What are the user need?
How can we address them?
Can we provide a solution to the user need using “e-nav technologies” .......

Is the customer ready to pay for it

- Planning and Optimization
- Data Supply
- Monitoring
  - Tracking & Navigation safety
  - Voyage Performance
  - System performance & Alarms
  - Crew performance
- Decision Support and Control
- Remote service and Support
- Reporting and documentation
- Data collection and Analytics
THESIS is a cloud-based platform that brings together

FLEET OPERATIONS, SHIP SOLUTIONS, ACADEMY functions,

and SHIP TRAFFIC CONTROL solutions on one interactive,

flexible platform with unparalleled functionality.
Ship Traffic Control Centre sends monitoring data, voyage plan and reports to the Fleet Operations Centre. The Centre optimizes the voyage plan and sends confirmation. It coordinates a fleet of vessels sailing globally and improves the decision-making process.

The Centre sends real-time ship’s operational data to the Academy, which analyses the Ship crew performance and creates a Recommended Training Plan.

The Academy shares a common operational picture for training in a realistic environment and sends voyage plans and positioning reports to the Ship. It sends voyage plans and positioning reports to the Ship Traffic Control Centre, which provides real-time decision support and monitors voyage plans and positioning reports.

The Centre accesses online training content at any time and carries administrative tasks on behalf of the ship. It sends monitoring data, voyage plan and reports to the Ship Traffic Control Centre.

The Centre simulates real-time sensor data for the operators training and shares a common operational picture for training in a realistic environment. It confirms new ETA and sends reports, e.g., in case of danger or lost AIS signal.

The Centre coordinates a fleet of vessels sailing globally and improves the decision-making process. It provides real-time decision support and sends voyage plans and positioning reports to the Ship.

The Centre optimizes the voyage plan and sends confirmation. It coordinates a fleet of vessels sailing globally and improves the decision-making process.
THESIS E-NAV STRUCTURE

INFRASTRUCTURE FOR COMMUNICATION AND INFORMATION EXCHANGE

- Ships
- Ports
- Pilots
- Agents
- Service providers
- VTS
- Other stakeholders

Co-financed by the European Union
Connecting Europe Facility
STM SERVICES

INFORMATION DELIVERED

- Individual vessel route
- Estimated time of arrival
- Recommended time of arrival
- Alternate route if necessary

VOYAGE AND PORT INFORMATION SERVICES

Vessel

Route Cross Check

Initial Route

Route Management System

Monitoring route

Alternate route

ETA

RTA

Port Terminal

VTS

Co-financed by the European Union
Connecting Europe Facility
VTS

Addressed delivery to vessel entering the VTS area

Regular broadcasts to all vessels

No Go areas, Navareas, SAR Areas

Notices to Mariners

Free Text data exchange (Chat)

INFORMATION DELIVERED

Amendments and changes in information concerning the VTS area such as boundaries, procedures, radio frequencies, reporting points

Meteorological and hydrological conditions

Any information concerning the safety of navigation

SAFETY AND ROUTINE INFORMATION DELIVERY

STM SERVICES
STM SHIP SOLUTIONS

- Voyage Planning and Optimization
- Voyage Sharing with FOS & STC
- Port Call Messages
- IHO S-124 format (NW Areas)
- Text Messenger (Chat)
- New CAS:
  Ship-2-Ship Route Exchange
SHIP EQUIPMENT

- Connected ECDIS
- Navi-Planner application (STM Module)
- Translink gateway
- Supplementary iPad solution
SHIP VOYAGE PLANNING

- ECDIS RTZ Route format
- Weather Optimization services
- Pilotage and Ice Breaker route services
- Voyage Exchange with VTS and Fleet Operation Solutions
SHIP PORT CALL MESSAGING

- Ship: PTA / ETA / ATA timing
- Port: RTA

![Port Call Synchronisation](image)

**Route Data**

<table>
<thead>
<tr>
<th>To WPT:</th>
<th>Pilot Boarding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ship PTA (UTC)</td>
<td>12-09-2017 11:51</td>
</tr>
<tr>
<td>Ship ETA (UTC)</td>
<td>7.5 kn</td>
</tr>
<tr>
<td>VIS-TransasShip44</td>
<td>Port RTA (UTC) 12-09-2017 11:51</td>
</tr>
<tr>
<td></td>
<td>STG 7.5 kn</td>
</tr>
</tbody>
</table>

**Port Call Synchronisation**

- ETA 12:00
- ETA 15:58

*Co-financed by the European Union*
SHIP S-124 AREA SUPPORT

- Navigational Warnings:
  - Table mode
  - Graphic presentation
  - Notifications
  - **No Go** areas
  - **Check Route** - planning
  - **Nav Danger** – Voyage monitoring
SHIP CHAT MESSENGER

- Ship-Ship
- Ship-VTS
- Ship-FOS
- Address Book
- Notifications
NEW STM AIS ROUTE EXCHANGE FORMAT

Advantages vs IMO Circ. 289 format: Radius and XTD (VDES type)

CPA Meeting Points, CPA-RDV Rendezvous calculations

Predictions – Decision Support, Out of Route AIS target deviation
- MV STENA GERMANICA
- SSRS ‘11-00’
- SSRA ‘Marta Collin’
Market Trends:

- Increasing of STC coverage beyond territorial waters up to country-to-country traffic monitor and control
- Availability of e-Navigation ship-shore data exchange
- Availability of analytics and decision support tools

US NTSB report highlights the most common safety risk in VTS area:

- VHF miscommunication
- Lack of decision support
- Poor training
STM Planning Station:
- Route exchange
- Route editor
- Route crosscheck
- Text message exchange
- S-124 area creating and delivery

STM Monitoring Station:
- Route reception and display
- Enhanced route monitoring
- Route prediction tools and trial maneuvering
- Decision support for collision danger/grounding
- Receiving of routes and schedules from vessels
- Notifications on new routes receiving
- Displaying of routes on chart and in table mode
- Enhanced route editor
- Sending of routes and schedules to vessels
Text Messages Exchange

- Text messages exchange with vessels
- Notifications on receiving of new messages
Creating S-124 zones with navigational warnings
Distribution of S-124 zones
MONITORING STATION

Routes Reception

- Route receiving and display
- Customized display of waypoints and XTD lines
- Enhanced route monitoring
MONITORING STATION
Prediction Tool

- Prediction of vessels positions depending on their routes
Nature Center Deployment

- STM Coastal Center in Gothenburg
- 4 x STM Coastal Centers in Italy
- STM Coastal Center in Tallinn
- STM Coastal Center in Cyprus
- e-NAV testbed in Saint-Petersburg
- e-NAV testbed in Port Kavkaz
- e-NAV testbed in Sabetta

- EMSN Coastal Centers
  (parallel infrastructure)

- Volunteers wanted
FLEET OPERATIONS

- FOS is a basis for functional activities that fleet operators perform daily
- FOS allows to cooperate with 3rd party system and companies
- Front end displays information based upon the users rights and subscriptions
- Its dashboard shows an overview of the vessels subscribed and have the ability to delve to the following levels:
  - Precise Vessels Monitoring
  - Operational task of Charts and Nautical Pubs management
  - Anomaly detection and prevention
  - Advanced Intelligent Routing service
  - Decision Support service
  - On-the-fly correspondence between ship and shore
Enabling all FOS users to be able to continuously monitor their vessels, confidently be aware of what is happening onboard the vessels and around them.

Any out of date information will be clearly defined to allow FOS users to manage each asset effectively.

A way to monitor a vessel in a close to real time mode, so shore operators (FOS) may act like a virtual Navigational Officers.

This is a tool that users would use for analyzing anomalies and understanding WHY is anomaly happening rather than just WHAT is happening.

**QUICK AND EASY**

**VESSELS MONITORING**
Tool provides on-the-fly correspondence, which both ship and shore operators would prefer to use in interactive app embedded in products (Connected Smart Ship and FOS) rather than jumping to “heavy” e-mail clients.

Chat will make life easier during the information exchange, especially, during the voyage planning approval stages with Fleet Operations Centres, Ports, other stakeholders.

It simplifies and speeds up the contact with Support team (ARM service).
This is the first thing customer is coming at. It owns the eyeball of the customer; it owns it every morning when customers are coming to the office, or opening their FOS from the mobile app.

Dashboard is becoming embedded within customers life and their processes

Easy way to show vessel connectivity, tracking performance, charts and data statuses by a simple and familiar red-green-and-amber approach

Quick review and simple monitoring of any deviation (Out of KPI)

Ability for Ship operator to control of the vessels voyage plans and data for each ship
Thank you!

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Mike Andrianov ( mikhail.andrianov@transas.com )