TRANSAAS HArmonized Eco SysteM of Integrated Solutions

THESIS

SHIPPING'S FUTURE DELIVERED NOW
THE FUTURE HAS ARRIVED

Welcome to THESIS — Transas Harmonised Eco System
of Integrated Solutions

EFFICIENT  FLEXIBLE  INTEGRATED  CONNECTED

A globally-connected data ecosystem for the maritime industry that creates maximum integration between all stakeholders.

“The ship, the operations office, training facilities around the world and the ship traffic control environment can all be connected through the ecosystem; effectively creating a community that is able to talk to one another.” — Frank Coles, CEO, Transas

THESIS enables Fleet Operations, Ship Solutions, Academy, and Ship Traffic Control to interact together through one central, flexible ecosystem.

It centralizes multiple sources of big data into one platform.

With limitless potential for data sharing, THESIS opens up entirely new interaction channels between stakeholders.

It enables optimal data exploitation to exponentially improve safety and efficiency throughout the maritime operations chain.

It allows for unrivalled oversight of operations and unprecedented collaboration.

THESIS gives a completely flexible approach to data sharing, providing users complete choice of what data to use, how to use it and with whom they wish to share it.

THESIS promotes the sharing of knowledge throughout the maritime infrastructure transforming shipping operations as we know today.
The Four Pillars of THESIS

SHIP SOLUTIONS

FLEET OPERATIONS

TRACKING

OPERATIONS

ANALYTICS

CENTRAL STORAGE & MOBILITY

SHIP TRAFFIC CONTROL

ACADEMY
Why is THESIS Different?

THESIS solves the ‘what, why, when, who and where’ of how the shipping industry can capitalise on big data and digital innovation.

THESIS is a practical solution for the maritime industry that expedites data flow. It a data infrastructure for the industry that creates an exponentially safer, efficient and modern maritime sector.

*THESIS exists now and will evolve as new requirements are included and refined as stakeholders provide feedback on what is needed.*

Throughout 2016, Transas engaged in in-depth consultation with the industry in order to understand the exact needs, priorities and barriers to the full-scale uptake of THESIS.

What the Industry Asked about THESIS

**WILL THIS MEAN AN ENTIRELY NEW WAY OF WORKING?**

THESIS does not require a completely new way of working, it does however require a change in mindset. It is about capitalizing on the potential of information flow to enhance the way that people work and the decisions that can be made.

It is about making operations easier, safer and more integrated.

The core functionality of THESIS is already in use by ship navigators, engineers, shore fleet operations, training departments, training schools, ports and flag state control.

THESIS allows for shared access and practical information flow between these different functions.

> Operations will need to adapt rather than adopt

**Will it De-Skill our Industry?**

THESIS was not designed to de-skill crew.

It helps to return crew focus to the specialist job role functions for which they were trained.

It gives the crew superior decision support tools to enable them to perform their roles with greater knowledge and skill.

The demands of modern shipping mean that the crew need to be equipped with the solutions to do their job. THESIS provides the tools that they need.

> It is about empowering and supporting, not de-skilling
What is Needed for the Successful Adoption of THESIS?

It is vital that every user of THESIS within an organization understands the positive changes that THESIS can bring to their role.

However, company culture and traditional process management can be barriers to successful adaptation.

For crew and onshore personnel to adapt their roles successfully, the working culture must change from the top downwards.

The entire company must be on-board and be empowered to use the ecosystem to its full potential.

SO WHAT DOES REALLY CHANGE?

THESIS allows for shared operational responsibility and collaboration between all stakeholders that enables a more streamlined, connected environment.

Reduction in Administrative Burden

Regulatory and internal reporting requirements have placed an increasingly untenable administrative burden on ship crews.

By automating key reporting, regulatory and performance criteria, THESIS enables the crew to concentrate on operating the ship.

Results of an independent global survey carried out by Fathom Maritime Intelligence on the internet from 13/7/2016-04/08/2016. There were 101 respondents to who completed the full survey and whose results are shown. Of these 55% were ship owner, operators or charterers. The remaining 45% were made up of regulators, government, training schools, class societies, technology suppliers and other maritime industry stakeholders.
WHICH PROCESSES, IF EITHER AUTOMATED OR CARRIED OUT BY SHORE-BASED PERSONNEL, COULD POSITIVELY IMPACT THE ADMINISTRATIVE BURDEN ON CREW WITHOUT AFFECTING THE SAFETY OF OPERATIONS?

- Regulatory Reporting: 75%
- Company Reporting (e.g. noon reports): 63%
- Port State Entry Requirements: 61%
- Environmental Reporting: 57%
- Mandated Port Entry Requirement Information: 57%
- Commercial Port Call Management Requirements (e.g. pilot requests): 48%
- Fuelling and Bunker Processes: 40%
- Other: 10%

Shared Operational Responsibility

Ship, shore and ports are becoming increasingly able to access real-time, operation critical data that allows for decision-making and responsibility to be shared.

With THESIS in place, all required stakeholders can access the same data and knowledge simultaneously.

The overall responsibility for decisions concerned with the operation of a ship must remain with the captain. THESIS enables this. However, it enables decisions and input to be shared where necessary.

"Share and support, but allow vessels to have ultimate responsibility."

WHEN WOULD IT BE HELPFUL TO HAVE SHARED INPUT/OPERATIONAL RESPONSIBILITY BETWEEN ONBOARD CREW AND SHORE BASED PERSONNEL?

- At all times: 59%
- At times of crisis: 18%
- When leaving and entering ports: 7%
- Other: 4%
- Whilst loading vessels: 11%
Shore-Based Operational Oversight

THESIS allows onshore personnel to access real-time information as it is being generated across the ship.

Navigational information such as radar overlays and ECDIS, ships alarms systems, route and voyage planning information, engine and equipment monitoring data and fuel consumption information can all be accessed in real-time.

Route planning, loading planning, voyage optimisation can all be shared decisions between ship and shore.

Ship operators have expressed a strong desire for this data to be available in the office as they believe that it will improve the speed and quality of decisions and reduce risks.

Simulators as Operational Support Tools

Instead of being just training tools, through THESIS, simulators can draw on real-time ship data to analyze scenarios and support operations pre, during and post event.

When a ship is taking a particularly rough passage or navigating in to a difficult port, this information can be relayed to simulators on shore. Shore based crews can simulate different scenarios and provide advice and support to the ship.

Ship operational data can also be used to recreate incidents for post event analysis and debrief improving knowledge and competence throughout an organisation.

Do you believe that crews would be willing to accept operational decisions from the shore?

- Only in certain circumstances: 47%
- Yes: 30%
- Only if required by the company: 15%
- Never: 4%
- Other: 4%

*Make the information shared both real-time and complete.*

*Simulators should be more than simple classroom training devices.*
Highest Fidelity Training School Environments

Scenarios can be run on simulators using real ship traffic control, ship specific and operational data. This real-world data can continuously fine-tune ship models and scenarios within the simulation environment. Through innovative system architecture, the simulators can be interlinked to provide training and assessment for multiple crew roles working together. By creating this unique environment, THESIS will enable seafarers to gain the critical core competences that enable superior decision-making, enhanced safety in every day operations.

High Quality Training on Land or at Sea

Improved integration between training schools, the ship and shore based fleet operations means there can be access to high quality professional development, content and expertise anywhere, onshore or onboard. Through THESIS, seafarers can drive their own continued professional development whether on land or at sea. System-specific training can be made available direct to the ship enabling immediate familiarization for new crew.

WOULD POST-EVENT SIMULATION AND ANALYSIS OF REAL LIFE OPERATIONAL SCENARIOS (UTILISING DATA DRAWN FROM THE SHIP) BE A POSITIVE INFLUENCE ON IMPROVING SEAFARER COMPETENCE WHEN USED FOR SHORE BASED TRAINING AND POST-INCIDENT DEBRIEFS?

- Yes definitely: 60%
- Very likely: 28%
- Possibly: 11%
- Unlikely: 1%

High quality training creates high quality seafarers

Competent, not just STWC-compliant crews are needed
Centralized Ship Traffic Control

Ship size and maritime traffic intensity growth have raised risk management concerns. With grounding and collisions (57% of all losses) being by far the most common type of ship accident, the industry should prepare for potential $1bn+ losses.

Safety of navigation is one of the key challenges. Establishing port-to-coast-to-country-to-country monitoring, control and support systems that extend far beyond simple tracking and monitoring can significantly improve this situation.

THESIS and Ship Traffic Control, with the support of automated self-learning decision support technologies, make it possible to operate a ship traffic control model similar to that available to the aviation industry. Ship movements can be advised and controlled by a country, even beyond territorial waters.
WHAT IS NEEDED TO DO THIS?

The requirements will vary by the stakeholder group and the functions required. Much of the technology required is already available today. However, it is not fully connected and instead operates in numerous independent ‘micro-ecosystems.’ Through THESIS, all technologies can be connected through one central operating system enabling the data to be available across the whole operational ecosystem.

What is Required in Terms of Ship Solutions?

THESIS provides a single point of connectivity for the data produced from Fleet Operations Solutions, Maritime Services Providers (MSP), Maritime Data Products and shore-based stakeholders.

Today’s ships host a collection of sensors and electronics including navigational equipment, bridge equipment, telemetry data, user defined manual data, fuel, automation data and ship alarms.

Ship owners and operators feel it would have a positive impact on safety if, in particular, ECDIS data, voyage planning data, weather and forecast data and ship stability data was available in real-time to both the ship and the shore.

Currently, only a fraction of the data produced is utilized and even less is shared between systems and users.

Let’s use the data we already have to better effect, not create more
Is THESIS technology provider agnostic?

Technology manufacturers must cooperate to facilitate a shared way of working in order for the shipping industry to collaborate.

The availability of data from machinery and systems is currently a barrier to data accessibility and shared data applications.

THESIS itself is provider agnostic. Data from other systems can be integrated into the ecosystem, but only if there is an infrastructure in place to do so. Transas will provide this through THESIS.

The issue of data ownership (technology buyers versus technology suppliers) must be addressed and barriers removed.

"OEM cooperation is required for shipping industry collaboration"
What is required for Fleet Operations?

A full Fleet Operations Centre provides the infrastructure needed for full resource management.

Fleet Operations Centres already exist and are tailored to individual company requirements. However, the size and scale of this can vary on the size and scale of an operation.

It can be as simple as increased connectivity, collaboration and oversight by superintendents and fleet managers.

For larger shipping operations, the power and potential of the Fleet Operations Centre can truly be realized through operations rooms, planning stations, and even shore-based company simulators.

Fig. 1. A computer generated image of Fleet Operations Centre proposal for an existing Transas client.
Ship Traffic Control Management

A new generation of Ship Traffic Control and Management Solution that extends safety and efficiency of navigation far beyond the limits of traditional coastal systems is required.

It must collect information from various data sources, process this information and integrate it into a common operational picture that is shared between all relevant stakeholders according to their needs and access level.

It must provide the tools for a coordinated global approach to maritime traffic control, monitoring and decision support.

Do Training Schools Need to Change?

With superior simulated environments available and the possibility to run full ship multi-role interactions, training delivered through THESIS can be adapted to focus on core competence training rather than just STWC compliance.

The key is ensuring that the correct simulation technology is used and the right design of training facilities is created.

The training schools feel that new generation of seafarers do not want or expect to have full responsibility over the vessel and machinery.

A unified operational approach, decision support and shared operational responsibility may encourage them to stay in the profession.

Is There Enough Data and is it of High Enough Quality?

There is both volume and quality of data available. However, as a general rule, the quality of any output can only be as good as the quality of the input.

In any sector, you usually get what you pay for. You may be able to have cheap but it is unlikely to be reliable.

Access to high quality data that is always available depends on investment in the correct equipment, and the infrastructure, to enable reliable transmission between stakeholders. Reliability is key.

Ships are multi-million dollar assets with human lives depending on their safe passage.

THESIS provides reliability as well as high quality application of the data. It improves the safety and operations of ships but requires the right equipment and data input. This means investment in quality.

Do We Have the Information Flow Capacity?

Historically, the weakest link in the chain has been the communications between ship and shore.

There is now high speed, high capacity services with full redundancy available for all vessels. Unlimited data can be exchanged at all times.

The data connection capability is not a limiting factor for THESIS.
Where is the Value?

Financial and safety considerations are the principal drivers for the adoption of THESIS. The value it provides is the improvement of operations, a decrease in operating costs and thus competitive operations that should drive an increase in market share.

Through using THESIS, shipping companies are future proofing their operations for both market and regulatory requirements.

The adoption of THESIS does require capital investment, however this is balanced against the reduced operational costs created by operational efficiencies, improved work flows and increased competitive advantage.

How Does Improved Safety Improve the Bottom Line?

A better safety record improves commercial prospects and can even command a premium over other ships.

Ships with a good safety record welcome increased charter prospects, fewer inspections and potentially higher charter rates.

For cruise and passenger ships, any safety breaches are potentially catastrophic in terms of public image and bookings.

Ship owners and operators with good records also enjoy better protection and indemnity insurance premiums.

Where are the Operational Efficiencies?

THESIS creates multi-level operational efficiencies throughout the operational infrastructure.

**VESSEL AND EQUIPMENT OPERATION**

With complete oversight of the operating parameters for all equipment within the ship, the whole ship can be optimized and streamlined for the most efficient and effective operations.

Through THESIS, crews can receive operational support from the shore in addition to expertise and knowledge being shared across the fleet.

Remote monitoring and diagnostics can extend machinery life, reduce spares inventory and improves vessel maintenance.

Additional onboard monitoring, including CCTV, allows for effective action to be taken before small issues become large problems.

**THE AUTOMATION OF TASKS**

By automating reporting and monitoring functions, administrative burden is lessened. Crew and on-shore personnel can focus on value adding activities.

**STREAMLINED OPERATIONS**

Expertize and knowledge is shared across the fleet and the entire structure of the organization can be streamlined for maximum efficiency. Similar numbers of personnel may be required but, with roles changed and processes refined, this can deliver better results.
WHICH OF THE FOLLOWING DO YOU BELIEVE COULD POSITIVELY IMPACT OPERATIONAL EFFICIENCY AND IMPROVE COST MANAGEMENT IF THEY WERE AVAILABLE IN REAL TIME TO SHORE BASED OPERATIONS?

Fuel Consumption .................................................. 83%
Engine Performance ................................................... 82%
Voyage Planning ........................................................ 71%
Weather and Forecast Data ......................................... 68%
Loading Plans ............................................................ 44%
Real Time ECDIS Data ................................................. 41%
Ship Stability ............................................................. 38%
Crew Lists ................................................................. 22%
Passenger Lists .......................................................... 12%
Radar Overlays ........................................................... 8%
Other ........................................................................ 5%

OPTIMIZATION OF THE HUMAN FACTOR

Through the automation of processes, there is a reduced degree of human factor on decision-making, reducing errors, time delays and mis-communication.

Time is money. Therefore, optimizing the use of the human factor to best effect and removing the need for human intervention where not absolutely necessary will save money.

How does THESIS Impact the Human Element?

By providing better training, more time to concentrate on value added tasks and the specialization of job functions, THESIS creates an exponentially better working environment.

Organizations can attract and retain the best personnel, reducing turnover and ensuring their operations are as effective and commercially competitive as possible.
IS THIS JUST THE AUTONOMOUS SHIP IN DISGUISE?

It will certainly be possible in the future to run a ship autonomously from A to B depending on how many sensors are onboard, what equipment and processes are put in place and the risk the industry wants take.

However, there are many regulatory, cultural and technological barriers to overcome first.

THESIS is an ecosystem that will enable the autonomous ship in future. But THESIS is also about creating an ecosystem for ship operations of the future.

THESIS is concerned with how the operational infrastructure of shipping can be improved to provide better support, knowledge and power to the human element. It is not about how to remove the human element.

THESIS is shipping’s future now.

WHICH OF THE FOLLOWING DO YOU BELIEVE THAT THE SEAFARERS OF TOMORROW WILL REQUIRE?

- Reduced Paperwork ............................................................. 86%
- Integrated Automated Technical Solutions ............................... 71%
- Improved ICT Training and Skills .......................................... 67%
- Shore-Based Engineering Support ...................................... 66%
- De-Criminalisation of the Seafarer ........................................ 52%
- Shore-Based Navigation Support ....................................... 44%
- Others .................................................................................. 6%
Realising the Power of THESIS

The Commitment from Transas

Transas is committed to ensuring that the technology, the capacity and the capabilities of THESIS are delivered to the maritime industry.

Many of the fundamental functions required are already in place and THESIS is already in action.

By investing in world class R&D resources, Transas will deliver new innovations and opportunities based on industry feedback.

Transas will continue to collaborate closely with industry to ensure that the functionality, usability and information flow capacities match the real needs of the industry.

However it is recognised that attitudes to change may be a significant barrier.

WHAT IS THE LARGEST BARRIER TO A SCENARIO OF SHARED OPERATIONAL RESPONSIBILITY BETWEEN THE SHIP AND THE SHORE?

- Investment/cost: 26%
- Crew Attitudes: 21%
- Regulation: 16%
- Technology: 14%
- Shore Based Attitudes: 12%
- Other: 11%
What does the Industry Need to do?

Whilst Transas can provide the technology, the industry must take responsibility for driving a change in attitudes.

*The definition of Insanity is doing the same thing over and over again and expecting a different result*  Albert Einstein

The industry must embrace a fresh way of working, making necessary changes to the infrastructure and the regulatory landscape to facilitate this.

**REGULATION**

The shipping industry has the complexity of being both regulated at an international level by the International Maritime Organization (IMO) but also often at a regional level by attendant regulatory bodies.

Regulation is usually viewed as a downward pressure beyond the control of industry itself. However, upward pressure can be applied to push for regulatory change to make a safer, more streamlined and automated industry.

Regulation needs to allow for the increased automation of safety, environmental and regulatory reporting requirements. It also needs to support the culture of shared operational decisions and de-criminalization sea-farers.

Port State Control must also be part of the solution accepting methods to enforce regulation that do not require manual or paper based records.

In certain circumstances it may be advantageous for the maritime industry to utilise regional regulatory bodies and laws. For example, EU anti-competition law could potentially utilised to push OEMs to make data more openly available.

**ATTITUDES**

The industry must proactively embrace necessary change and solve problems.

Initiative should be taken to create new culture.

There needs to be collaboration and a willingness to change.

This can only come from industry itself.
TRANSAS HAVE OPENED THE WAY FOR THE GLOBAL MARITIME COMMUNITY TO FINALLY TAKE ADVANTAGE OF TRULY INTEGRATED OPERATIONS TO CREATE A SAFER, MORE EFFICIENT AND MODERN MARITIME SECTOR.

THESIS ALLOWS THE INDUSTRY TO WORK AS ONE INTERCONNECTED ECO-SYSTEM.

NOW THE TECHNOLOGY AND SOLUTIONS ARE AVAILABLE, THE OPERATIONAL STAKEHOLDERS THEMSELVES MUST STEP UP TO MAKE THE CULTURAL AND REGULATORY CHANGES THAT WILL RELEASE THE FULL POWER AND POTENTIAL FOR THEIR BUSINESS.