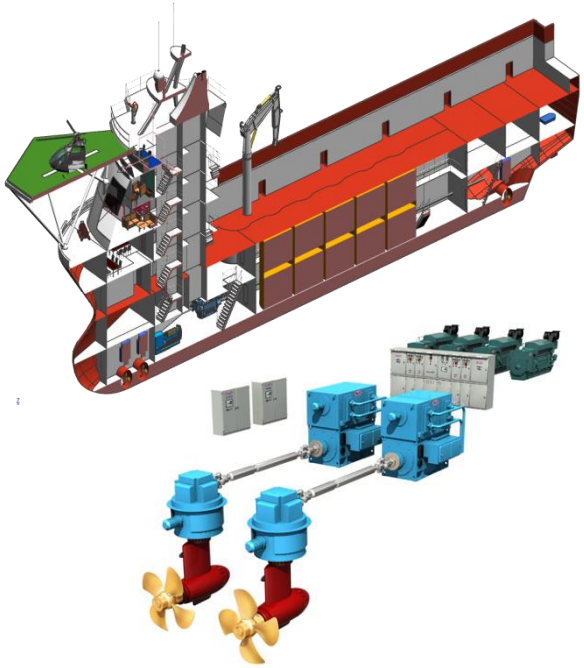

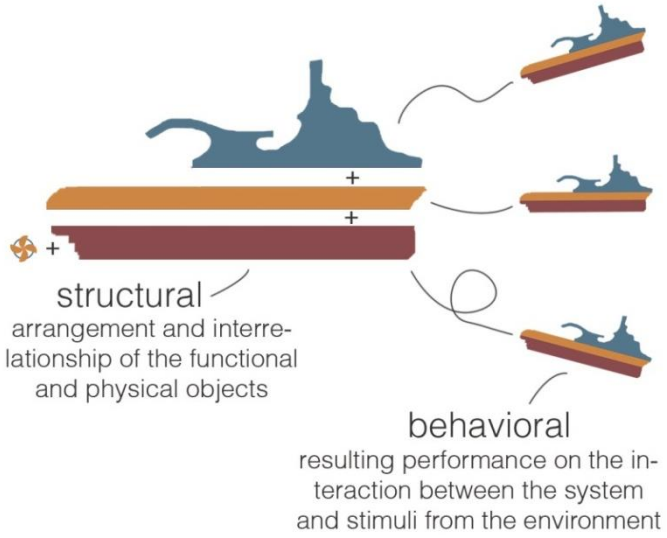

Ålesund University College and MSc: Ship Design

Thiago Gabriel Monteiro
Novembro 2014

HØGSKOLEN I ÅLESUND
Aalesund University College

Agenda

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Aalesund University College

- Background
- Region
- Ålesund University College (HiALS)
- Opportunities: Bachelor and Master Degrees
- Applied Research
- Ship Design and Operation Laboratory
- Other Laboratories

Background

- Bachelor Naval Engineering (5 years)
- Iniciação Científica (6 months)
- Monitoria Projetos I e II (1 year)

- Internship IPT (1.5 year)
- Hired IPT (6 months)

- FINEP Project (1 year)

- MSc Ship Design (HIALS)

- Assistant Researcher (Ship Design Lab)

Region

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Geography

- Ålesund occupies seven of the outer islands in the county of Møre og Romsdal
- Ålesund is adjacent to the Hjørund and Geiranger fjords
- The municipality covers an area of 93 km^2 (São Paulo city covers 7,944 $km^{2)}$
- About 45.000 inhabitants. (5 mi Norway)
- Temperature varies from about +10 to +25 degrees Celsius in summer and from –5 to + 15 in winter
- Language: Norwegian and English

Ålesund

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- 1904 – Ålesund Fire. City completely destroyed by flames.

Ålesund

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- After the incident, Kaiser Wilhelm of Germany helped to rebild the city.
- 1907- City completely rebuilt (Art Nouveau)

Ålesund

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- Strong Maritime Industry:
  Ship Design - Strong vessels and equipment industry
  Fishing – Most important fishing harbor in Norway
  Tourism – Near to major Fjords

- Life Cost x Life Quality

50 – 60 NOK

100 NOK

30% - 40%

Ålesund University College (HIALS)

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- 2 000 Students / 200 Staff Members
- Close Cooperation With Industry
- 5 Faculties
  - International Business
  - Life Sciences
  - Health Sciences
  - **Marine Technology and Operations**
  - Engineering and Natural Science

Campus Ålesund University College

The Role of Norwegian University

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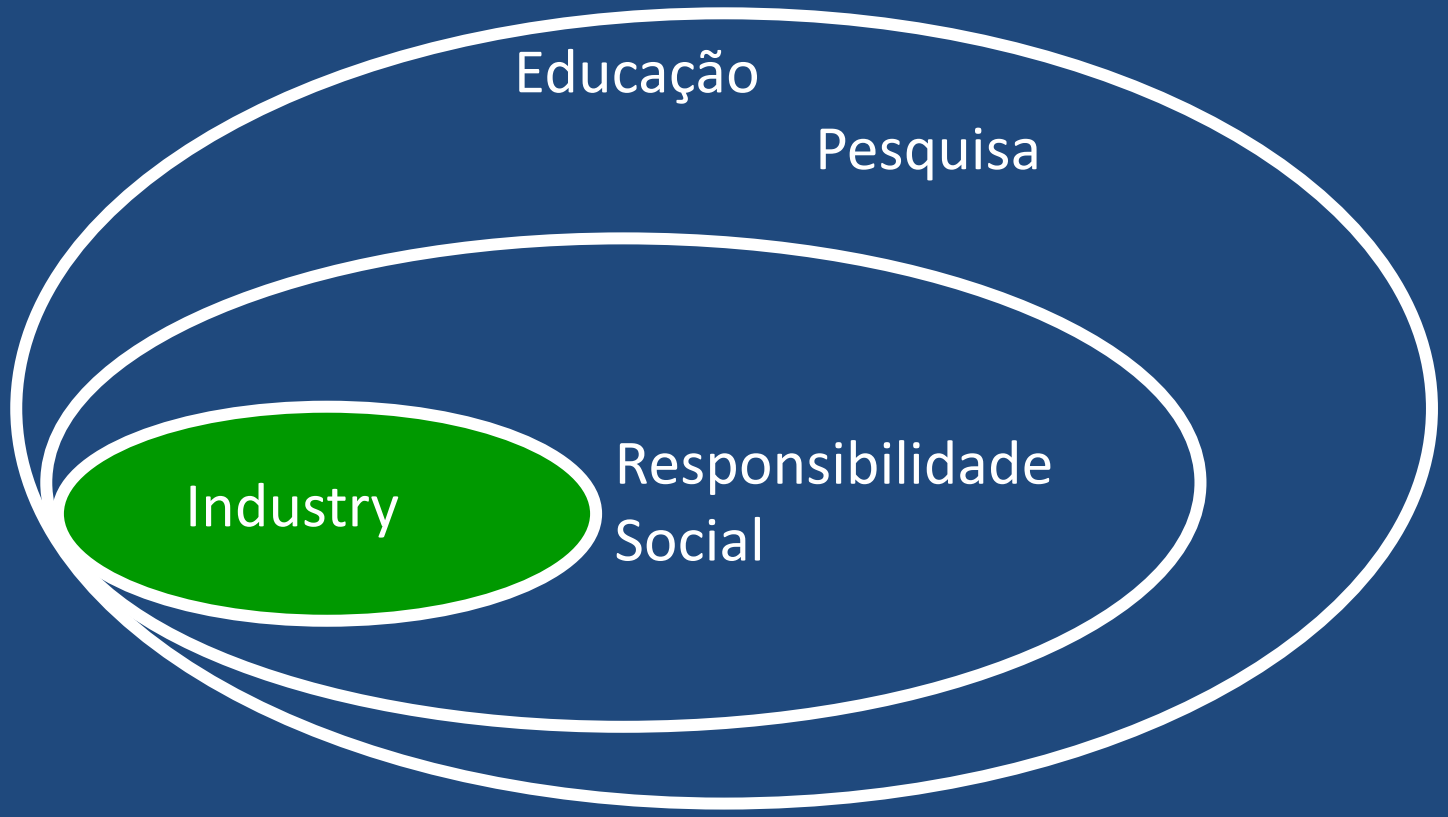

Educational System - Norway x Brazil

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- 4 years high school.
- Emphasis at the student interest area.
- Educational system is public and free of charges.
- Universities selection process: High school grades.
- Big Universities x Local Universities.

UNIVERSITAS OSLOENSIS MDCCCXI

NTNU
Norwegian University of Science and Technology

UNIVERSITAS BERGENSIS

Opportunities: Bachelor and Master Degrees

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Master of Product and System Design

- discipline oriented master (120 ECTS)
- professional master (90 ECTS)

Both programs are taught in English, and can be pursued as full-time or part-time studies.

Please note that the admission procedure, application form and application deadline is different from the bachelor programs.

Master of Ship Design

- discipline oriented master (120 ECTS)
- professional master (90 ECTS)

Both programs are taught in English, and can be pursued as full-time or part-time studies.

Please note that the admission procedure, application form and application deadline is different from the bachelor programs.

Master of International Business and Marketing

- dicipline oriented master (120 ECTS)

The program is taught in English.

Management of Demanding Marine Operations

- Master of Science: Management of Demanding Marine Operations

- Official Partnership With POLI-USP
- Science Without Borders
- 2 Types of Exchange:
  - Registered Students, Classes, Credits, Courses;
  - Research and Project.
- 2 Years Master Degree ()
- Co-orientation of Master Degree
- Summer Projects (2-3 months)

Powerful tools to:

- test new ideas
- optimize performance of systems
- provide support for making decisions

The use is rapidly increasing in industry, in public planning and management, as well as widely used in dedicated simulators to train pilots, sea captains and police.

http://laht.info/WebGL/Offshore.html

Regional industry: Offshore Ship Activity

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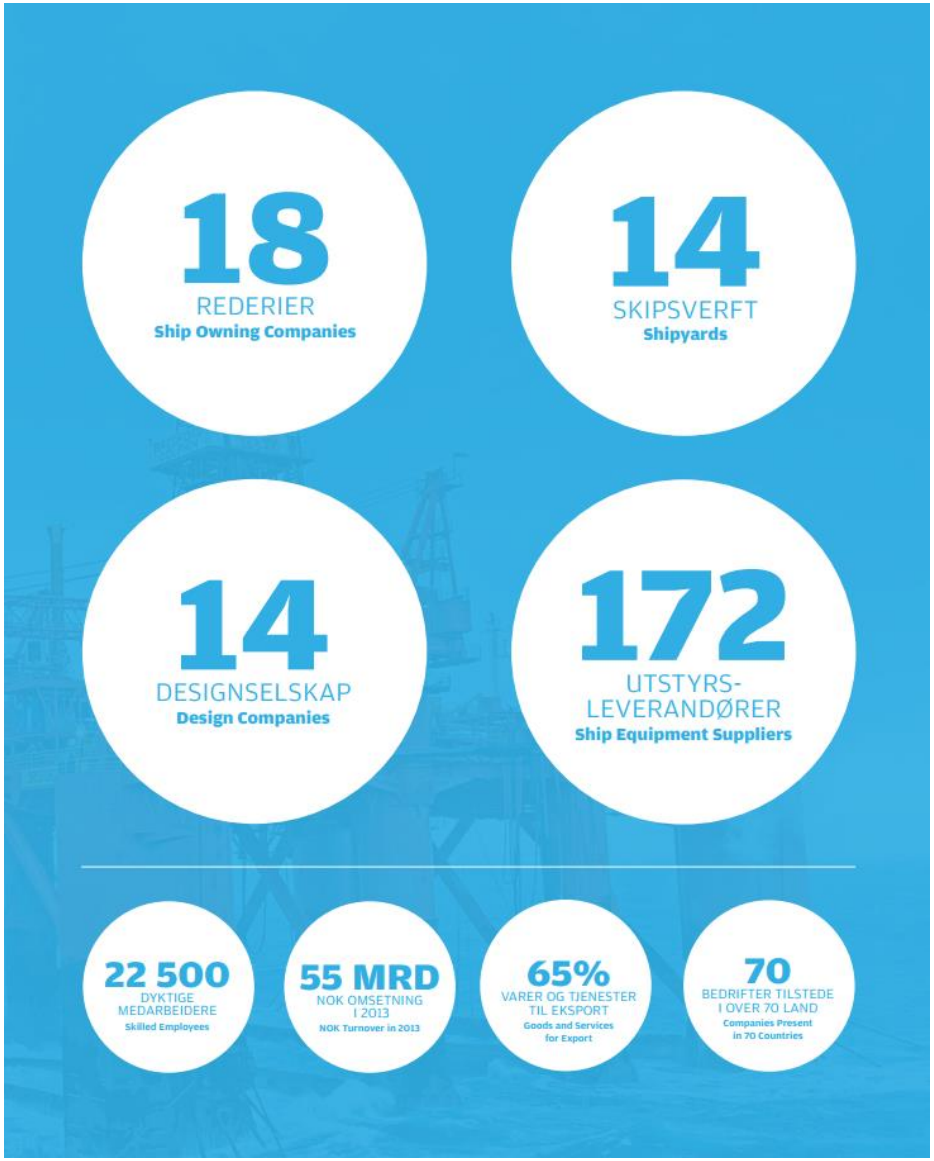

THE MARITIME INDUSTRY AT MØRE IS BASED ON FAST INNOVATION, FAST ADAPTATION TO NEW POSSIBILITIES AND A VERY CLOSE COOPERATION WITH CUSTOMERS.

Ship of the year, Skipsrevyen

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År	Skip	Design	Verft	Rederi
2012	FAR SOLITAIRE	Rolls-Royce Marine	STX	Farstad
2010	Skandi Aker	STX	STX	DOFCON
2009	FAR SAMSON	Rolls-Royce Marine	STX	Farstad
2008	Island Wellserver	Rolls-Royce Marine	Aker Yards	Island Offshore
2007	NORMAND SEVEN	Vik Sandvik	Ulstein Verft	Solstad Offshore
2006	Bourbon Orca	Ulstein Design	Ulstein Verft	Bourbon Offshore
2004	VIKING AVANT	Vik Sandvik	Aker Yards	Eidesvik Shipping






Ship of the year, Offshore Support Journal

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År	Skip	Design	Verft	Rederi
2012	North Sea Giant	STX	STX	Sea Shipping
2011	Seven Havila	Havyard	Havyard	Subsea 7 / Havila
2010	Fugro Synergy	Marin Teknikk	Bergen Group	Fugro N.V.
2009	Far Samson	Rolls-Royce Marine	STX	Farstad
2008	Island Constructor	Ulstein Design	Ulstein Verft	Island Offshore





Current Challenges

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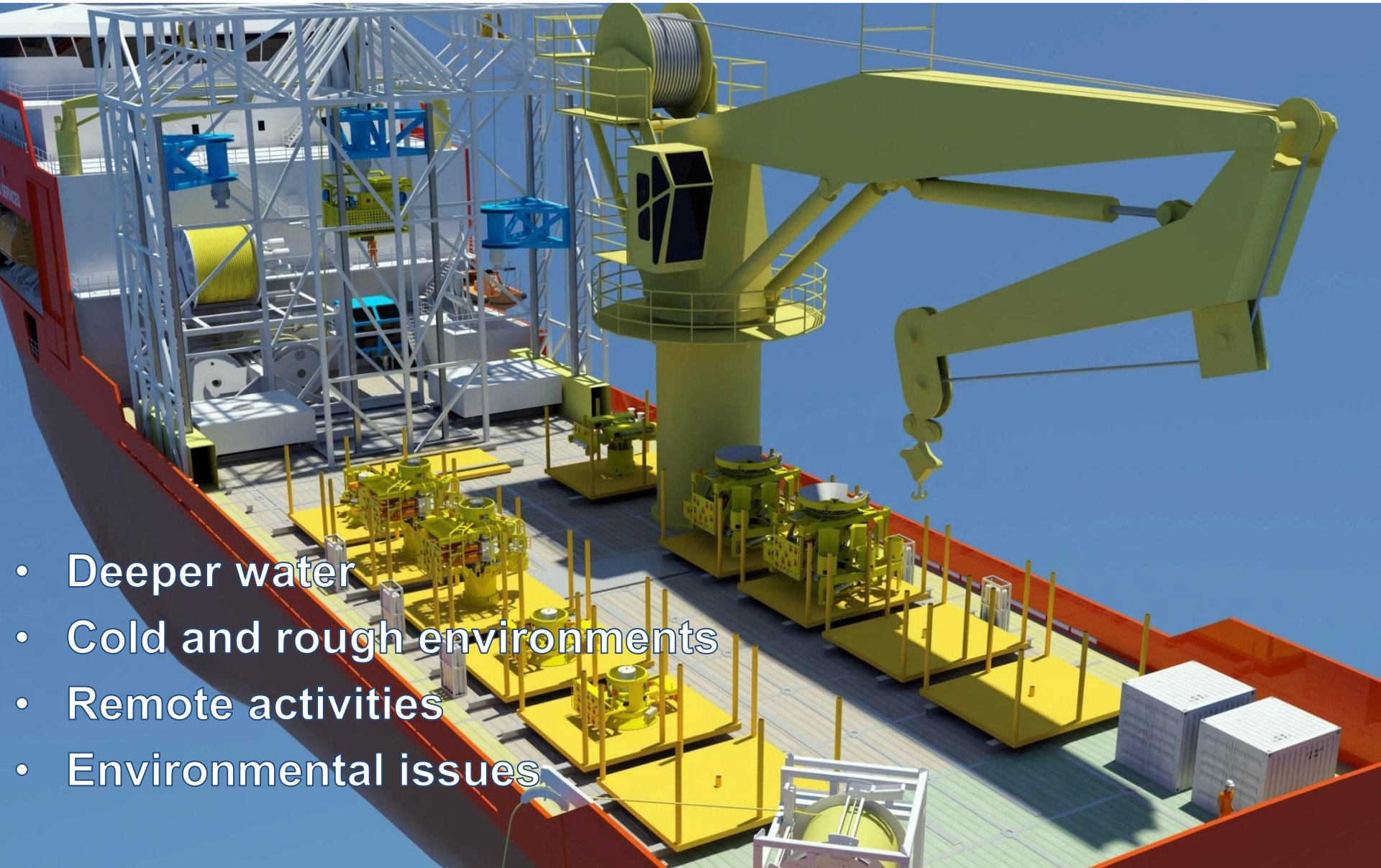

- Deeper water
- Cold and rough environments
- Remote activities
- Environmental issues

Marine Operation in Virtual Environment (MOVE)

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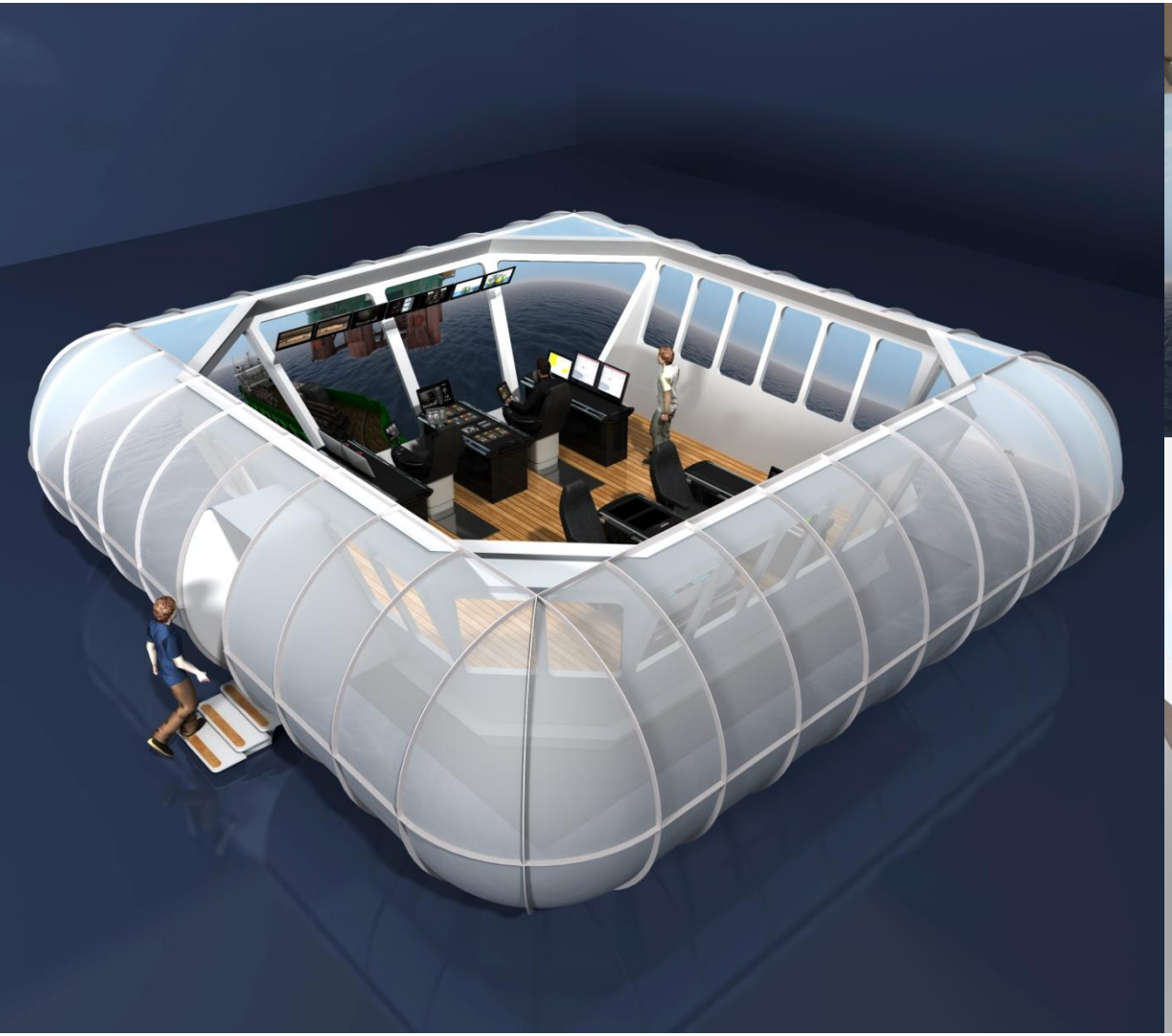

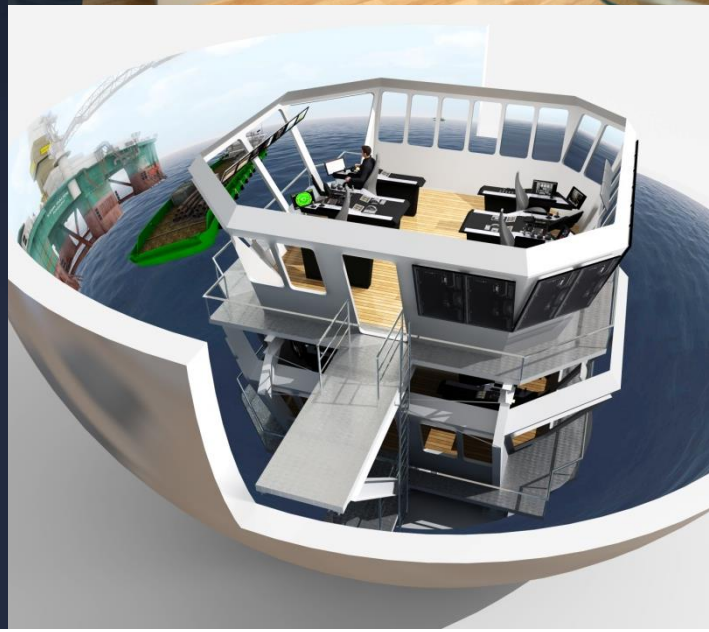

Training Portfolio

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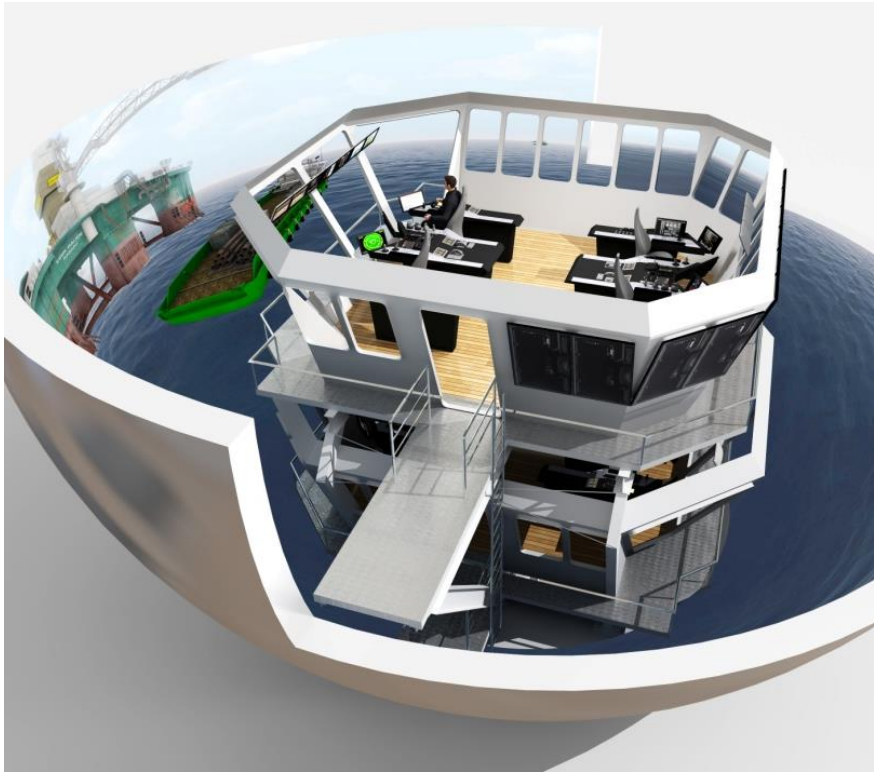
- AHO/ PSV / Subsea/Seismic
  - 0 Introduction
  - 1 Operational Training
  - 2 Team Performance
  - 3 Managing Risk
- SCTH – Safe Cargo Transport and handling on offshore vessels
- Costal Navigation for apprentice Pilot Exemption
- Dynamic Positioning, DP
- Position References
- ECDIS/ AIS
- Fast Craft
- Applied Risk Management
- BRM / CRM
- Stability on offshore vessels
- Train the trainer
- Language and culture



MOVE

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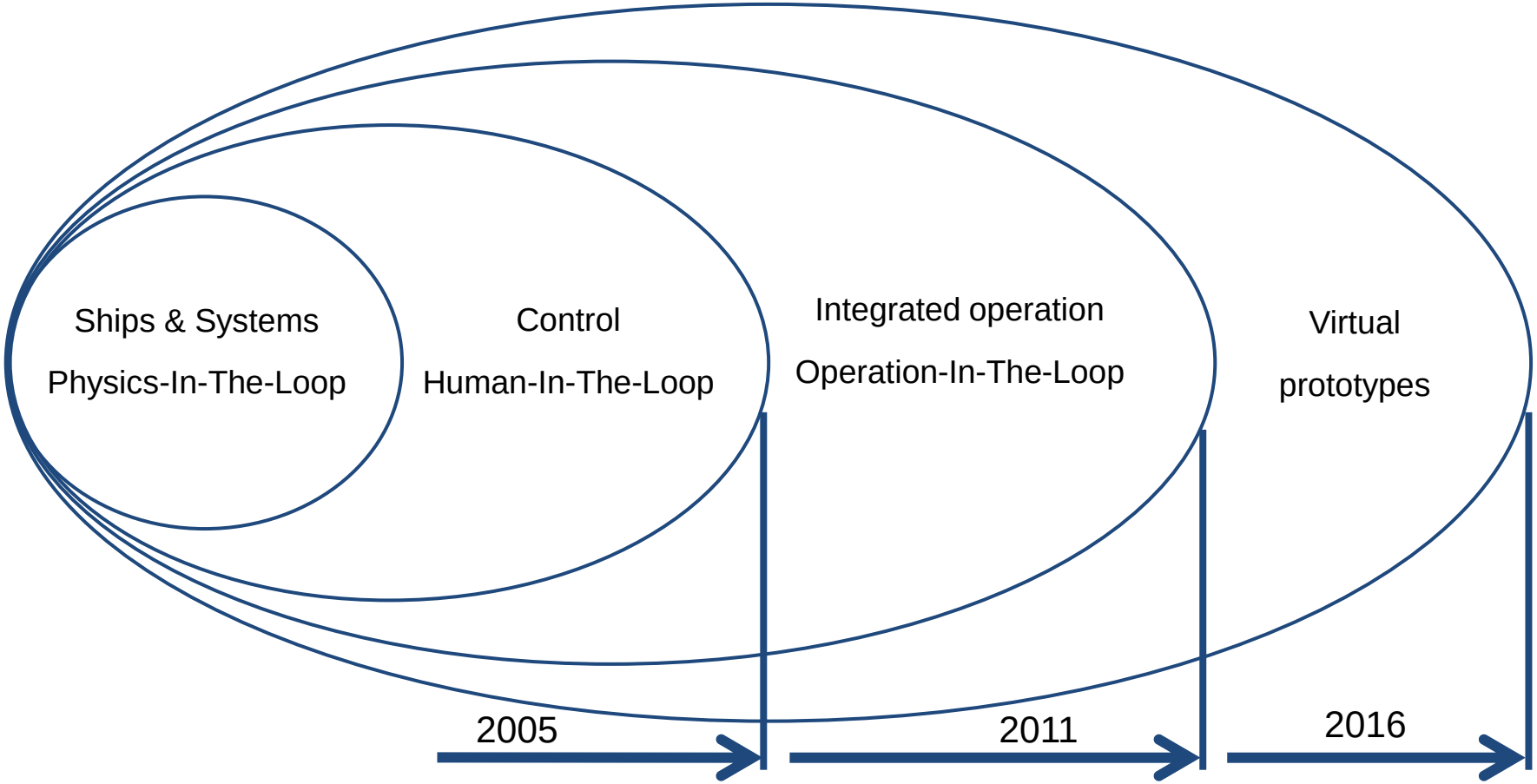

Integrated operations: Ship - Rig - Crane

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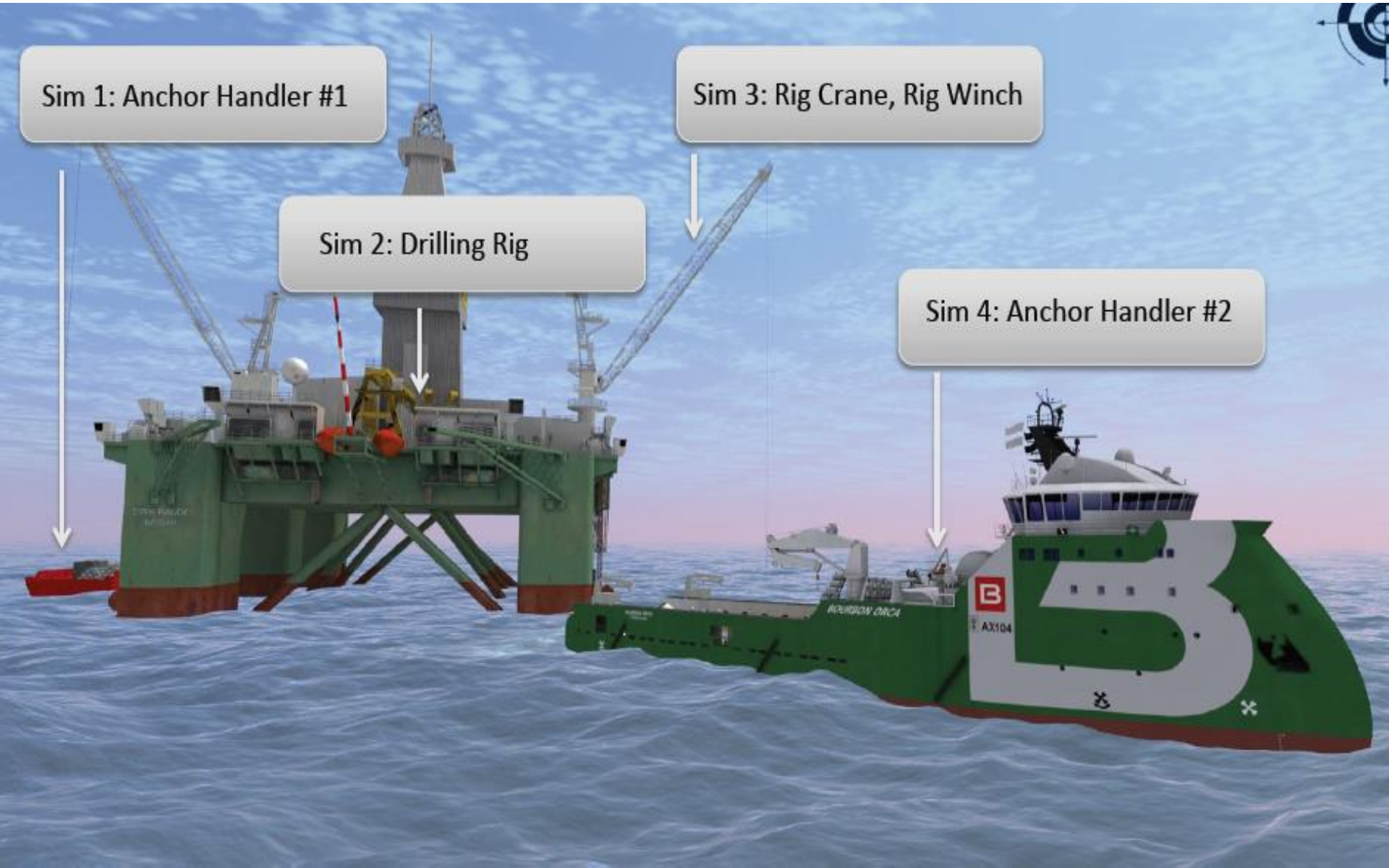

The Virtual Continental Shelf

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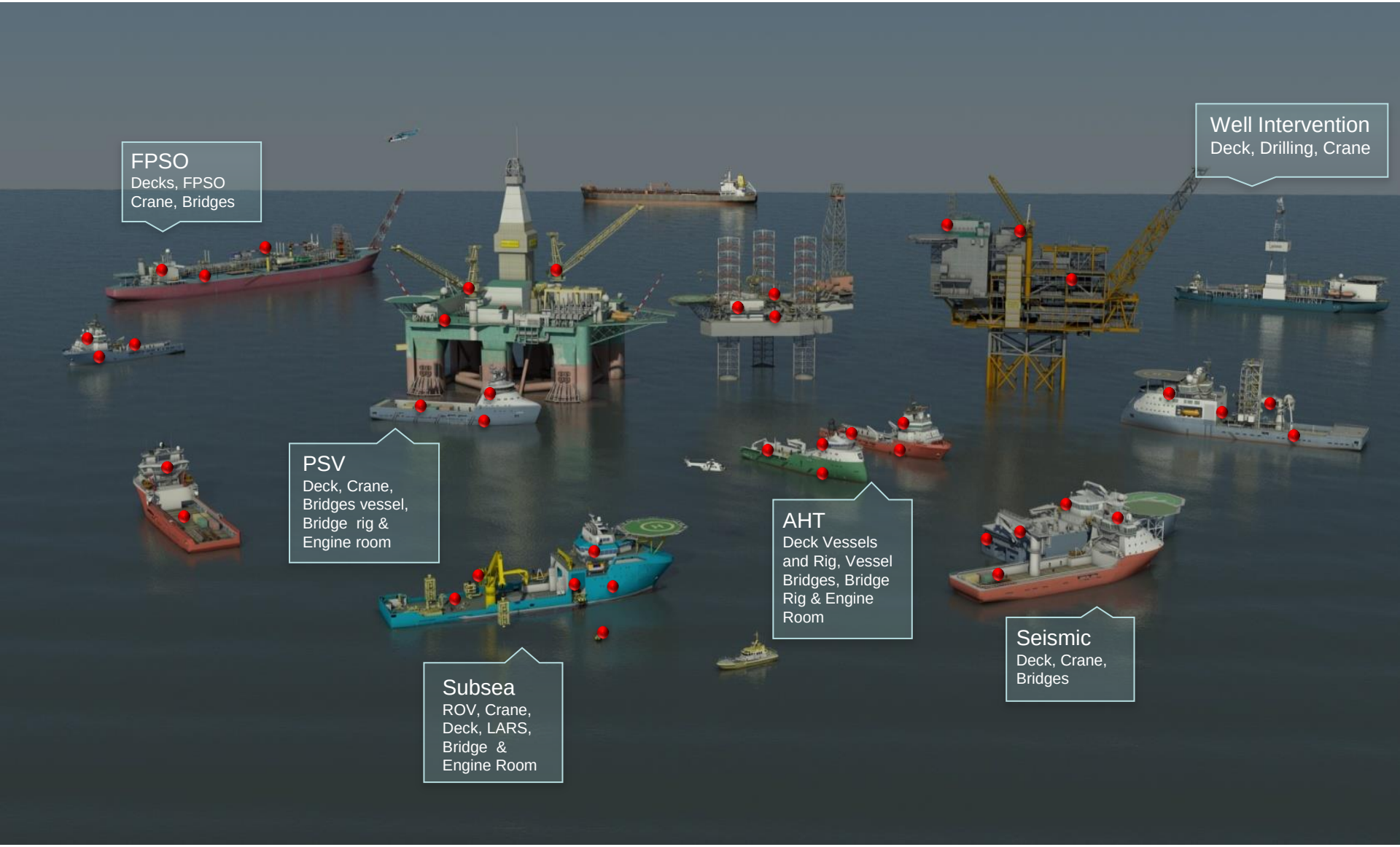

Ship Design Lab

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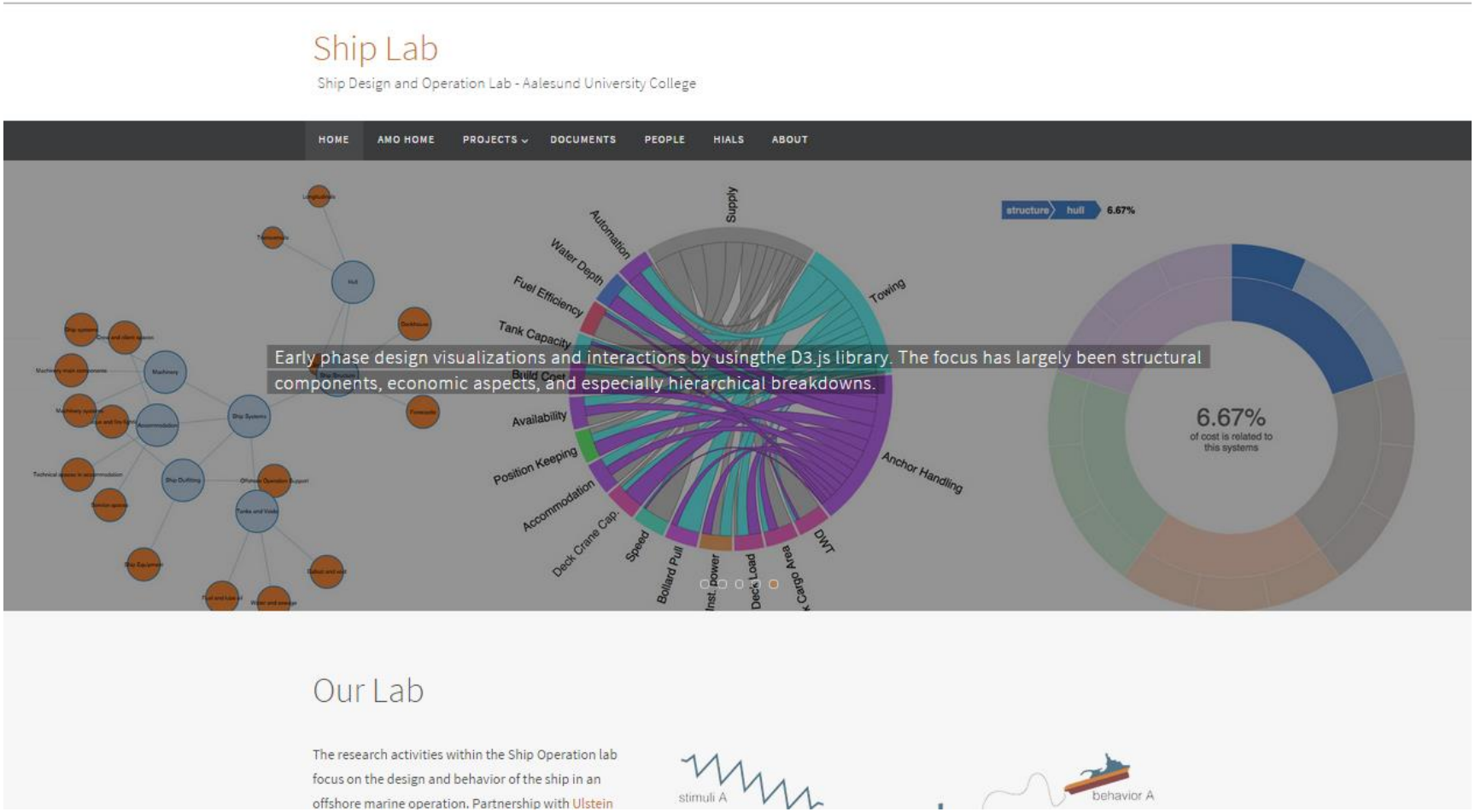

Ship Design Value Chain

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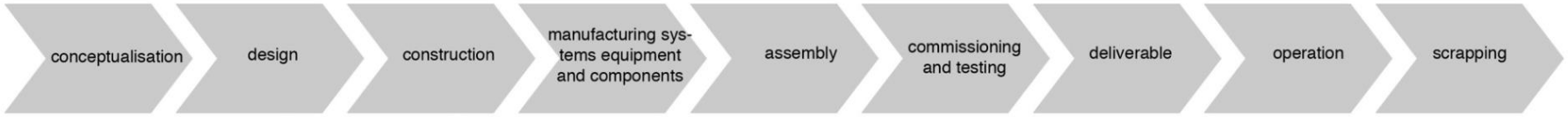
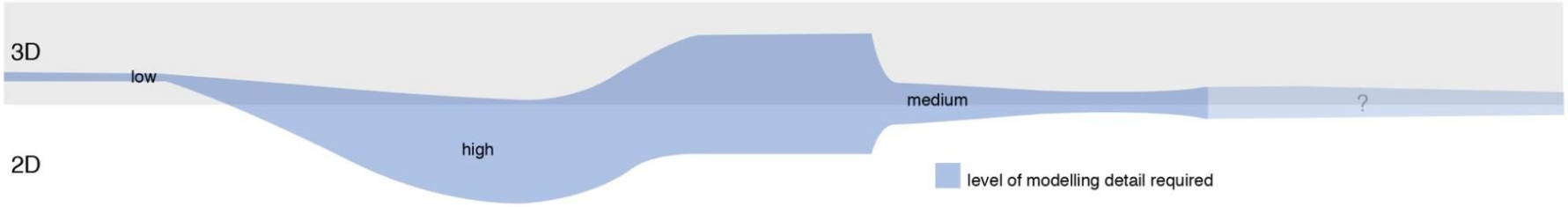
activities in the value chain



required design modelling/analysis



activities man-hours

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ÉMIS

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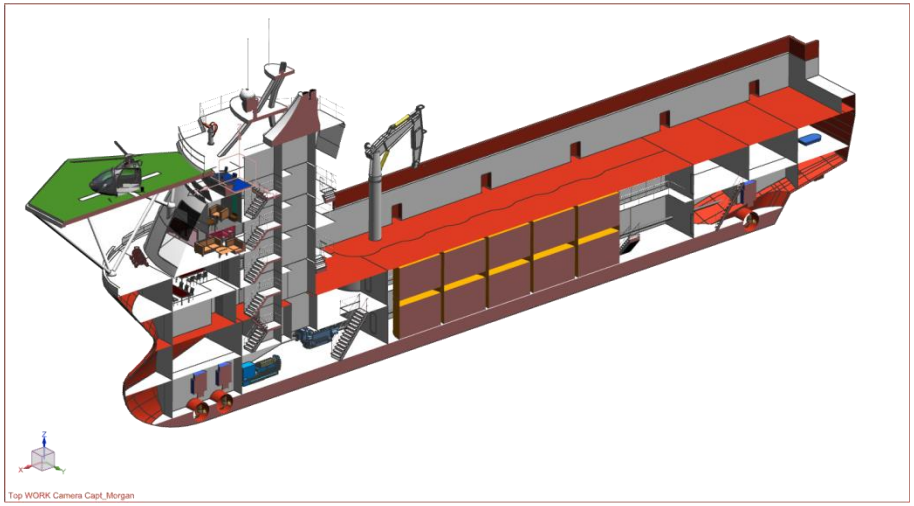
Innovation Project for the Industrial Sector between Ulstein and HIALS :

ÉMIS - Efficient Modular Integration of Systems for Ship Design: Speeding up Modules Customization and Detailing Engineering for Ulstein

- To develop and implement **more efficient methods to integrate complex modules** in the process performed at Ulstein
- **Deal with productivity constrained** by the limited ways to create, combine, evaluate and document each of the modules
- Effective and robust modular **framework**, able to **combine standard (traditional) with customized (emergent) solutions** through the ship design process.
- Take into account as well the **detailing engineering, specially regarding an effective documentation** towards 3rd party partners.



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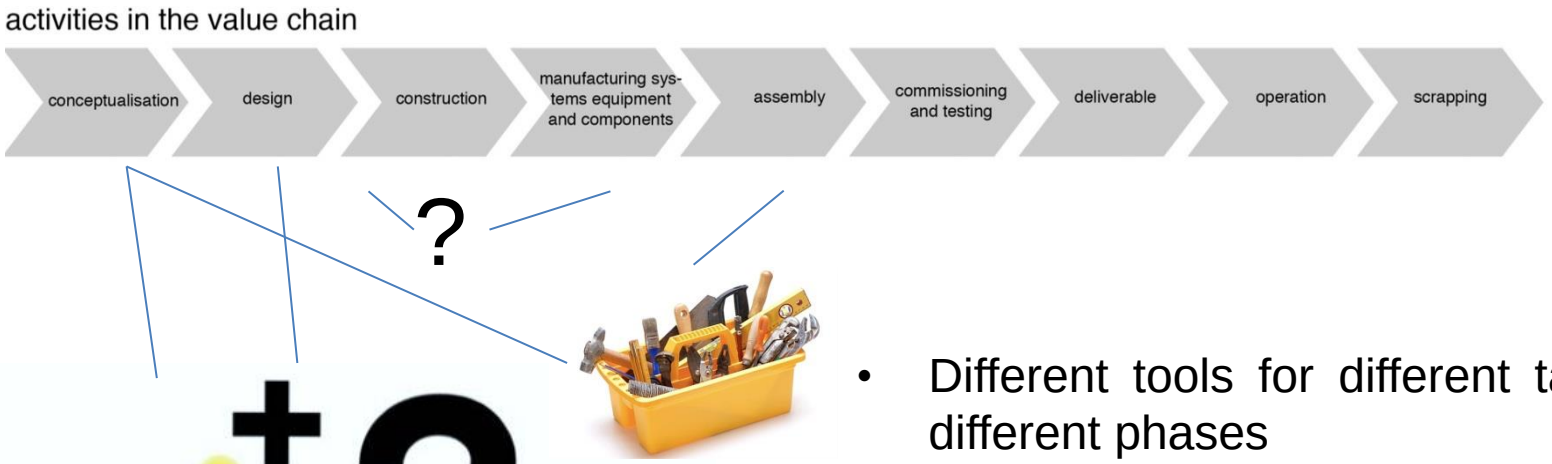
Toolbox Analogy



- Different tools for different tasks for different phases
- Not necessarily they “work together”
- Each solution as a necessary tool for the ship design process
- It all converges on **how the relevant information is handled** (observed, generated, analysed, evaluated and presented)

EMIS FOCUS and challenges

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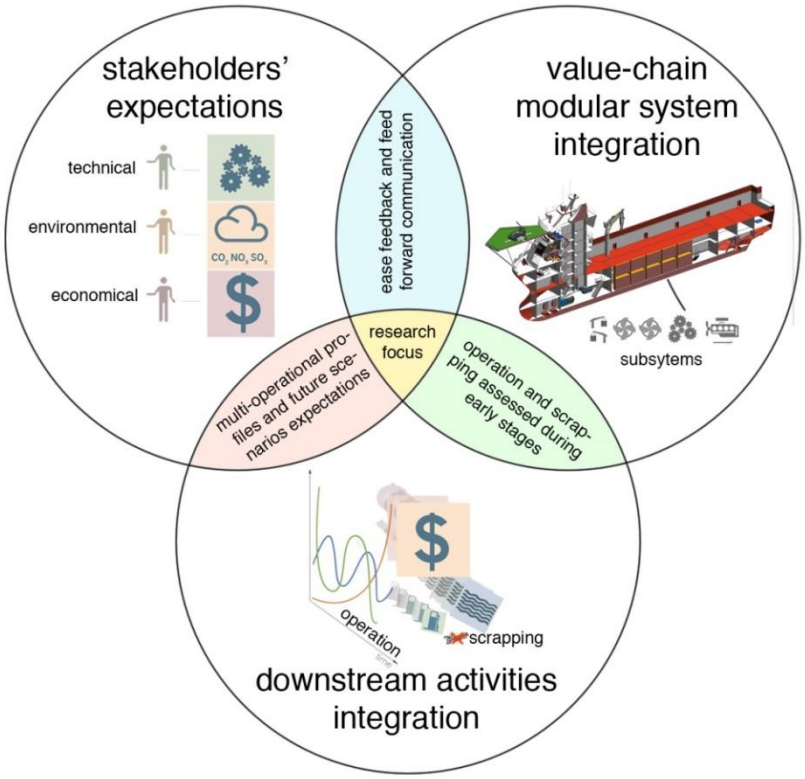
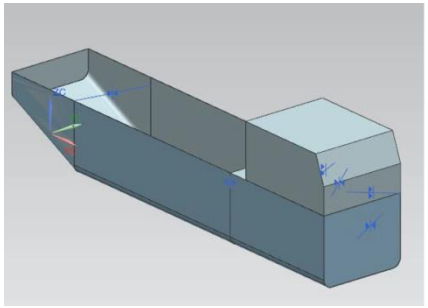
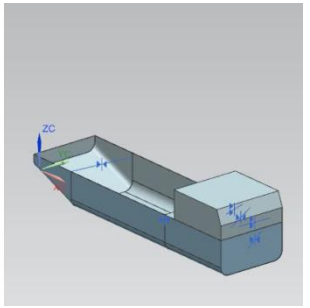
2 research lines: Framework and 3D Modular System Integration







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Which relevant information should be handled?

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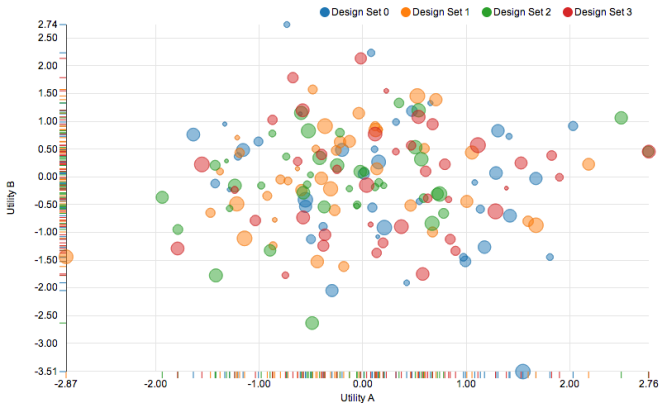
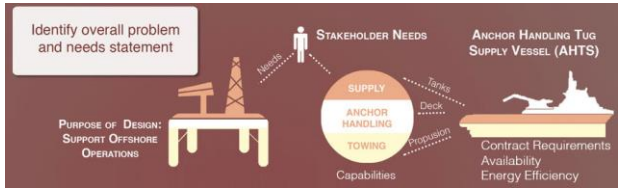
Benchmark Comparison



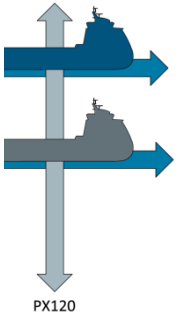
Owners' requirements



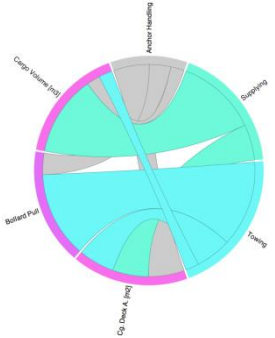
Capability	A. Handling	Supplying	Towing	Total
Cargo deck area [m^2]	500	500	500	1500
Bollard pull [MT]	50	0	200	250
Cargo volume [m^3]	500	3000	500	4000

Parametric Models

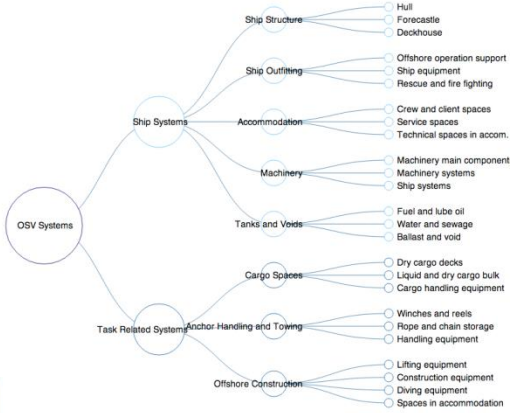
Parameters	Value	Range
Length [m]	100	
Breadth/Length	0.22	
Breadth [m]	22	
Depth/Breadth	0.45	
Depth [m]	9.9	
Draft/Depth	0.7	
$Draft_{Design}$ [m]	6.9	
C_B	0.75	
Powering [kW]	20689	
Price / GT [kNOK/GT]	50	



Mission/Capabilities dependencies

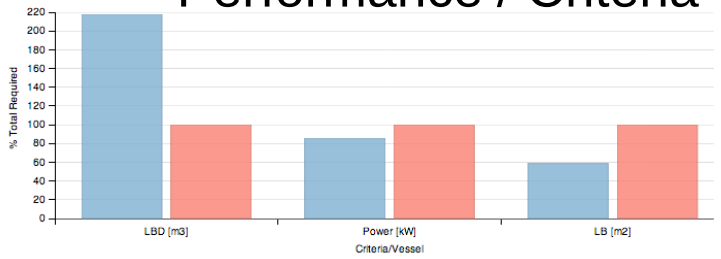


System Breakdown



Analyses database

Performance / Criteria



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Tool Box

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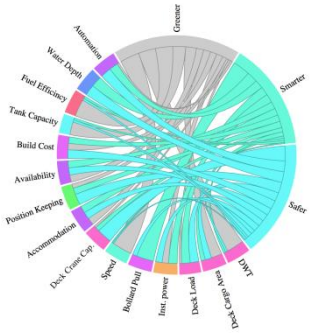
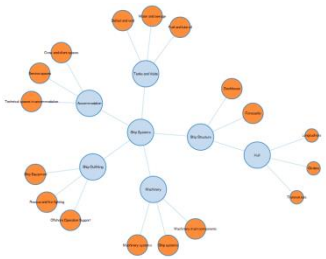
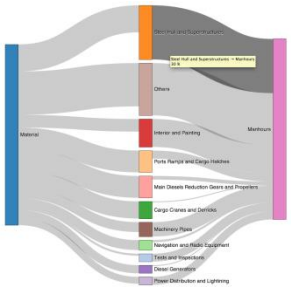
- Online collaborative environment
- Open source
- Features beyond powerpoint /excel
- On the way to very advanced online user interaction:
  - **Data driven visualization**
  - **Virtual prototype**

http://laht.info/WebGL/Offshore.html







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Visual Representation of Knowledge

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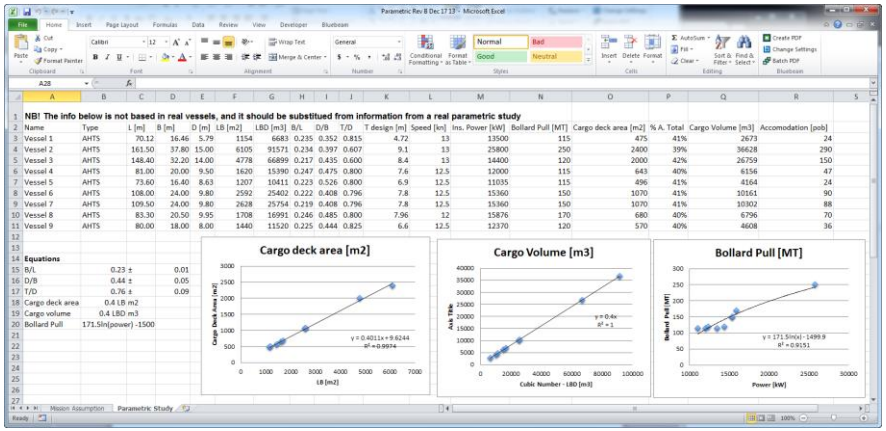
- Extension of the procedure
- Handling parametric data outside the row versus column format,
- Handling data in an open/readable format
- Progress beyond the passive share of performance evaluation
- Presenting a new type of graph, visualizing parametrically aspects previously handled as static figures.



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Data Driven Document (D3)

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- JavaScript Library developed initially by the Stanford Visualization Group and today mainly developed by Michael Bostock
- Combines powerful visualization components and a data-driven approach to objects manipulation
- A representation-transparent approach to visualization for the web.
- Direct inspection and manipulation of text-like data, binding input data to HTML document elements.
- Efficiency in quickly rendering and animating charts.

[*uscience.org/compit2014/*](uscience.org/compit2014/)

Using D3 during conceptual design allows the user to interact with different visualizations, creating an increased understanding of different variables correlations with each other. It also provides a simple and aesthetically pleasant interface.

Extracting Ship Design Knowledge

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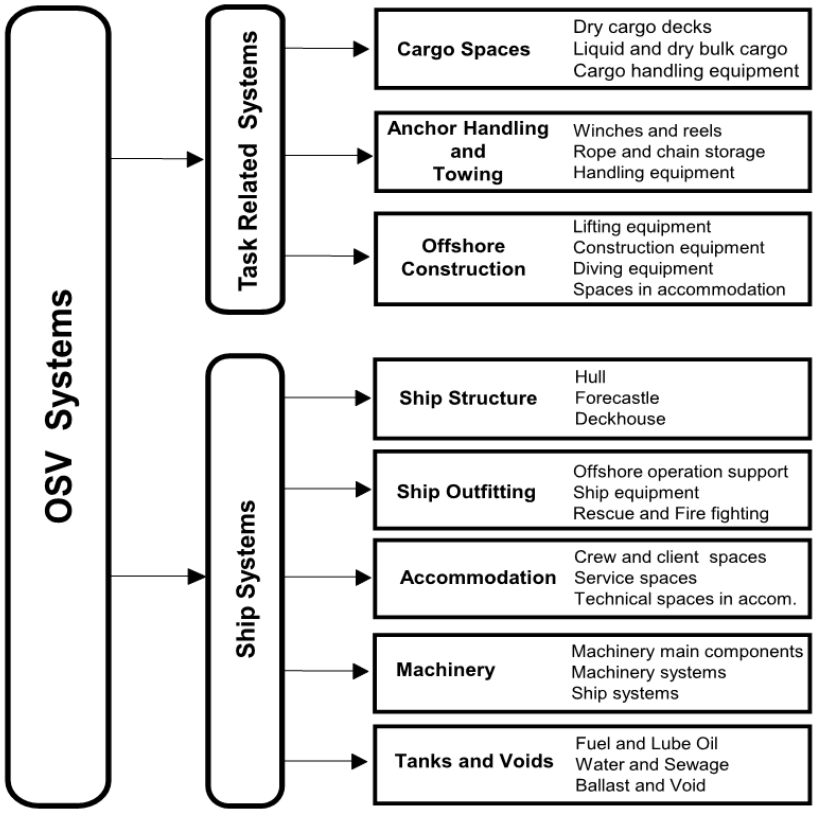
- Structural Examples

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Extracting Ship Design Knowledge

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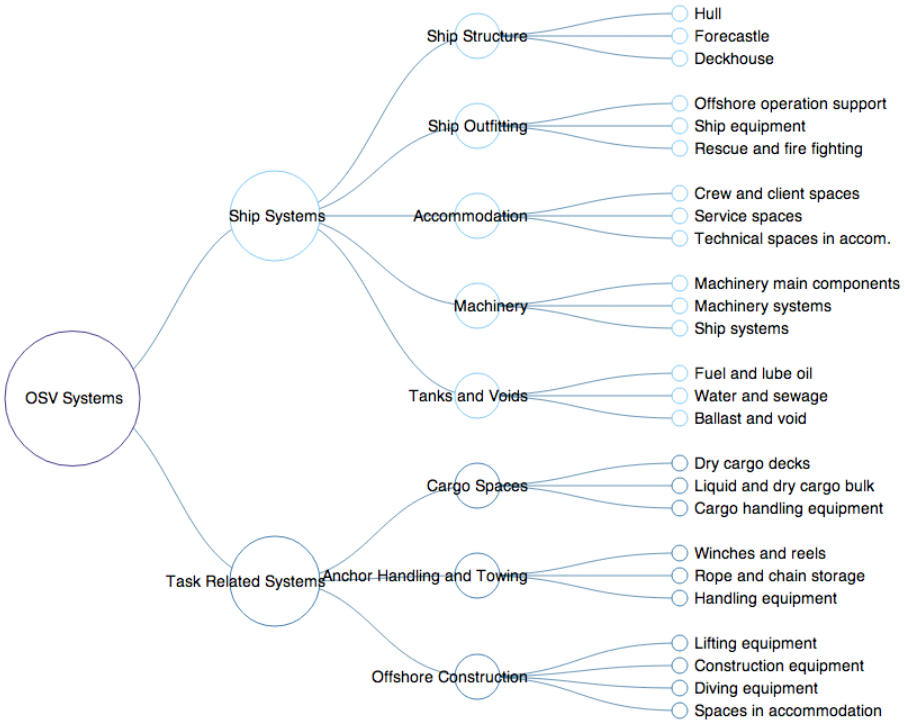
- Structural Examples



Extracting Ship Design Knowledge

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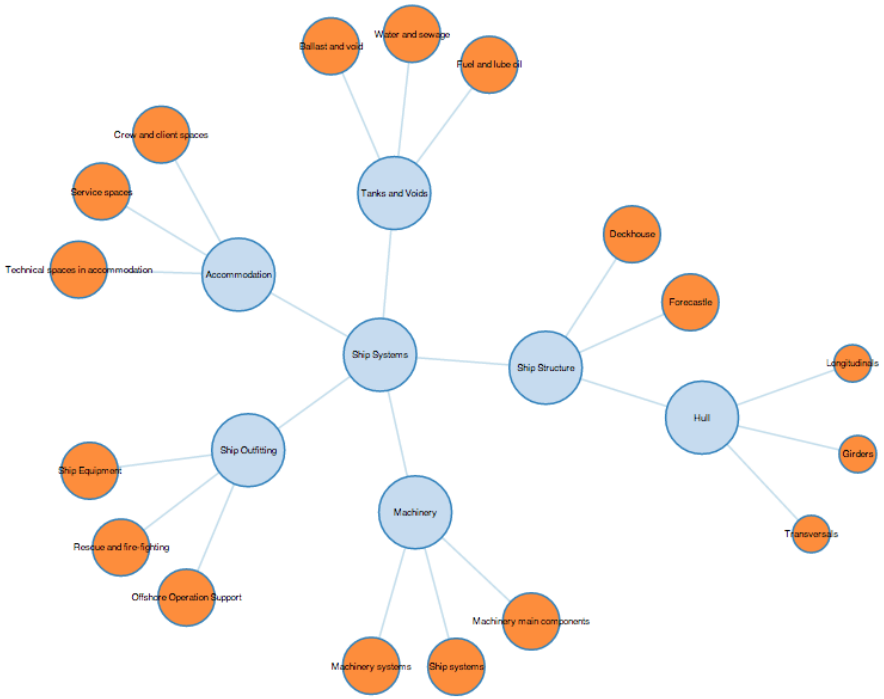
- Structural Examples



Extracting Ship Design Knowledge

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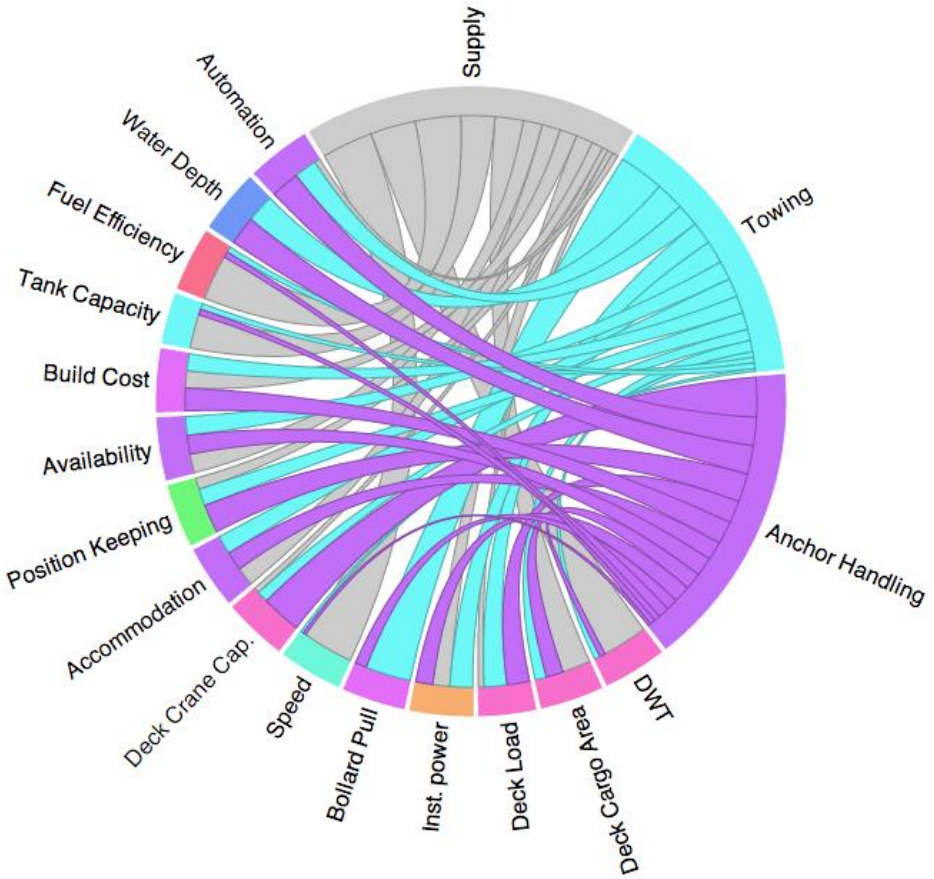
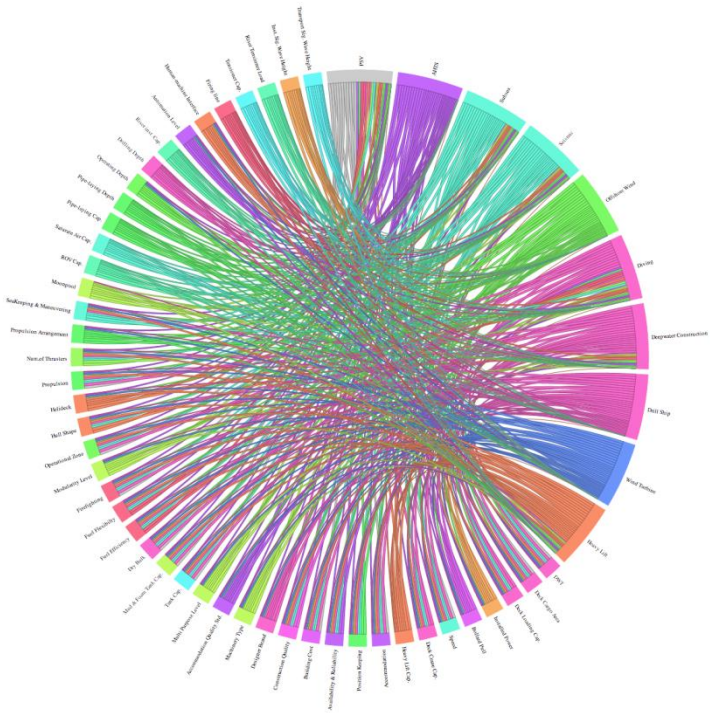
- Design Mapping





Extracting Ship Design Knowledge

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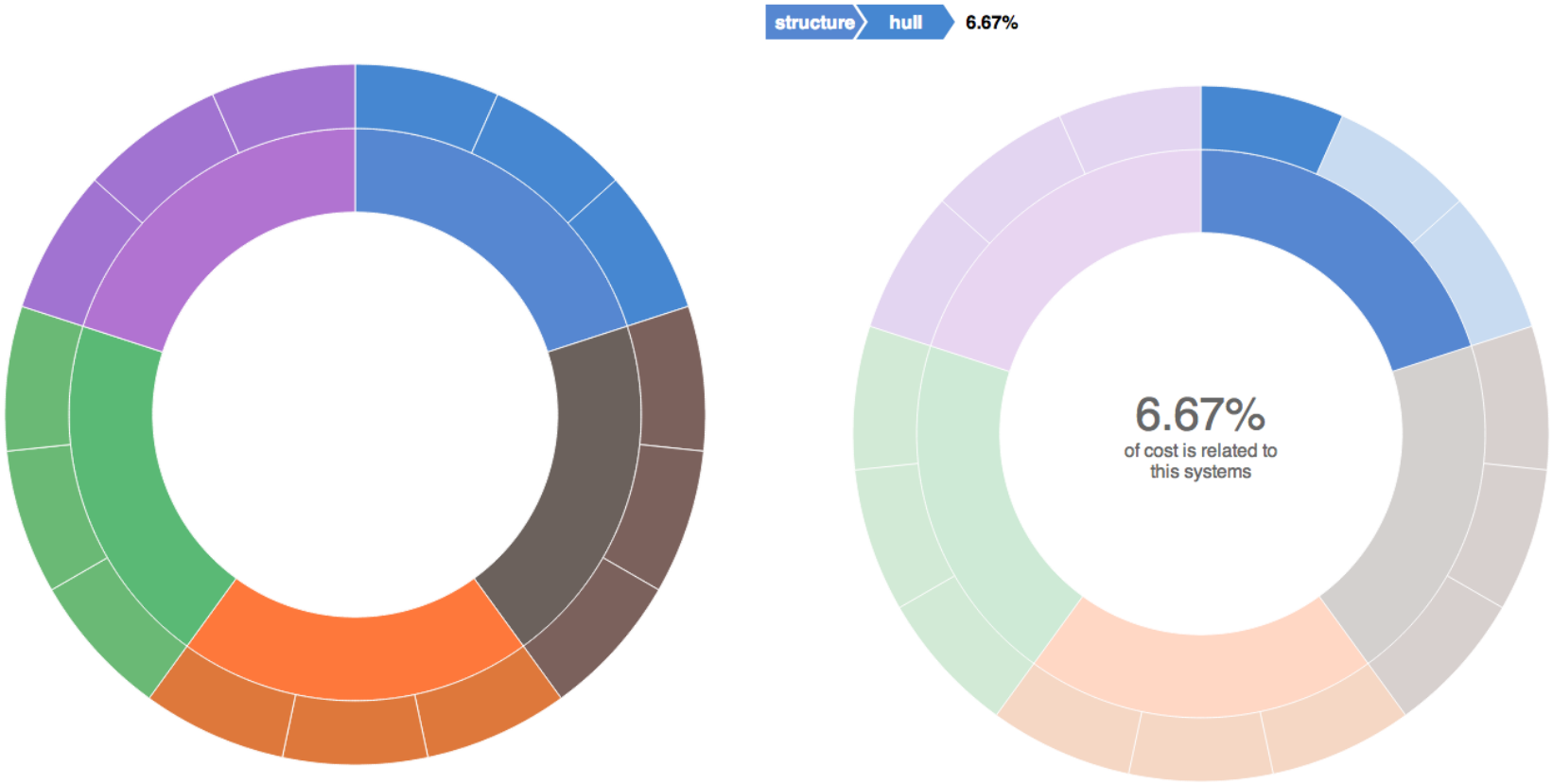
- Economic Examples



Extracting Ship Design Knowledge

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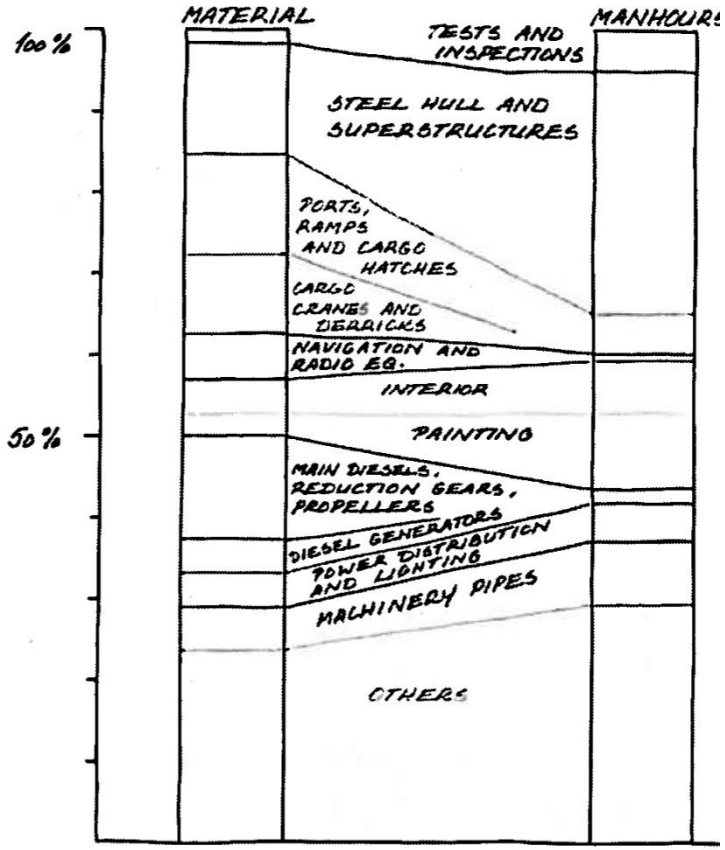
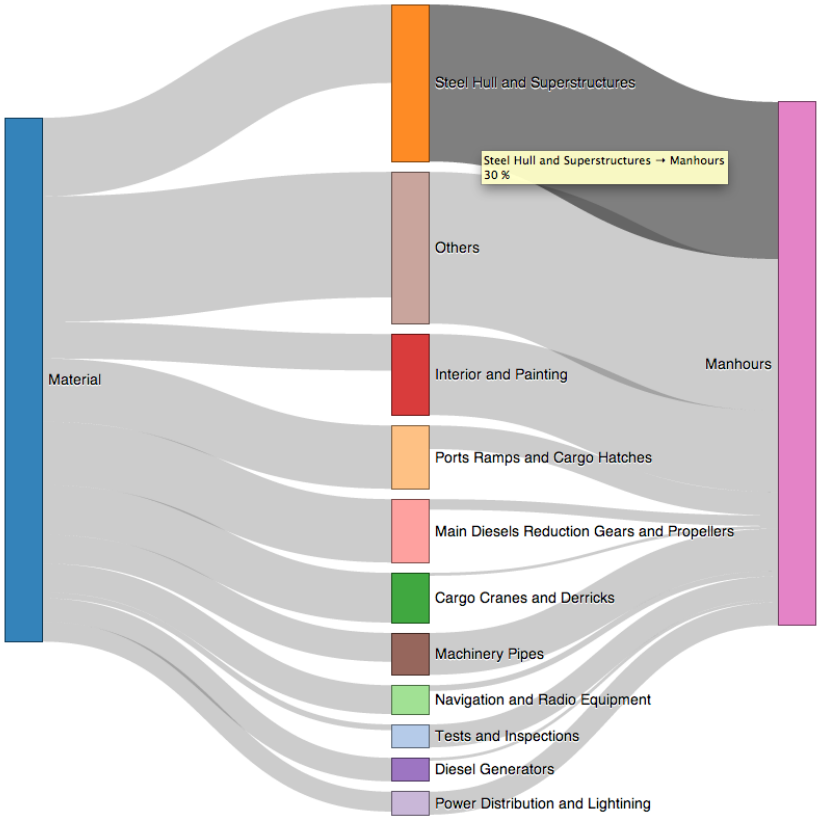
- Economic Examples





Machinery System Lab

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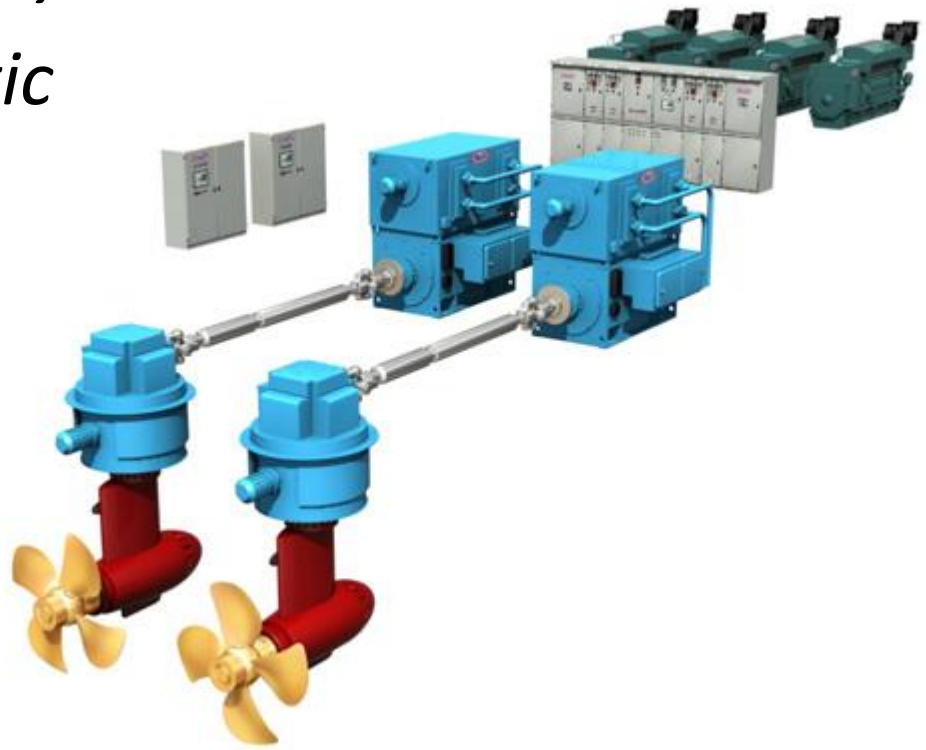
Aalesund University College

- *Greener Fuel Researches (LNG and Other Fuels)*
- *Virtual Prototyping of Machinery Systems*
- *Integrated Machinery Systems*
- *Propulsion for the arctic*



Human Factor Lab

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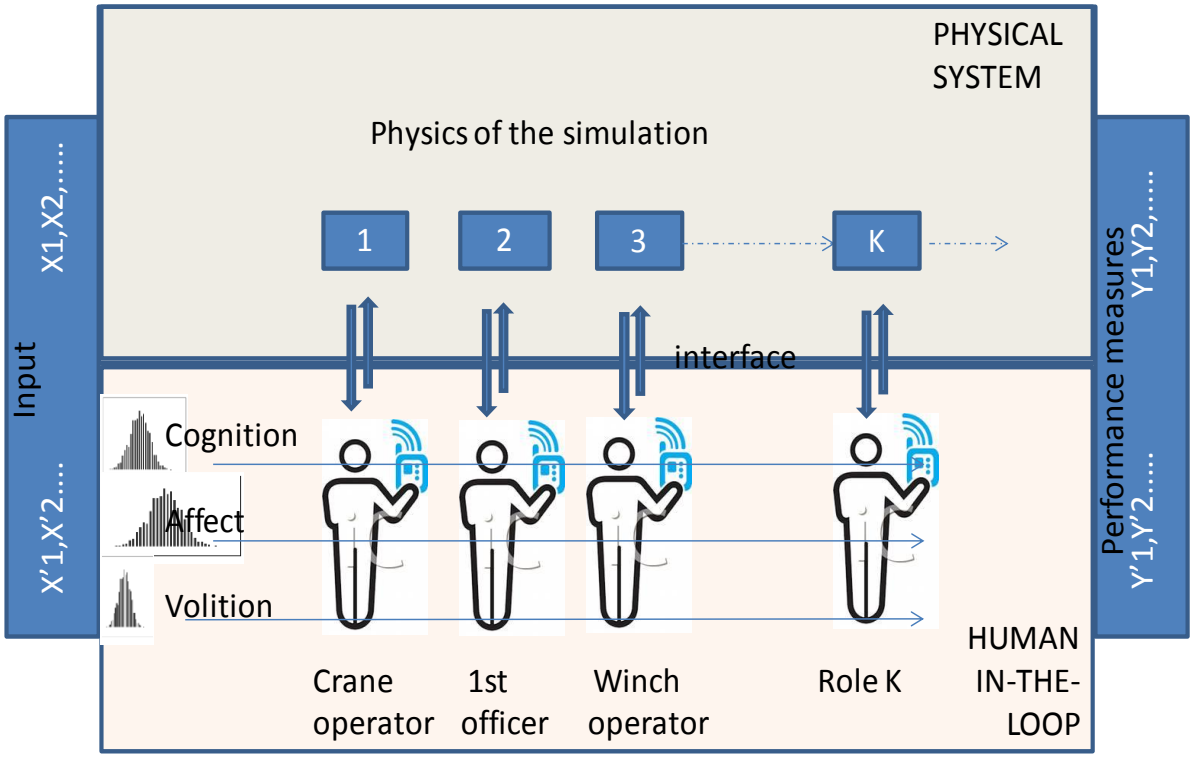
- Utilisation of integrated simulator facilities for safety risk and performance assessment of demanding marine operations



Simulation Modelling Framework
© Hans Petter Hildre and Sashidharan Komandur

Mechatronics Lab

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- *A Flexible and Common Control Architecture for Marine Cranes and Robotic Arms*
- *A Novel Integrated Anti-sway System for Rolls-Royce Marine Shipboard Cranes*
- *A Novel Climbing Robotic System for Ship Anti-fouling, Cleaning and Inspection*

Opportunities: Bachelor and Master Degrees

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Aalesund University College

Master of Product and System Design

- discipline oriented master (120 ECTS)
- professional master (90 ECTS)

Both programs are taught in English, and can be pursued as full-time or part-time studies.

Please note that the admission procedure, application form and application deadline is different from the bachelor programs.

Master of Ship Design

- discipline oriented master (120 ECTS)
- professional master (90 ECTS)

Both programs are taught in English, and can be pursued as full-time or part-time studies.

Please note that the admission procedure, application form and application deadline is different from the bachelor programs.

Master of International Business and Marketing

- dicipline oriented master (120 ECTS)

The program is taught in English.

Management of Demanding Marine Operations

- Master of Science: Management of Demanding Marine Operations

- Official Partnership With POLI-USP
- Science Without Borders
- 2 Types of Exchange:
  - Registered Students, Classes, Credits, Courses;
  - Research and Project.
- 2 Years Master Degree ()
- Co-orientation of Master Degree
- Summer Projects (2-3 months)