

# Redefining Shipping



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Ship  
Intelligence

# Disruptive change





# Marine 4.0 – the Ship Intelligence era

1.0 Steam engines

1860 – 1910



2.0 Mass production

1940



3.0 Containerization

1957



4.0 Digitalization

2010+



TESLA

amazon

 Spotify



# Change driven by digitalization



Operation



Business



Technology

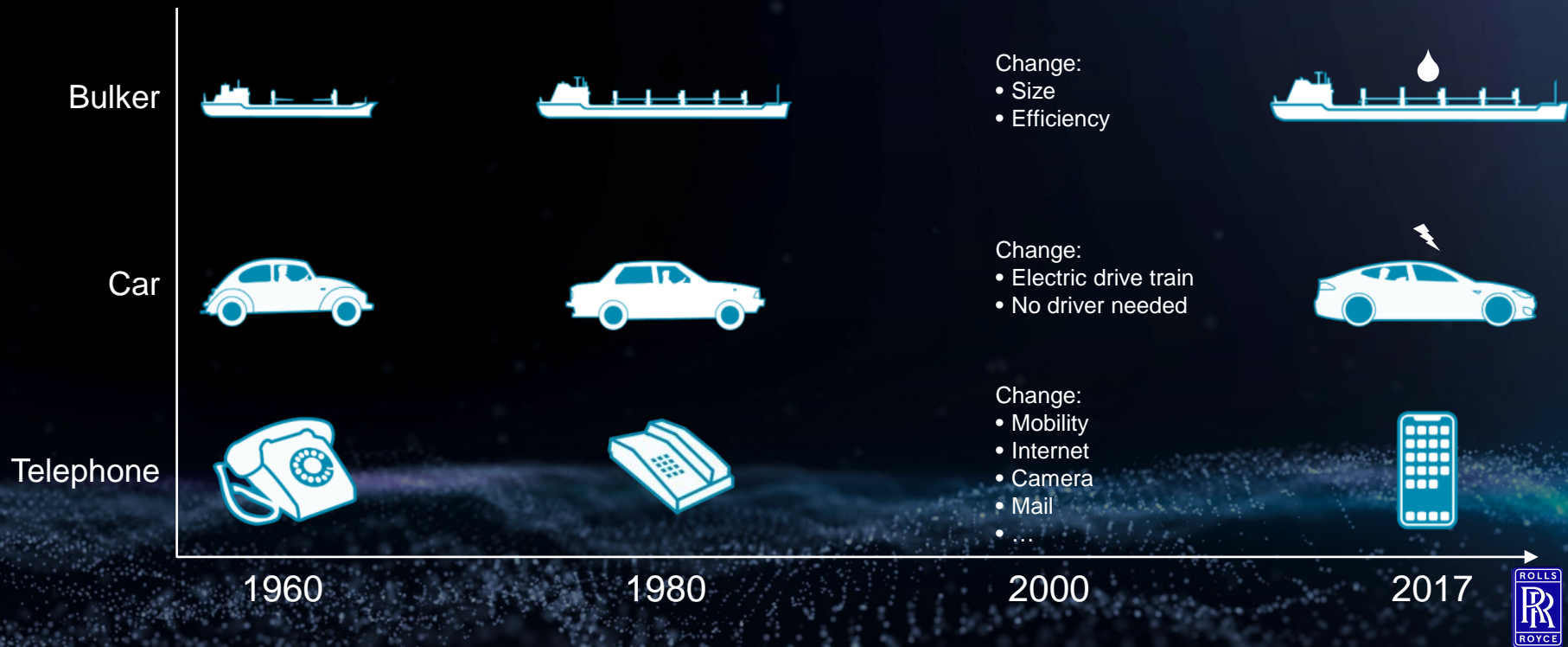


Management

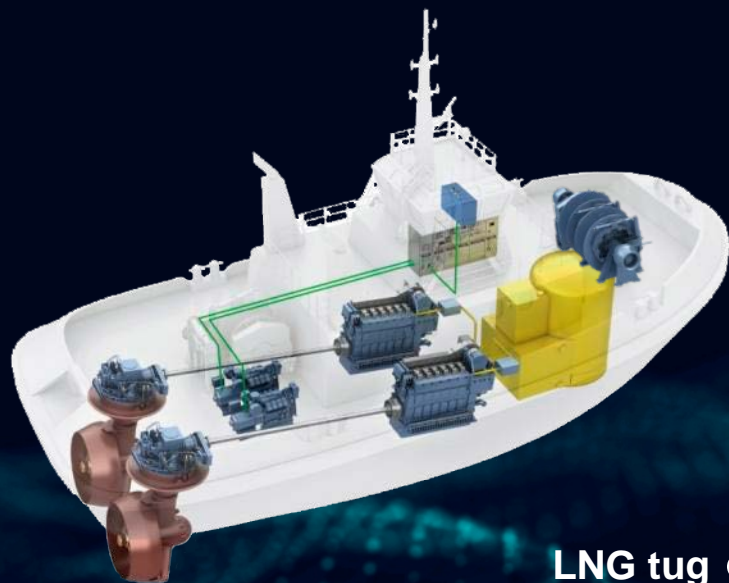




# Time for change



# Evolution or revolution?

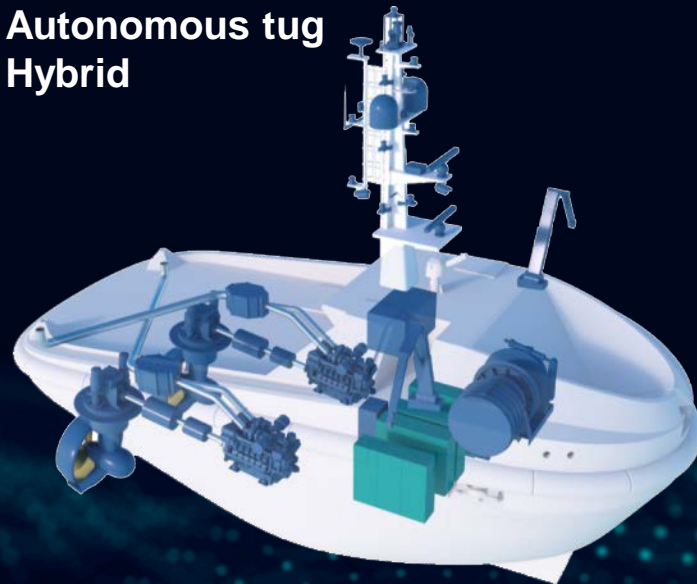


LNG tug ●

Revolution



Autonomous tug  
Hybrid



Evolution



# Digital management





# Remote operations





Ship  
Intelligence

# Remote and autonomous shipping



# Drivers for R&A shipping



Safety



Business



Cost



Risk

Sustainability





# Safety

**Safer than before**

**Fewer accidents**

**Human error factor**



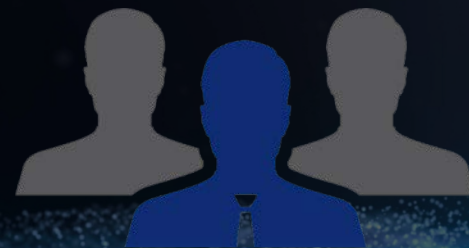
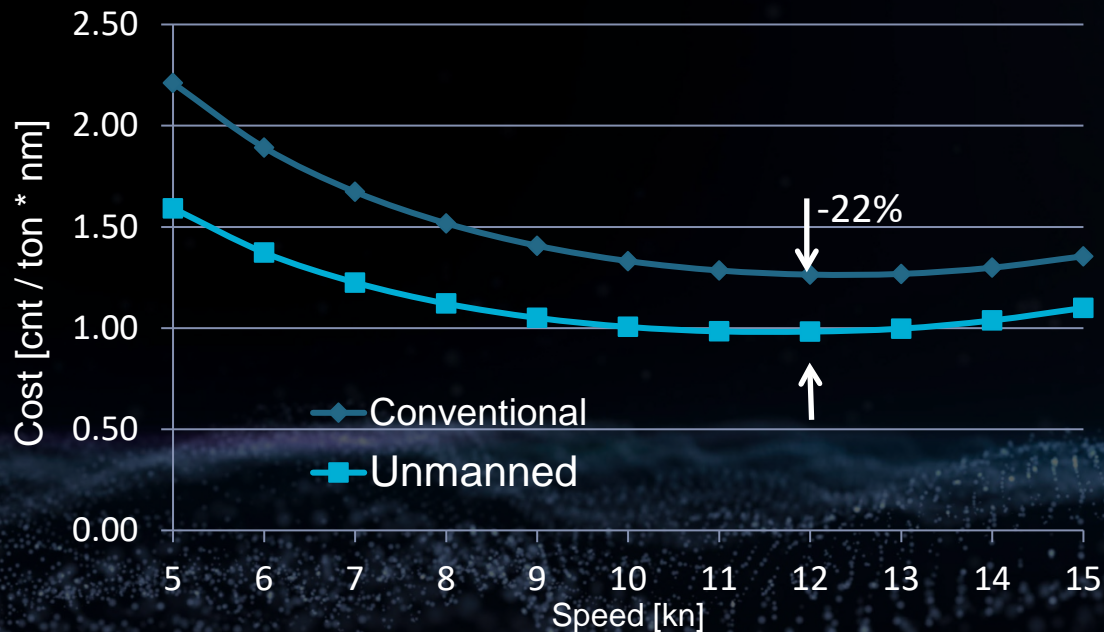
**No piracy victims**

**Humans away from danger**

# Cost - transport

20 000 dwt general cargo vessel

Transport cost (cost / ton \* nm)



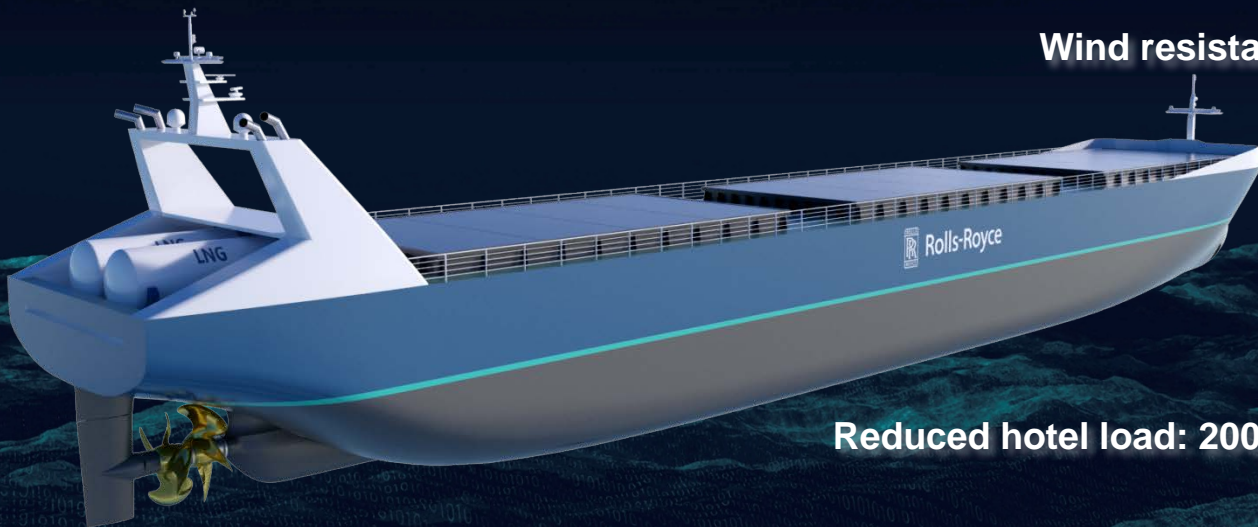


# Energy reduction

Lower weight: 700 – 1.000 ton

Lower operating speed?

Wind resistance: ~1% saving



Reduced hotel load: 200 – 270 kW

## 10-15% fuel savings

# Remote and autonomous shipping

## Systems for crew

Sewage  
A/C  
Galley  
Life saving

NON VALUE ADDING

5M \$



VALUE ADDING

## Reliability

Sensors  
Redundancy  
Automation

5M \$



# Reliability

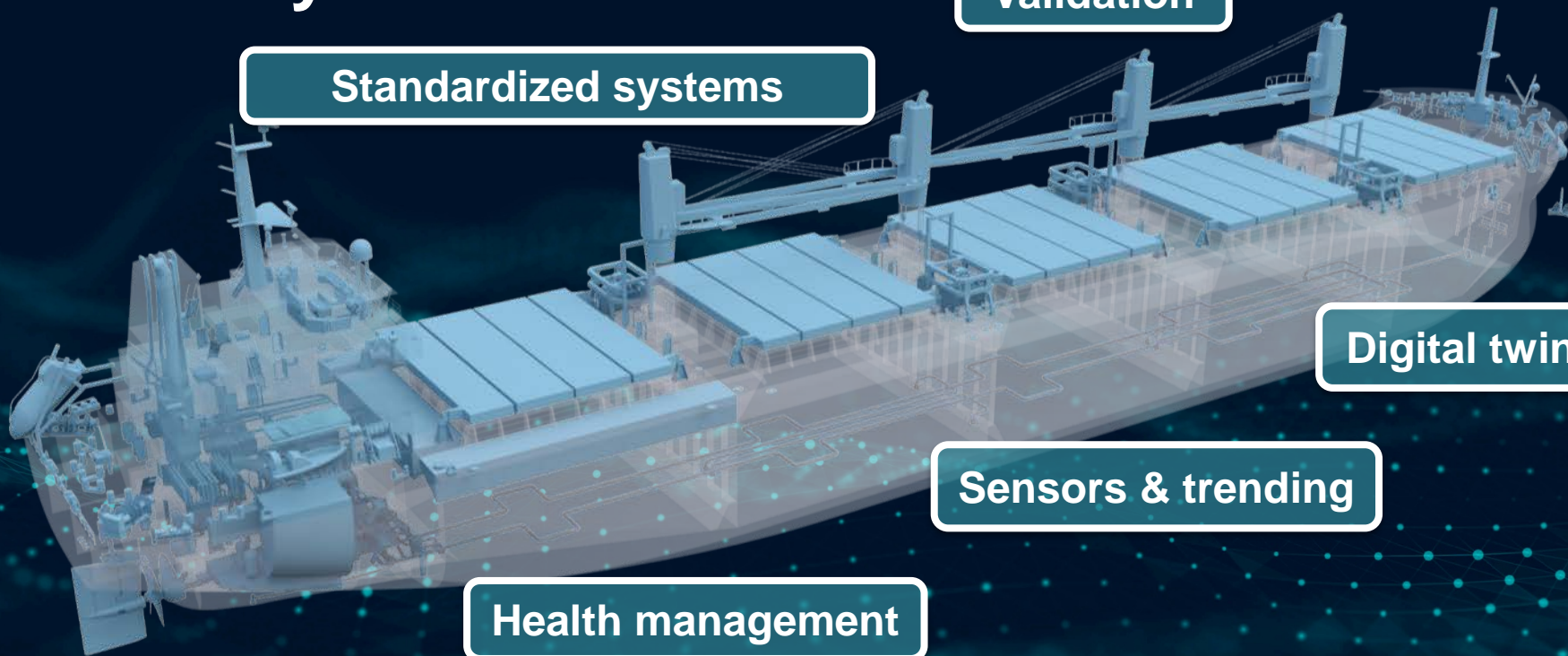
Standardized systems

Validation

Digital twin

Sensors & trending

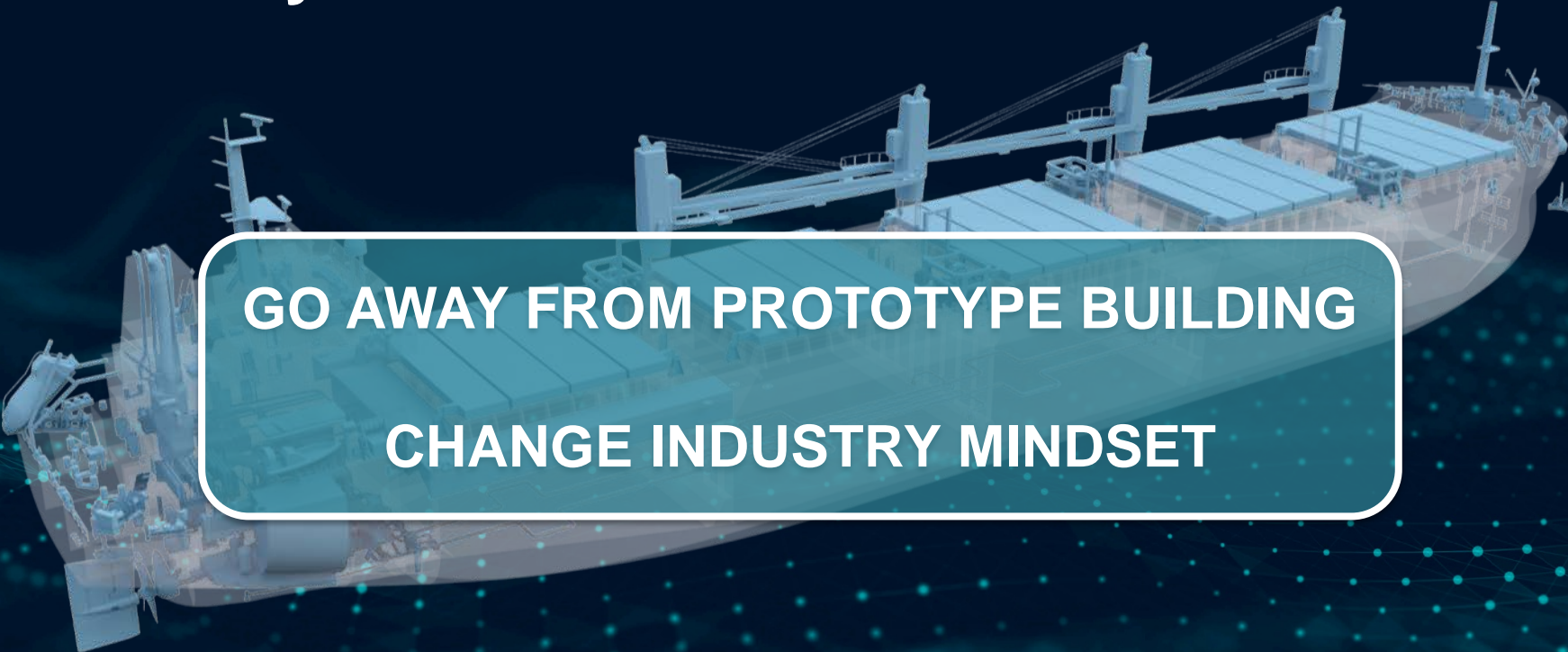
Health management





Ship  
Intelligence

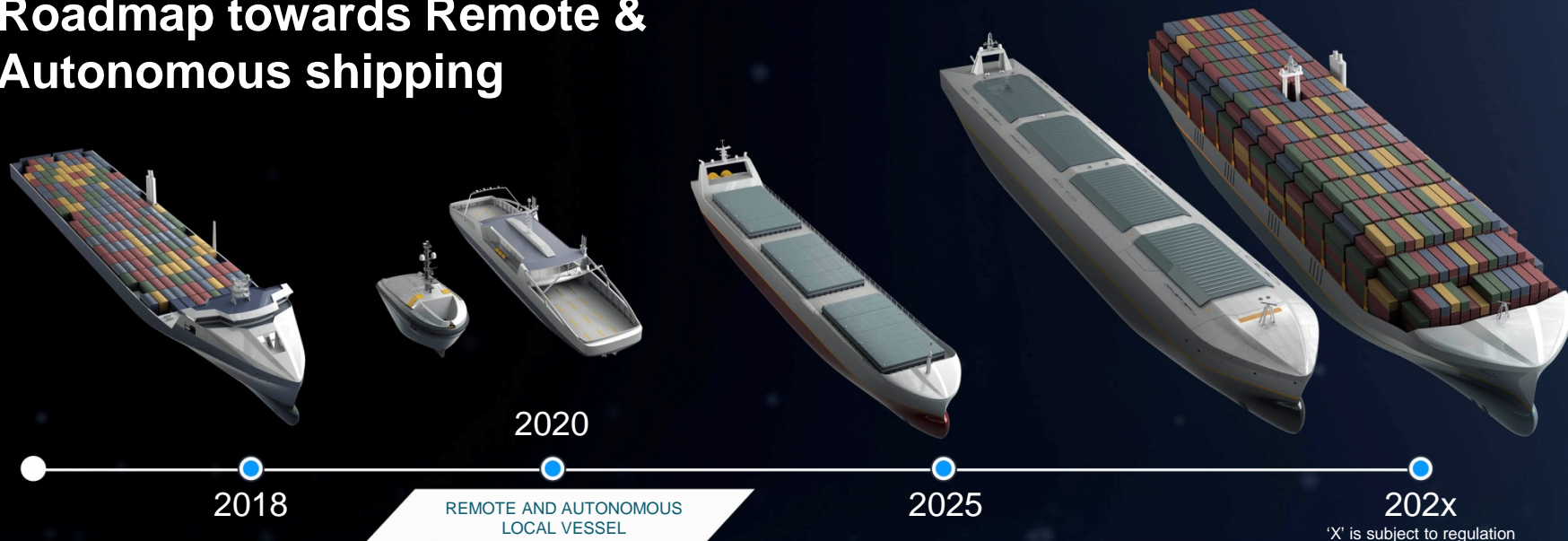
# Reliability

A 3D wireframe model of a large cargo ship, shown from a side-on perspective. The ship's structure, including its hull, deck, and various equipment like cranes and antennas, is rendered in a light blue, semi-transparent wireframe style. It is positioned diagonally across the frame, from the bottom left towards the top right. The background is a dark blue gradient with a network of glowing blue dots and lines, suggesting a digital or data-driven environment.

**GO AWAY FROM PROTOTYPE BUILDING**  
**CHANGE INDUSTRY MINDSET**



# Roadmap towards Remote & Autonomous shipping



# Automatic crossing system

- 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
- 21 systems in operation or on order





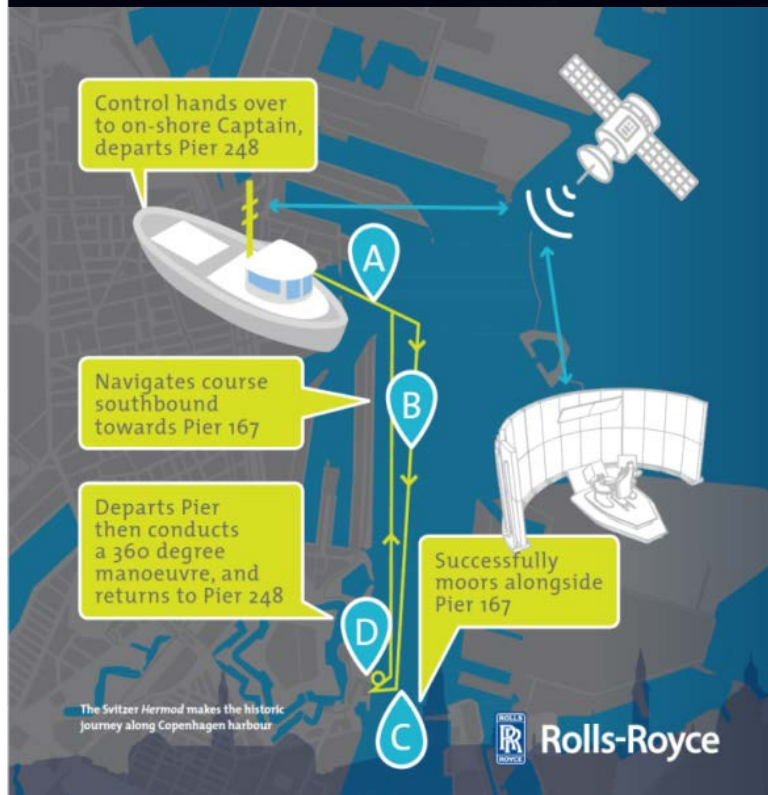
# Project SVAN



- Optimize the safety and efficiency of marine operations
- Develop technology for decision support systems
- Demonstrate remote and autonomous ferry operations



# World's first remotely controlled commercial tug



**RR/Svitzer**  
**Remote Controlled Tug Demo §**





Ship  
Intelligence

# Remote operation station







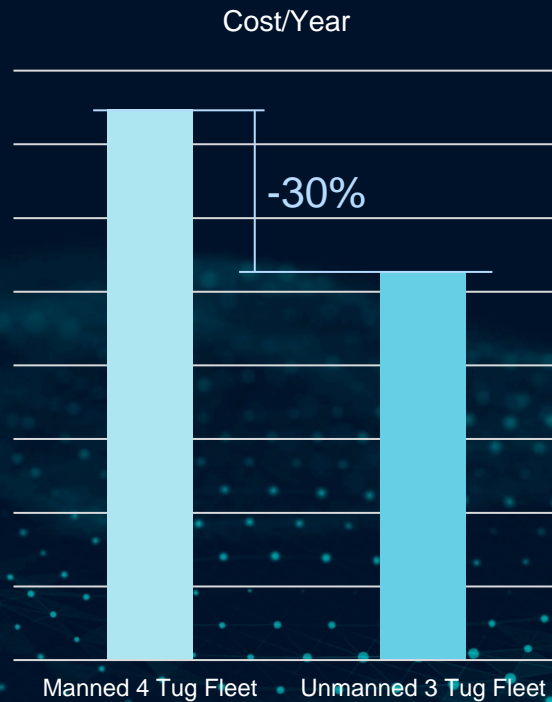
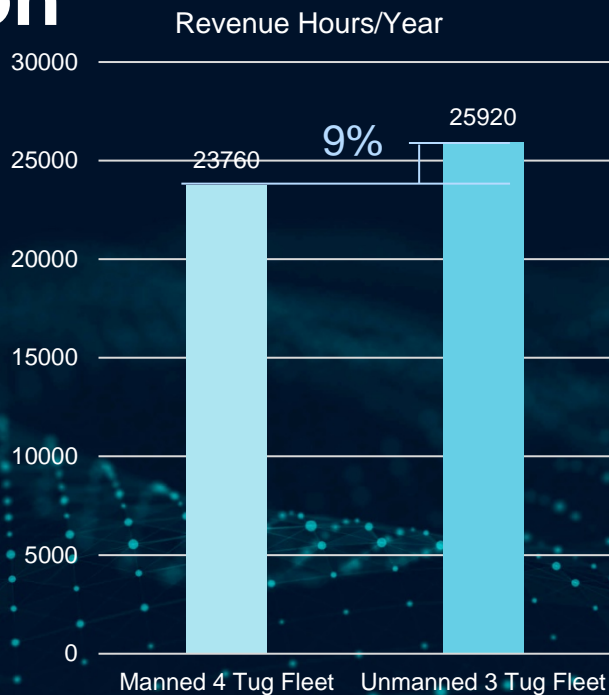
Ship  
Intelligence

# Autonomous tug



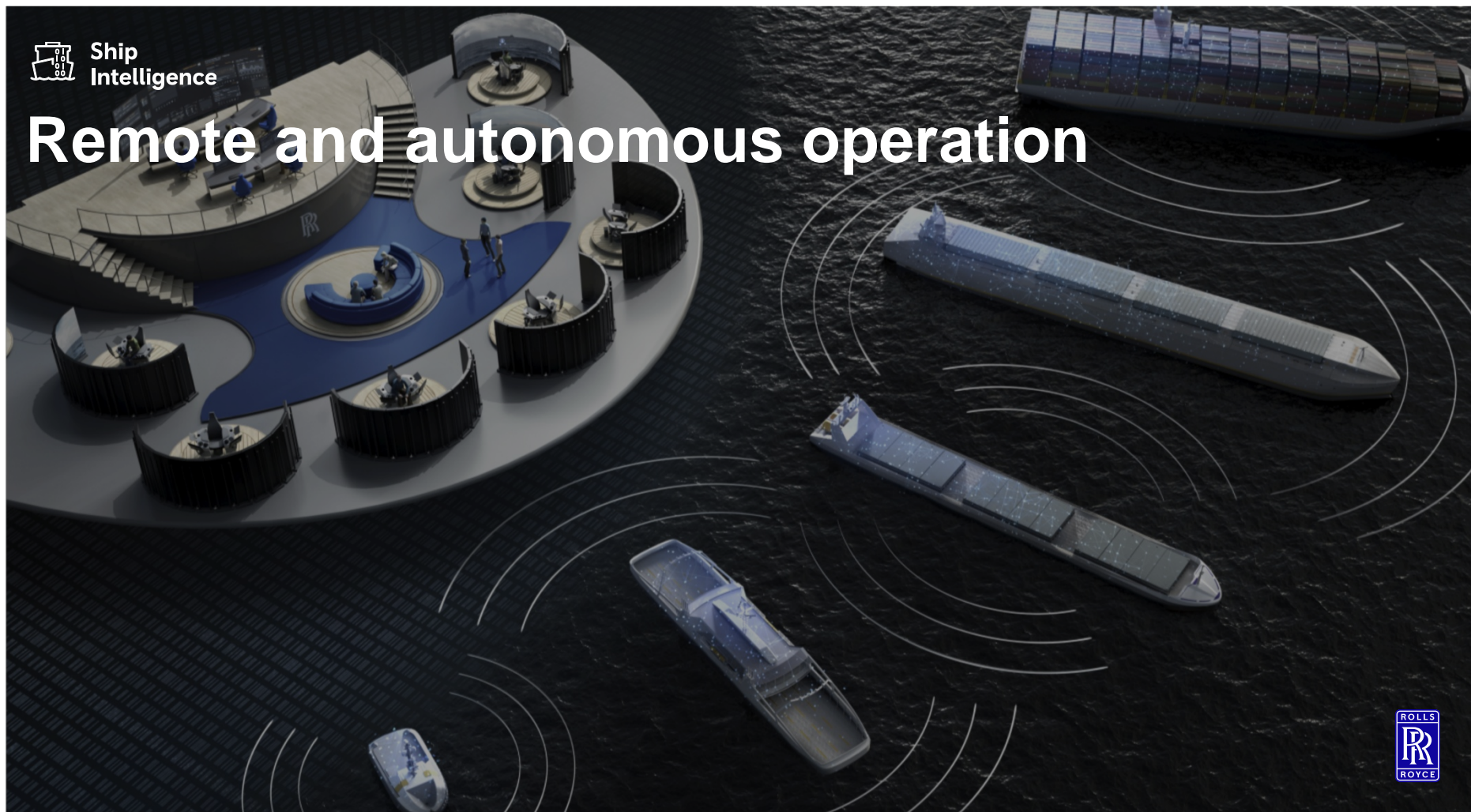
# Fleet comparison

- Manned Fleet
  - 3 x Flex Manned (14hrs)
  - 1 x Double Manned (24 hrs)
- Unmanned Fleet
  - 3 x Unmanned Tugs (24hrs)





# Remote and autonomous operation

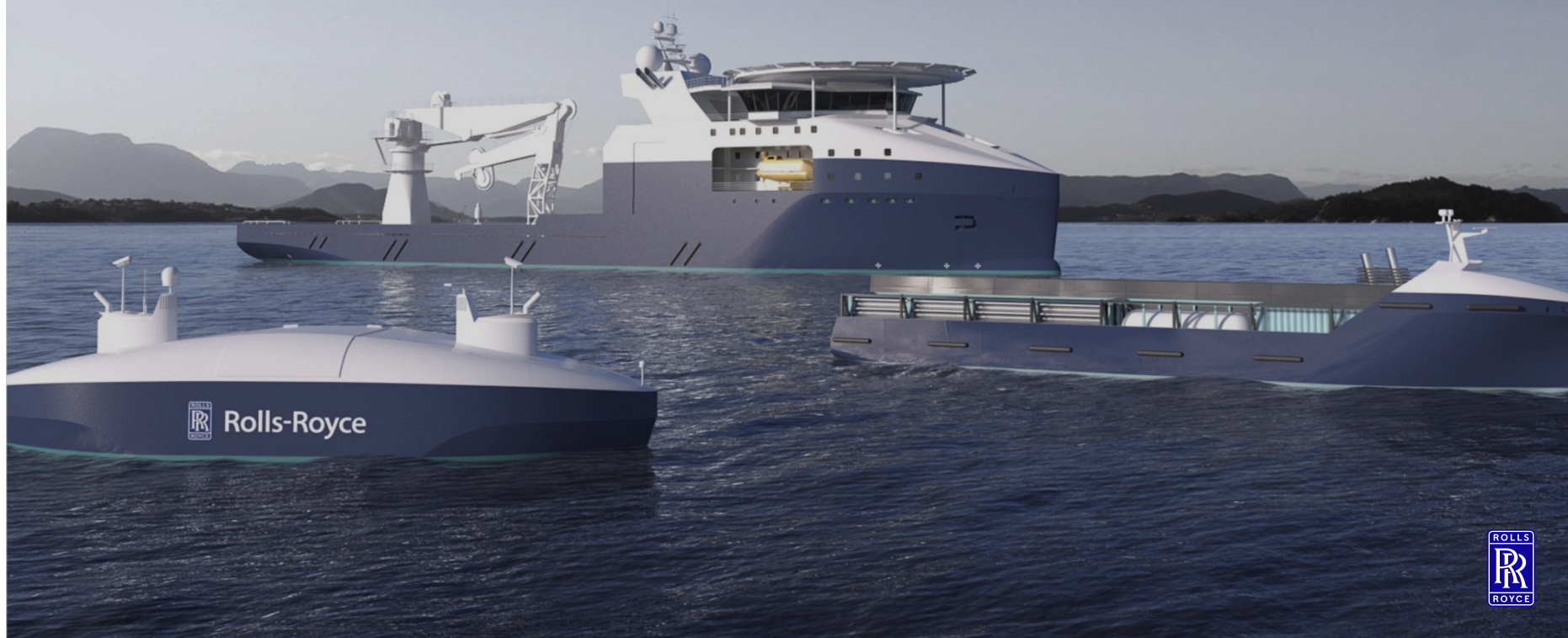


































Ship  
Intelligence

# Unmanned or reduced manning?



# R&A markets

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





Intelligent  
Awareness

# Intelligent awareness



IA Central Unit

R-R antennae



Lidar Unit



PTZ Unit



Camera Unit



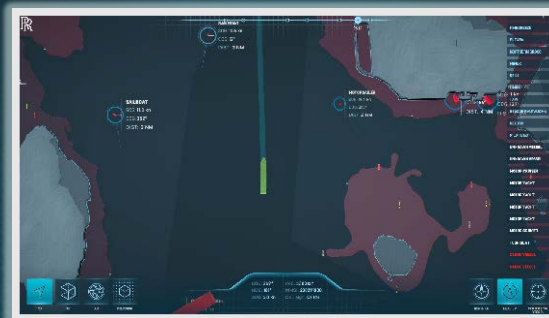
R-R radar





# Intelligent awareness

## IA User Interfaces



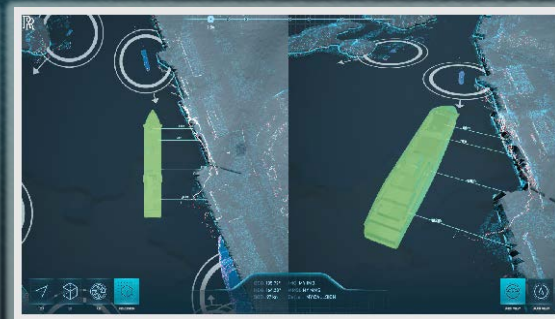
Virtual Reality 2D



Virtual Reality 3D



Augmented Reality



Precision

# Autonomous supply vessel drone







Ship  
Intelligence

# ROV with autonomous surface vessel





# Learning from aviation - low cost airlines

Internet sales and marketing

Standard - new efficient fleet



Lean organisations

Point-to-point

High utilisation rate of fleet

# Low cost smart shipping

Cost is focus

Leasing schemes

Low onboard manning

Ship intelligence  
(new way of operating)



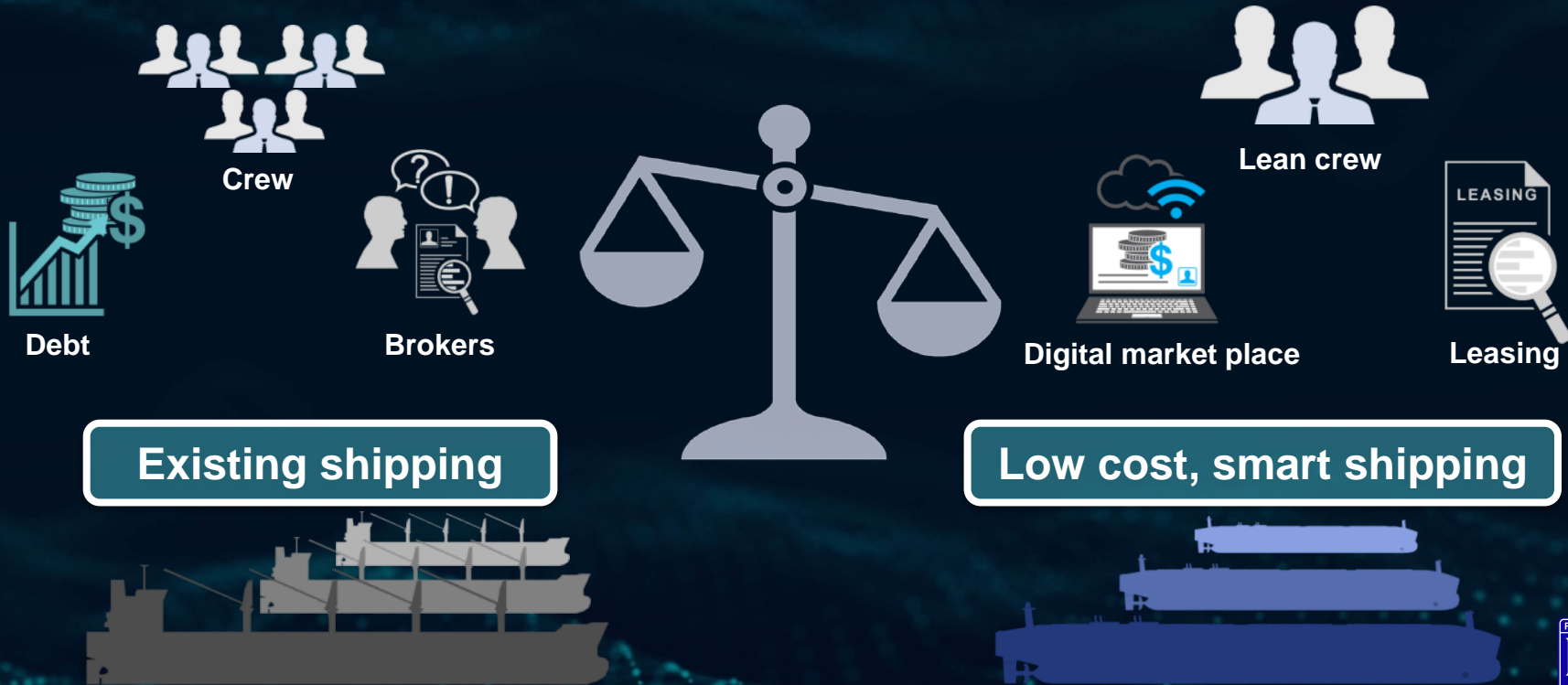
Low emissions

New standardized fuel  
efficient ships

Point-to-point  
routes

Digital market places  
“Uber of the sea”

# New business models - disruption





# New roles in shipping?

Investors



Digital market place



Operation & management





Ship  
Intelligence

” Redefining  
shipping

with intelligent  
solutions ”

