

**FLEXSHIP & DT4GS Workshop**  
**Towards Zero emissions Synergies Workshop**  
Organized by WEGEMT

**10 December 2024**



***DT4GS***  
***The Digital Twin for Green Shipping***



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***R&D Digital Innovation Project Manager***  
***RINA Consulting***

*This project has received funding from the Horizon Europe framework programme under Grant Agreement No 101056799*

# Project Facts



Project title: The Digital Twin for Green Shipping

GA No: 101056799

Start date 1<sup>st</sup> June 2022

Duration: 3 years

Consortium: 21 partners

Coordinator: Inlecom Group

Website: <https://dt4gs.eu/>



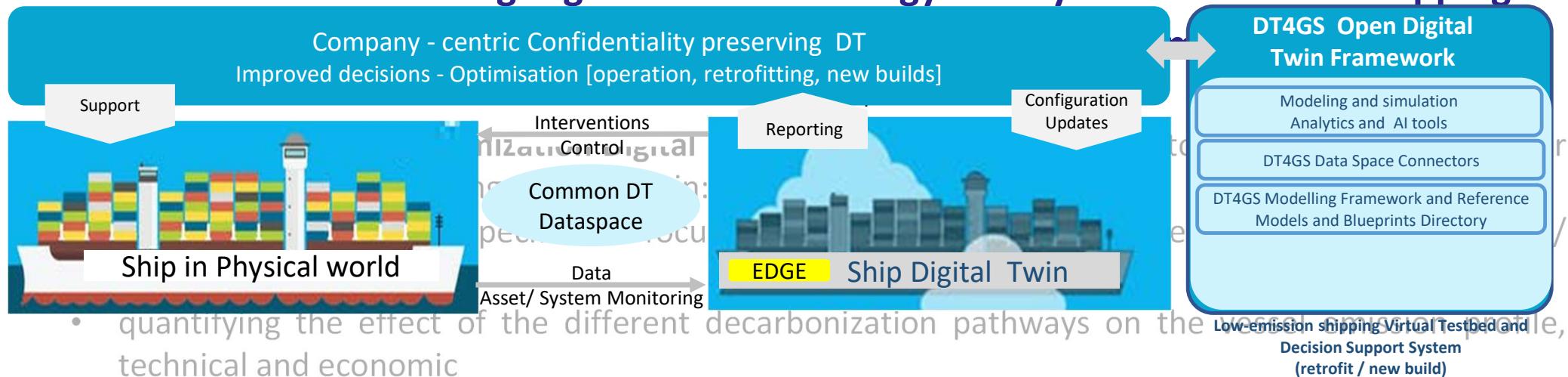
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# DT4GS Objectives



DT4GS is aimed at making Digital Twin technology readily available to the shipping



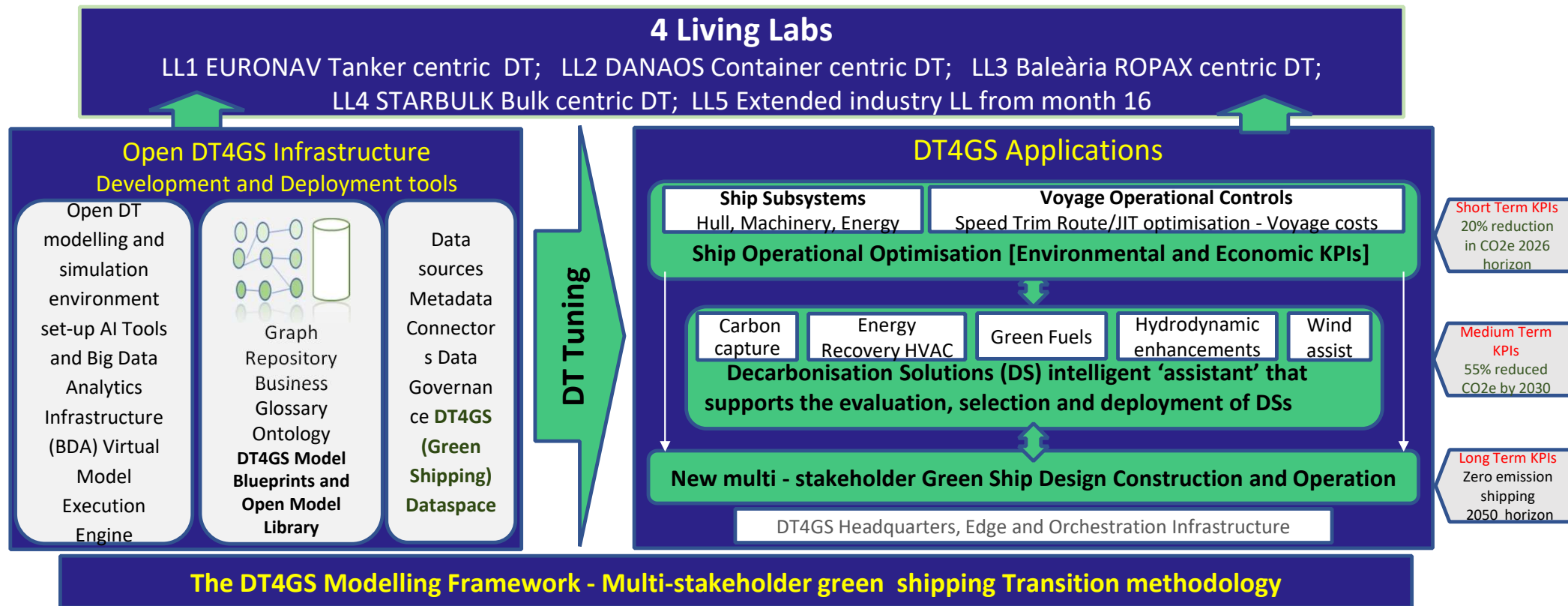
- quantifying the effect of the different decarbonization pathways on the vessel's environmental profile, technical and economic
2. A Multi-stakeholder green shipping transition methodology underpinning a collective DT capability for the waterborne industry to harmonize and increase synergies between DT applications in shipping companies, shipyards, equipment manufacturers, class societies, ports, and policy makers



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# DT4GS Methodology



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# Breaking down the approach



## Open DT Framework

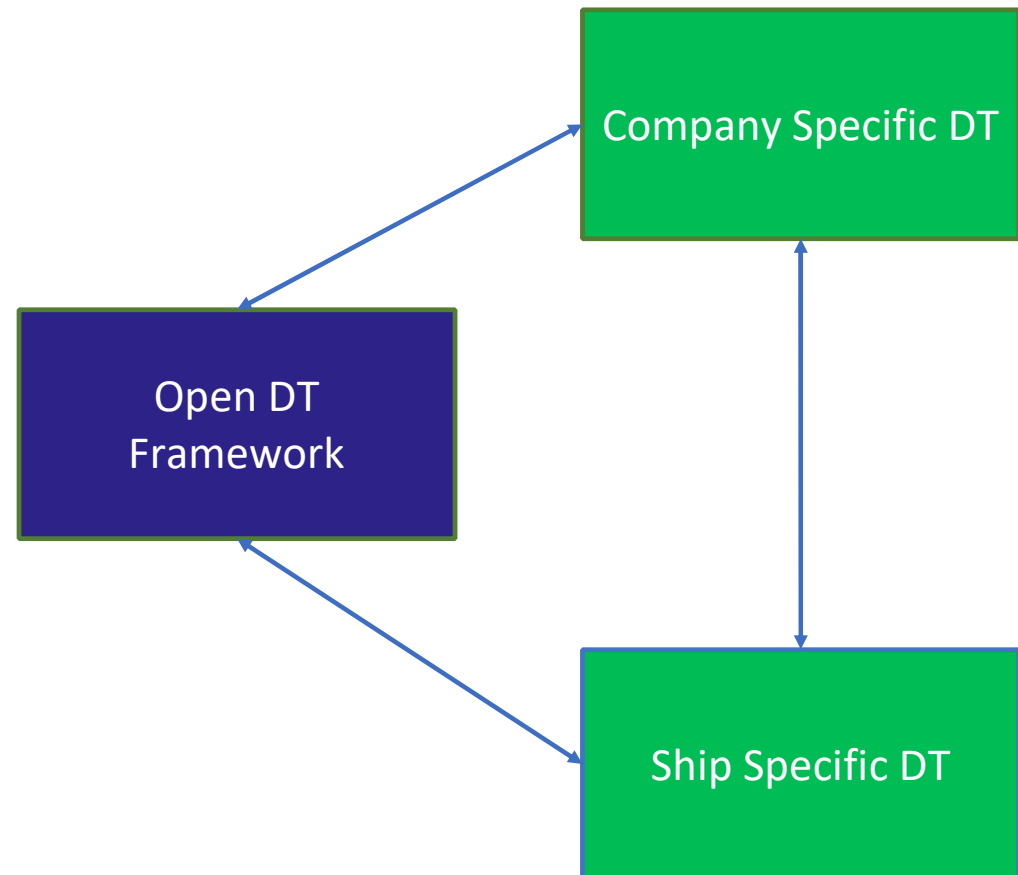
- Open to everyone generic DT4GS platform Tier 1 (Community version and free to use)

## Company Specific DT

- Based on the Open DT Framework
- Customized by the company for its specific needs
- Collects data from the Ship Specific DTs in order to optimize the company's operation
- Feeds non confidential data to DT4GS Dataspace

## Ship Specific DT

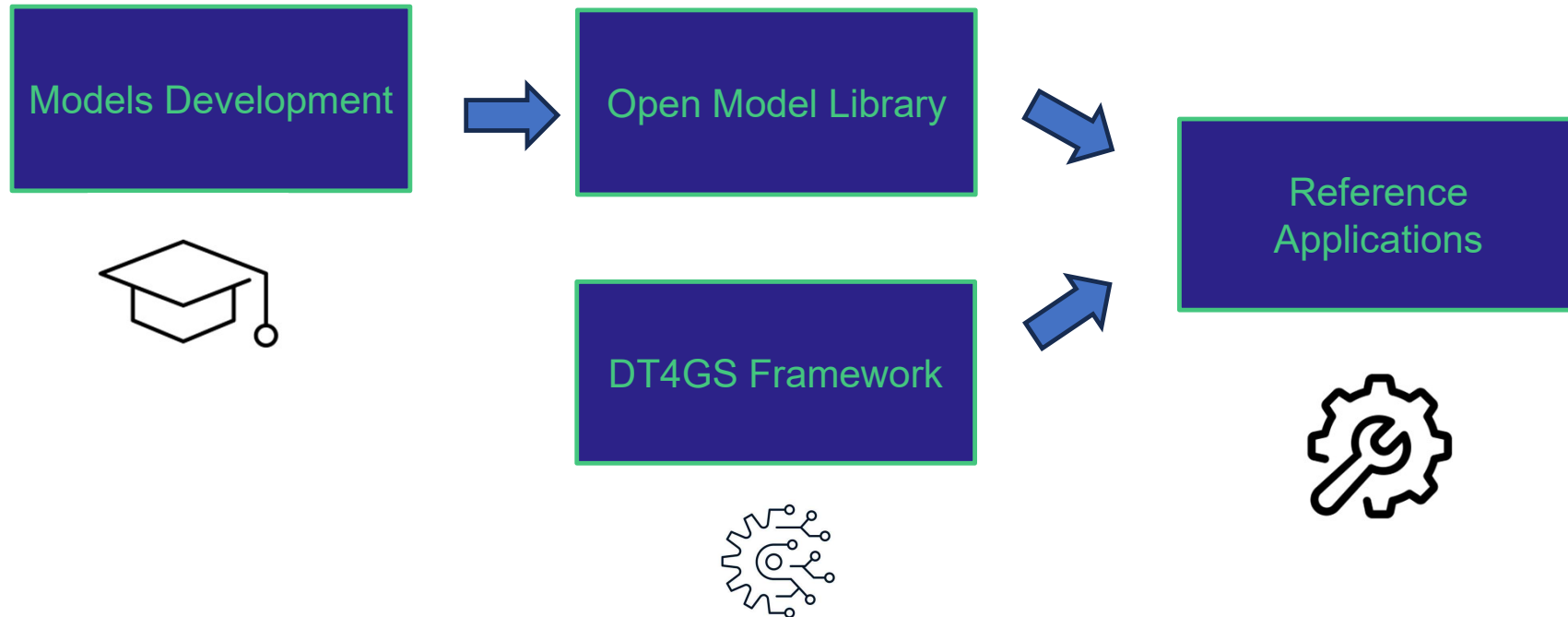
- Based on the Open DT Framework
- Customized by the company for each ship
- Collects data from various sources (machinery, weather, etc.) to optimize the ship's operation
- Feeds data back to the company's DT
- Feeds non confidential data to DT4GS Dataspace



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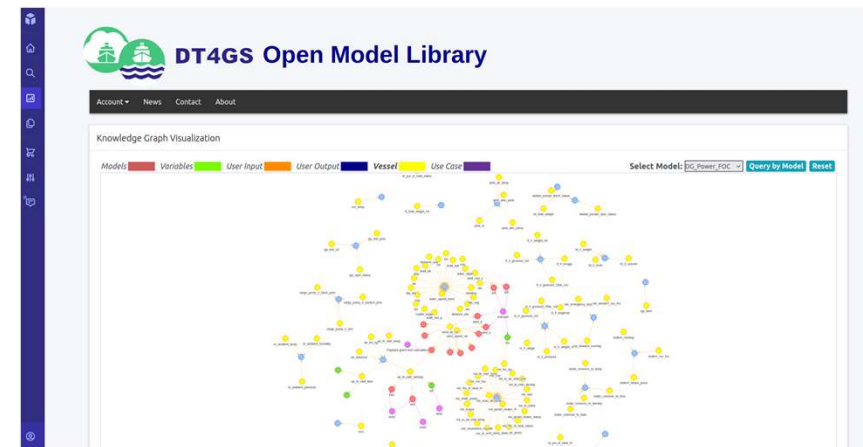
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# DT4GS Implementation Workflow





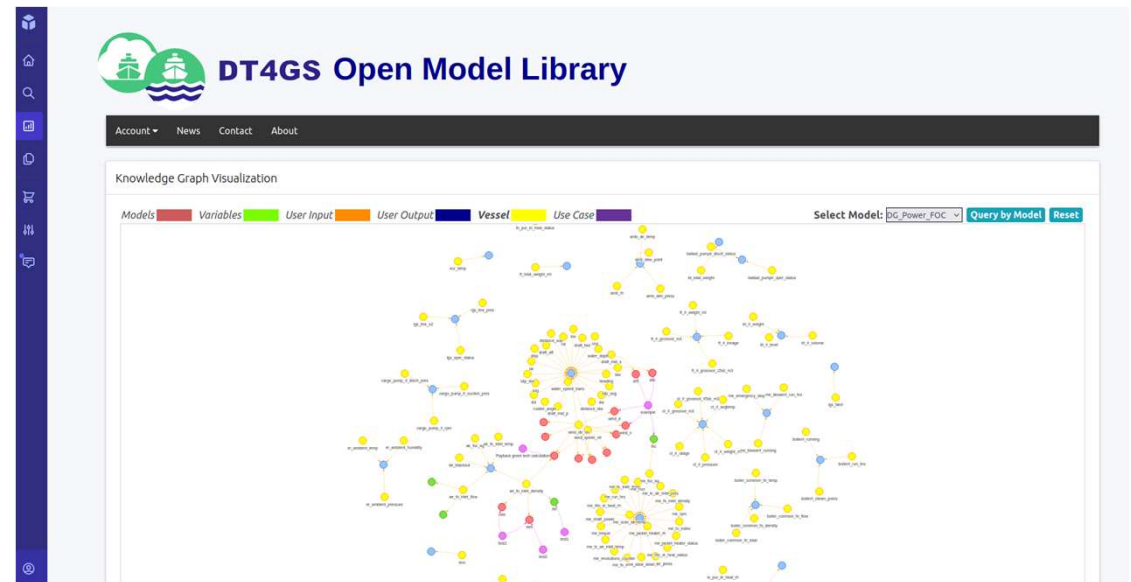
# DT4GS Implementation Workflow



# Open Model Library (OML)



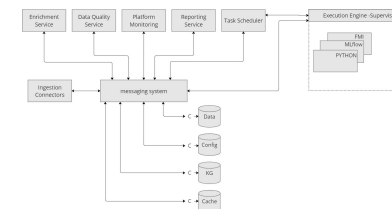
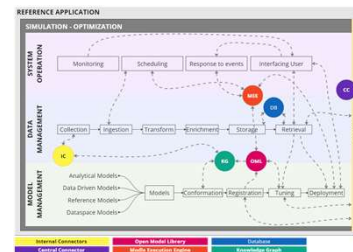
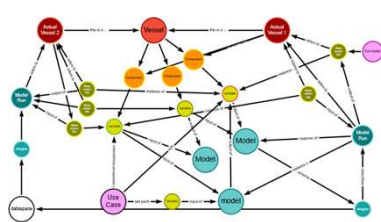
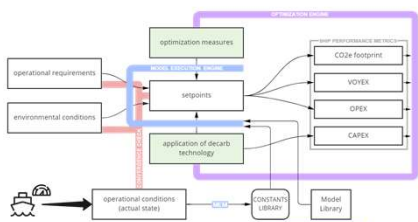
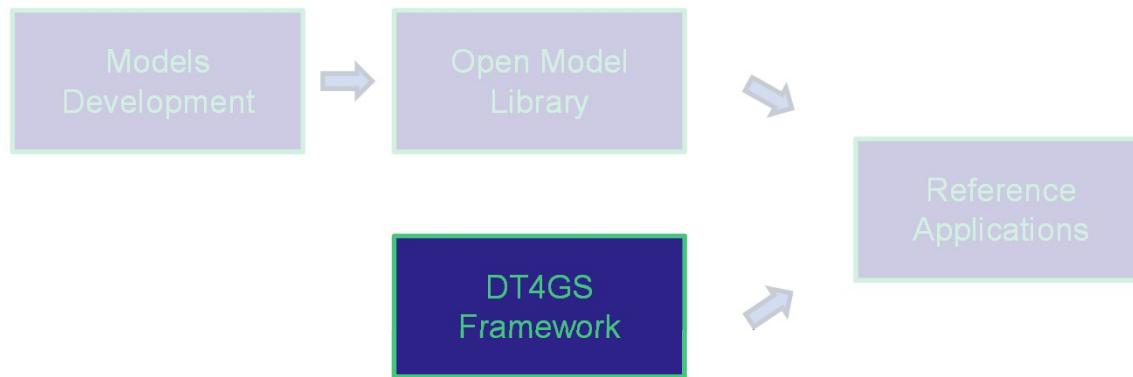
- Platform openly available
  - Functionality
    - Register-validate models/metadata
    - Run models
    - View models /metadata
    - Download models /metadata
  - Supported model types:
    - ML models
    - API calls
    - FMUs
  - Linked to DT4GS Knowledge Graph







# DT4GS Implementation Workflow

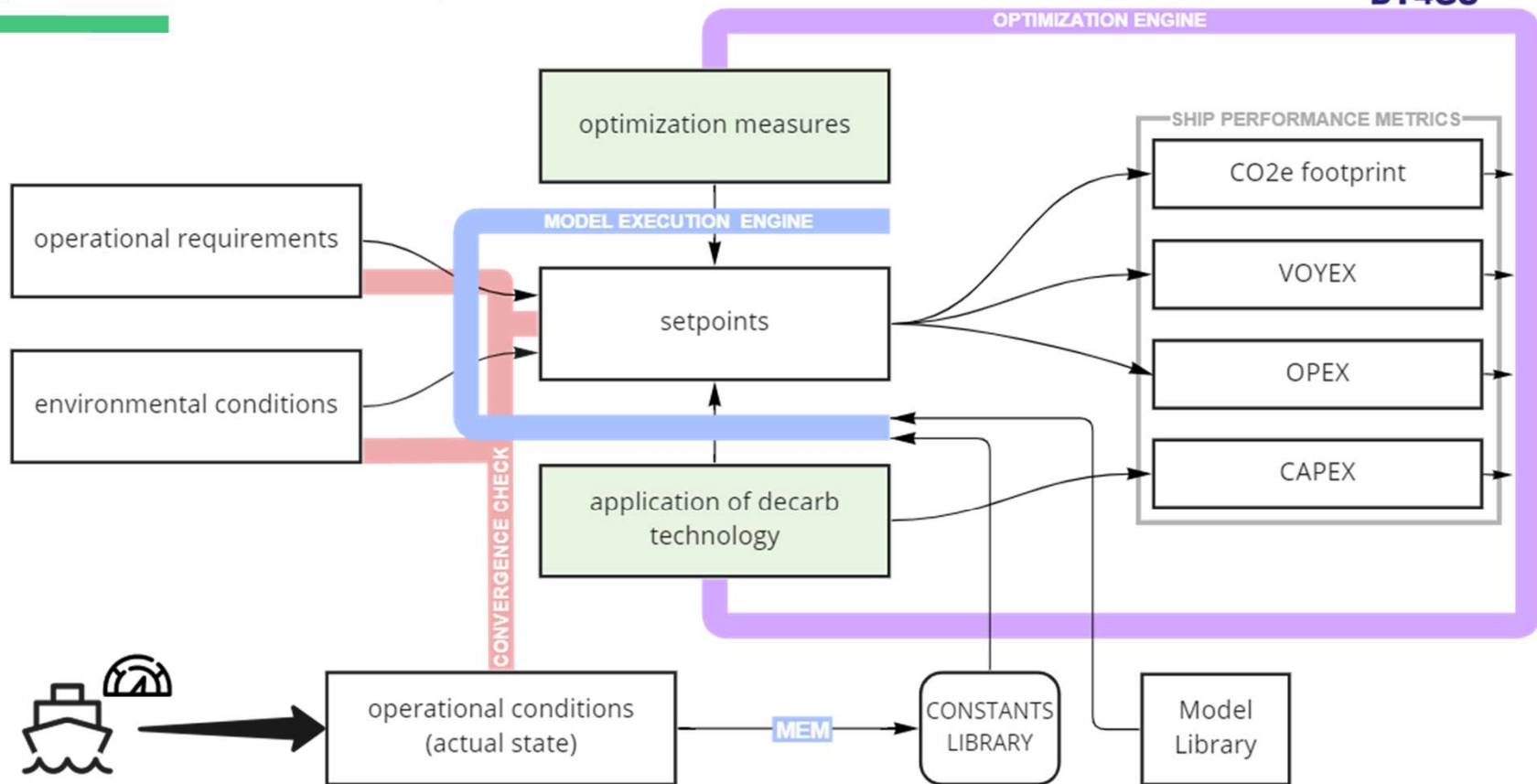


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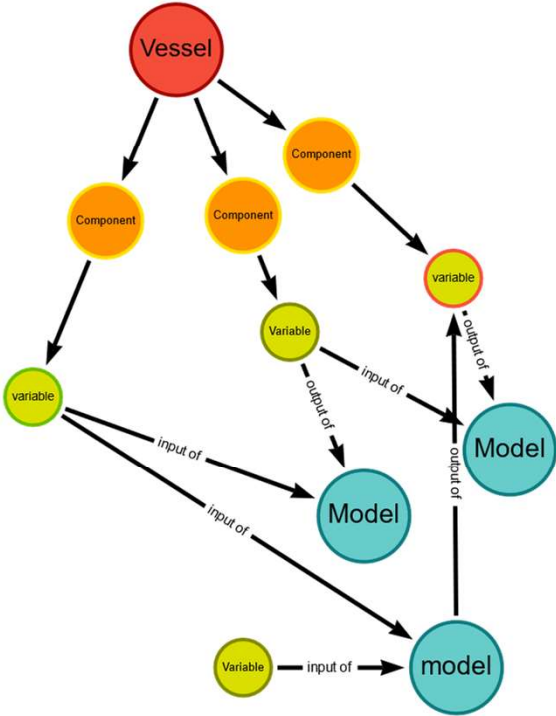
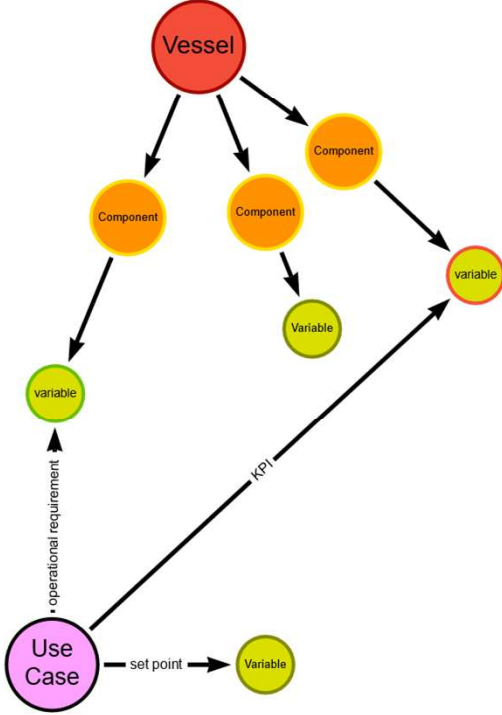
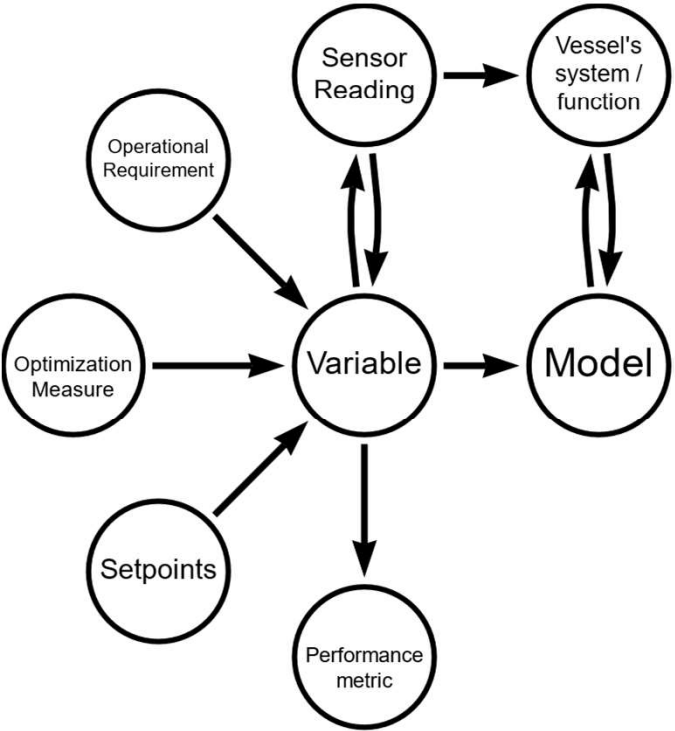
# DT4GS framework

## Bridging with domain requirements



# DT4GS framework

## Knowledge graphs as technology enabler



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# DT4GS framework

## Knowledge graphs as technology enabler



- Unified representation of vessel
- DT functionality
- Semantic layer for the user
- Simulation pathway identification
- Reproduction of collective knowledge

IBM Research DT4GS

Chat Bot | Dashboard | About

Can I get a tool to monitor the wear of the auxiliary engine system?

I'm generating a tool for you! I'm creating an Item Degradation Model specifically designed for the Auxiliary Engine System. This model will track the wear and tear of the system based on five key data points: ae\_foc\_kg, ae\_fo\_inlet\_temp, ae\_fo\_inlet\_flow, ae\_fo\_inlet\_density, and ae\_blackout. This will give you valuable insights into the system's performance over time.

Would you like to have any of the properties explained, changed or would you like to get started with zero-shot/finetuning of a TTM model?

Great could you explain to me what exactly ae\_foc\_kg is?

The 'ae\_foc\_kg' property refers to the Fuel Oil Consumption (FOC) of the Auxiliary Engines, measured in kilograms (kg). It's a variable that represents the amount of fuel consumed by the auxiliary engines on a ship. The default range for this variable is from 0 kg to an unspecified maximum value. Would you like to have anything else explained, changed, or would you like to start creating a zero-shot or finetune model?

Input

**Configuration**

Select Model  
Llama-3-70b

Choose a model you like.

Temperature  
0 ————— 2 1

Verbose  
 Off

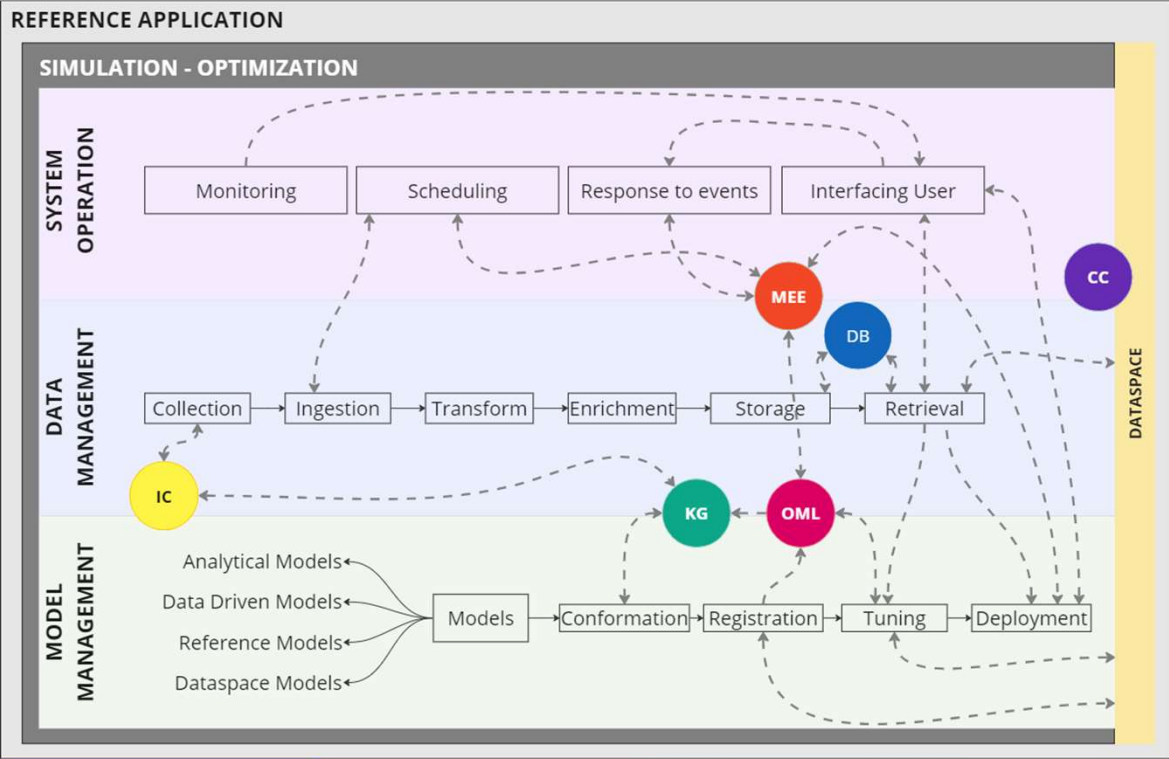
**Statistics**

Token Count  
1256 Tokens used

LLM Calls Made  
5 LLM calls made

# DT4GS framework

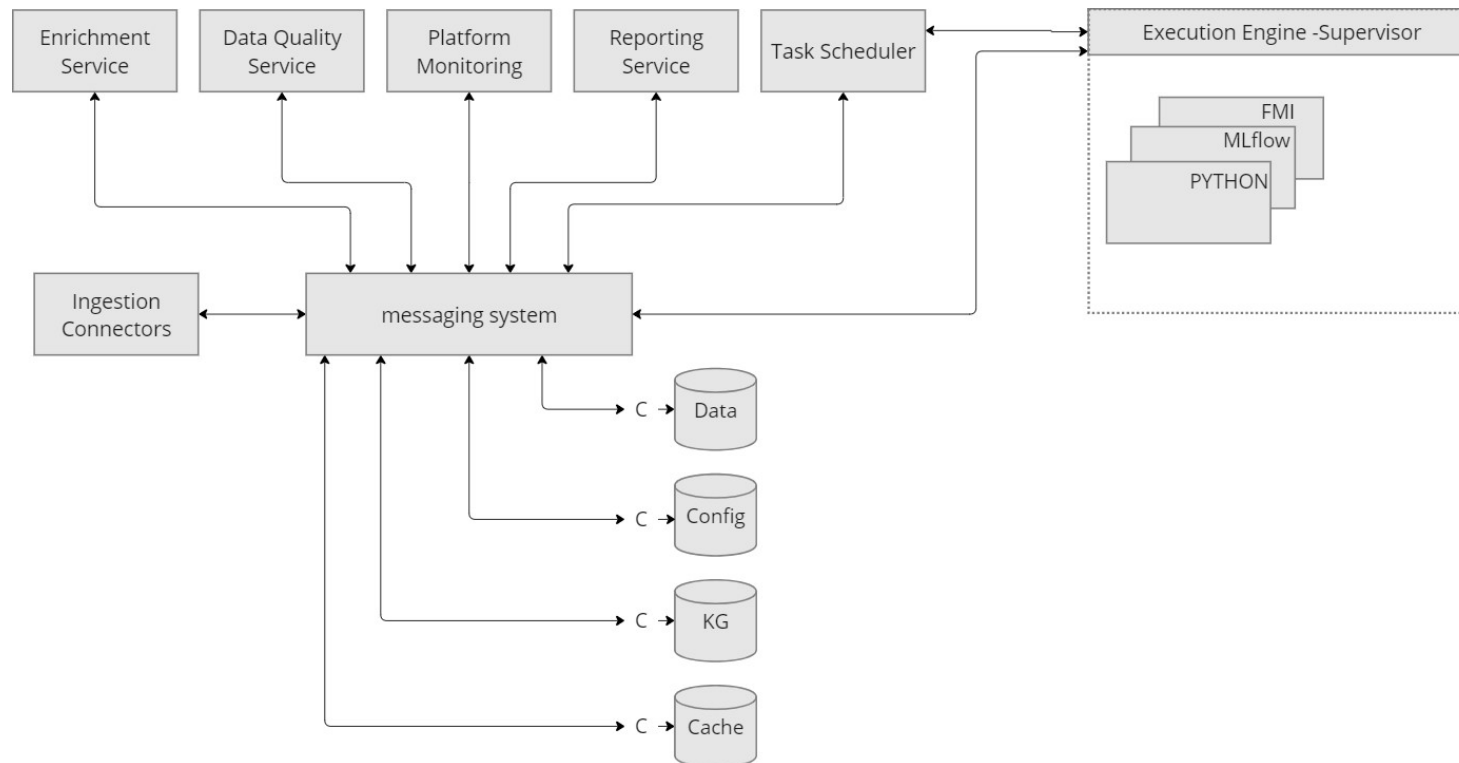
## Deployment Guidelines



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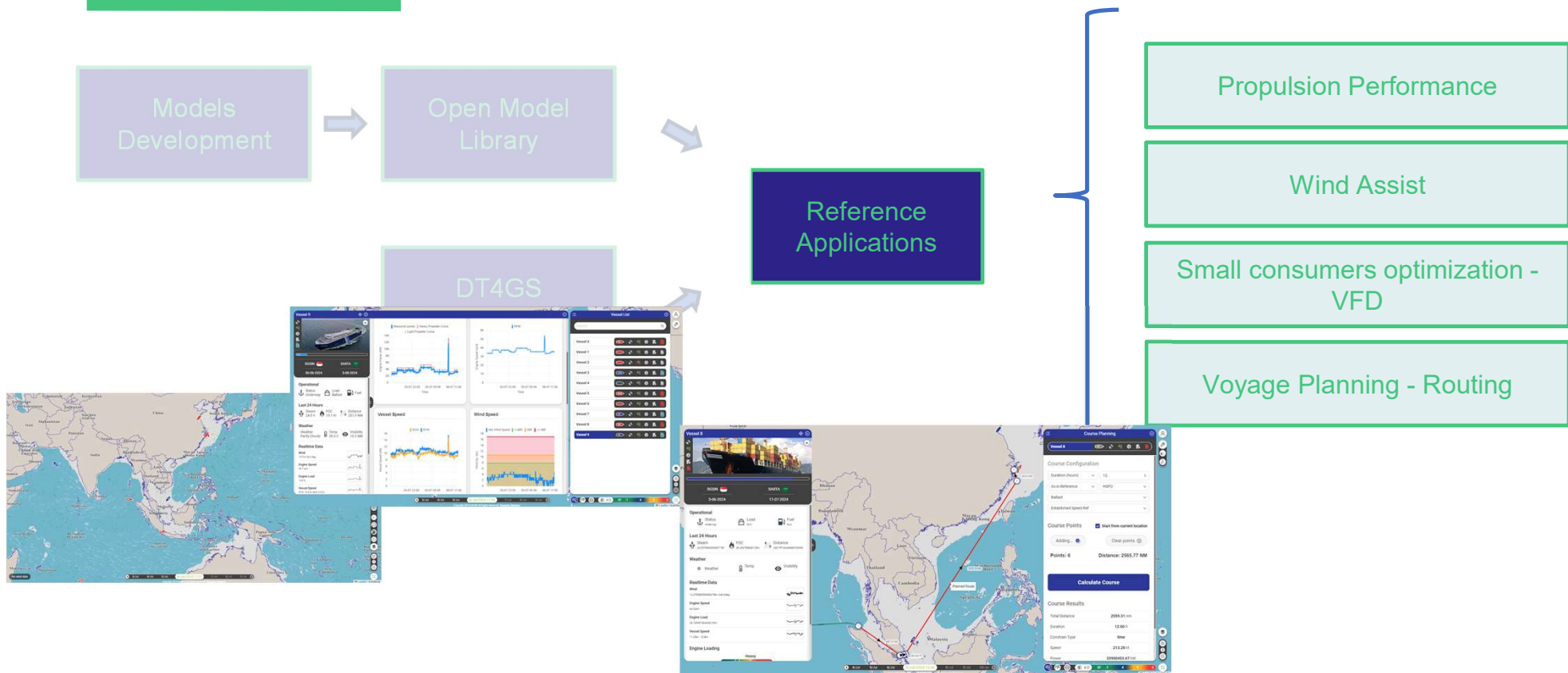
# DT4GS framework

## Reference Deployment



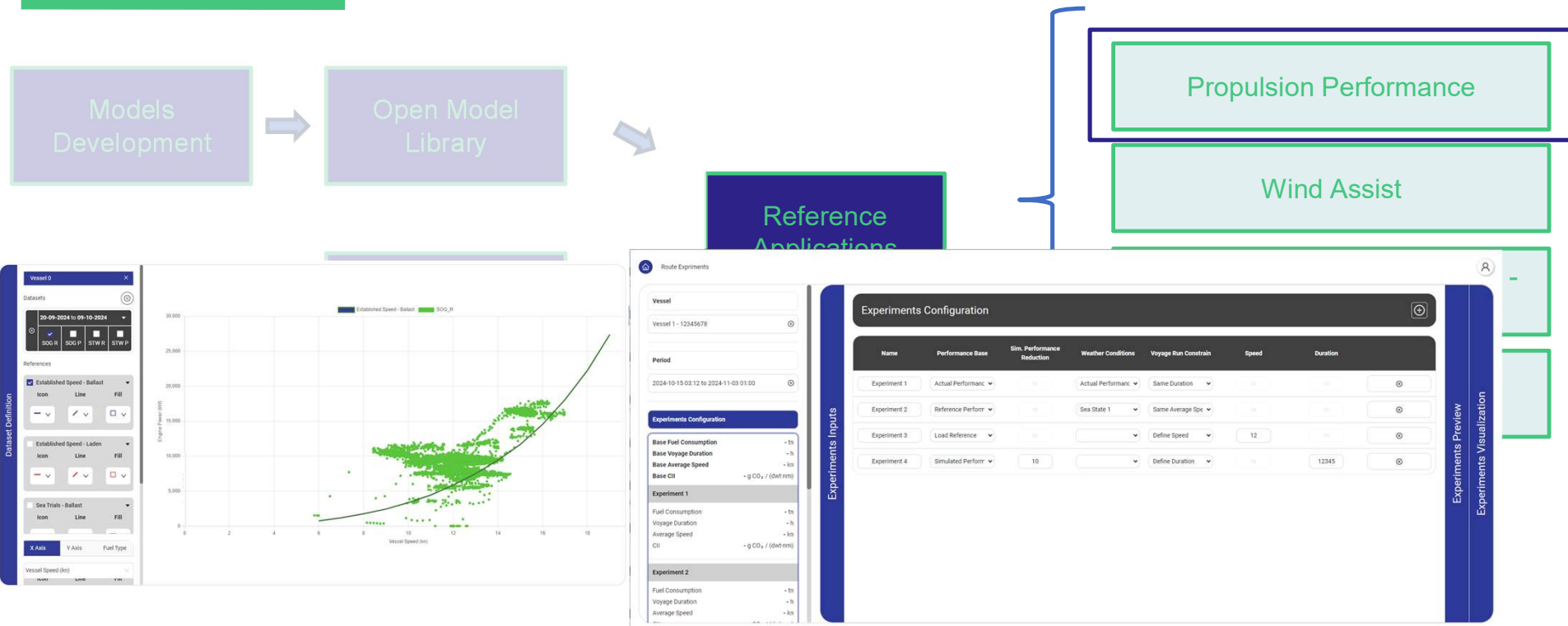


# DT4GS Implementation Workflow





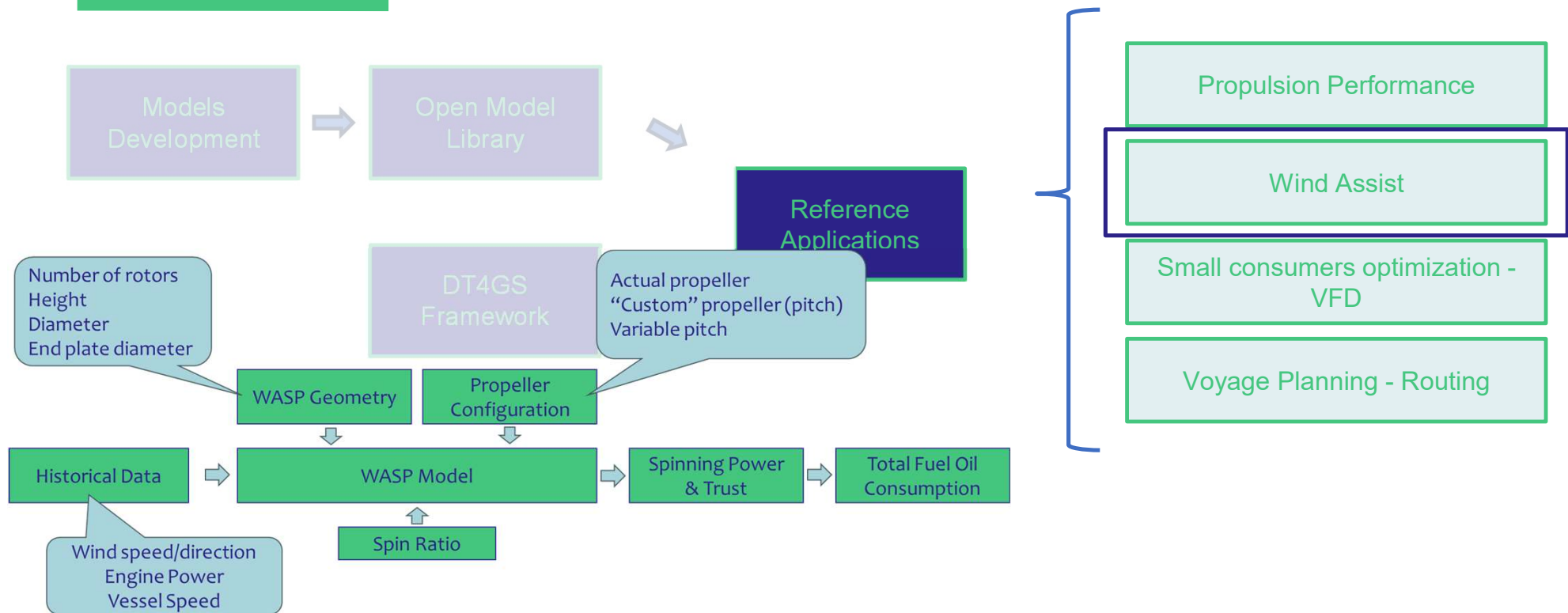
# DT4GS Implementation Workflow





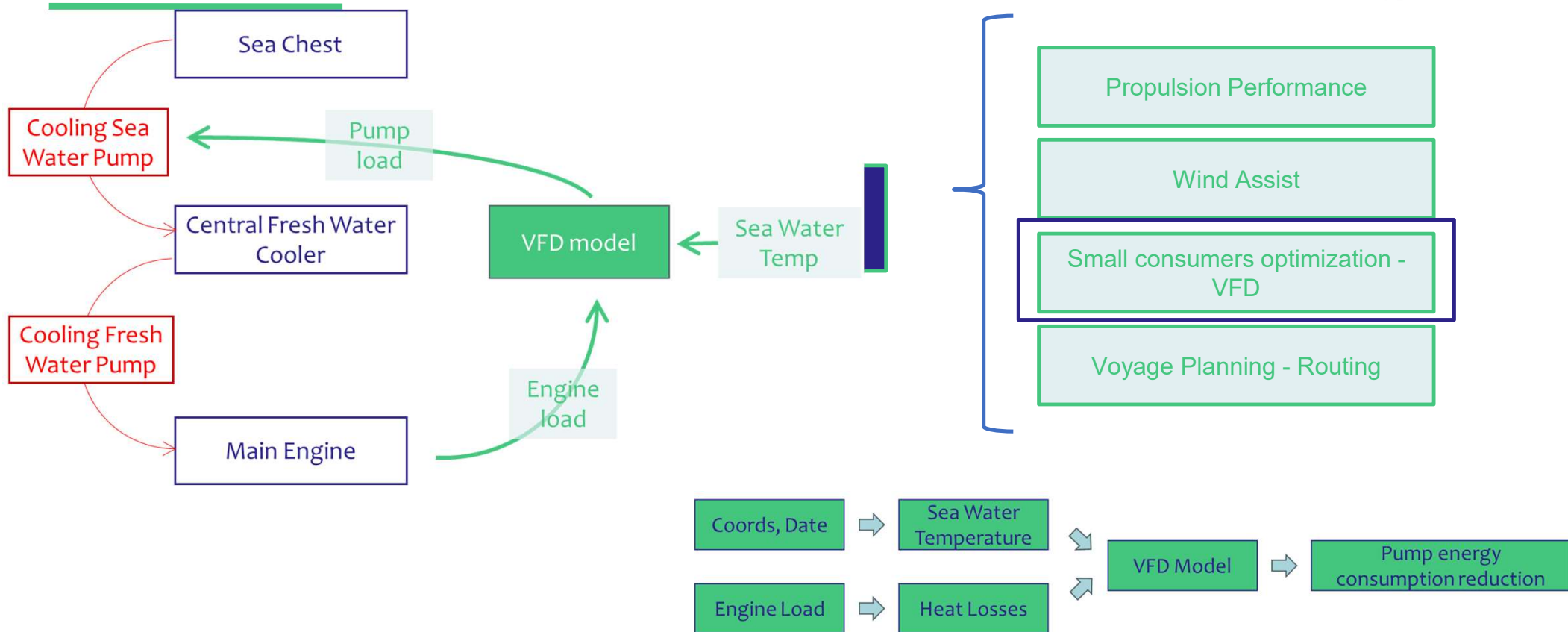


# DT4GS Implementation Workflow

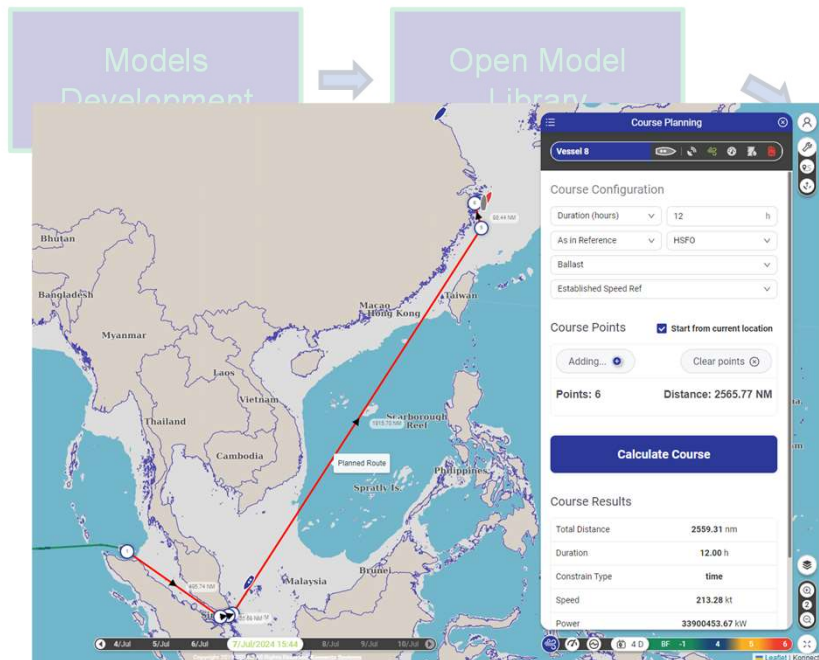




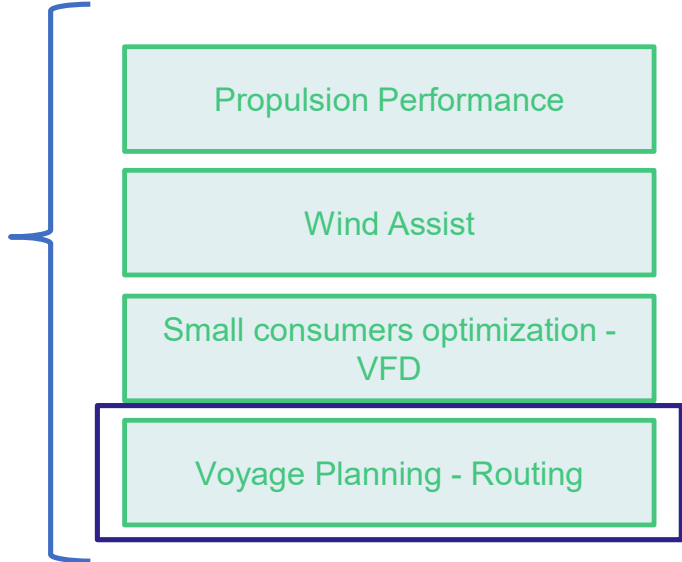
# DT4GS Implementation Workflow



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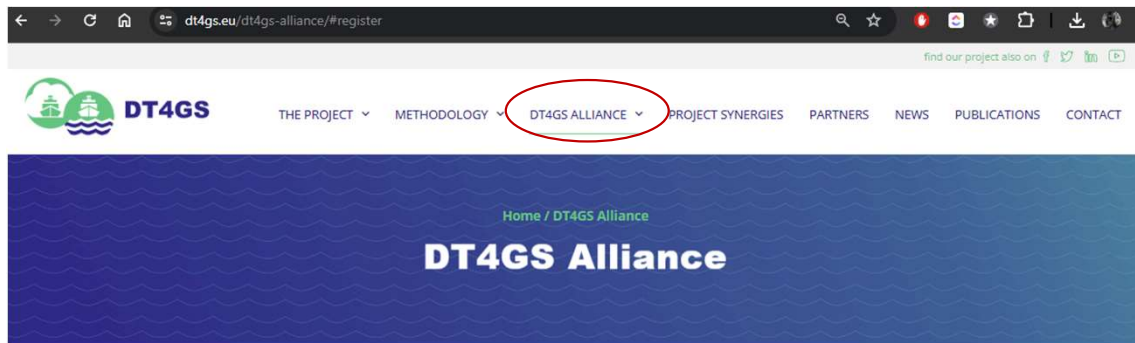


Reference Applications



# DT4GS Alliance Registration

<https://dt4gs.eu>



DT4GS project , establishes the **DT4GS ALLIANCE**, a consortium of leading organizations working together to accelerate the decarbonization of the shipping industry through the use of Digital Twin technology.



**Register here to join the DT4GS ALLIANCE**

Name

Surname

Email

Organization

Sector

Your position

Message

I have read and agree to this website [Privacy Policy](#)

**Send**

**Thank you for your  
attention!**

**Martina Galluccio  
(RINA Consulting)**



[Martina.galluccio@rina.org](mailto:Martina.galluccio@rina.org)



<https://dt4gs.eu/>



<https://www.linkedin.com/showcase/dt4gs/>



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