

APRIL 27TH, 2023

Net zero carbon using digital twins

Digital Ship –Athens, Greece

Matthew Miller – Marine Industry Principal



AVEVA

AVEVA - Leading the market in industrial software



85%
of the top oil and
gas companies



1000+
utilities worldwide



9
of the top 10 mining
and metal companies



24
of the top 25
pharmaceutical
companies



9
of the top 10
chemical companies



60%
of the global ship
production



AVEVA

The world has changed



Digital era

Businesses refocus resources and investment on digital transformation to ensure safety, support remote activities, and ensure profitable operations

Executive stakeholders rapidly study conditions and operations to make key business decisions

More complex models integrated into work, workflow, documentation and real-time reporting

Competition/Cost pressure



Compressed design and build cycles



Decarbonization



Increased automation



Digital services



Enterprise-wide Control & Monitoring



Remote & Optimized Workflows



Workforce Safety & Agility



Digital Collaboration with Stakeholders



Talk topics

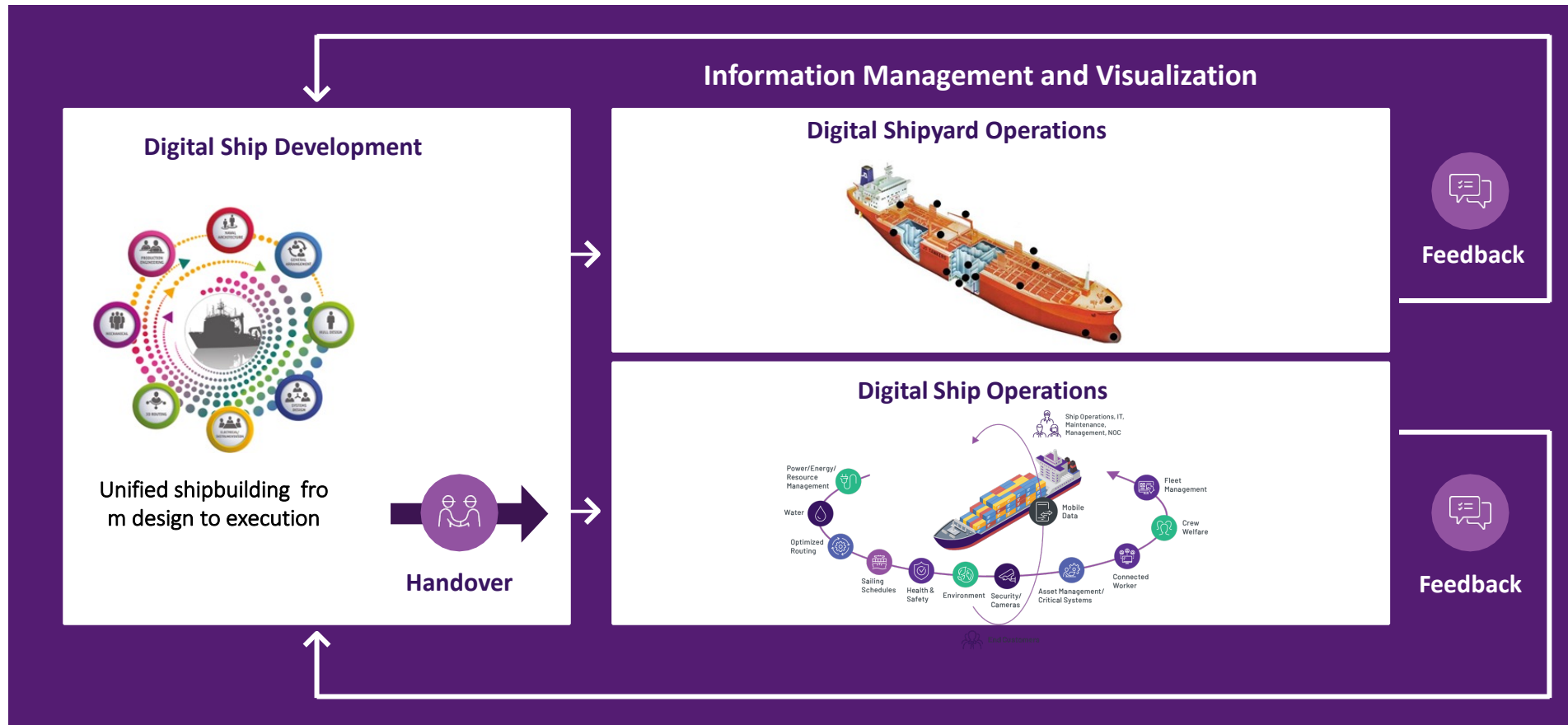
Connecting gaps through the digital journey

1. Driving to Net Zero with more effective designs and retrofits

2. Using the digital twin and threads - Model-based design, construction and operations

3. The long-tail of value and the triple bottom line

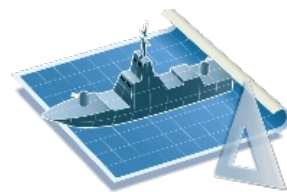
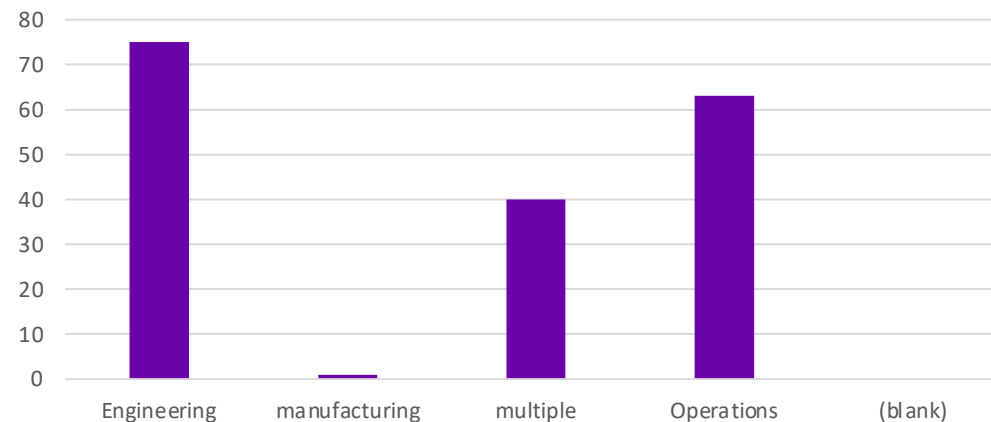
Digital Twins and the Digital Handover



Which Digital Twin?

A combination of twins will win out , providing value to those who need it most.

- Predominantly Engineering ‘as this is where the costs get baked in’
- Operations as this is where the vessel spends most of its life
- An engineering backbone (what and why) with operational twin (performance) is probably going to deliver the most value in most use cases.



Source – IMarEST Digital Twin Survey 2021

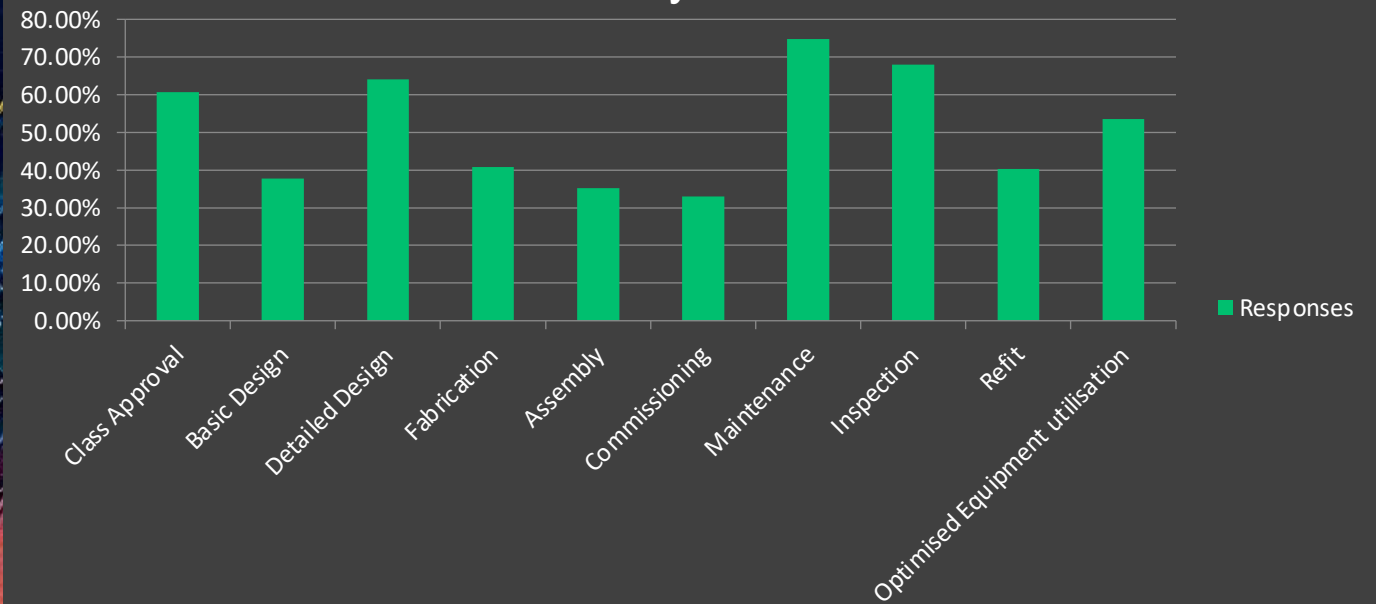


Benefits of Digital Twins over the whole lifecycle

Broad spectrum of perceived benefits

- Maintenance (predictive/condition monitoring)
- Inspection (Y% of total OPEX)
- Detailed Design (X% of total CAPEX)
- Classification & Compliance

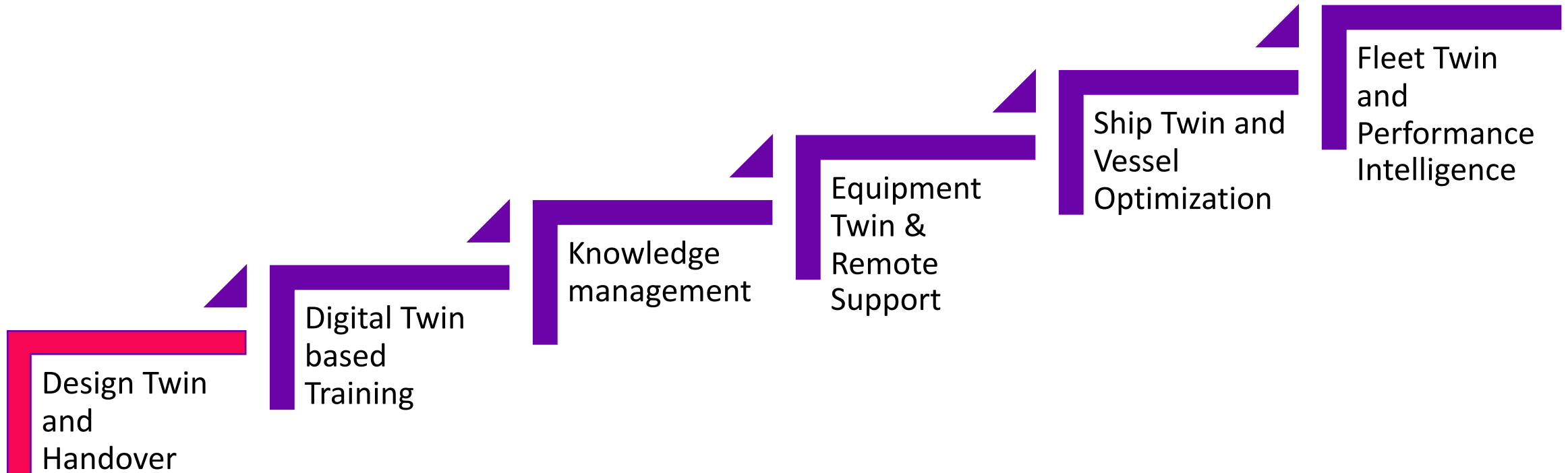
What processes in the ship lifecycle do you expect to benefit most from digitalised strategies in the next 5 years?



Source – IMarEST Digital Twin Survey 2021

Many other use cases for Digital Twins

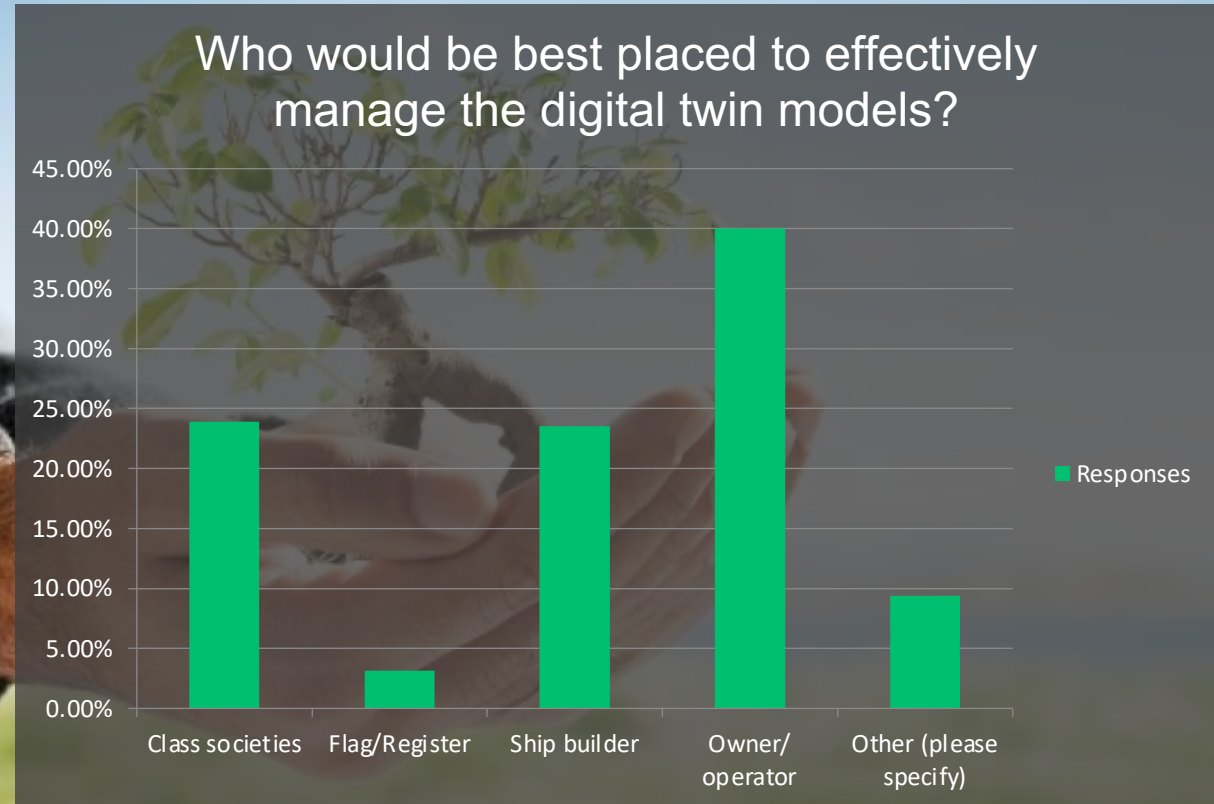
Complex models help resolve complex problems



Who should manage the Digital Twin?

No clear custodian of the Digital Twins

- Owners want to get their data and control it
- Shipyard could provide new services
- Class are a stable and reliable partner for this

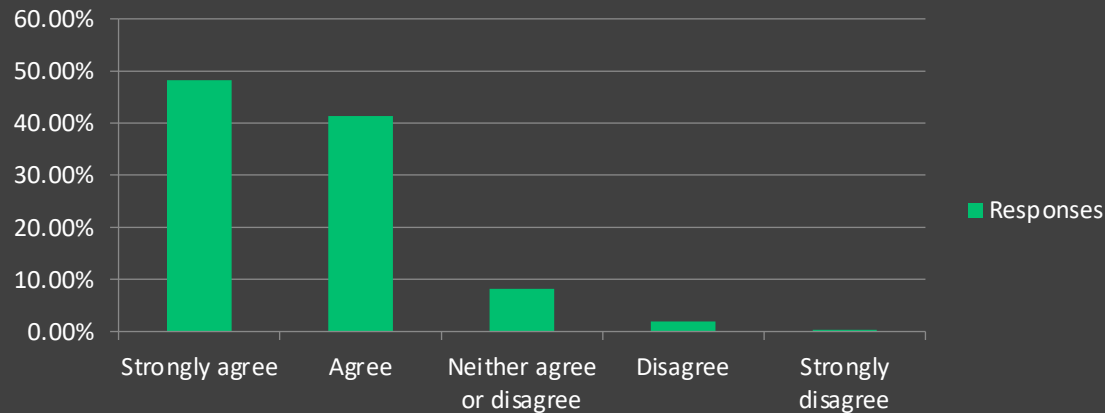


Source – IMarEST Digital Twin Survey 2021

The Digital Handover

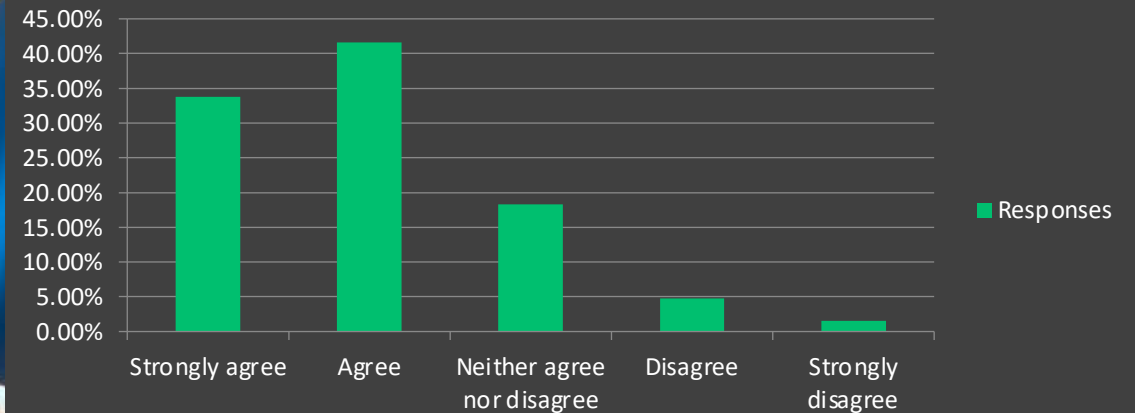
The digital handover is a key to enable digital operations

It is extremely important that a **shipyard hands over an accurate, as-built digital twin of the vessel**, for improving operational optimization.



~90%

It is very important that the shipyards are **kept current on any changes in the vessel and its digital design twin** after the one-year warranty period has expired.



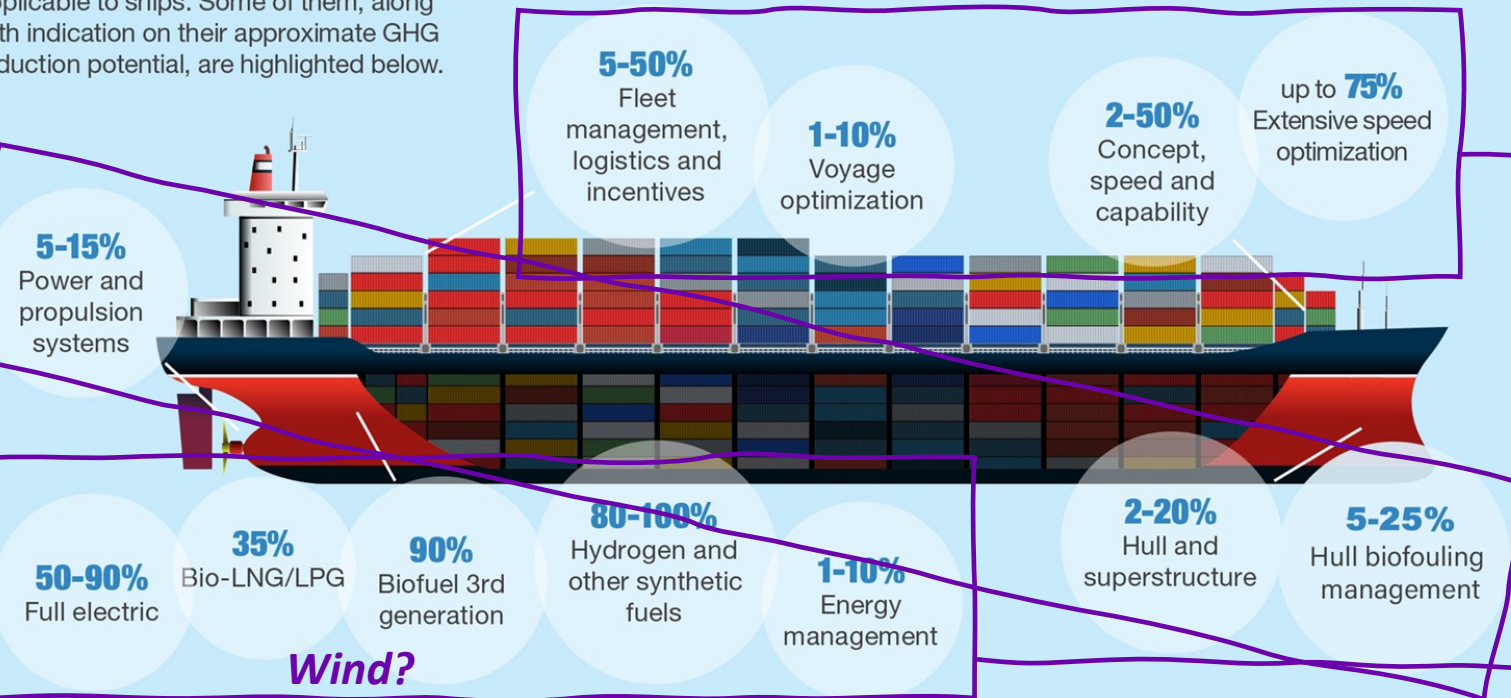
~75%

IMO GHG Strategy- combinations of solutions needed



A wide variety of design, operational and economic solutions

Achieving the goals of the Initial IMO GHG Strategy will require a mix of technical, operational and innovative solutions applicable to ships. Some of them, along with indication on their approximate GHG reduction potential, are highlighted below.



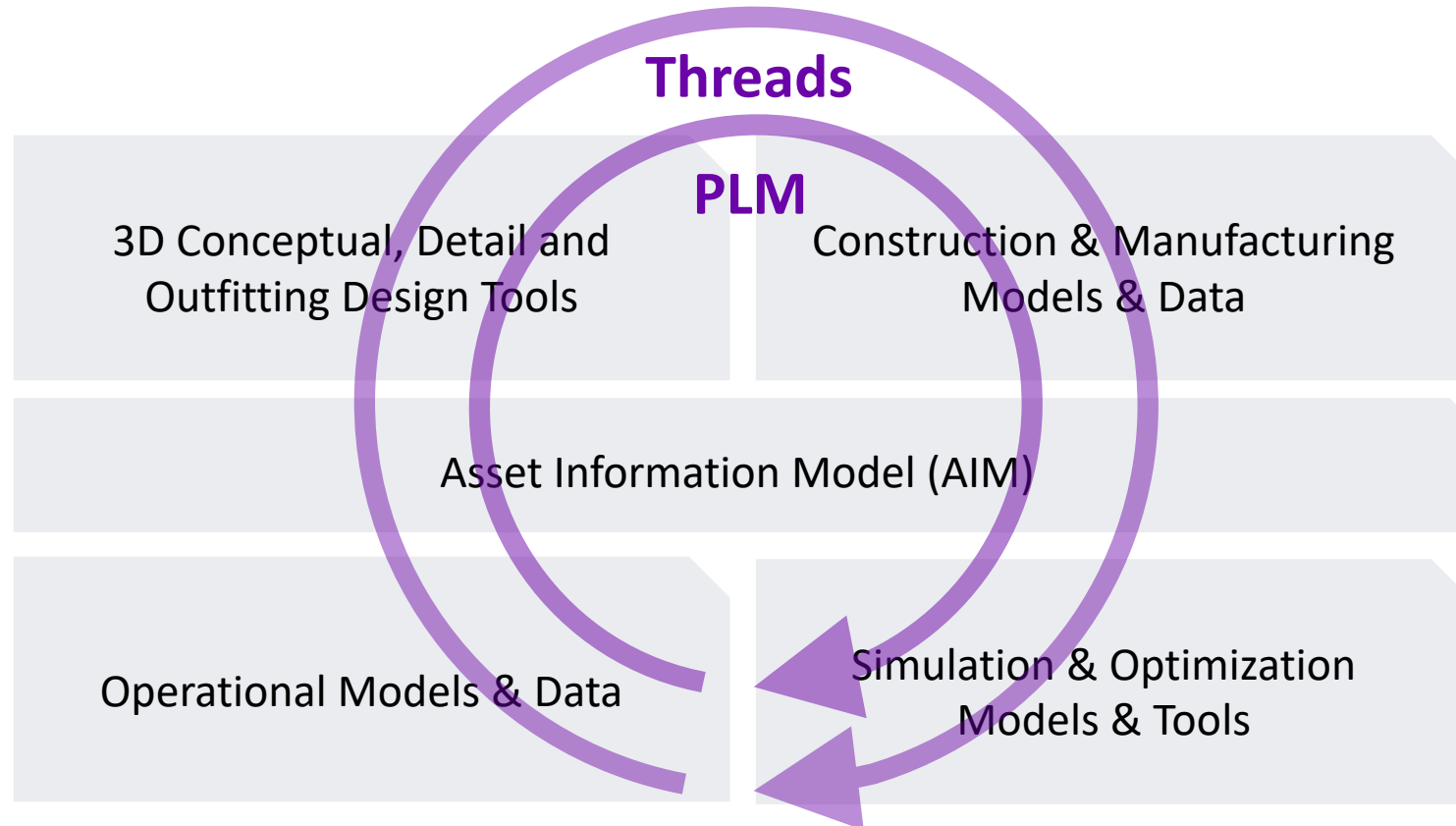
Operations

New Designs

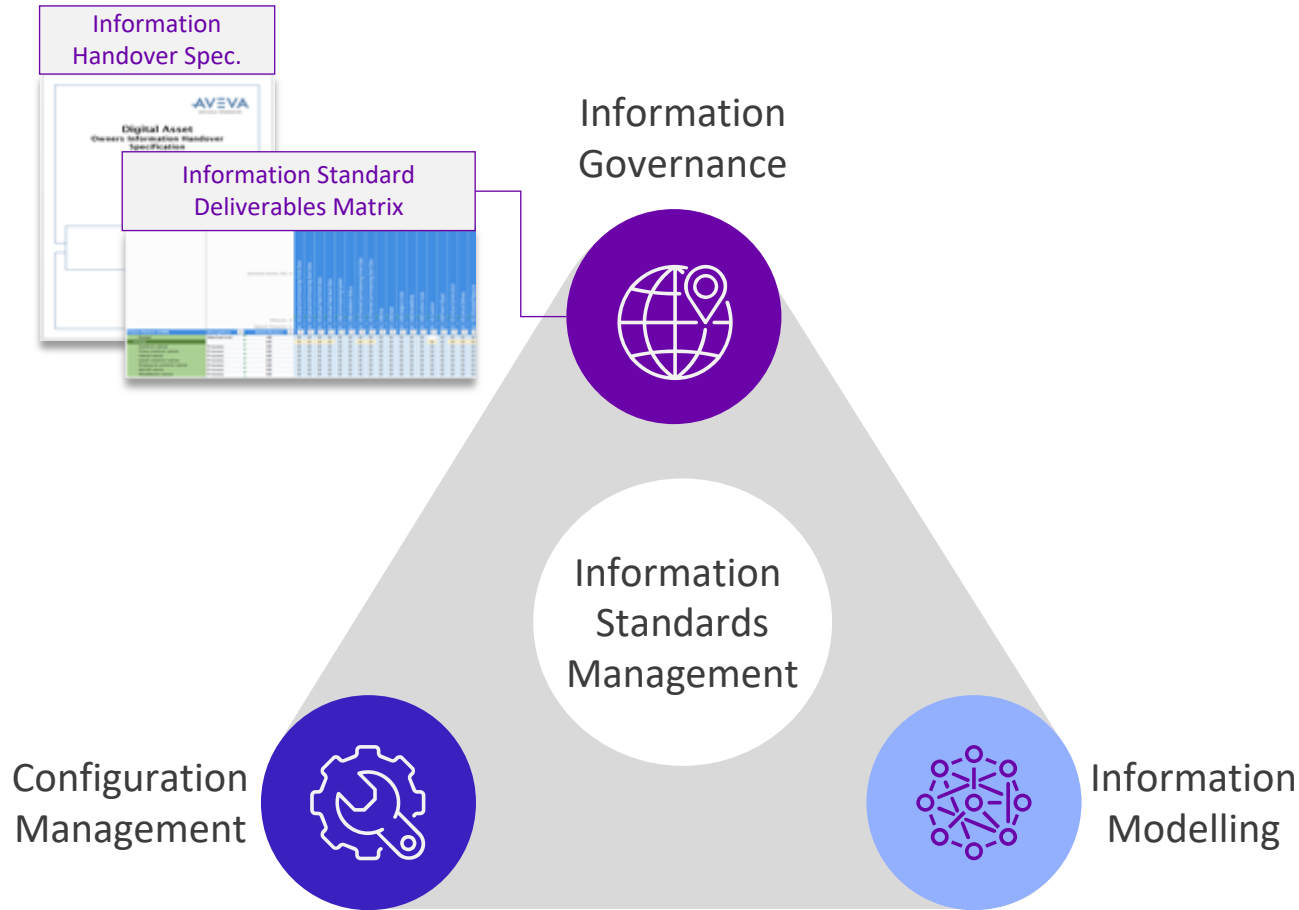
New Energy



Operating Model Integration



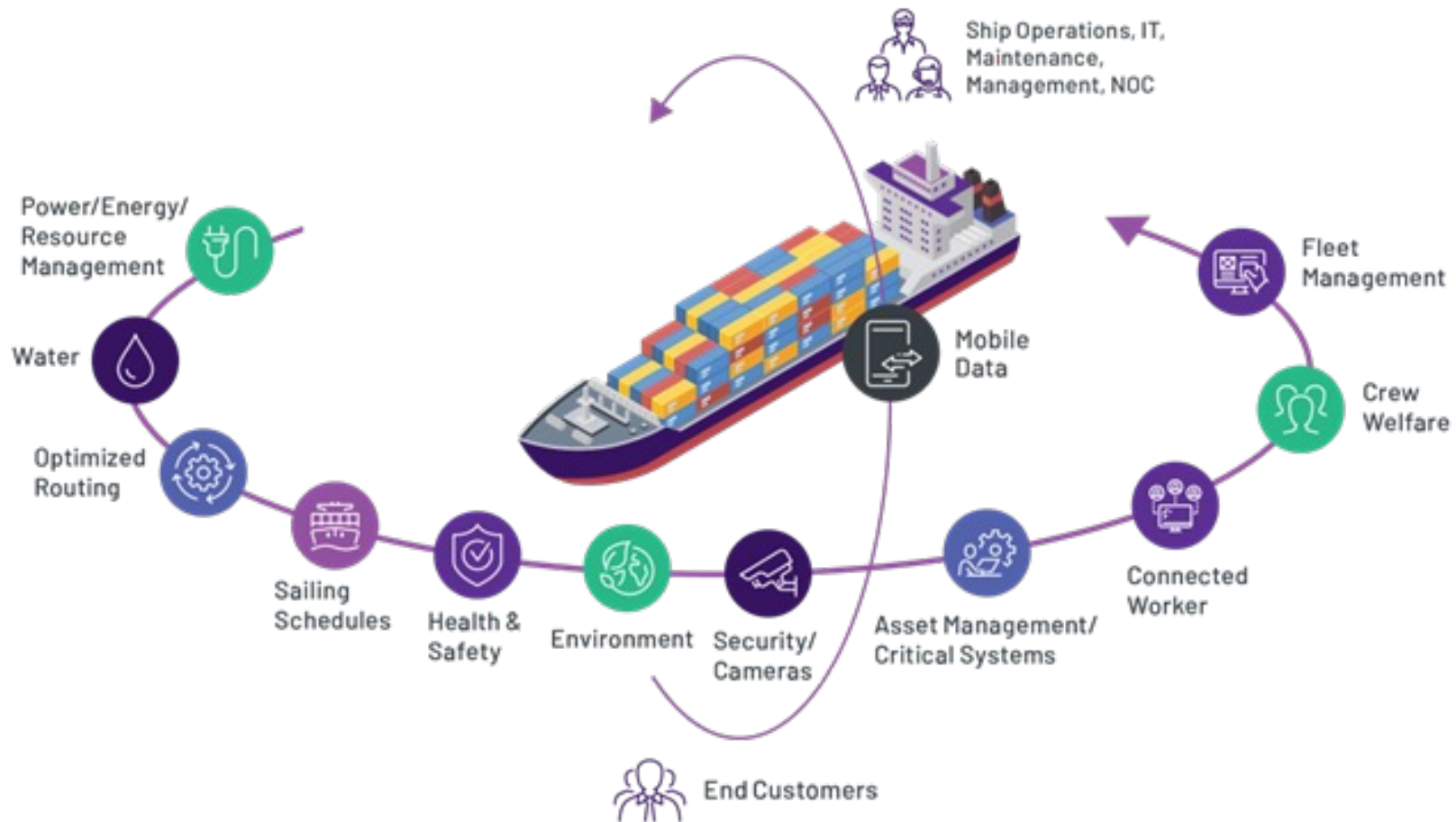
...facilitated by a well-defined information management standard across the enterprise...



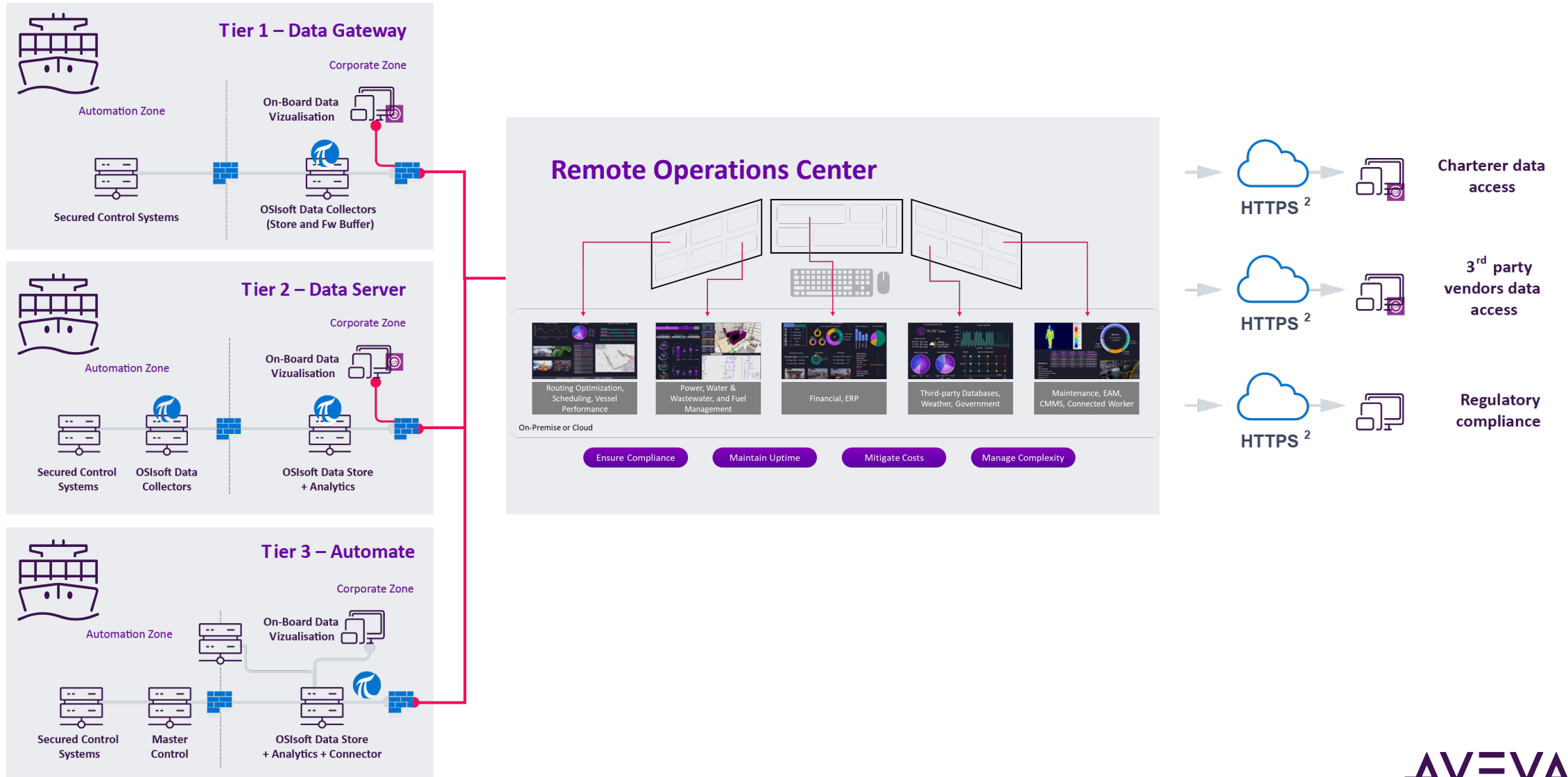
Information Standard Management

- The Class Library (“Information Standards”) will be based on Industry Standards such as ISO 15926, ISO 14224, CFIHOS etc. in addition to specific Corporate standards:
- The Class Library defines the following:
 - Classes, Attributes and UoM
 - Taxonomy
 - Industry Standards
 - Naming / Numbering Rules
 - Lifecycle Phase Definitions
 - Maturity Model
 - Validation Rules

Digital Twins simplify operational complexity



Marine Fleet Monitoring Solutions

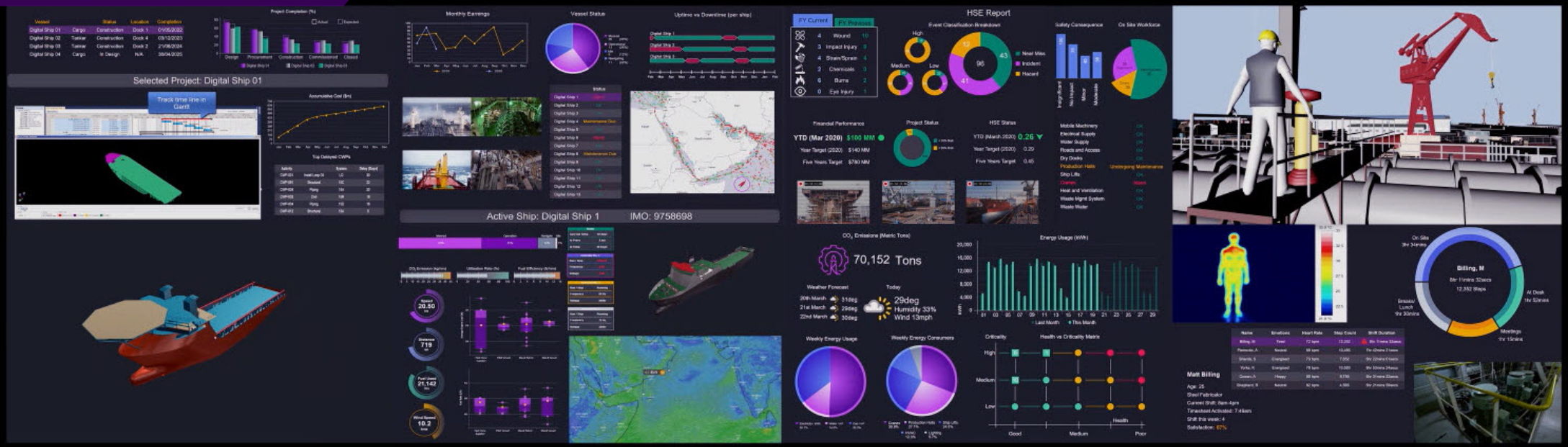


Real-time Stakeholder Collaboration



Unified Operations Center - Enterprise Visualization

Converge and contextualize for end-to-end enterprise visibility



Enhanced layer of intelligence that ensures data works in service of organizational goals

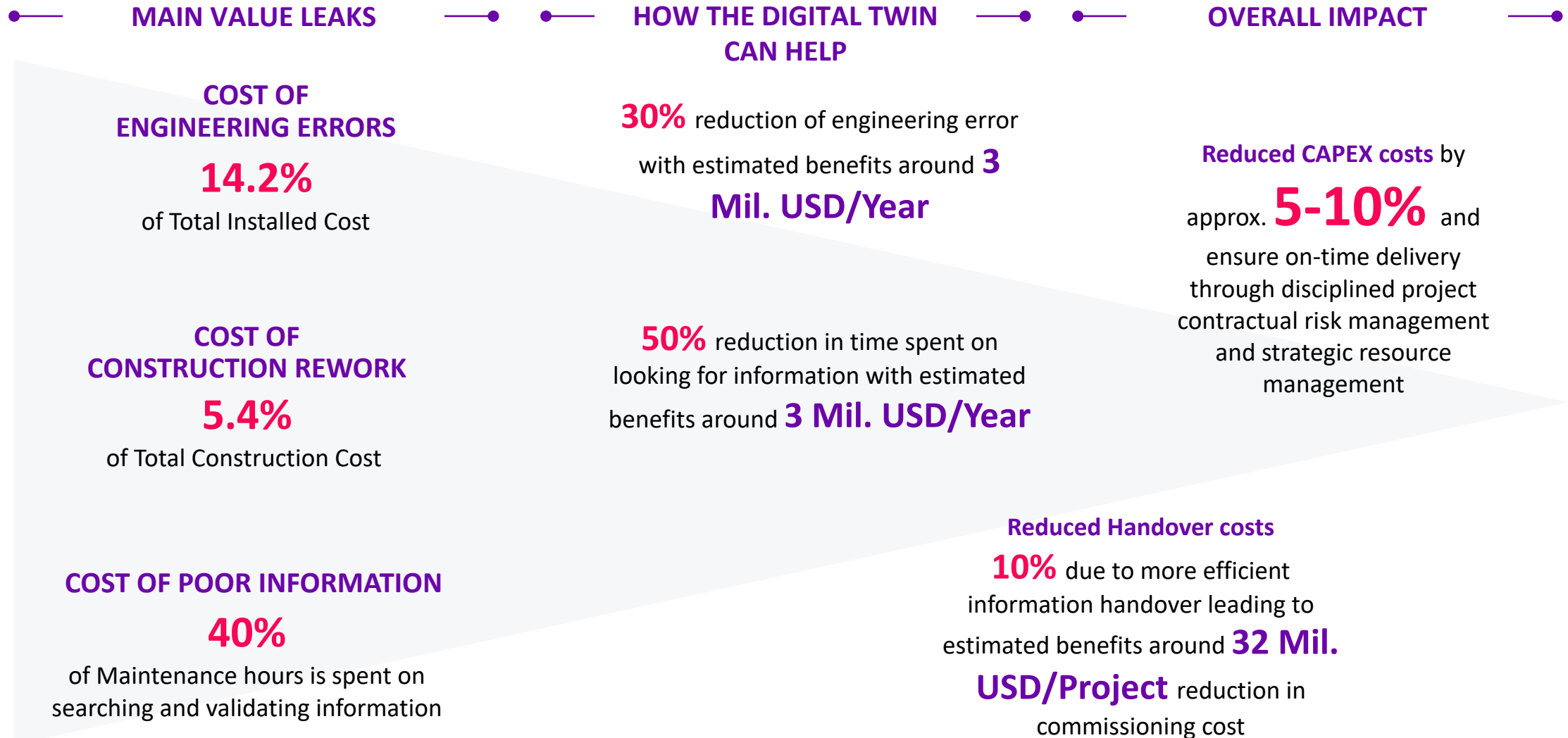
Marine Operations

Trusted by leading marine operations on-shore and off

- *Installed on over 3000 vessels across the globe*
- *Type certified for class approval (DNV, ABS, others)*
- *Wide range of asset types from tugs to tankers and FPSOs*



...bringing benefits between 5% and 10% of the Total Installed Cost



Value now and value over time



Real-time operational awareness – **manage exceptions**



Fleet asset maintenance management – **5-25 %**



Energy and GHG(CII) management - **3-30 %**



EH&S compliance & Training – **10-20%**

Proven Business Outcomes (\$)

PROJECT EXECUTION



“Reduce Capital Project Costs by 10-15%.”
- **Evonik**

HANDOVER



“Reduce handover cost by 80%.”
- **Suncor**

OPERATIONS



“We avoided all the headaches, the firefighters, the overtime heroes, the night and weekend rates, the ‘just go to the airport and get a ticket, I don’t care how much it costs type things.’”
- Caterpillar

How Digital Twins can help meet IMO goals

1. Use models to reduce complexity and increase data actionability to achieve fleet-wide operational excellence
2. Bring operations improvements together with engineering changes as “green” technology evolves – better data to decide which ones and when.
3. Deal with the holistic data lifecycle of the vessel across operations and engineering with effective change management

The long tail of TCO

Triple bottom line thinking.

€ Lower Total Cost – Design, Build, Operate, Rebuild & Recycle

€ Improve supply chain resilience – on-time arrivals & cargo tracking

€ Reduce environmental impact – CO², SoX, NoX & H₂O

Want to know more?

Stop by our Sponsor Table and meet our local team

- *Understand how AVEVA delivers on Digital Twins and Threads*
- *Get a copy of the IMarEST Article and summary*
- *Explore YOUR use cases for digital twins*
- *Client success stories and references*
- *See the combined digital twin DEMONSTRATION in action*



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