

Smarter & Greener





Slower at sea and faster in port

- Over 90% of Finland's trade is conducted by sea
- Globally Shipping is undergoing a major change, and the pace is historically fast
- Regulatory and customer requirements for low-emission shipping are growing
- The shift to alternative fuels, though necessary, is challenged by their high cost and limited availability
- In Global Shipping, up to 50% - 80% of the ship's operating costs already come from bunker
- A better situational awareness, connectivity and the ability to optimize operations are the key to success
- Reduced logistics costs directly impact domestic product prices and are essential for maintaining a competitive edge in global exports



Fintraffic

The mission of Fintraffic is to ensure safe, smooth and environmentally friendly mobility in Finland by road, by rail, by sea and by air. We help people and things get where they are going, safely, smoothly and with care for the environment

Railway Traffic



- 500,000 trains per year
- 82 million passengers per year
- Rail network 6,000 km
- 470 professionals

Air Navigation Services



- Air traffic control services at 22 airports
- 280,000 aircraft movements per year (190,000 at Helsinki-Vantaa)
- 440 professionals

Road Traffic



- Roads carry 90% of passenger transport in Finland
- More than 120 million km driven in vehicles every day
- Road network 78,000 km
- 90 professionals

Vessel Traffic Services



- Shipping carries 94% of exports and 91% of imports
- 30,000 visits by foreign vessels per year
- 29 ports
- 100 professionals

We produce digital services and up-to-date open-source traffic data for operators and end users in the transport ecosystem



Fintraffic VTS – What Do We Do



DIGITALIZATION OF MARITIME LOGISTICS



MARITIME SINGLE WINDOW



PORT AND COASTAL VTS OPERATIONS

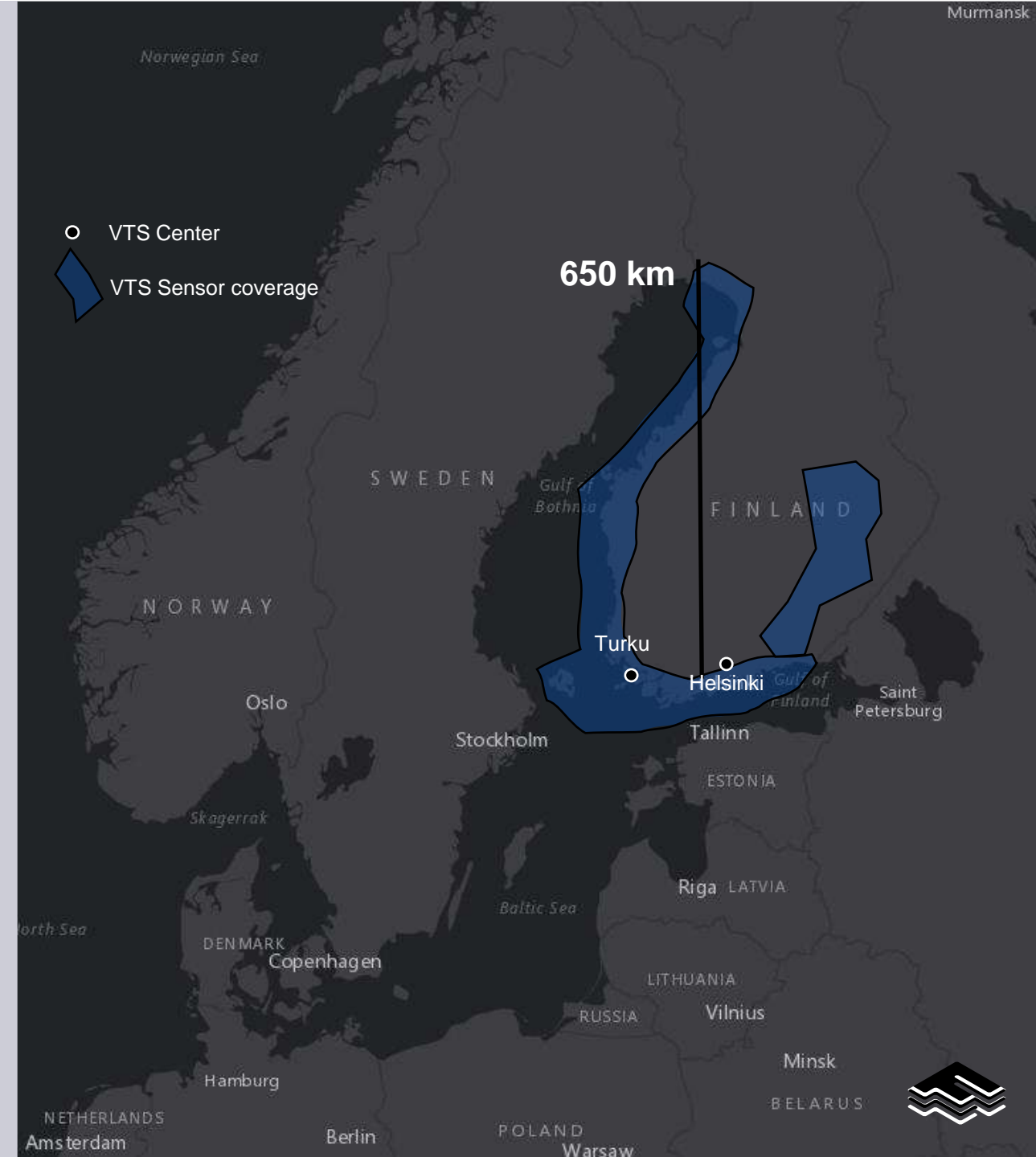


eNAVIGATION SERVICES

Fintraffic VTS operations

The VTS system managed by Fintraffic VTS ranks among the world's largest VTS systems.

Sensor type	Number of sensors
VHF radio base stations	80
Radars	100
AIS base stations	60
Cameras	44
DGPS reference stations	9
Sea level altimeter	13
Weather stations	82

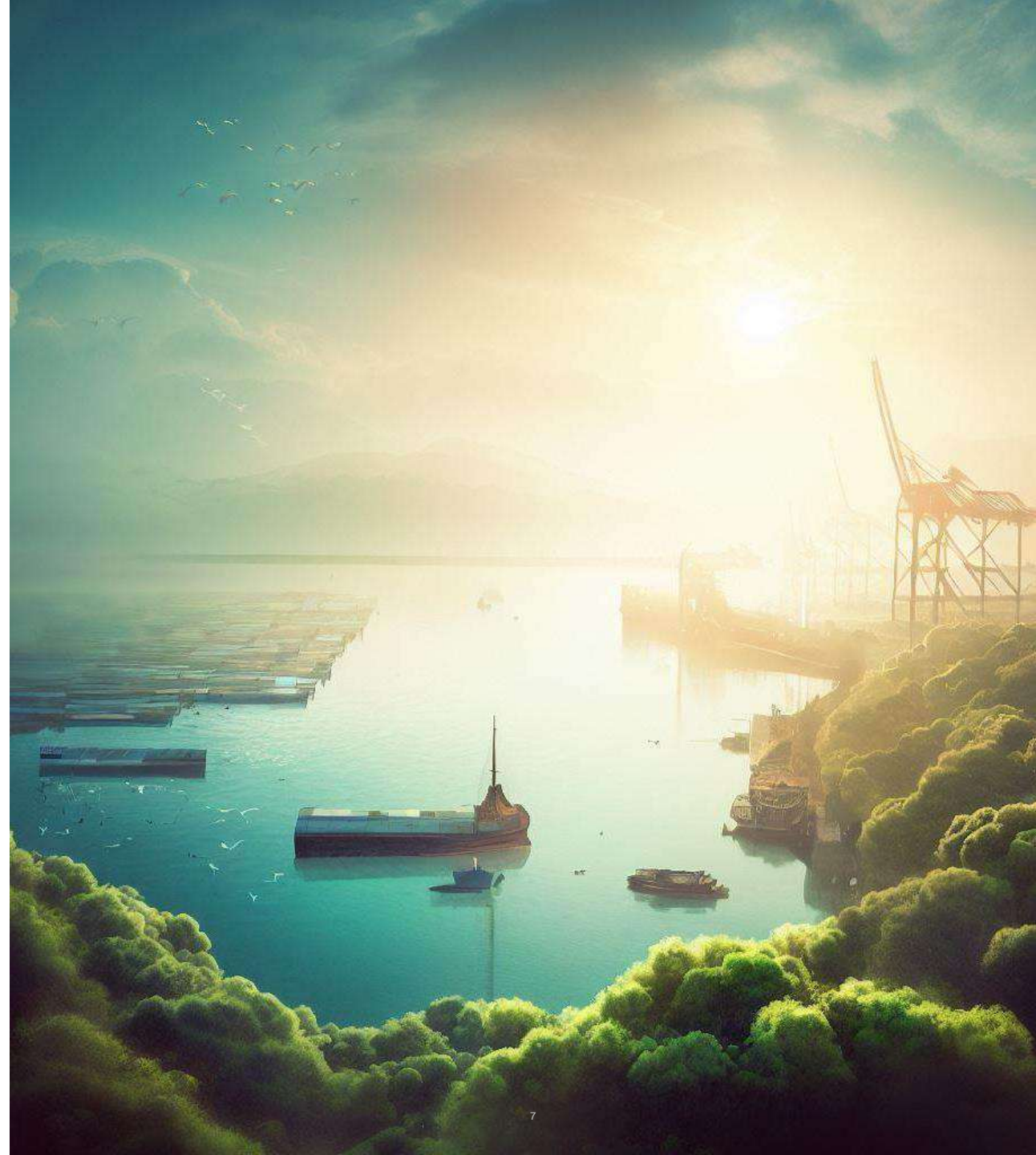


What are the practical digitization activities that can reduce CO2 emissions

- **Digitalization in Ports**
- **Electricity-powered Operations**
- **Electrified Zero-emission Yard Equipment**
- **Low and Zero-emission Fuels**
- **Digital Applications**

Digital Applications to reduce CO2

1. **Optimized movement sequencing**
2. **Smart metering**
3. **Energy solutions**
4. **Port-call optimization**
5. **Data analysis**





**Experiences
from Finland**

ETD/ETA Estimation Service



ETD/ETA Estimation Service

Problem:

- Actors in the maritime supply chain do not share vessel schedules
 - > *Manual work / less efficient*

Solution:

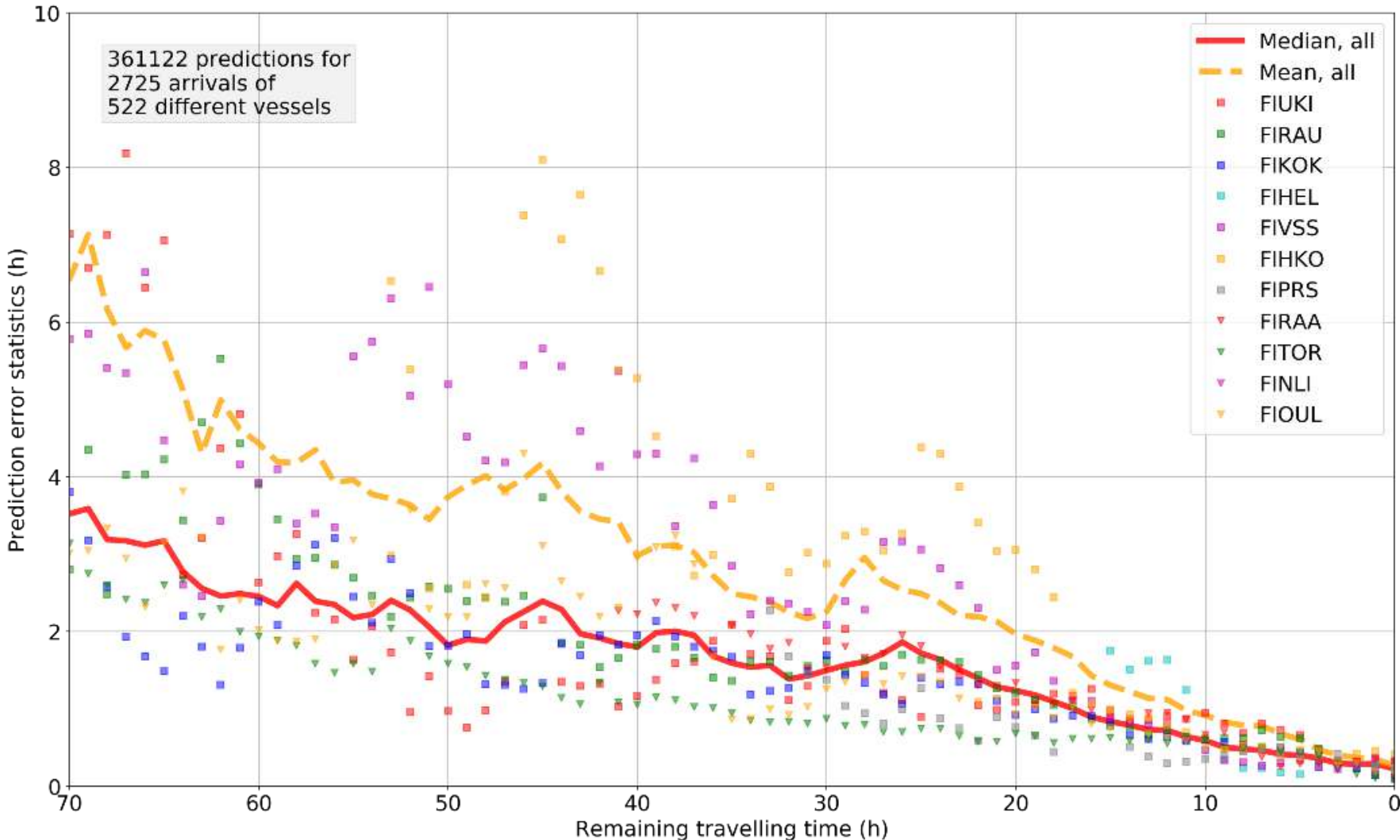
- A machine learning based system in the Baltic region
 - > *Integrates global vessel data with regional port call plans*

Beneficiaries:

- Port operations planners and coordinators, port service providers, cargo owners, land transport operators

**Nation wide maritime data solution in Finland:
Port call estimation and time stamp service**

Time data forecasting service



- Time data forecasting service calculates ETA forecasts for commercial transport vessels entering Finnish ports (ETB berth)
- In the future, ETA forecasts of the arrival of vessels at pilot sites will also be included in the service
- Time forecasts are calculated for vessels that are constantly on the move in focus (continuous distance)
- New forecast data is calculated on board every 5-30 minutes, depending on the availability of AIS data



Port Activity App

Port Activity App

Information exchange platform for better situational awareness

Fintraffic combines ETA/ETD predictions and meteorological data from various systems

Ports enhance the service with their independently financed additional features

Key Features:

- Real-time Tracking (AIS)
- Vessel Schedules (ETA/ETD)
- CO2 emission calculation for ships (port water area)
- Customizable Notifications (Events/Incidents),
- Service orders (pilot, tug, water, waste, mooring/unmooring)
- Berth Planning

The screenshot displays the Port Activity App interface. At the top, there are three vessel activity cards for LORLAND, VLEILAND, and ALAND, each showing status (e.g., 'At Berth'), location, and schedule. Below these is a large table with multiple columns listing various events and their timestamps, such as 'ETA (to berth, Portnet)', 'Customer ETA PBP', 'ETA Live Pilot Boarding', 'ETA Live VTS Berth', 'Dead Reckoning ETA', 'ETA', 'Pilotage Estimated', 'Pilot Ordered', 'Pilotage Commenced', 'ATA', 'Pilotage Completed', 'Customer ETD', 'PTD', 'Customer ETD', 'ETD', 'Pilotage Estimated', 'Pilot Ordered', 'Pilotage Commenced', 'ATD', 'Pilotage Completed', 'Customer ETA PBP', 'ETA Live Pilot Boarding', 'ETA Live VTS Berth', 'Dead Reckoning ETA', 'ETA', 'Pilotage Estimated', 'Pilot Ordered', 'Pilotage Commenced', 'ATD', 'Pilotage Completed', 'ATA', 'Pilotage Completed', 'ETD', 'Customer ETD', 'ETD', 'Pilotage Estimated', 'Pilot Ordered', 'Pilotage Commenced', 'ATD', 'Pilotage Completed'. On the right side, there is a map of the Baltic Sea region with a search bar 'Search vessel by name' and a search icon. The map shows numerous colored icons representing vessels in the area. The top right corner of the app shows weather information: '- °C Wind - m/s' and the location 'Kirkkonummi Mäkioluoto'.

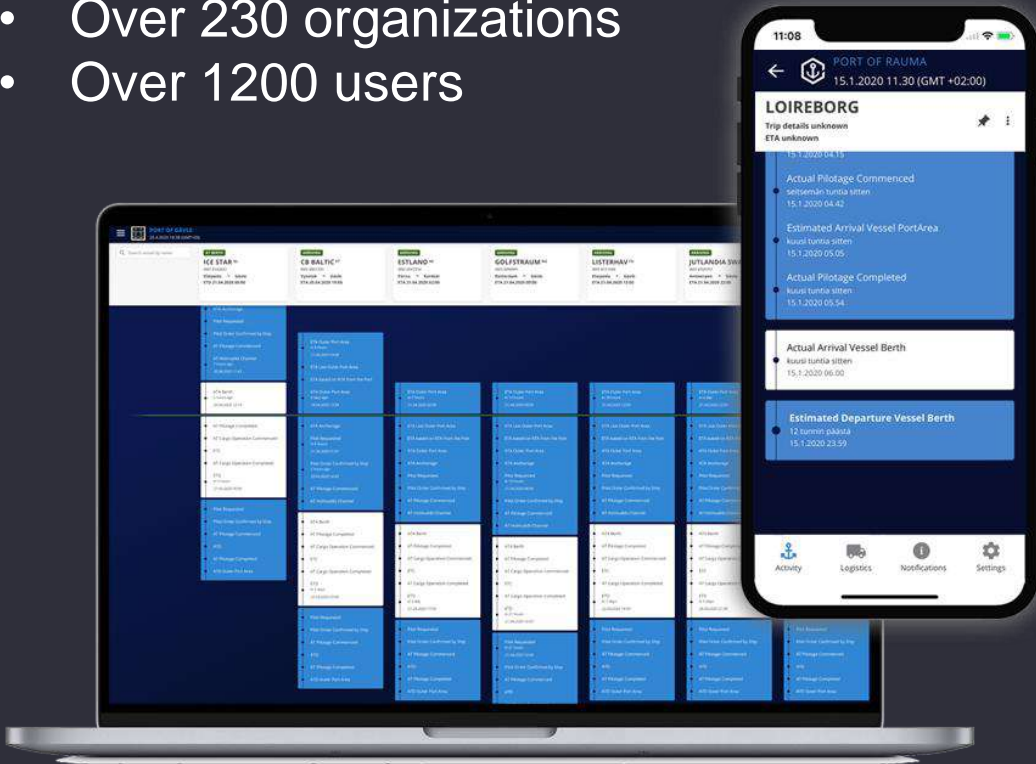
Each Port have their own view

- Ports' manage the user rights of their view

Use of the application is based on user agreement between Fintraffic and Ports

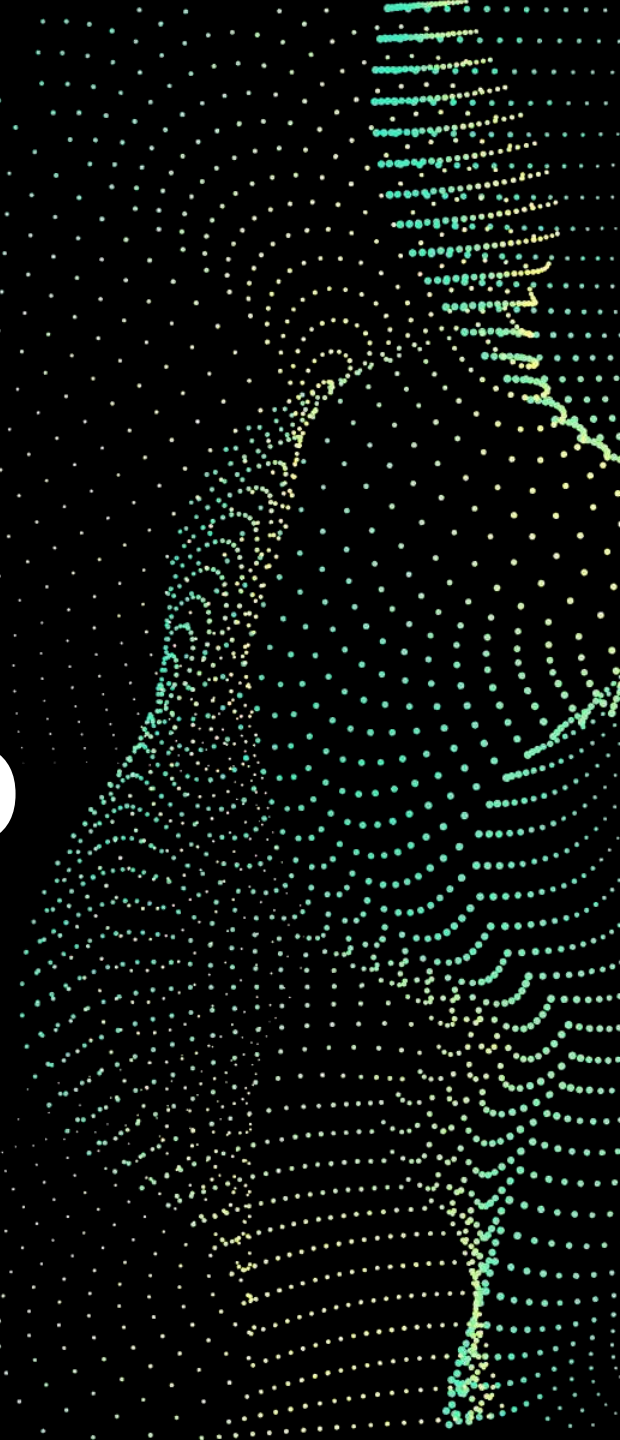
Statistics:

- 25 Ports
- Over 230 organizations
- Over 1200 users



nemo

Finnish Maritime Single Window program - NEMO



MSW (NEMO) program goals

Facilitate information exchange between public and private actors in maritime domain

Facilitate digitalization of maritime logistics

Create a data platform to enhance information exchange and trade facilitation

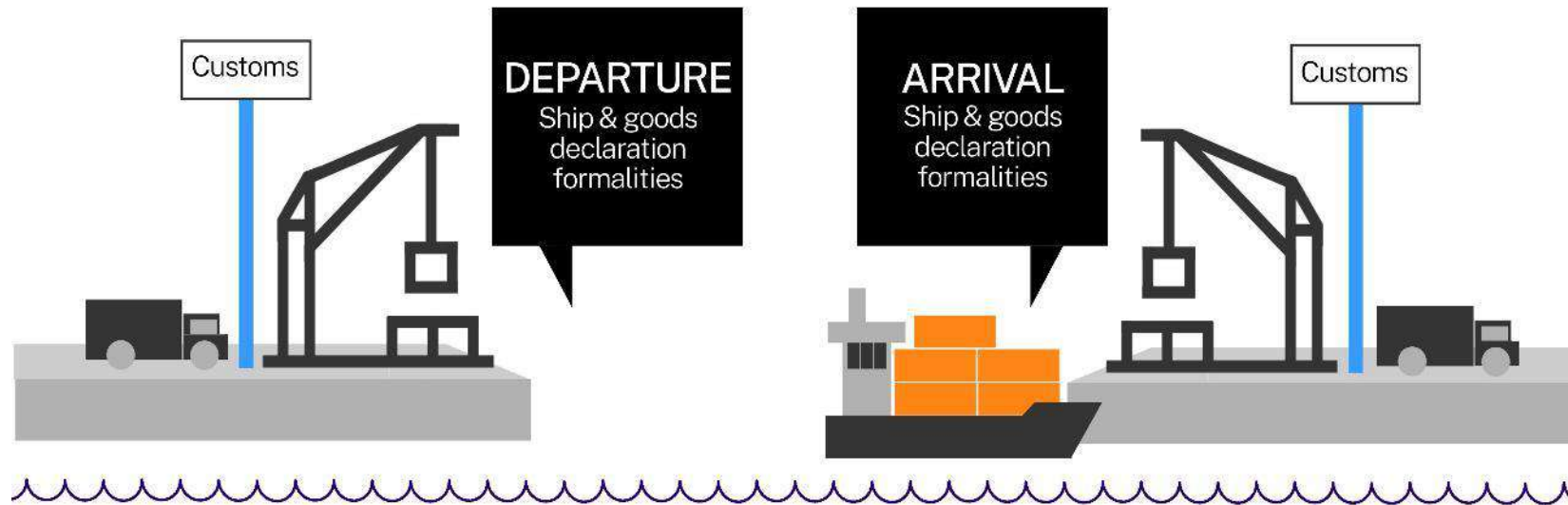
Implement value-added services

Implement new MSW system in Finland following the European Maritime Single Window EMSW regulation 2019/1239 and IMO requirements

Support capacity building

The logo for NEMO, consisting of the lowercase letters 'nemo' in a white, sans-serif font, positioned on a black circular background that is partially visible on the right side of the slide.

The NEMO concept was created with consideration for the full scope of maritime logistics

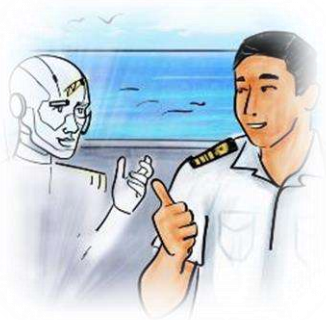


NEMO Vision concept

A visionary maritime data platform of the future that combines public and commercial information in a way that benefits all parties in the operator ecosystem.

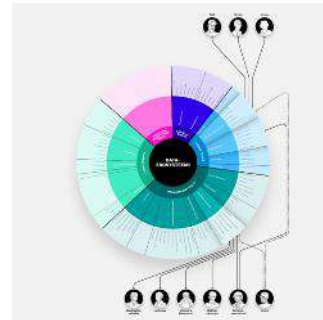
NEMO MSW concept was produced together with more than 150 stakeholder representatives who represented almost 70 different organizations (public and private)

Development of NEMO system began through conceptualization



Concept story

A story set in the future about the different stages of a ship's port call, the benefit achieved by different actors and the value produced.



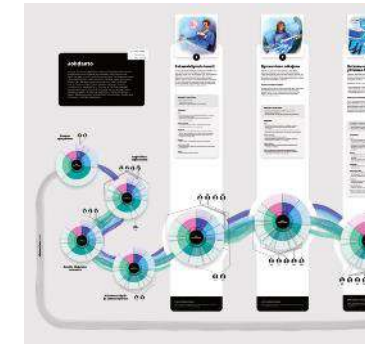
Data journey

Tasks, rights and responsibilities of actors in the concept story, utilization of data in the ecosystem



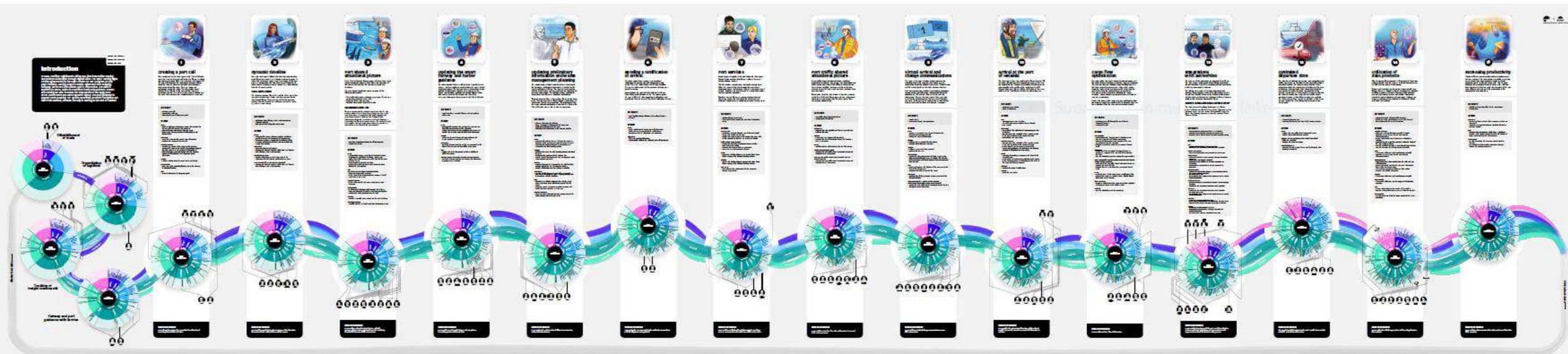
UI proto

A conceptual prototype of a possible future user experience



Blueprint

Summary of the concept story and data journey



FINTRAFFIC DATASPACE FOR MARINE TRAFFIC AND LOGISTICS DATA



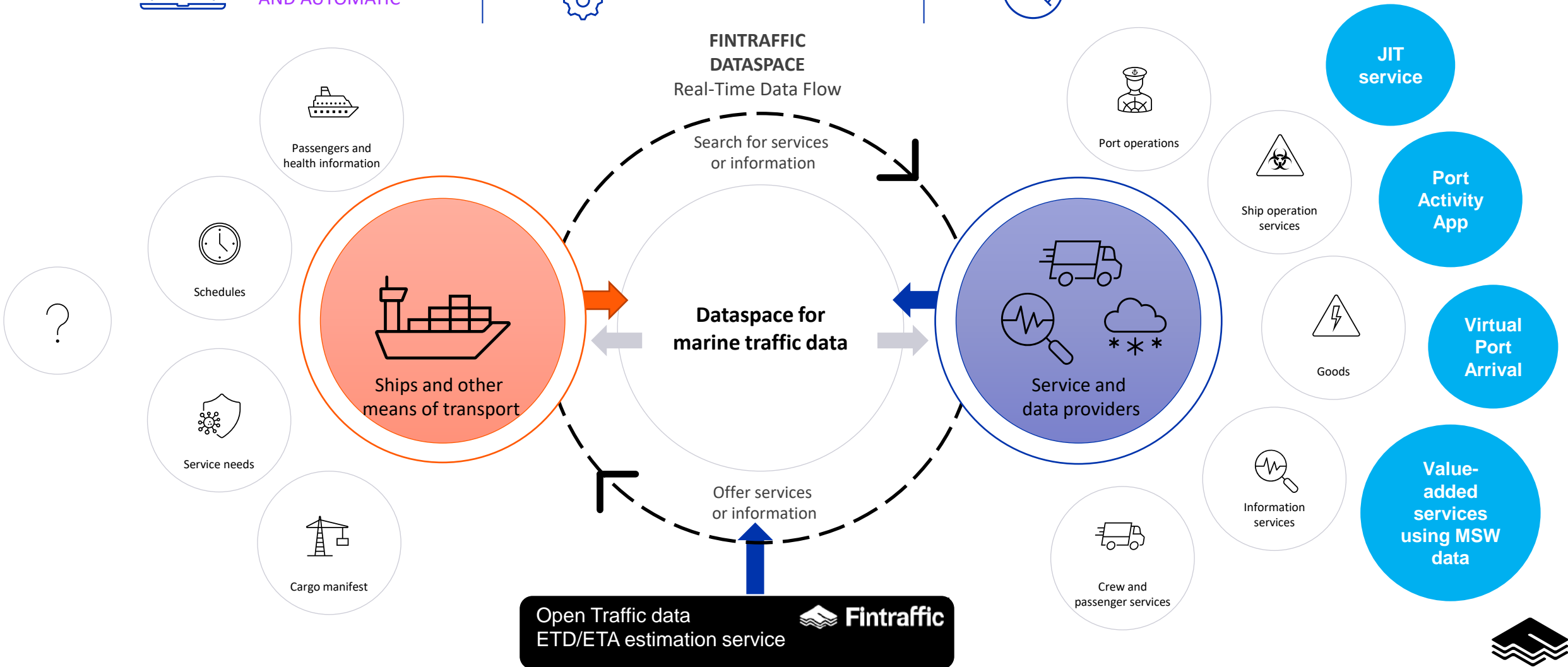
DIGITAL AND AUTOMATIC



STANDARDIZED



REAL TIME AND EVENT BASED



Maritime Data Space



Maritime Data Space



Just-in-Time arrivals (JIT)

Optimizing the arrival and departure times in port visits based on predictive analysis.

Virtual port arrival (VPA)

Agree vessel line-up and schedule port arrivals through data-focused collaboration and information sharing among stakeholders.

Business case: Reduce time at port
Optimise fuel consumption



Technology partner



Shipping company



Cargo owner

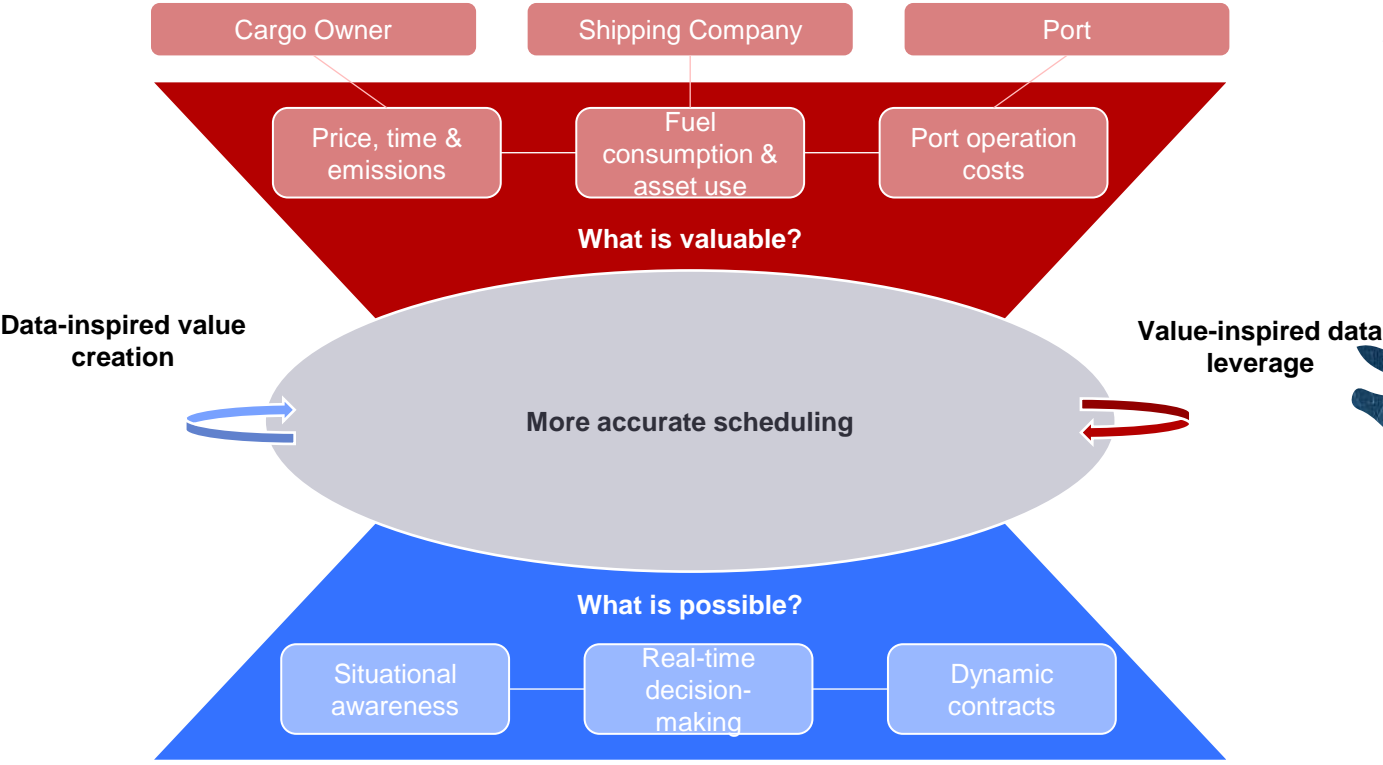


Port



Value potential & value creation of data sharing – JIT & VPA

- Maritime Logistics value chain currently compensates individual parties for inefficiencies resulting in costs and CO2 emissions that could be avoided with more accurate value chain wide scheduling capabilities.



Just In Time (JIT)

Identified value potential

Reduced vessel turnaround times
and CO2 emissions

Value
Drivers

27%

cost savings in port operations.
Terminal operator

21%

cost savings with less delays.
Port authority

20%

cost savings with reduced lead times.
Cargo owner

20%

cost savings with faster turnarounds.
Ship owner

Value
Levers

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Avoided delays

Reduced overtime

Reduced extra port call fees

Avoided extra chartering costs



Just In Time (JIT)

Identified data requirements

Reduced vessel turnaround times
and CO2 emissions

Situational awareness

Shared situational awareness and predictions through user interface and APIs.

Smart decisions

Smarter decision making with AI and machine learning.

Effective Communication

Effective communication across the port community.

Dynamic Action

Proactive actions taken to avoid the problems from materializing.

Planned leg schedules

Global vessel location and metadata (terrestrial & satellite AIS)

Global port location and route prediction models

Vessel bunker consumption data
(total consumption + consumption vs leg average draught and speed estimates)

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Vessel CO2 emission factor
(fixed value for converting bunker consumption to CO2 emissions)

Reference data for past leg durations, draughts, times, speeds

Port congestion models

Berth/terminal availability

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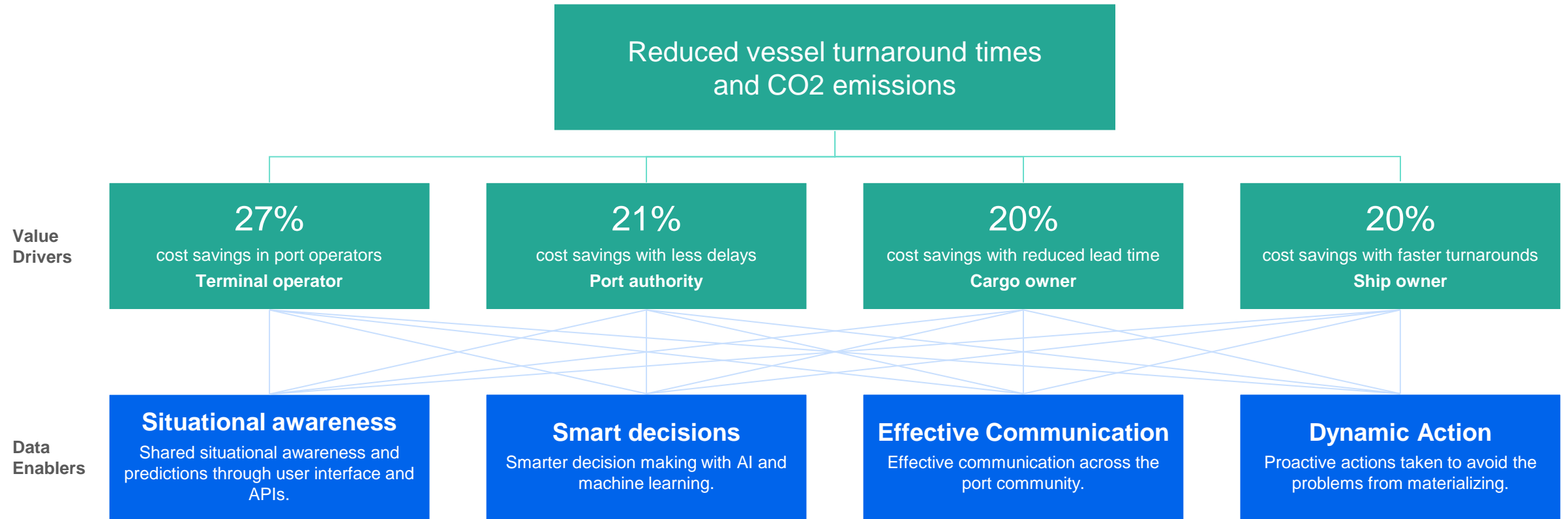
Data
Enablers

Data
Elements
/ Models

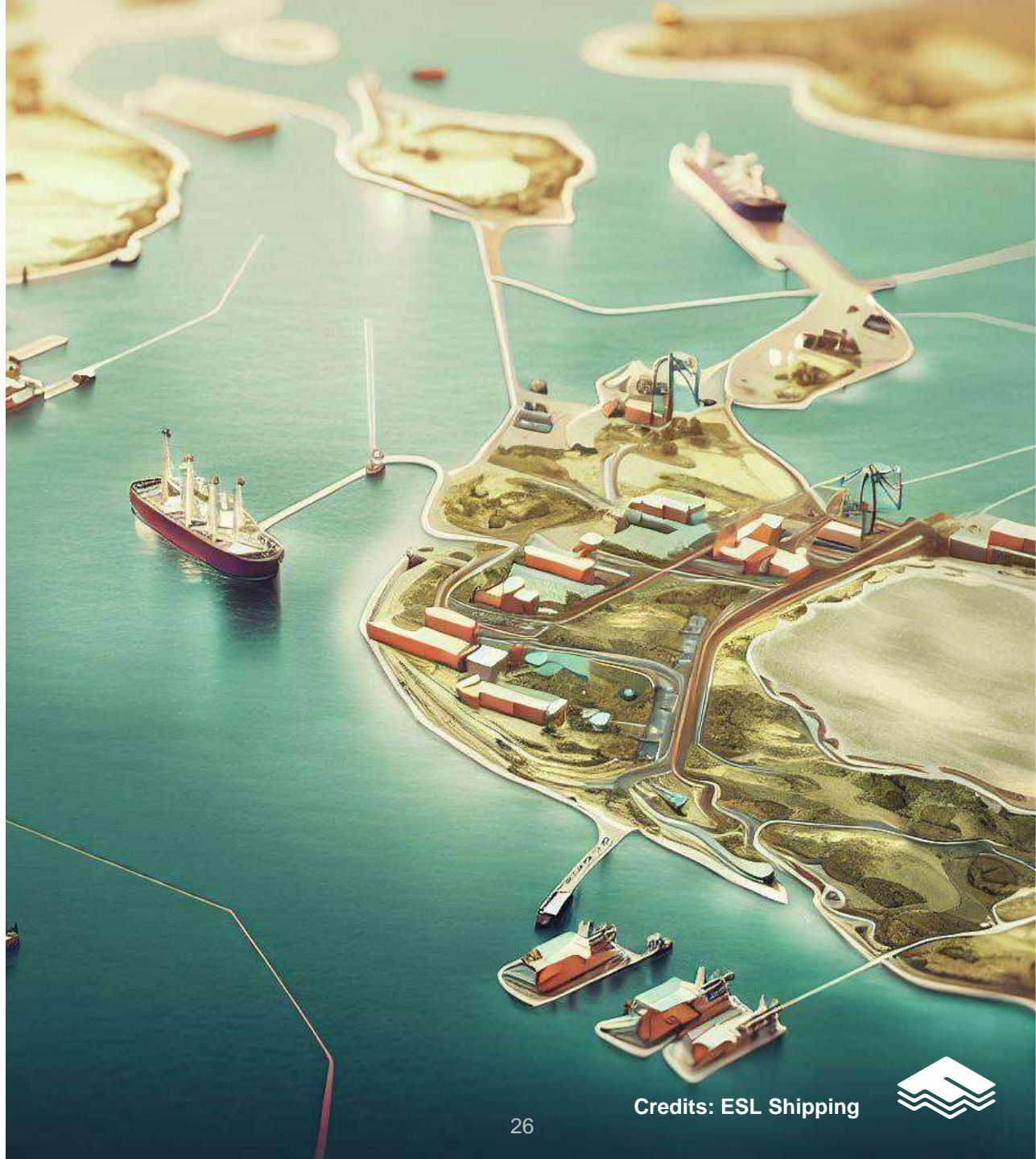
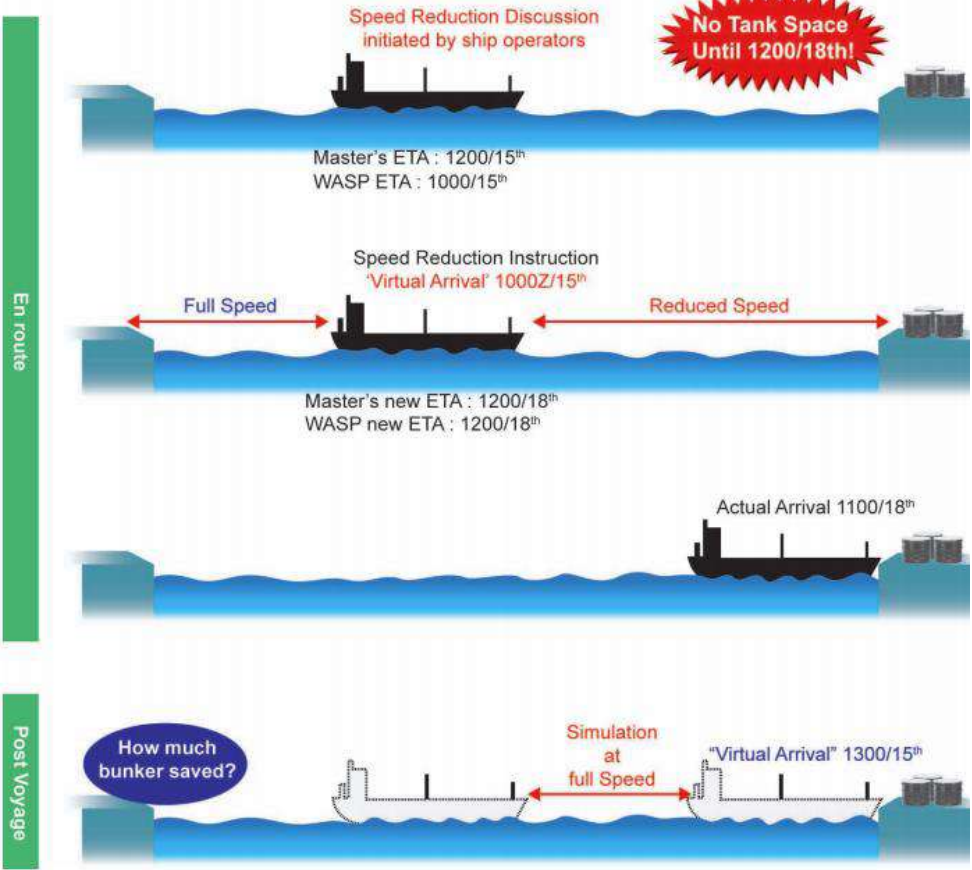


Just In Time (JIT)

Identified value enablers



Virtual Port Arrival (VPA)



Virtual Arrival as a Method to Cut Down Bunker Consumption

Bunker consumption with and without Virtual Arrival based on last 5 legs utilizing VA

Without
Virtual Arrival

With
Virtual Arrival

Difference

100 %

82 %

18 %

Thank you!

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