TrAM project
Zero emission application for ferries

Grant Agreement 769303
TrAM - Transport: Advanced and Modular

Funded by the European Union’s Horizon2020 Research and Innovation programme
Example of a high level modular architecture in seaborne transport

Propulsion module

Cargo module

Grafic references: https://products.damen.com
Modulality Concept - Main Modules

Modularity

- Aft
- Access
- Passenger accommodation
- Access
- Utility
- Bridge (navigation)

- Stern
- Energy systems
- Hull (displacement)
- Bow
Modular assembly kit evolution

Comparison Automotive

Unicum
- No synergies
- Only one vessel design

Platform strategy
- Synergies with platforms
- Implemented on multiple vessels

Modular strategy
- Synergies platforms & modules
- Implemented on multiple vessels

Assembly kit strategy
- Synergies platforms, modules & equipment
- Implemented on all vessels
Production of modular products
E.g. Airbus

Single independent modules are automatically assembled
(Usage of riveting robots)

Interfaces between individual modules are specified
Modular Production
E.g. Audi

Assembly belt substituted by DTS/AGV
Production islands can be reordered with clicks in the factory control
Uncontentious, dynamic material flow
Stavanger demonstrator
Overview of industry partners

Bridge & navigation: LEIRVIK

Passenger accommodation: LEIRVIK

Propulsion unit (marine propeller & gearbox): SERVOGEAR

Hull: FJELLSTRAND

Electric motor: WÄRTSILÄ

Energy system: WÄRTSILÄ

Aluminum profiles & modules: HYDRO
Not the Boat to Be in TrAM
Challenges and still not solved

• Battery: 750 kilowatt, yes! Size, type, storage material, weight
• Switch board (7 tons - -> 1 tonn?)
• Charging, voltage and power is a challenge
• Speed – high speed code, yes! – but actual traffic speed is still to be decided
  • Today 22 - -> min 23 knots (  
  • Max 27 knots?
• Length – defined, but challenged
The boat for the nostalgics!

Thank you! Questions?
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