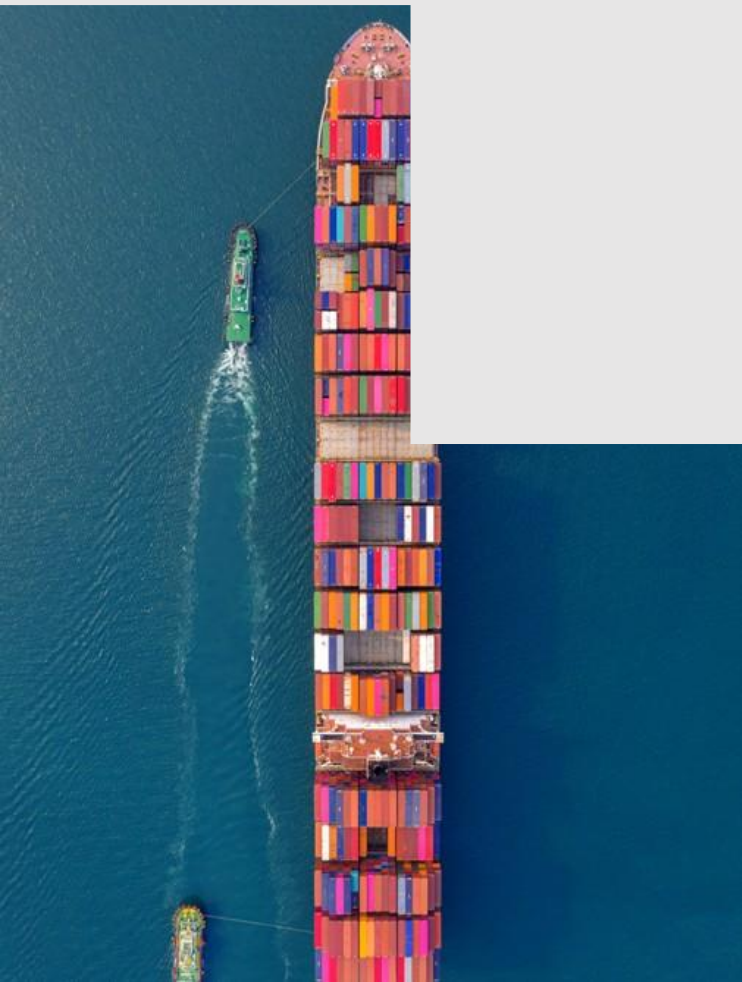




Future of Control Rooms

The Path to Human Augmentation

June 2025



Intro and Background

Digital Twin and AI enabling Human Augmentation

NextPort

CMA-CGM



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R&D DIRECTOR,
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DEVELOPMENT

Standardization & Interoperability

The challenge

Currently, Terminal systems lack a common data language, hindering interoperability between systems, compromising terminal implementation and preventing integration of AI.

TIC 4.0 initiative

Establishes common standards for data and processes, enabling seamless data exchange.

Benefits

Data flows seamlessly, allowing operational intelligence to be scalable, repeatable, and continuously optimized.

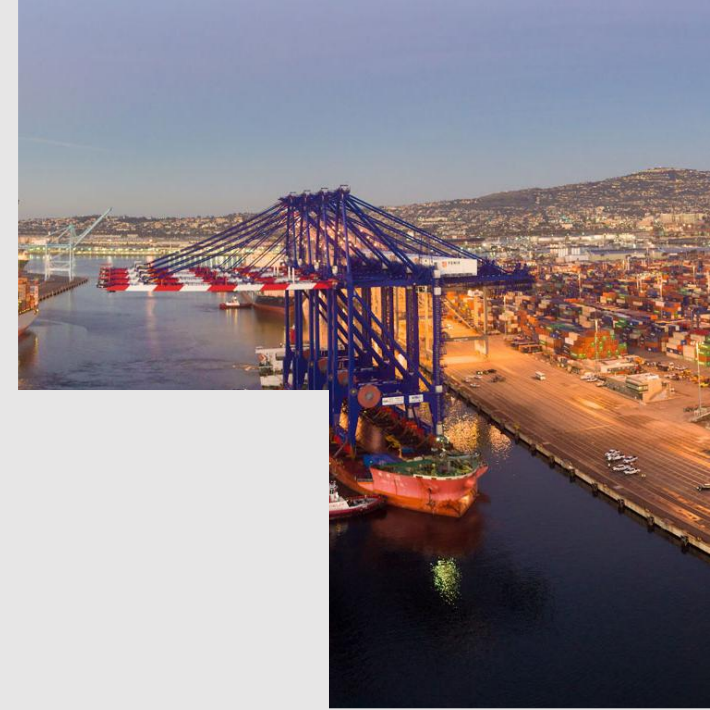
The future

By standardizing data we will enable interoperability, allowing Terminals to harness the power of AI for optimized performance, increased safety, and enhanced customer service.

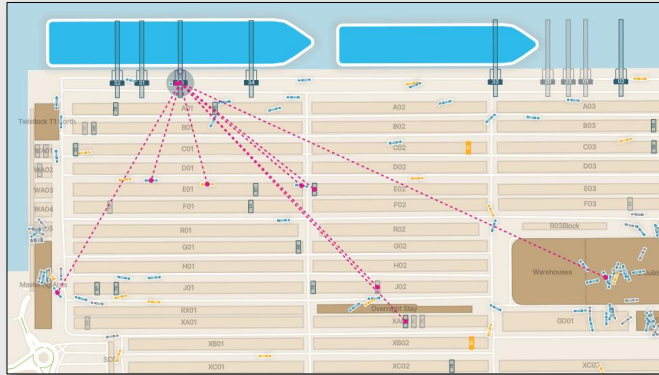




NXP | Terminals Where we are



Digital Twin = Data service for decision-making



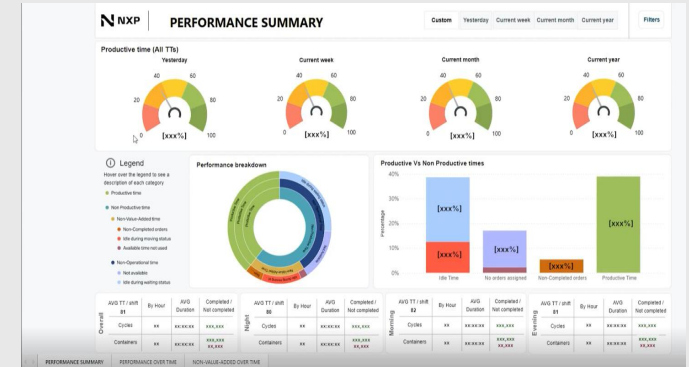
Top View

Operations Visual Management

Prio.	Type	Trigger time	Elapsed time	Container id	Move kind	Operator id	POW	CHE
4	TT Container cycle excessive time	19 Jan 11:44:59	00:00:04	MTCU237009	Discharge	EB832	GC06	TUG038
4	TT Container cycle excessive time	19 Jan 11:44:59	00:00:04	TUGU003872	Discharge	EB832	GC06	TUG038
4	Idle time anomaly	19 Jan 11:44:49	00:00:14	-	-	1698	SCANNING	TUG038
4	RTS Container cycle excessive time	19 Jan 11:44:44	00:00:19	CMAL044430	Load	1943	GC32	RT014
4	Idle with order assigned	19 Jan 11:44:19	00:00:44	-	-	ET137	GC31	TUG036
4	Idle time anomaly	19 Jan 11:43:53	00:01:06	-	-	ED405	GC06	TUG035
4	Idle with order assigned	19 Jan 11:43:38	00:01:24	-	-	1698	SCANNING	TUG036
4	Order assignment delay	19 Jan 11:43:13	00:01:46	-	-	ET131	GC33	TUG035
4	TT Container cycle excessive time	19 Jan 11:43:43	00:00:16	APHU462028	Load	ET864	GC32	TUG037
4	Idle with order assigned	19 Jan 11:43:23	00:00:38	-	-	ET139	GC32	TUG032

FlowOps

Process Orchestration



LeanIQ

Continuous Improvement

Existing Client IT Ecosystem
TOS, ECS, PLC, IOT, CMMS



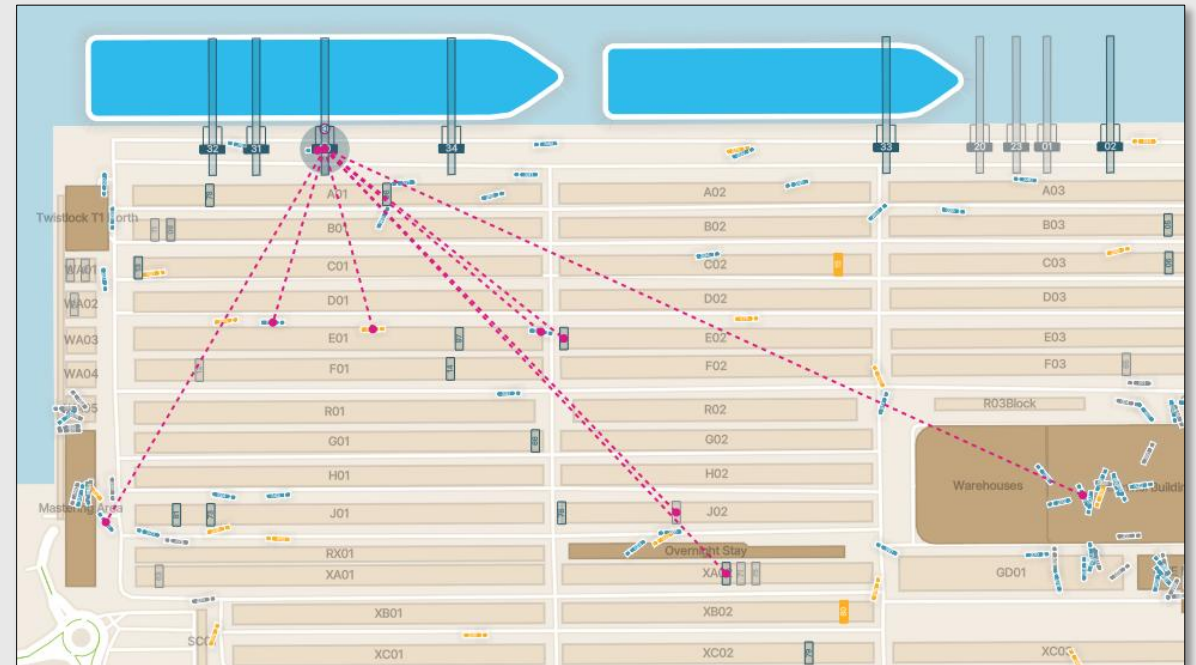
NXP Terminals Solution

Applications

Top View

Operational Visual Management

- Enriched Dataset
- Simplified UX
- Context & Priority
- Actionable Insights



TopView – Terminal's View

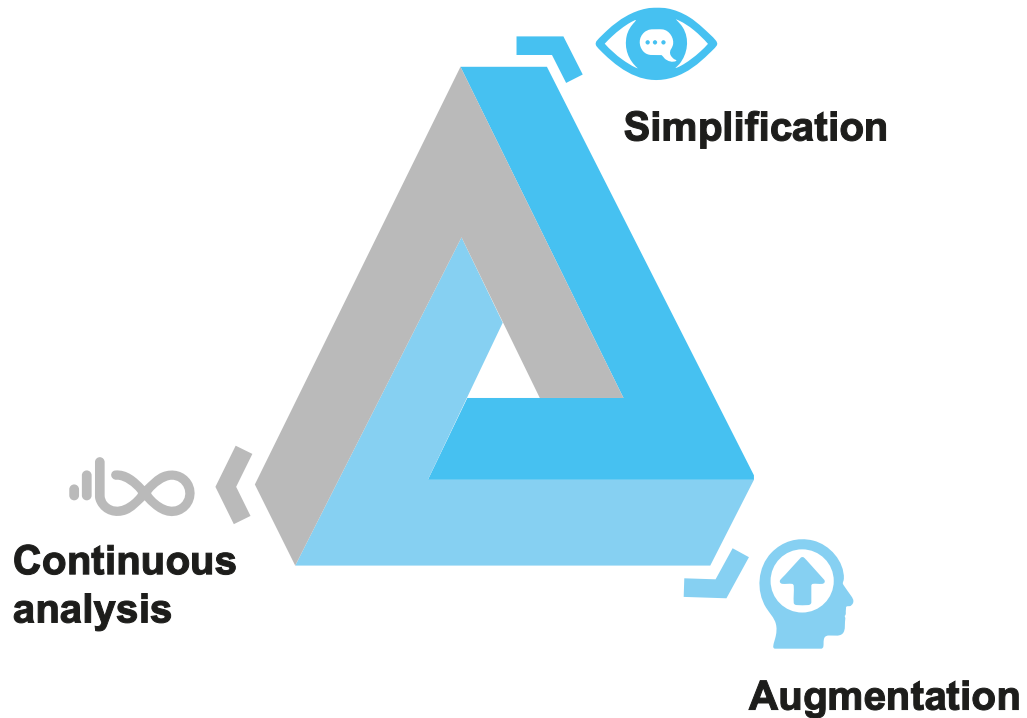


DECISION-MAKING

VISUAL EXPERIENCE

HOLISTIC MONITOR

PROACTIVE POP-UPS



NXP Terminals Solution

Applications

FlowOps

Process Orchestration

- Continuous Analysis
- Configurable Alarms
- Role-based Customization
- Learn from Execution

Slow driving

Priority: High Medium Low

Alarm configuration
Here you can choose the thresholds that triggers or deactivate this alarm.

Limit Speed km/h: 45 (set to <7)

Activation time min: 60 (set to 7)

Roles
Add roles taking into account that this alarm will only be triggered if the previous role has not deactivated it.

ADMIN	0 min	✎	🗑️
Data	5 min	✎	🗑️
LUX	10 min	✎	🗑️

+ Add role

Cancel Save

Idle with order assigned

Trigger time: 19 Jan 11:43 Elapsed time: 00:00:13

Information

CHE TUG236 Operator: 1698 POW SCANNING

Problem

Terminal Truck is not moving while has a dispatched order.

Idle time: 00:02:17

CRSU6095714 Yard Rehandle

MTC 11:27:19 RTC 11:31:27 MTD 11:32:41 RTD -

Recommended actions

- Check TT in Ops. Visual Management
- Check workload (TOS)
- Get feedback from TT operator

1 2 3

Close View map Acknowledge

Idle with order assigned

Actions taken

- Check TT in Ops. Visual Management
- Check workload (TOS)

What cause the alarm?

- RTG overflow
- TT malfunctioning
- Operator behaviour
- Traffic related issue
- QC overflow
- Other

Write the other option

Cancel Acknowledge

FlowOps – Terminal's View

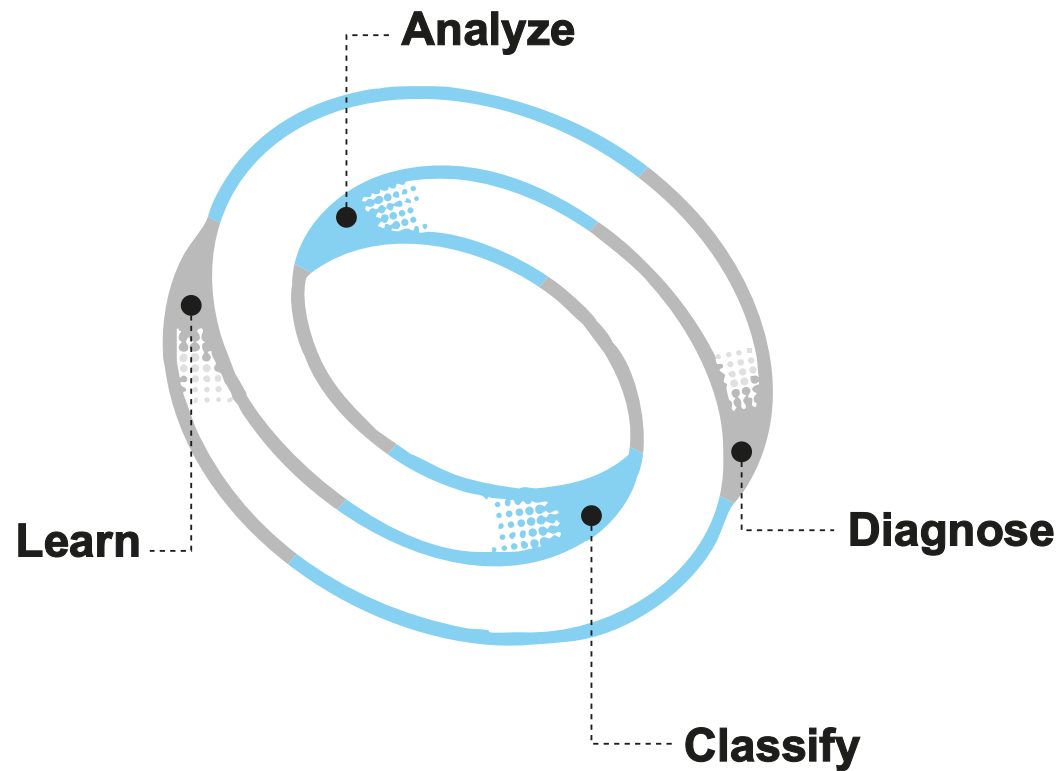


UNCOVERED BEHAVIORS

TOS AUGMENTATION

EDUCATE & TRAIN

FOUNDATION FOR AI



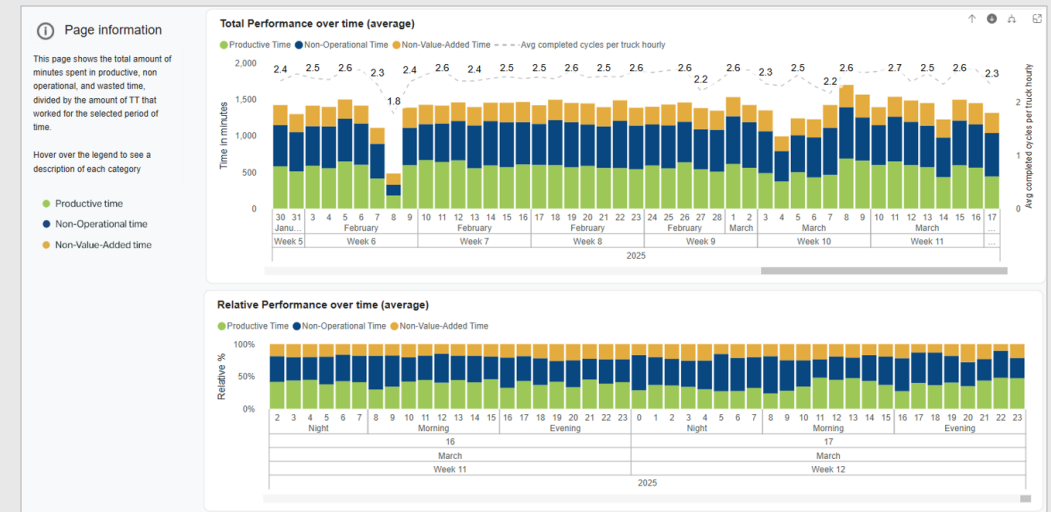
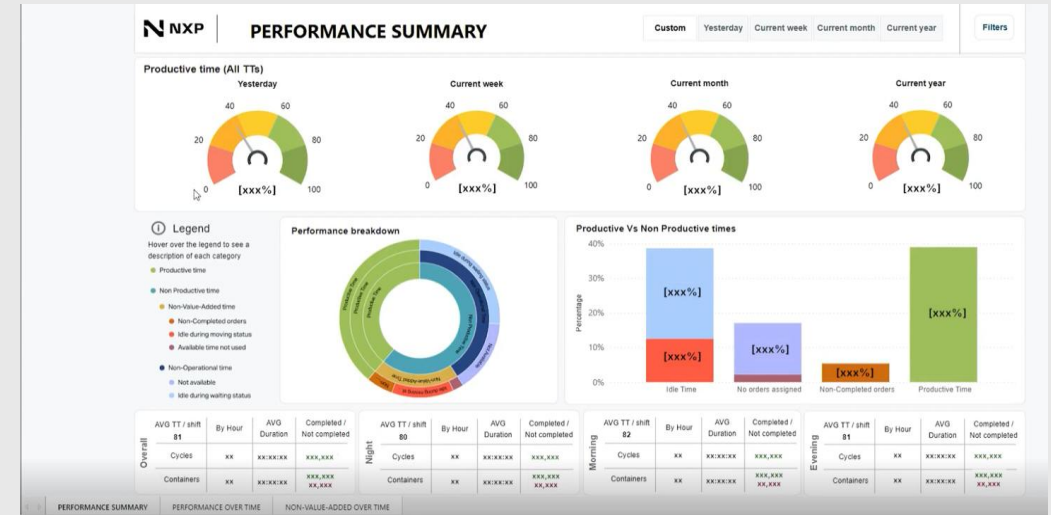
NXP Terminals Solution

Applications

LeanIQ

Continuous Improvements

- Root-Cause Analysis
- CHE & OPS domains "blended"
- Human behaviour analyzed
- AI enabled (trend, patterns, t-series...)

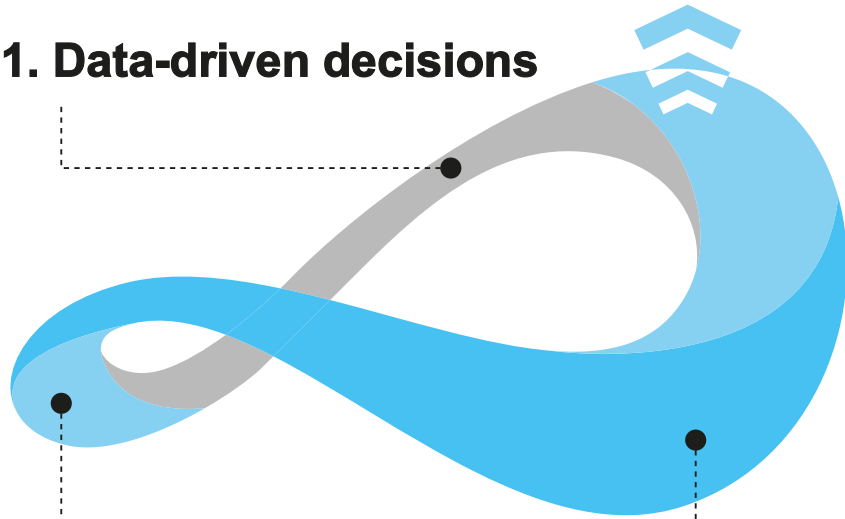


LeanIQ – Terminal's View



Forecast and learn

1. Data-driven decisions



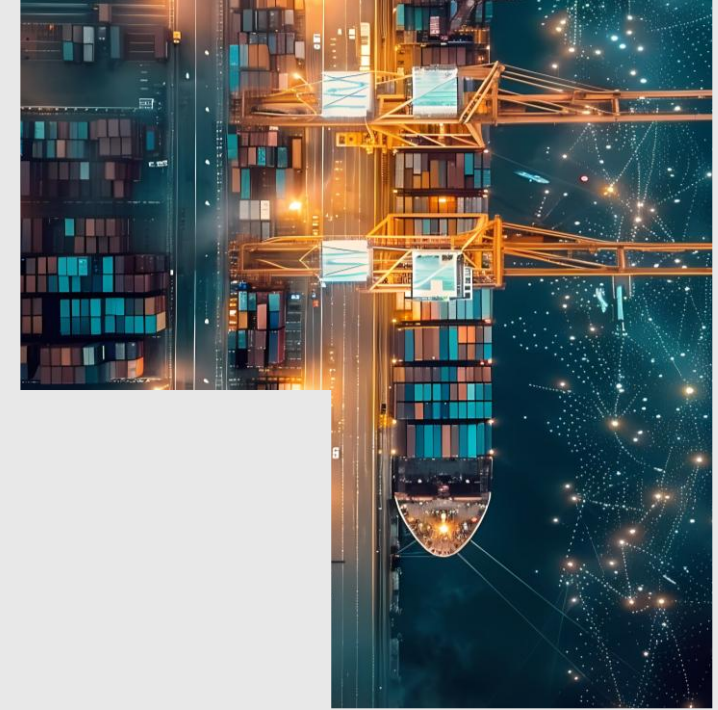
2. Root cause analysis

3. Troubleshoot

CONTINUOUS IMPROVEMENT

FORECAST WHAT WILL HAPPEN

**AUDIT & CONTROL
AI SUPPORT**



What's Next



[Integration of AI]

Innovation – Carrier & Terminal Port Stay

Goal: blend terminal and port-level visibility into a unified decision support layer, focused on Berth Planning and Port Stay Optimization for CMA-CGM and partners.



Terminal + Port Integration: One unified product for control room and planning coordination.



Physical Context: Meteo/oceanographic data for safe & optimal berthing.



Service Visibility: Complete maneuvering sequence with pilot/tug/bunker scheduling.



Outcome: Minimise port stay, maximise throughput, and connect sea and shore operations.

CMA CGM JACQUES SAADE
ETA Berth 10 Jun 00:00

LOA | Beam | DWT 400 m | 62 m | 221251 tn
Next Stop NLRM
Arrival draft 10.00 m
Departure draft 10.00 m


Context Awareness


- Berth available on Arrival
Bollards 30 - 55
CMA CGM ALCAZAR | ETD Berth 9 Jun 22:00
- Nautical services not ready on Arrival
Resources VB-TRON, VB SIMUN, VB TITAN
- Checked MetOcean conditions
Sea level 2,8 m Waves 0,71 m
Wind 9,5 m/s Current 20,8 cm/s

2 min ago


Innovation – Agentic AI for troubleshooting

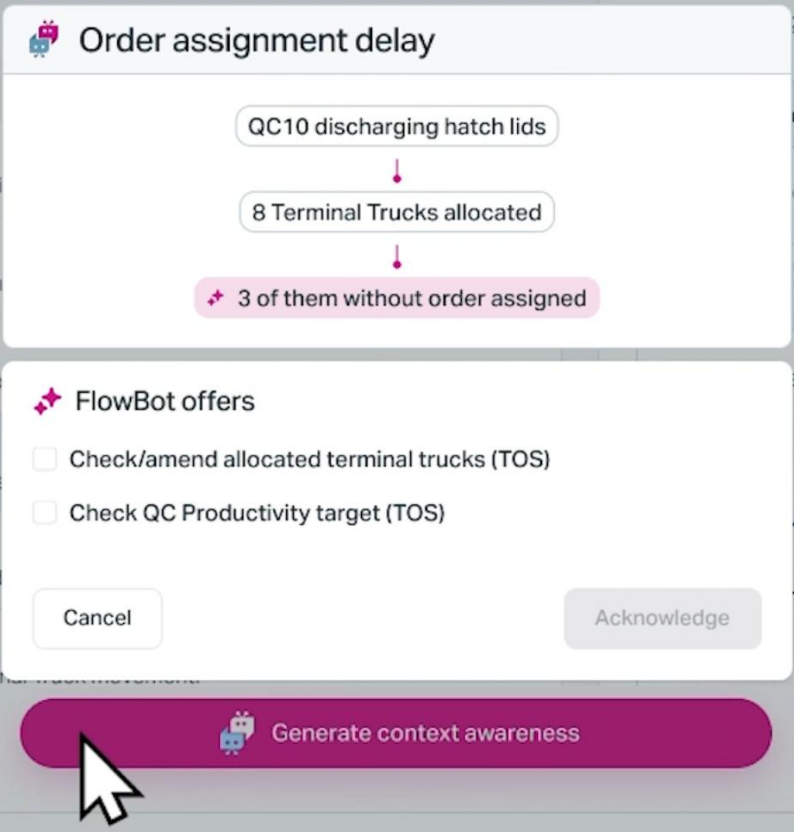
Goal: Agent / LLM acts as a virtual assistant, helping control room operators troubleshoot alarms using context-aware, multi-system intelligence.

 **Integrated Data Sources:** TOS, PLC logs. Order dispatch, event logs.

 **Contextual Analysis:** LLM correlates alarm with cross-system signals.

 **Smart Recommendations:** Actionable steps based on past resolutions and learned patterns.

 **Goal:** More consistent, faster, and effective control room responses.



Order assignment delay

QC10 discharging hatch lids

8 Terminal Trucks allocated

3 of them without order assigned

FlowBot offers

- Check/amend allocated terminal trucks (TOS)
- Check QC Productivity target (TOS)

Cancel Acknowledge

Generate context awareness



CONNECT WITH US AT OUR BOOTH -K50

Thanks!