Interactive Design Platform

WEDA Dredging Summit & Expo 2022

C-JOB

DEDICATED NAVAL ARCHITECTS

Overview

- Introduction
- About C-Job Naval Architects
- Why create the Interactive Design Platform?
- What is the Interactive Design Platform?
- How does it work?
- Continued development

About the Author

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- MSc Marine Technology, Delft University of Technology

About C-Job Naval Architects

Dedicated & independent Naval architects

Our drive:

“A sustainable marine sector within one generation”

Our method:

Tailored solutions, co-created with our clients

Our scope:

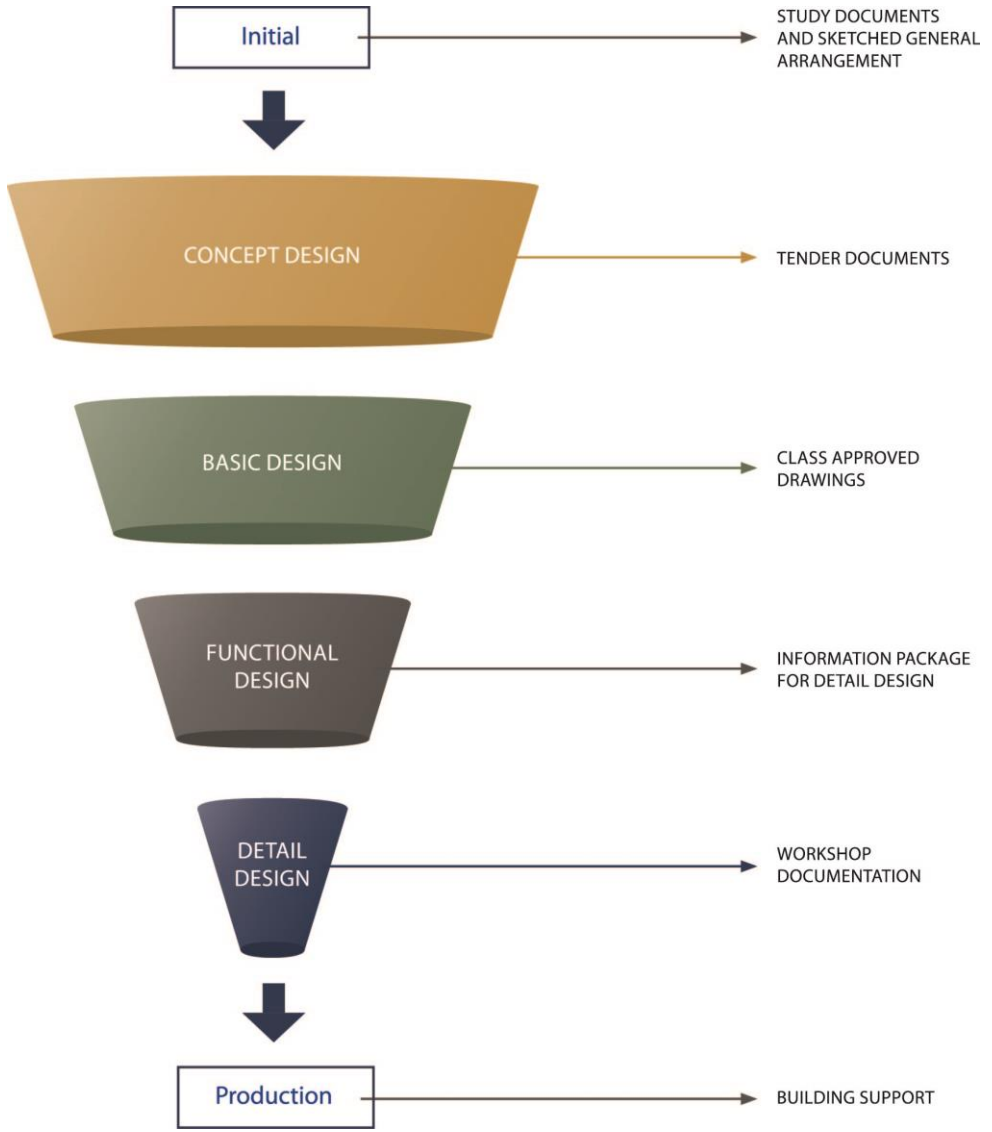
Projects from initial phase to production phase

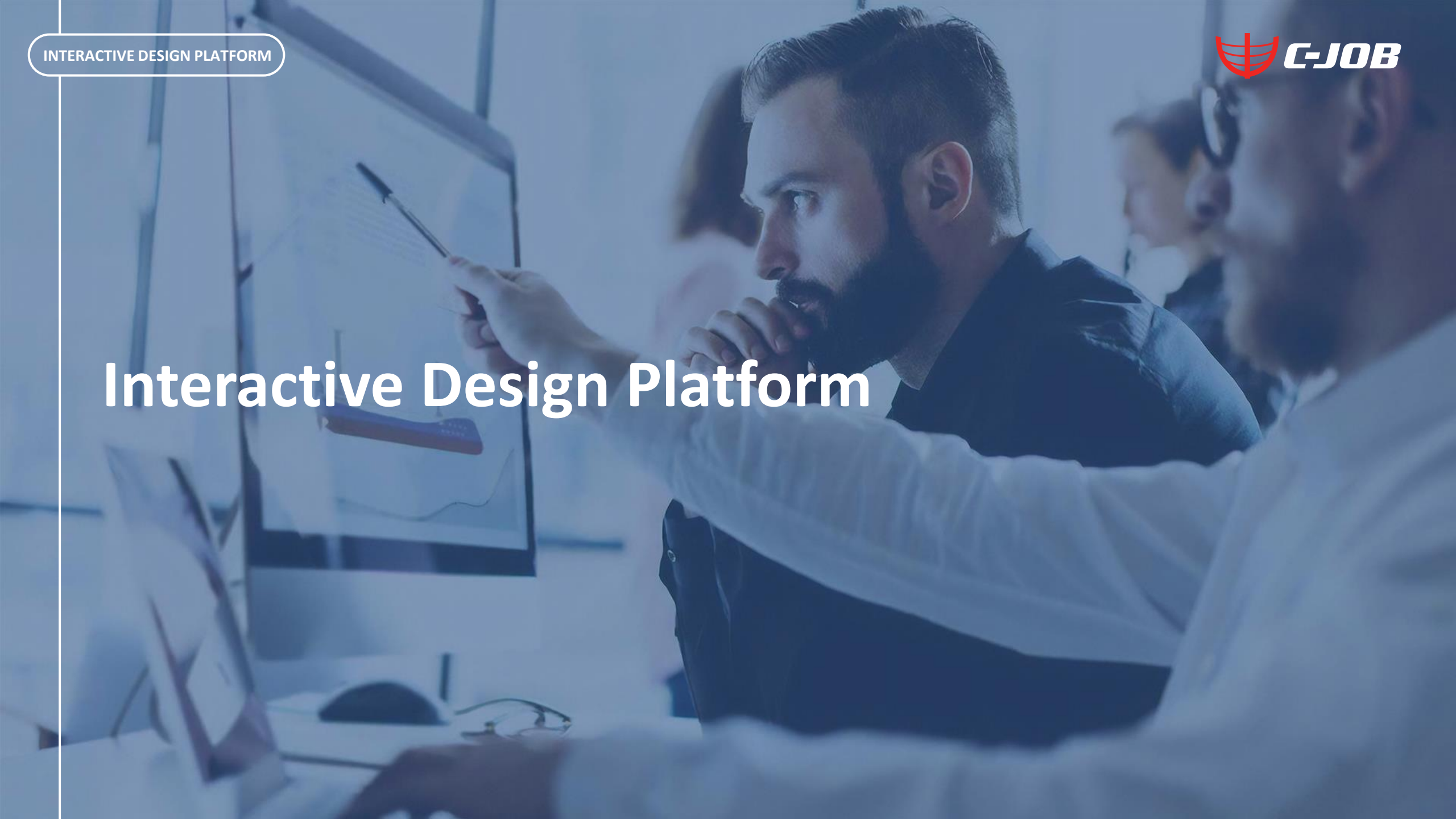
Full – scope projects as well as partial projects

Independent design and engineering company

- Serving ship owners and shipyards worldwide
- 7 offices:
  - Houston
  - Hoofddorp
  - Rotterdam
  - Heerenveen
  - Nikolayev
  - Athens
  - Gdansk
- > 180 in-house engineers employed

C-Job Design Funnel





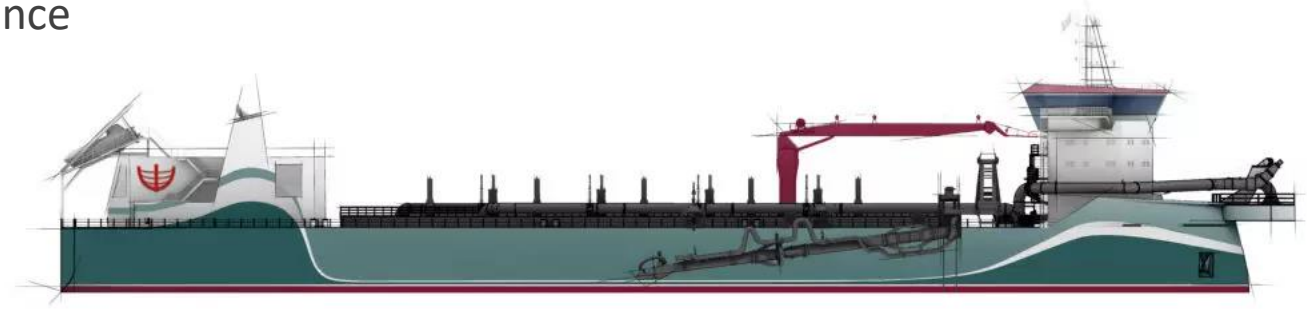
Interactive Design Platform

Why create the Interactive Design Platform?

- Translating design requirements in a proof of concept
- Outcomes initial design:
  - Design Parameter Study
  - Sketch General Arrangement

Traditional (hand-work) Design Parameter Study:

- Reference Selection
- Defining the design variations
- Iterations of design variables
- Selection of solution based on trends and experience

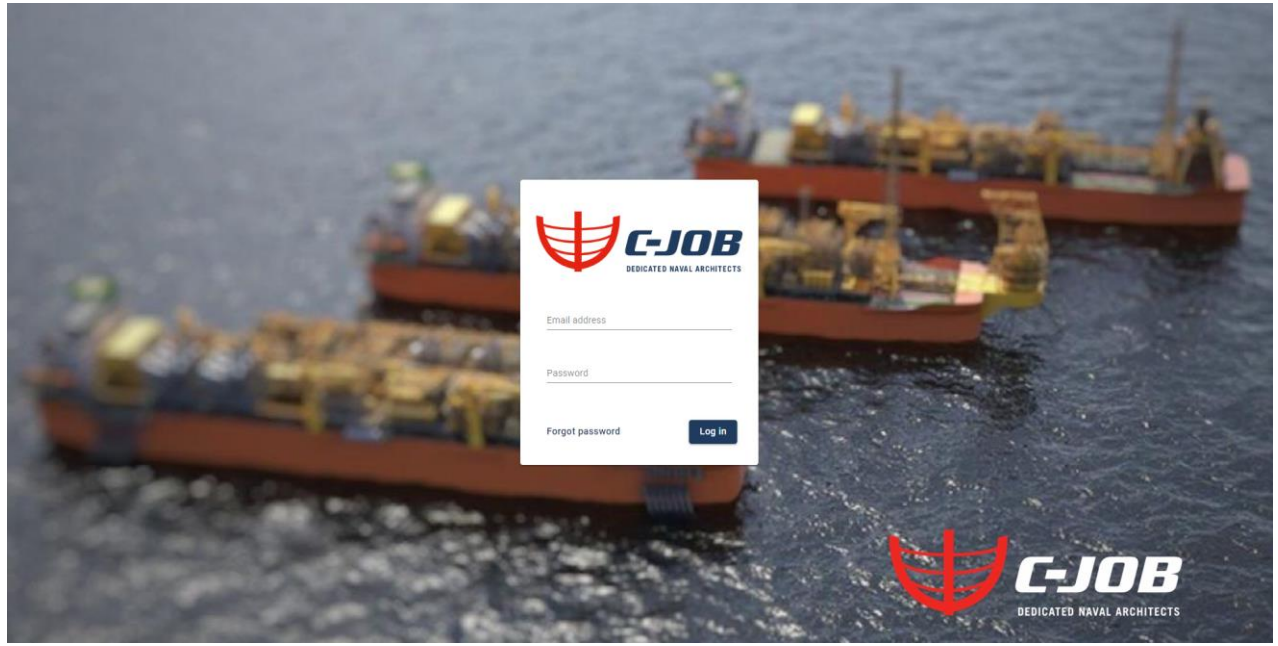


What is the Interactive Design Platform?

Online interactive platform

Developed for:

- Early design stage of TSHD’s
- Empowering customers
- Close cooperation
- Optimizing towards operational deployment
- Assess impact of design requirements
- Support decision-making
- Address gap between standard and one-off



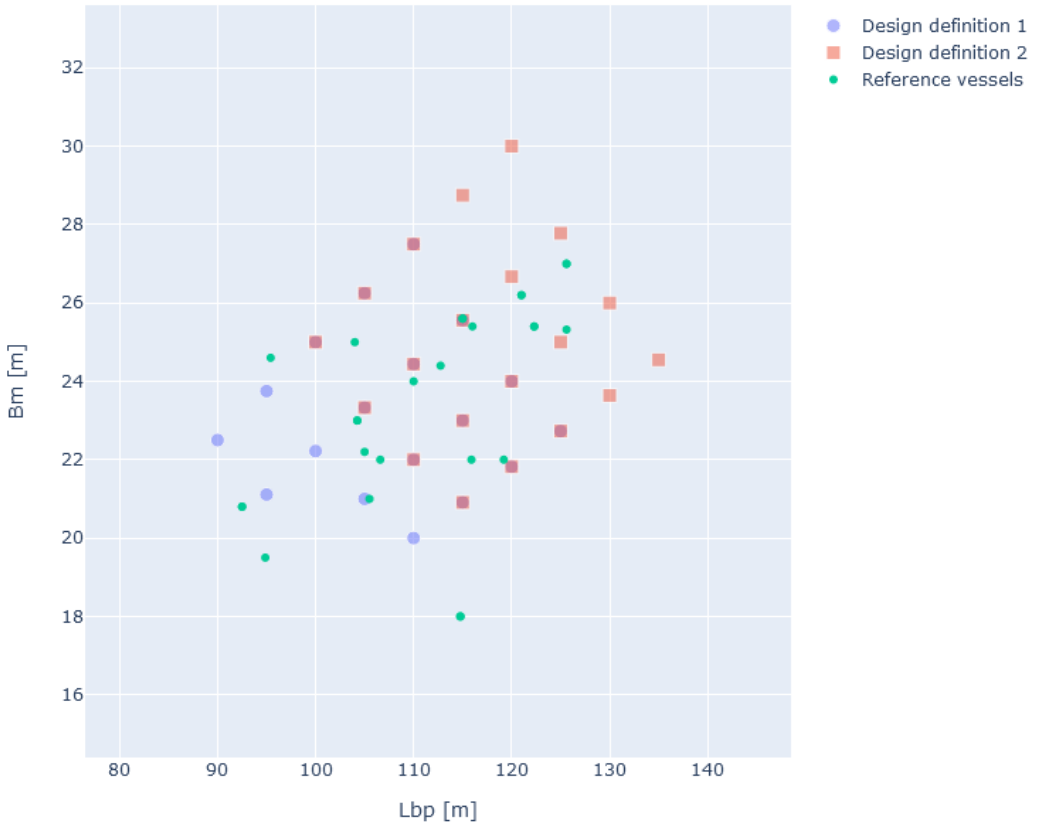
It delivers **higher accuracy**, **more control** and **more flexibility** than traditional methods

How does the Interactive Design Platform work? - input

Definition of Design Space:

- Design objectives (payload, speed, etc.)
- Parameter constrains (breadth, draught, etc.)
- Power Installed (dredge, jet, etc.)
- Optional (water density, correction, margin)

Design Definition



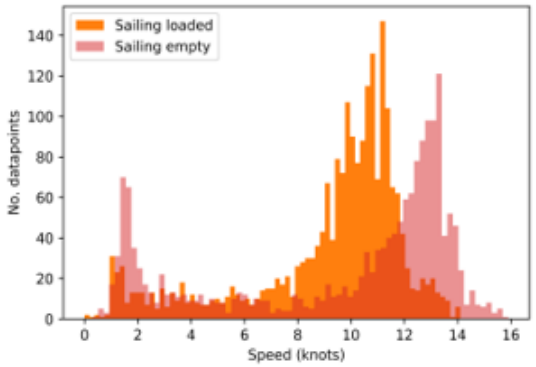
How does the Interactive Design Platform work? - input

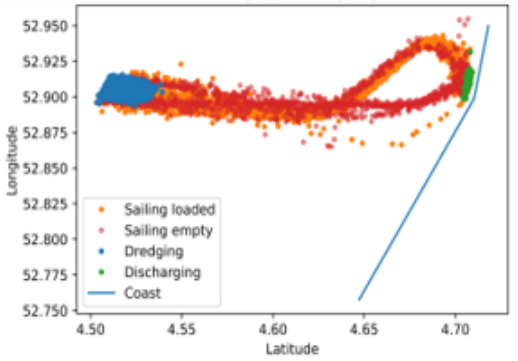
The platform has initially been optimized for dredger designs

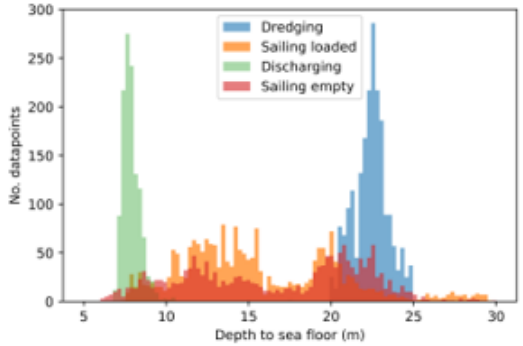
Input values include:

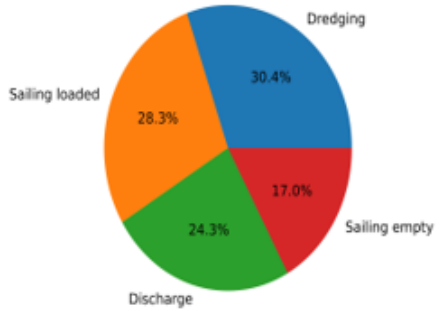
- Dredging materials
- Dredging depth
- Sailing distance between dredging and discharge site
- Discharge methods

Operational scenarios







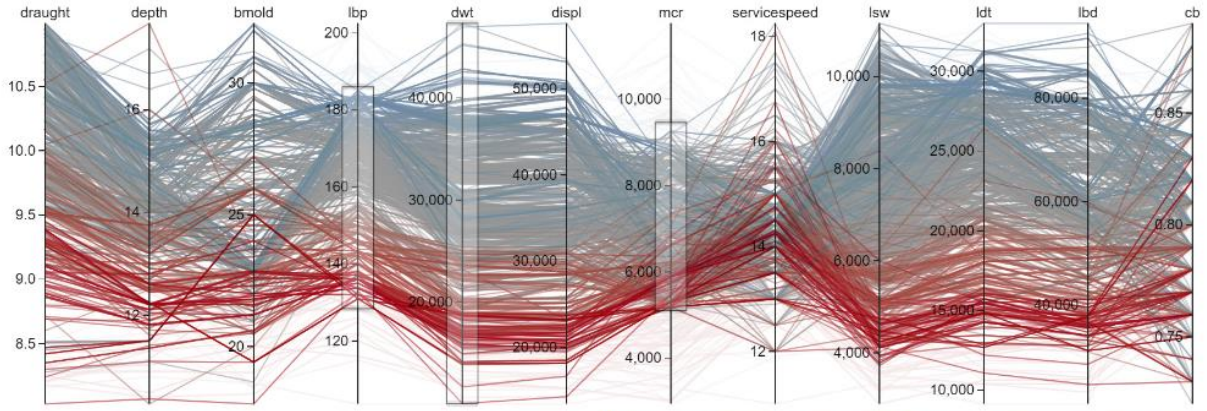


- Alternative energy sources

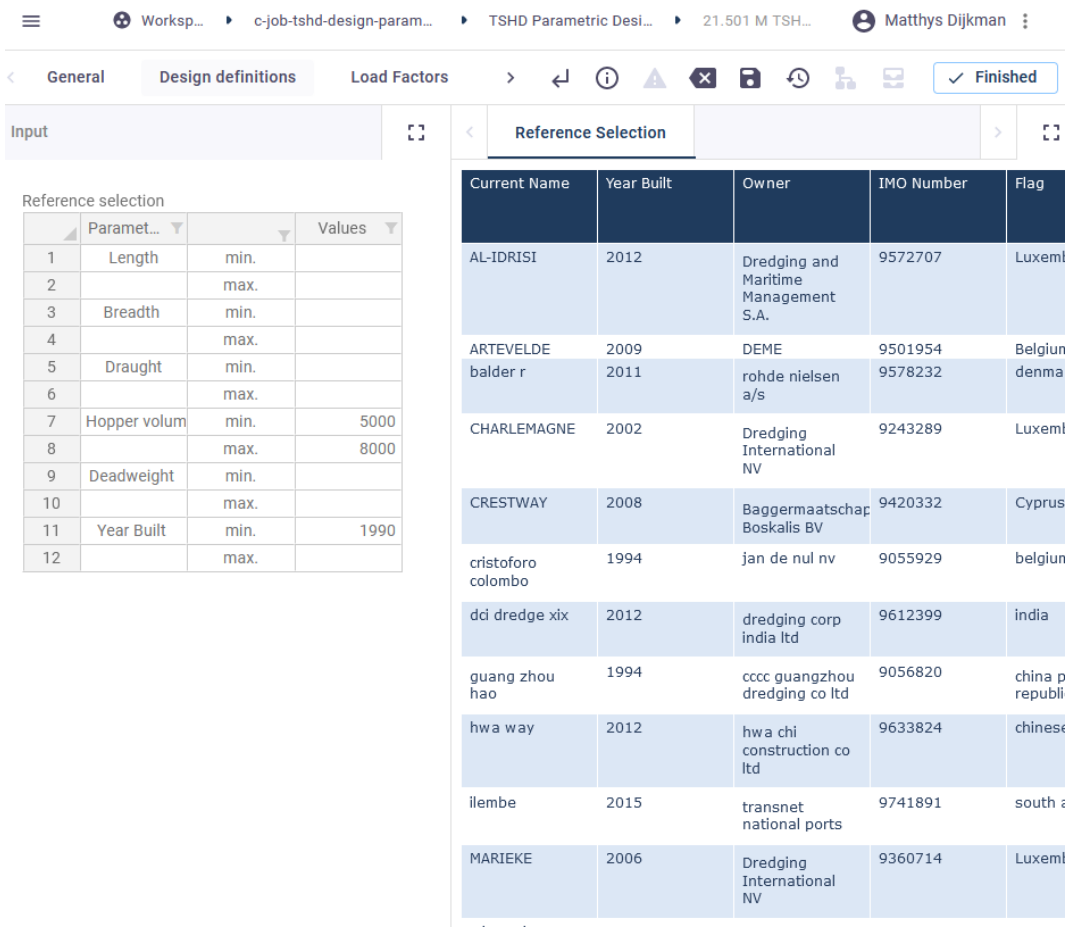
How does the Interactive Design Platform work? - input

Reference Selection

- C-Job's Maritime Intelligence Tool
- Over 170,000 ships (over 500 TSHD's)
- Making informed decisions



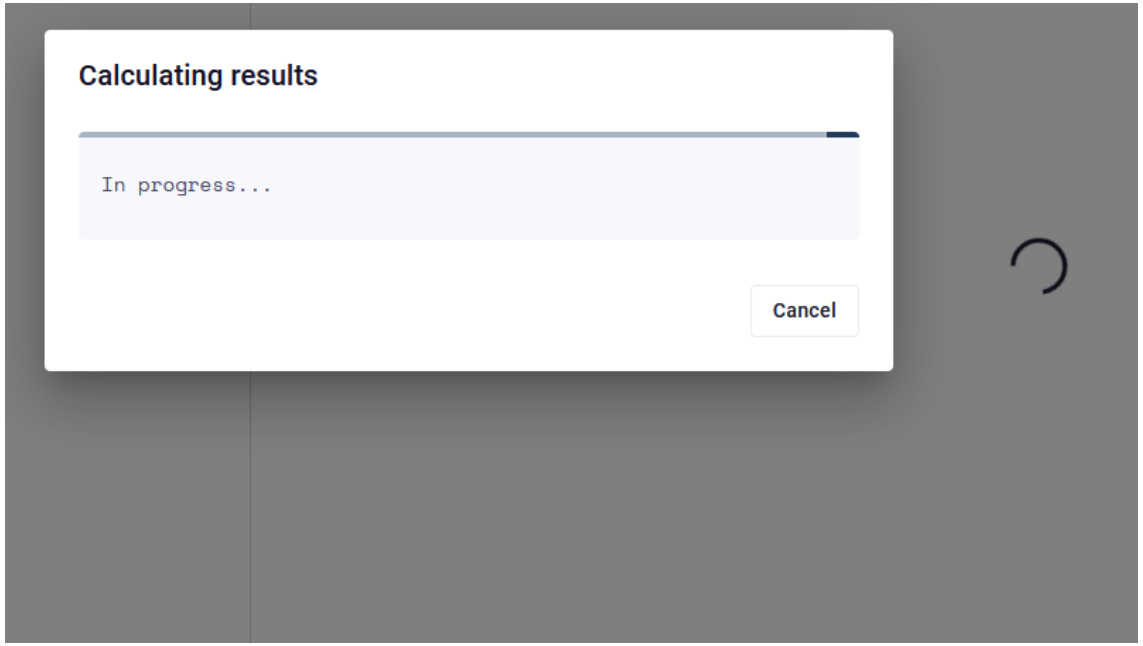
PARALLEL COORDINATES PLOT SHOW VESSEL MARKET TRENDS



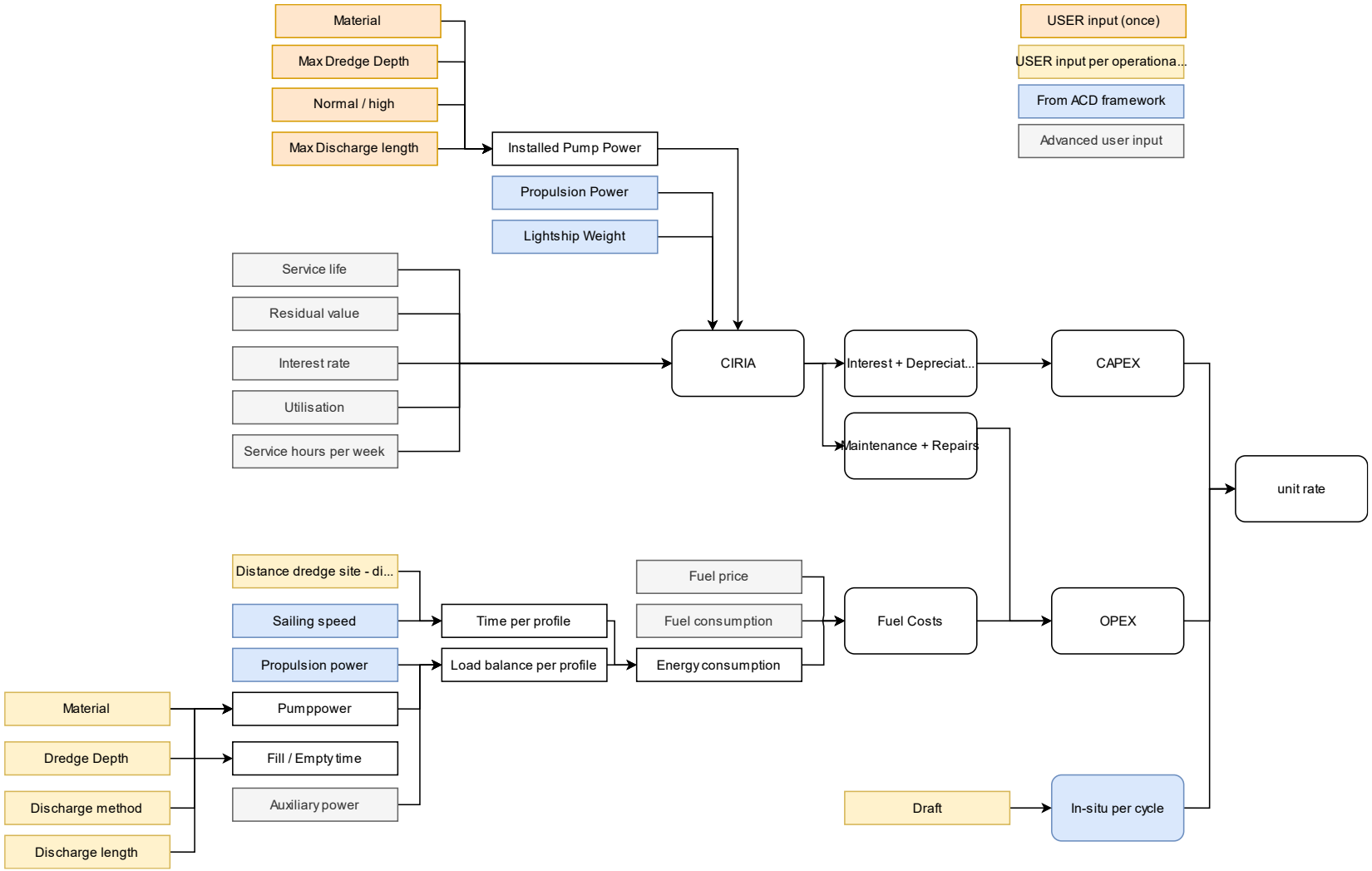
How does the Interactive Design Platform work? - calculation

Each run of the Interactive Design Platform (following values input) will assess **multiple** design variations on various operational scenarios

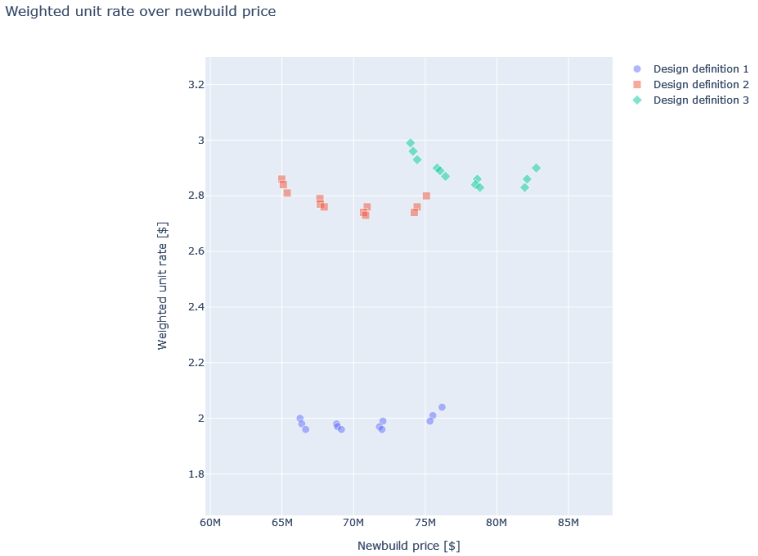
- main particulars are determined, and performance is calculated.

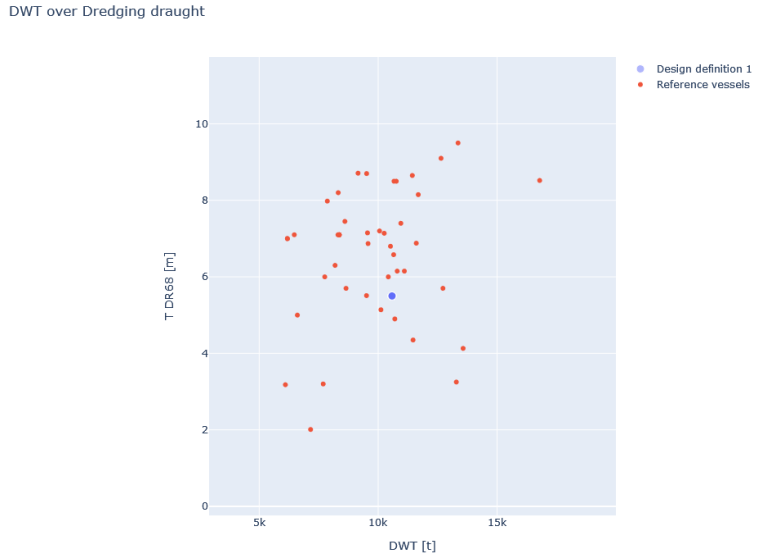


How does the Interactive Design Platform work? - method



How does the Interactive Design Platform work? - results





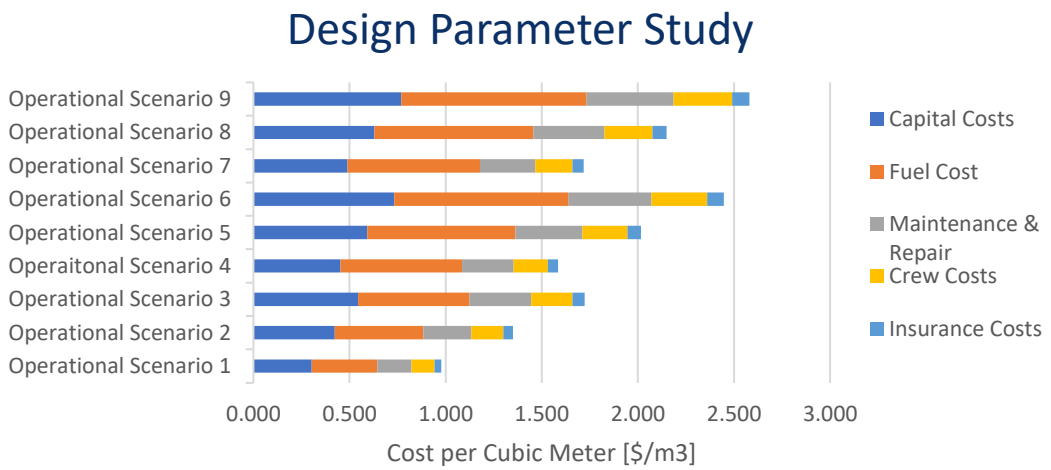
- Estimated costs per cubic metre (CCM) of dredged material.
- Comparison to reference vessels.
- Different Design Definitions to determine how a change in the effects the optimal variation.

- Overview Report - expert view at core of the design process
- Post-processing – market study

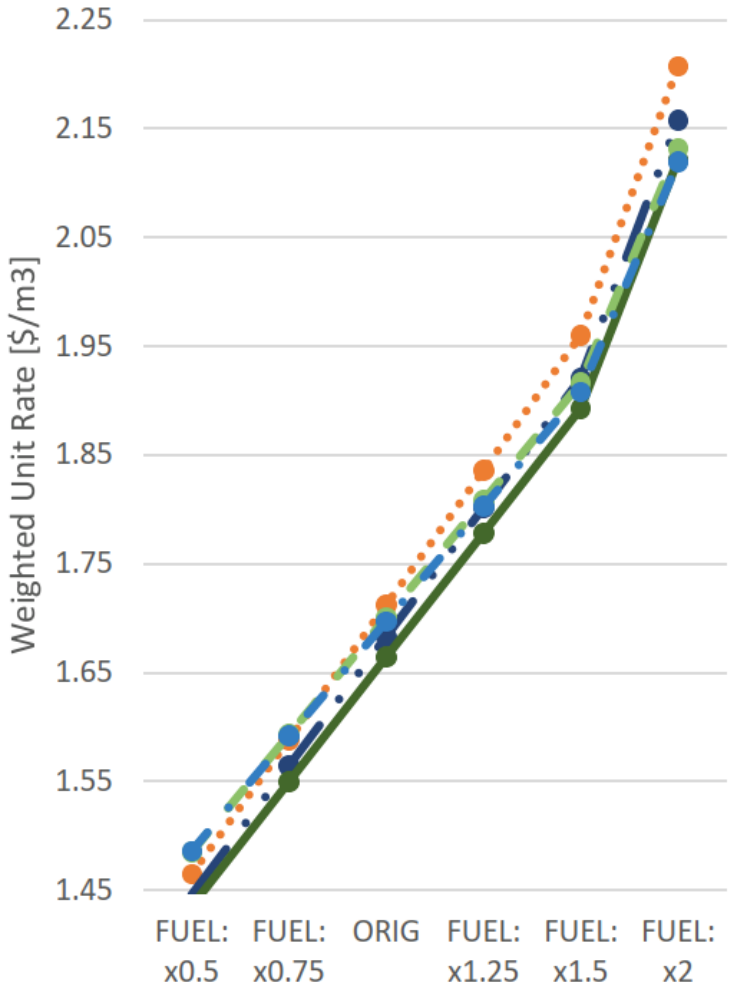
How does the Interactive Design Platform work? – post processing

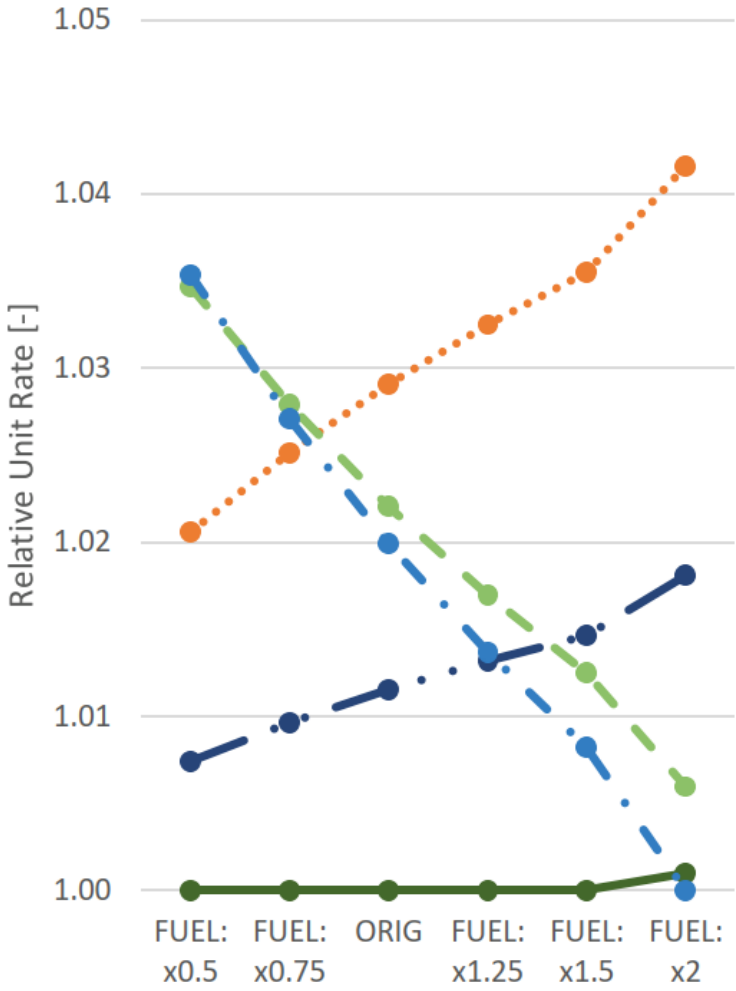
Processing the outcomes:

- Sensitivity Analysis
- The **optimal set of main particulars** (design variation) for various fuel scenarios.
  - Determining exactly where the **tipping point** occurs.
- Competitiveness analysis new design with dredging fleet.
- Comparison between dredge equipment configurations.



How does the Interactive Design Platform work? – post processing





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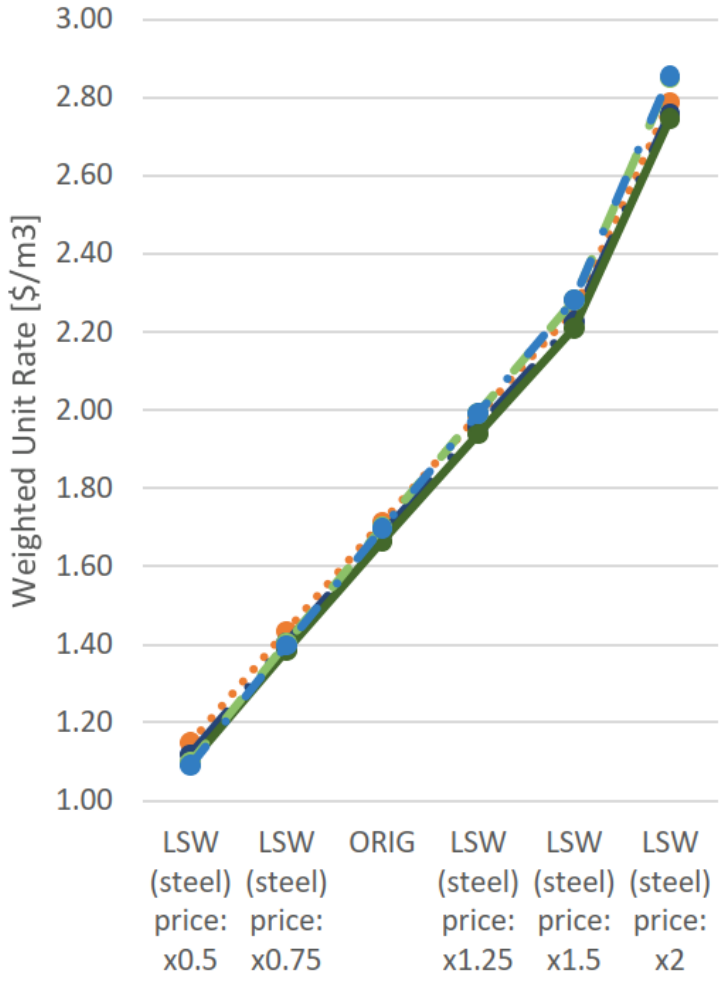

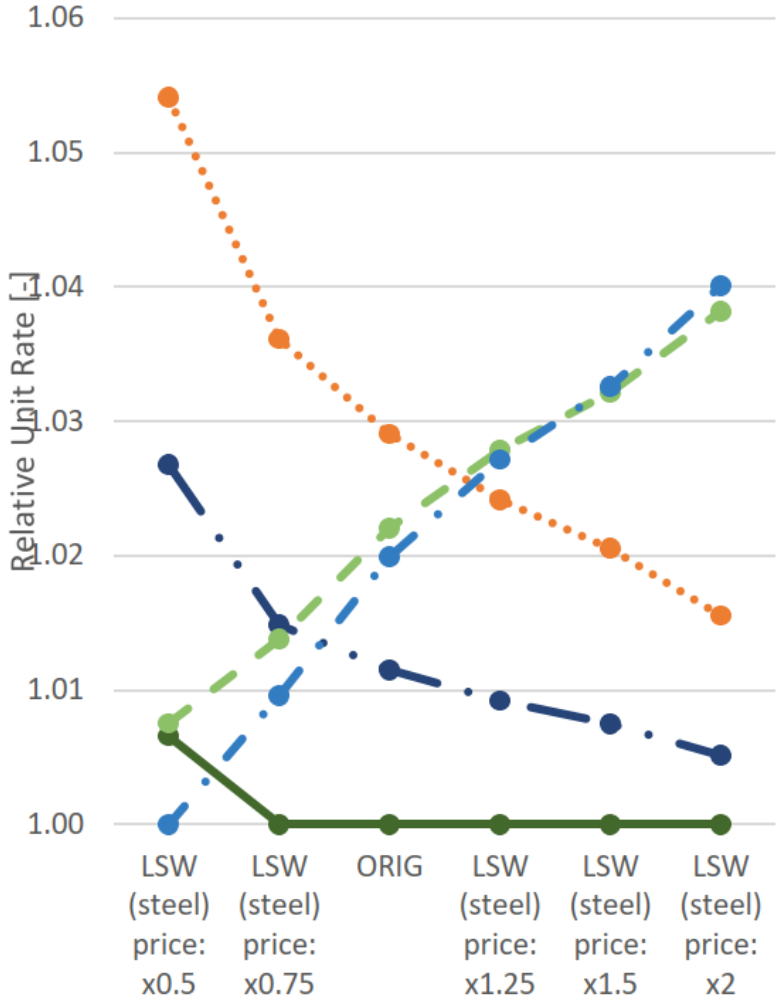

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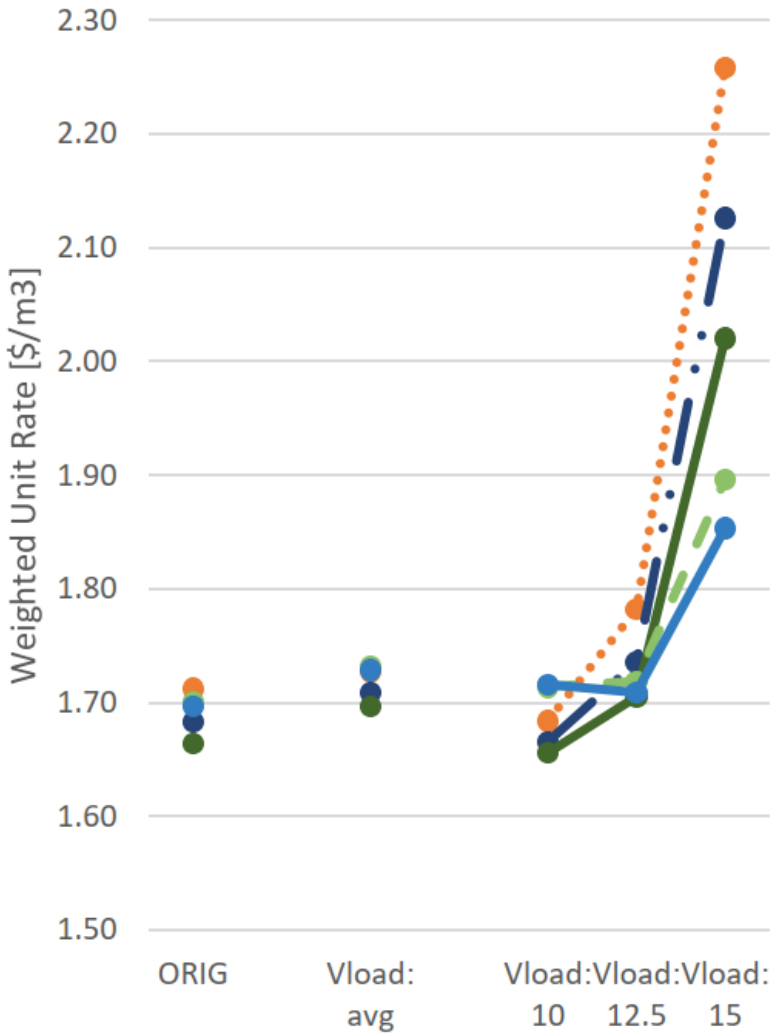

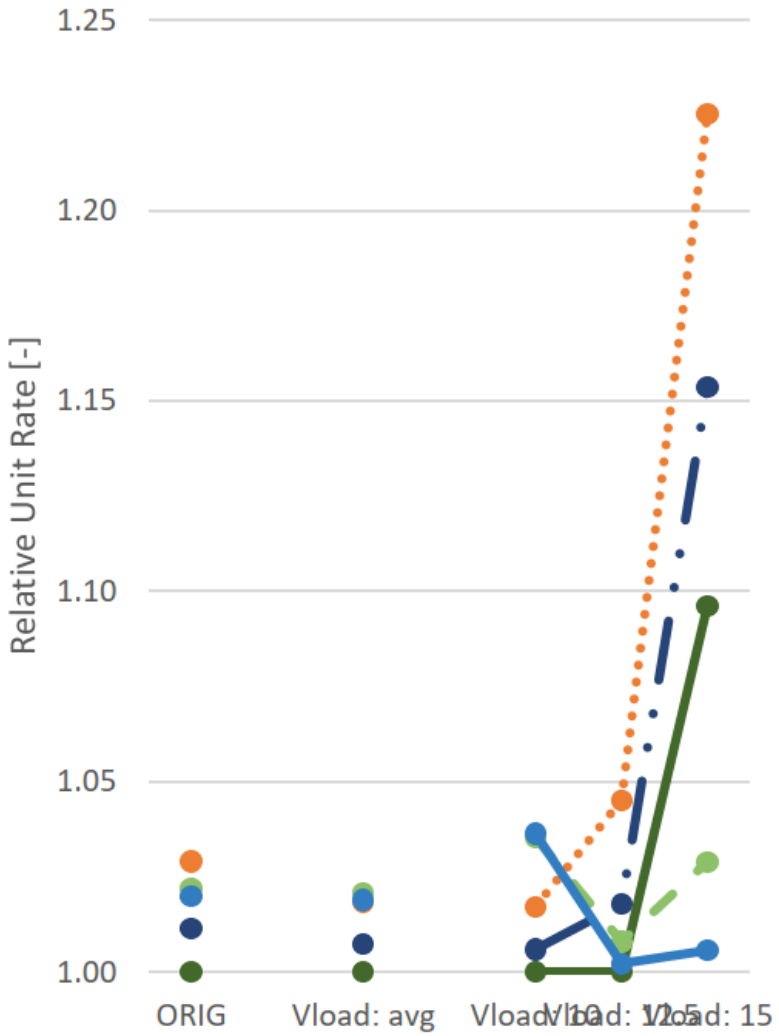

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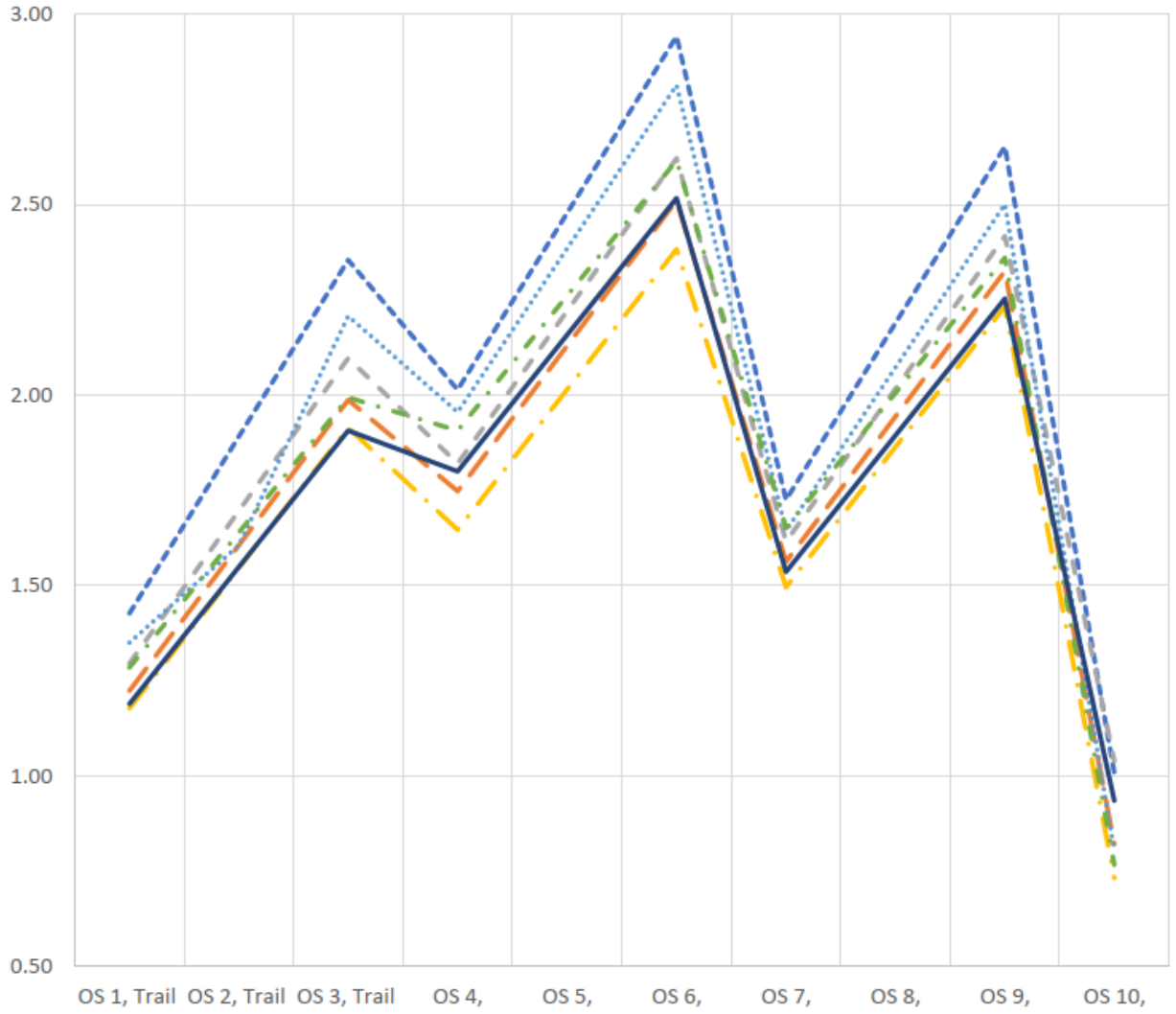


Continuous Development

C-Job TSHD series includes nine different models, three of each of the three main classes of dredgers

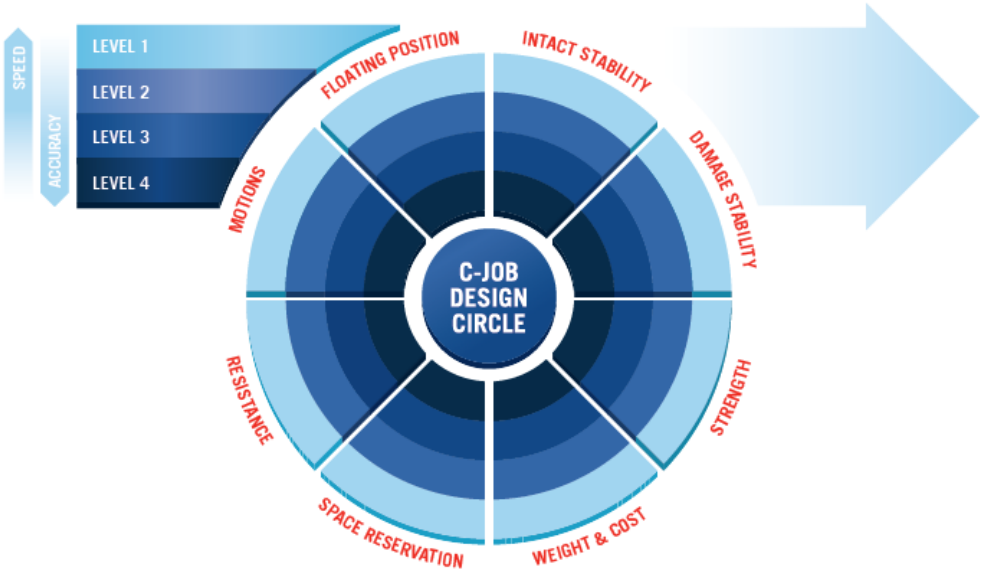
- Hopper capacities are 20-40,000m³ for capital dredging
- Hopper capacities are 5-15,000m³ for multi-purpose dredging
- Hopper capacities are 1.5-7,000m³ for maintenance dredging

- The platform can be adapted for any class of vessel, using any set of variables
- Data-driven interactive model

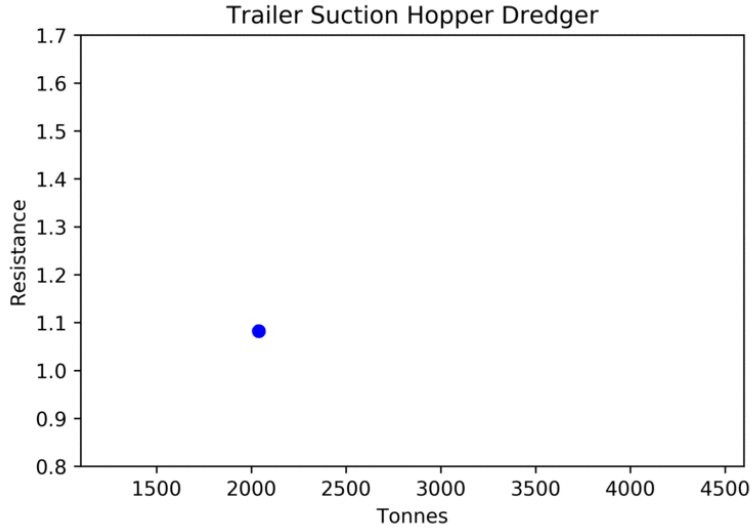
Continuous Development

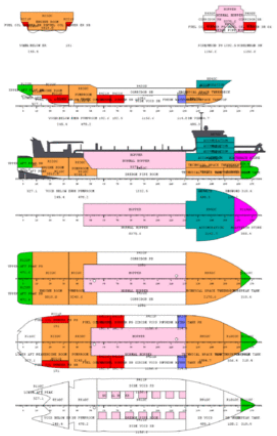
Further expanding the data-drive approach:

- Implementation Dredge Performance Calculations
- Link towards C-Job Accelerated Concept Design



Accelerated Concept Design





Questions?

For more information, please contact:

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Or visit us at booth #12

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