



SHIP EFFICIENCY 2017

by STG

6th International Conference
Hamburg, 25 – 26 September 2017

Presentation on:

The road towards autonomous shipping

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The Road towards Autonomous Shipping



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Disruptive change



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Digitalisation – disruptive change

The graphic illustrates digitalisation through a central globe with data streams. To the left, the text 'Internet of Things' is positioned above the globe. Below the globe, the text 'Big Data' is displayed. To the right of the globe, the text 'Industry 4.0' is shown. Surrounding these elements are logos for several major companies: Airbnb, Uber, Tesla, Amazon.com, Spotify, and Hotels.com. The background is a light blue with faint digital patterns.

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Change driven by digitalization

The diagram illustrates the impact of digitalization on four key areas: Business, Operation, Management, and Technology. Each area is represented by a blue-bordered box. The 'Business' box is accompanied by a bar chart and a dollar sign icon. The 'Operation' box is accompanied by a satellite and a factory icon. The 'Management' box is accompanied by a globe and a line graph icon. The 'Technology' box is accompanied by a satellite, a cloud, and a robot arm icon. The background features a world map, a hand holding a pen, and various data-related icons.

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Integrated operation



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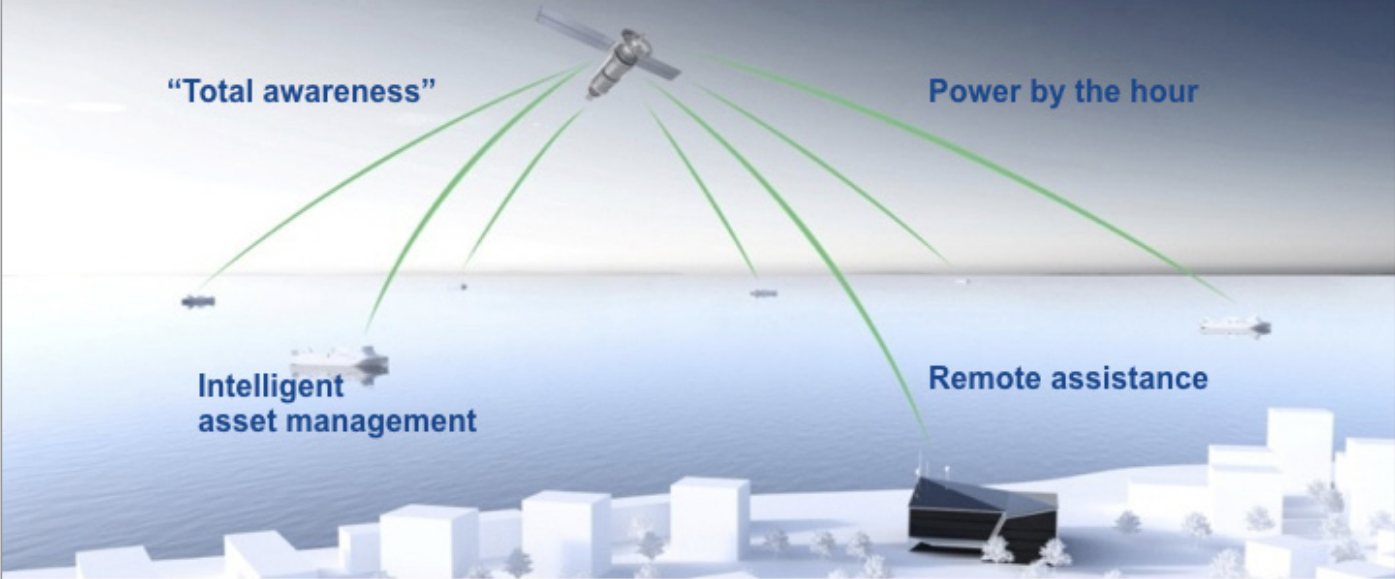
New roles in shipping?



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Digital management



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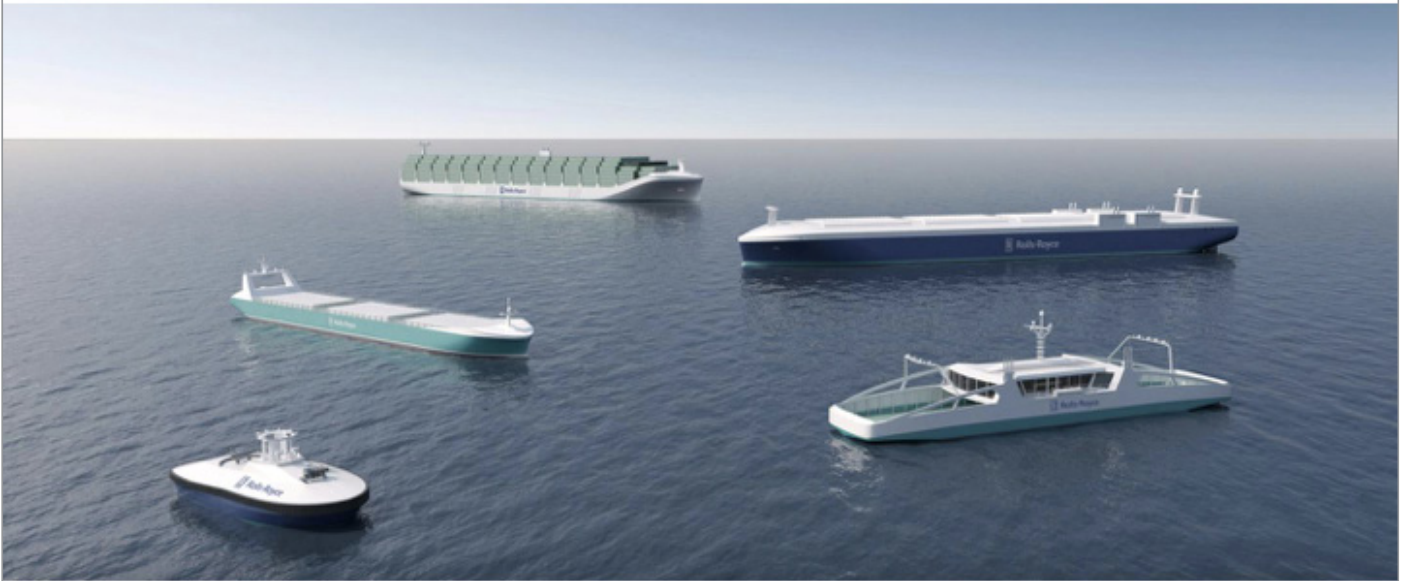
Remote operations center



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Remote and autonomous shipping



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Safety

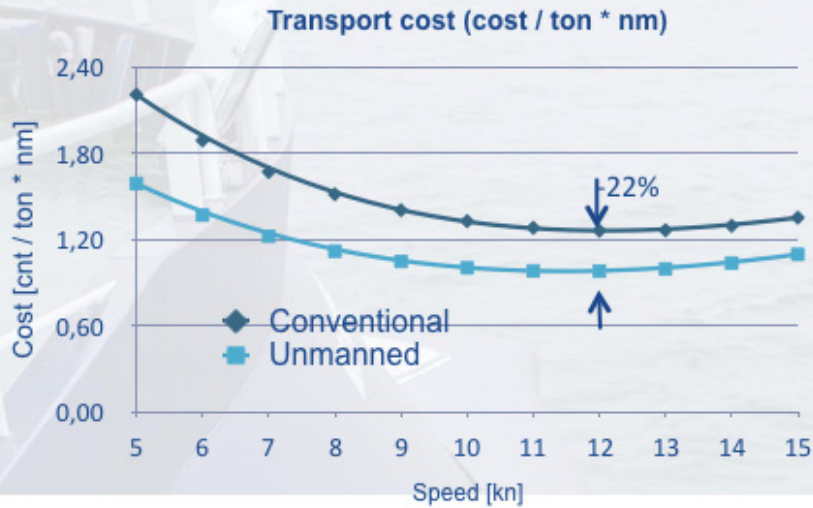


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Cost - transport

20 000 dwt general cargo vessel



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Remote & autonomous ships



More cargo

No hotel systems

Lower power demand

No deck house

Redundant machinery

Increased automation and sensors



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Energy reduction

Lower operating speed?

Lower weight: 700 – 1.000 ton

Wind resistance: ~1% saving



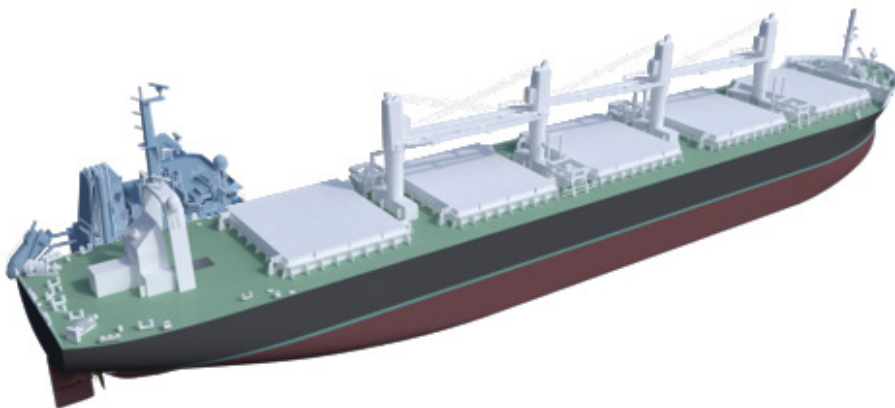
Reduced hotel load: 200 – 270 kW

10-15% fuel savings

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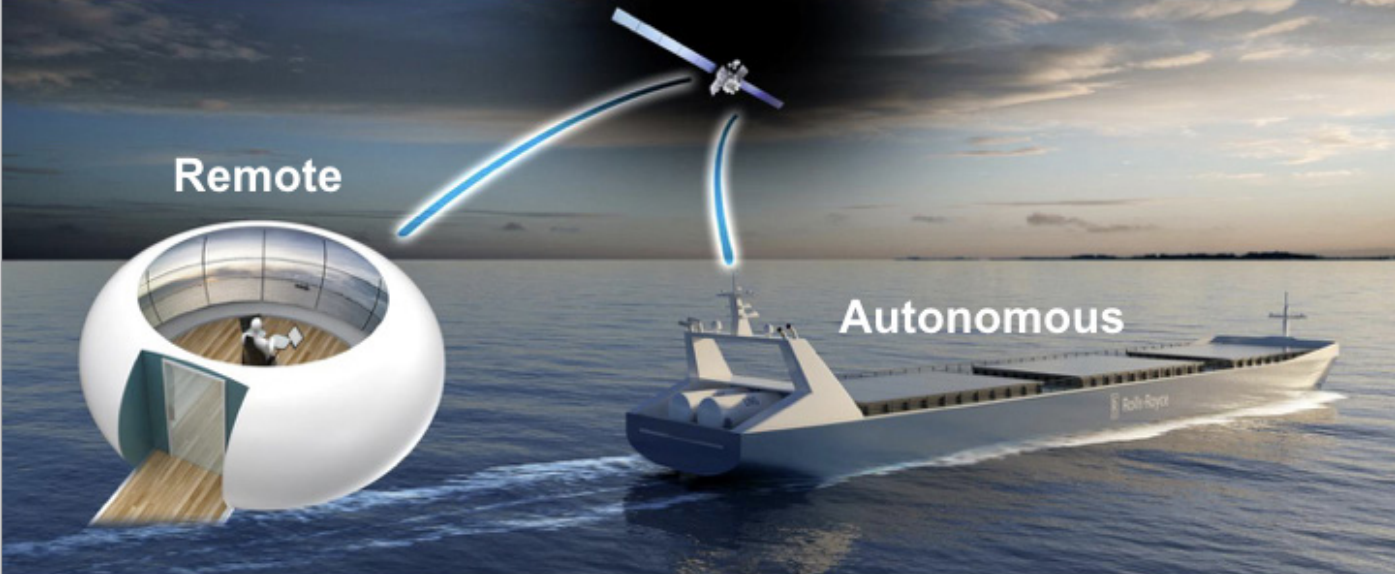
The evolution of unmanned vessels



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Remote and autonomous operation



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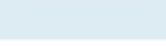
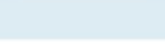
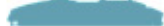

Fully autonomous or manning onboard?



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R&A markets vs ship segments

	R&A technology	Low manning	Unmanned
Bulker			
General cargo			
Feeder container			
Large container			
Tanker			
LNG/LPG			
OSV			
Tug			
Road ferry			
RoRo			
RoPax			
Cruise			

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Roadmap towards autonomous shipping



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World's first remotely controlled commercial tug



RR/Svitzer
Remote Controlled Tug Demo

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Remote operation station



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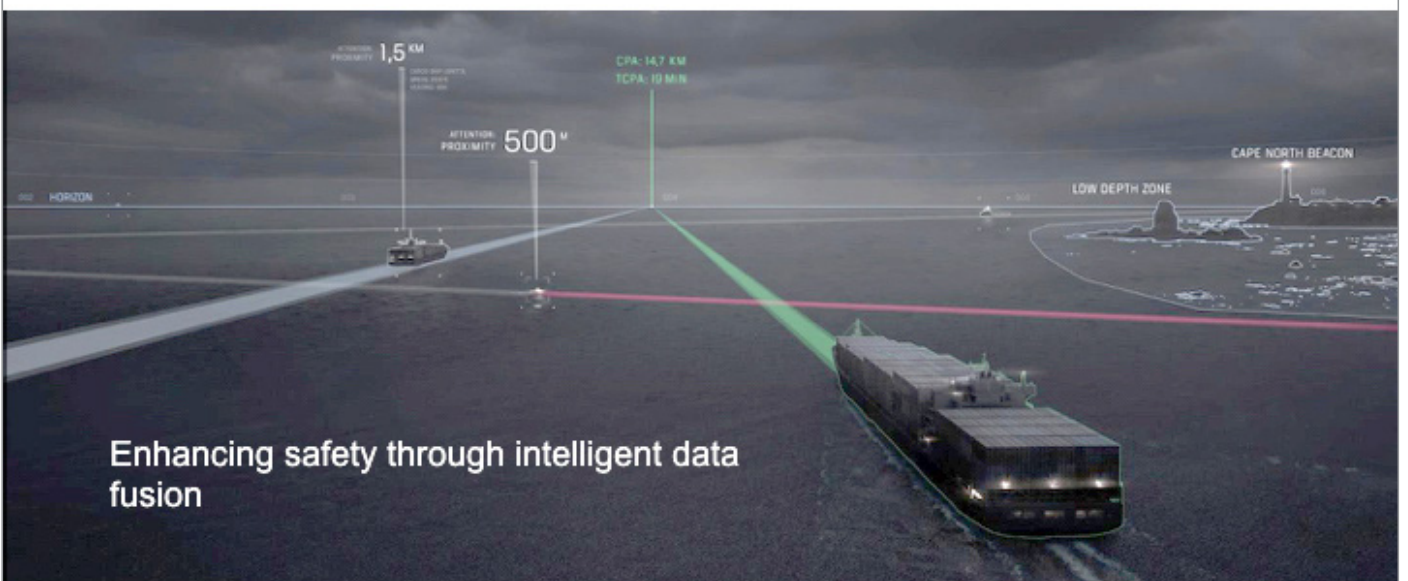
Situational awareness



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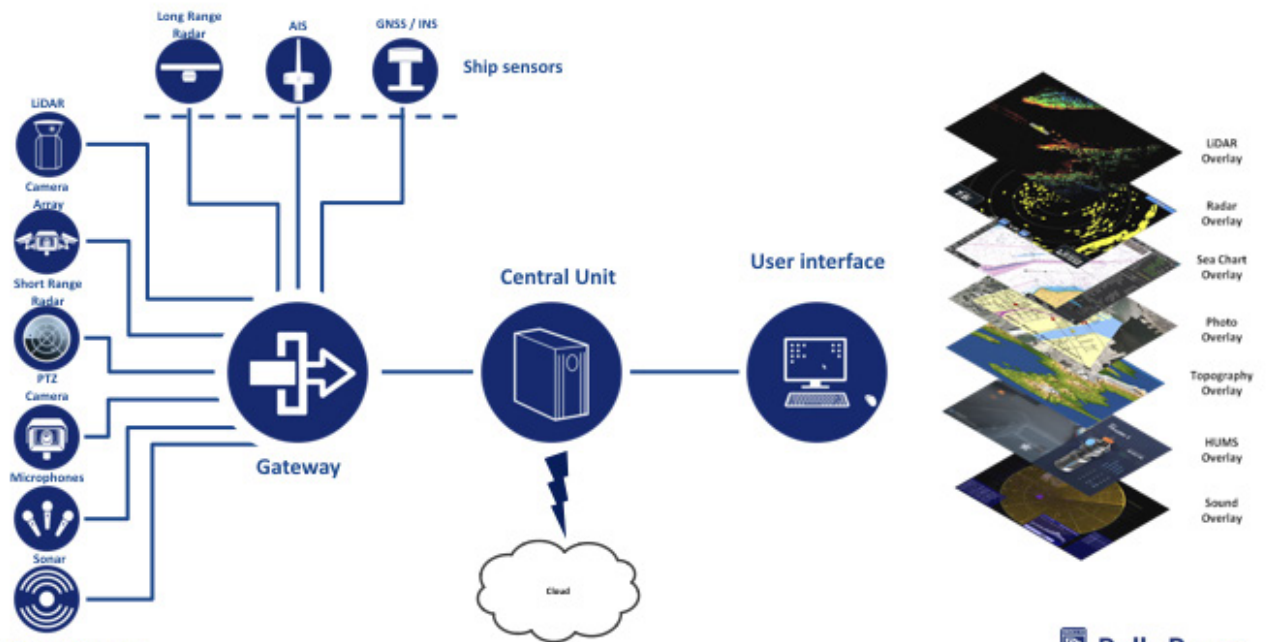
Situational awareness



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Sensor data fusion



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Cyber security



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Rules and regulations



SOLAS

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Reliability

Standardized systems

Validation

Digital twin

Sensors & trending

Health management

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Roadmap towards autonomous shipping

2015

Remote support
and situational awareness



Remotely operated
local vessel



2020

Remote controlled and autonomous
offshore vessels



Autonomous ocean going
cargo vessels



2030

Autonomous ships will start with local applications!

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R&A ships – first movers



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First automatic control systems to Fjord1

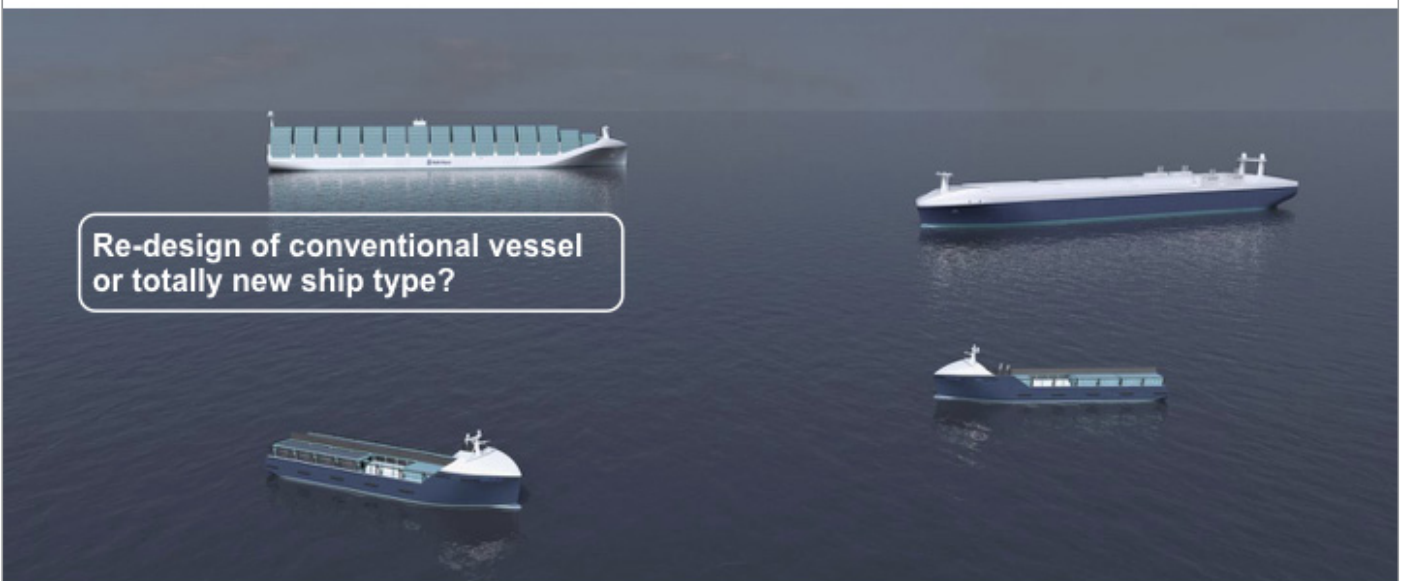
- The automatic crossing system ensures safe and energy efficient transit by automatically controlling the vessel's acceleration, deceleration, speed and track.
- The captain will supervise the system, and intervene if needed
- The vessels are due for delivery in 2017



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Autonomous



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Autonomous supply vessel drone



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ROV with autonomous surface vessel



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Changing shipping scene



Technical
development



Logistic
development



Cost



Environmental
regulations

What is the right investment decision today?

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Low cost smart shipping

Cost is focus

Leasing schemes

Low onboard manning

Ship intelligence
(new way of operating)

Low emissions

New standardised fuel
efficient ships

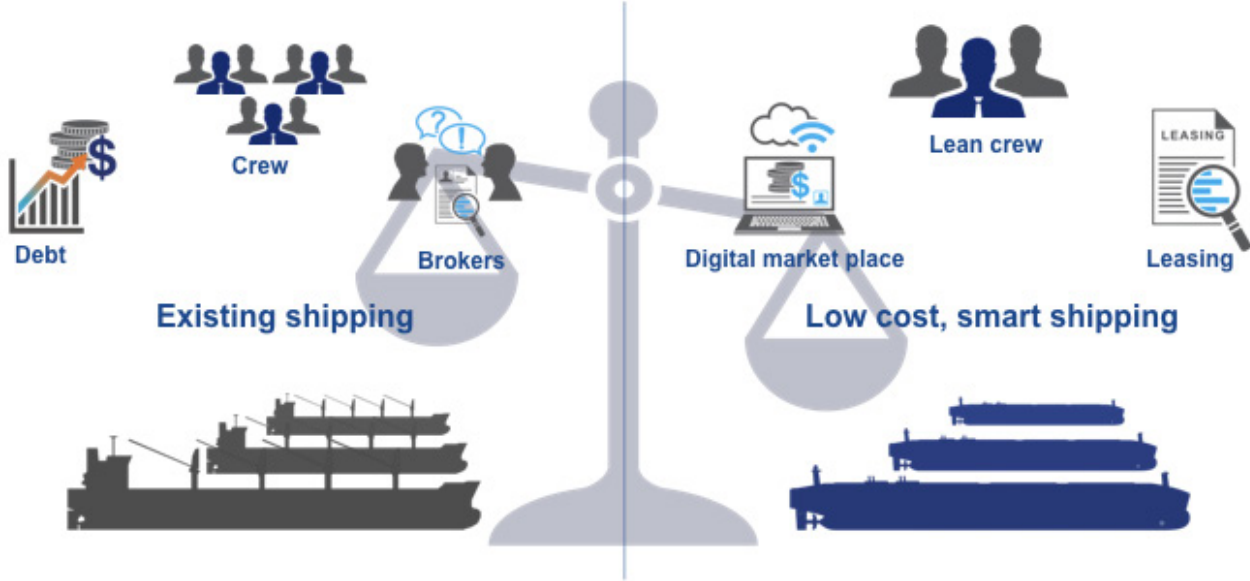
Point-to-point routes

Digital market places and
IoT - "Uber of the sea"

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New business models - disruption



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Towards zero emissions




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” Redefining
shipping
with innovation
and design ”

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