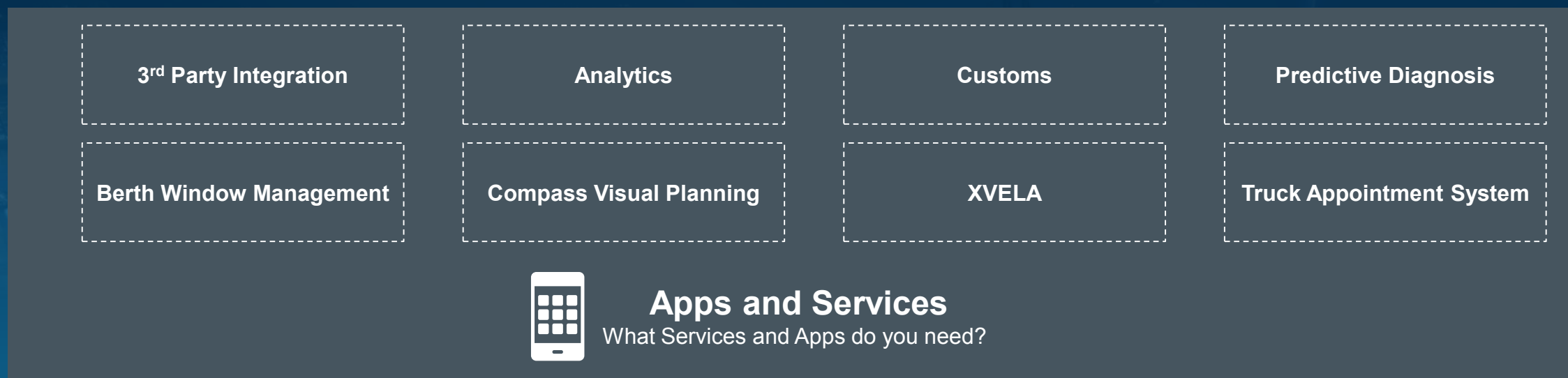




# PORT Strategy Pillars







On-Premise/Cloud/Hybrid



Vsl	ETA/ATA Berth	ETD Berth	ETC	Service/Voyage								Berthing	Facility
XCL	FICED081 Ice runner	ETA 02:30 22/03	11:20 23/03	-	XCL FEEDER In 1000N - Out 1000N		0 (102)	0 (62)	0x2	11 / 17	0	BM042 - BM035 DB	RWD

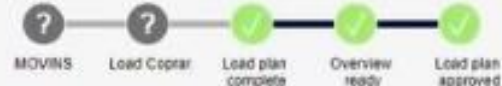
## Preparations



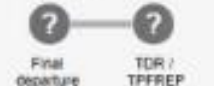
## Discharge



## Load



## Departure



## Unit Counts

Discharge			Load		
0 Empties	0 Full	0 Total	0 Empties	9 Full	9 Total

## All Tasks

## Remaining Tasks

## Unit Counts

## Vessel Notes

## Planning Notes

## EPis

Name	Agreed	Actual	Difference	Comments
ETA	01:00 28/02/2018	02:10 25/03/2019	9553h	
ETD	09:00 28/02/2018	11:20 26/03/2019	9578h	
DISHCOUNT	150	0	-150	
LOADCOUNT	300	0	-291	
CI	2.00			



N4 COMPASS - FICED081  
COPRAR\_D expired  
10.40.79.44:5200







# Navis Smart Apps



*Blue  
Tracker  
One*

*MACS3  
Connected*

*BERTH  
Window  
Planning*

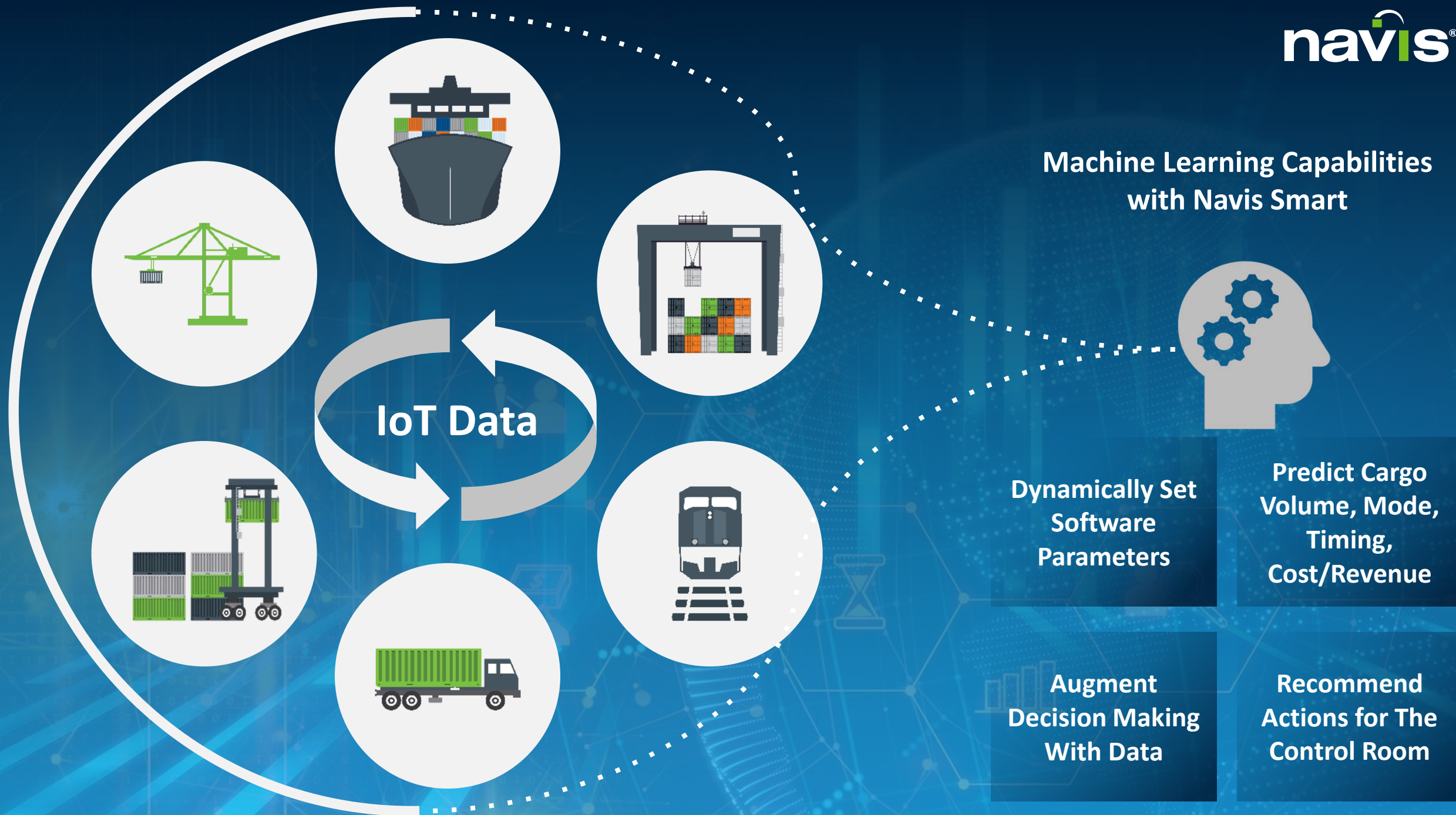
*Compass  
Visual  
Planning*

*XVELA  
Stowage  
Collaboration*

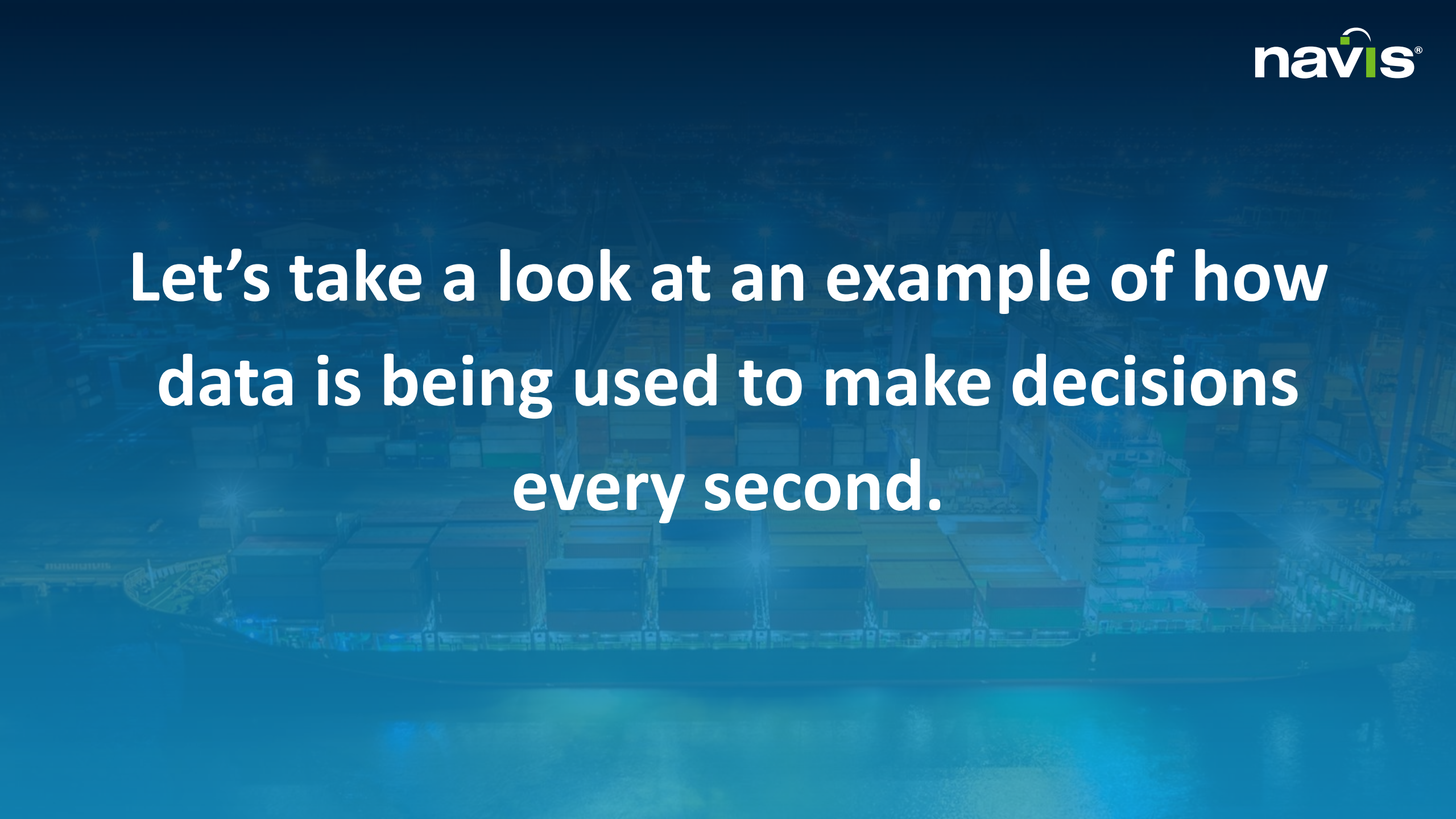
*Control  
Room*



## Machine Learning Capabilities with Navis Smart

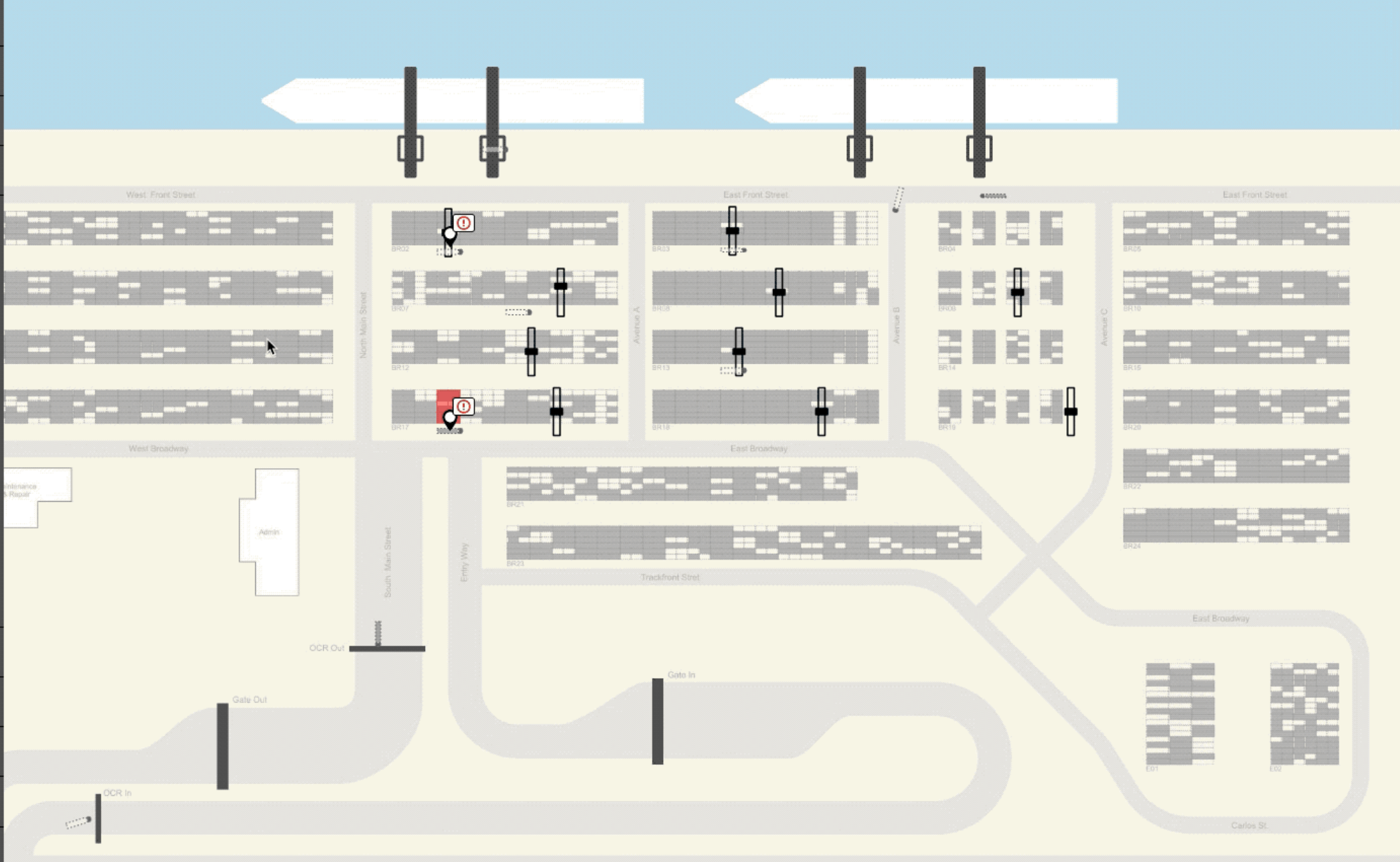




A large container ship is shown from a high-angle perspective, sailing on a body of water. The ship is covered with numerous colorful shipping containers in shades of blue, red, and yellow. The background is a deep blue gradient.

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







**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.**



# THANK YOU!



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