

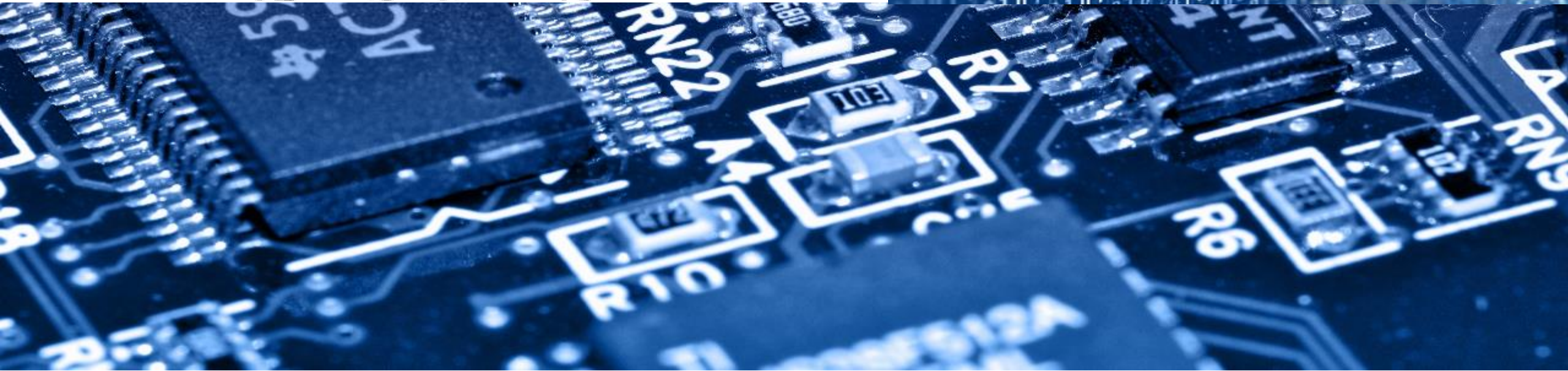
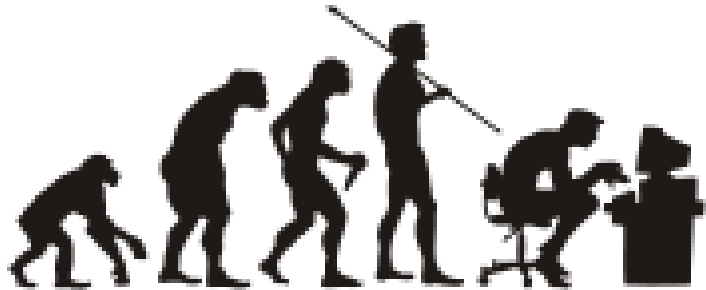
# The Future of autonomous shipping

Project Manager Svein David Medhaug





# The Future is digital





# Automation, digitalization and remote functionality



# New technology and AI - artificial intelligent



Internet of Things

SCIENCE ROBOTS TECH  
TOOLS CLOUD ADVANCE TRENDS  
MACHINES PROCESS  
COMPUTER  
MODERN AUTOMATION NEWEST

# TECHNOLOGY

*e-Navigation*

RESEARCH INTERNET INNOVATION BIG DATA  
IMPROVEMENTS  
IMPLEMENTATION ELECTRONICS POWER INDUSTRY EASE  
COMMUNICATION GADETS

ARTIFICIAL INTELLIGENCE



# Benefits

- Cost
- Safety
- Security
- Environmental
- Efficiency
- Digitalization
- Reliability
- Human errors
- Continuous trade– Non-stop process
- optimal Logistic
- Shore based control stations





# From the drawing board to water

Who?





# From the drawing board to water

Where?

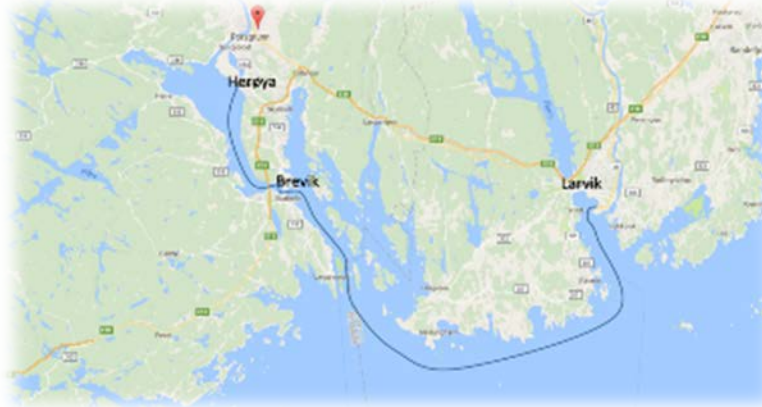






# Test areas for autonomous ships

- Trondheimsfjorden
- Strategically located for;
  - Research and development
  - Geographical limited
  - Monitored infrastructure





# Achievable

When?



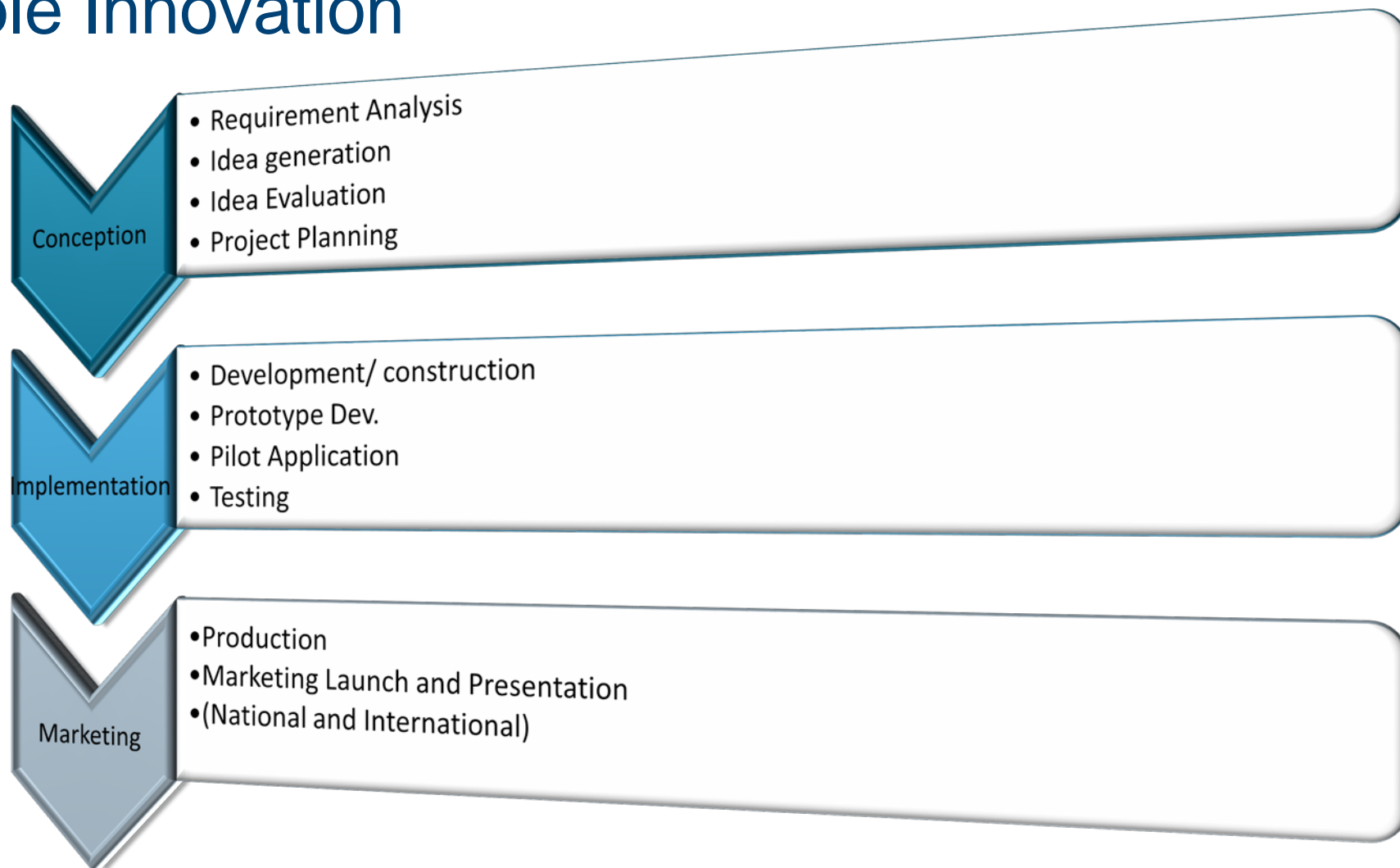
## Automation

- Advanced DP systems
- Auto Crossing System
- Auto Docking Systems
- Collision avoidance systems
- Complexed sensor-fusion
- De-centralized navigation tasks
- Harmonized Bridges  
(e-navigation & INS)
- Wide Communication carrier
- Shore support

Harmonized and  
interfaced systems



# Sustainable Innovation





# Regulation framework



# National regulations



# International regulations



UNITED NATIONS



# IMO's strategic framework for 2018-2023

- Development in Marine Technology
  - Automation and remote operations





# International regulations

- MSC98/20/2
- MSC98/22/2

Estonia, 

Finland, 

Japan, 

the Netherlands, 

the Republic of Korea, 

the United Kingdom 

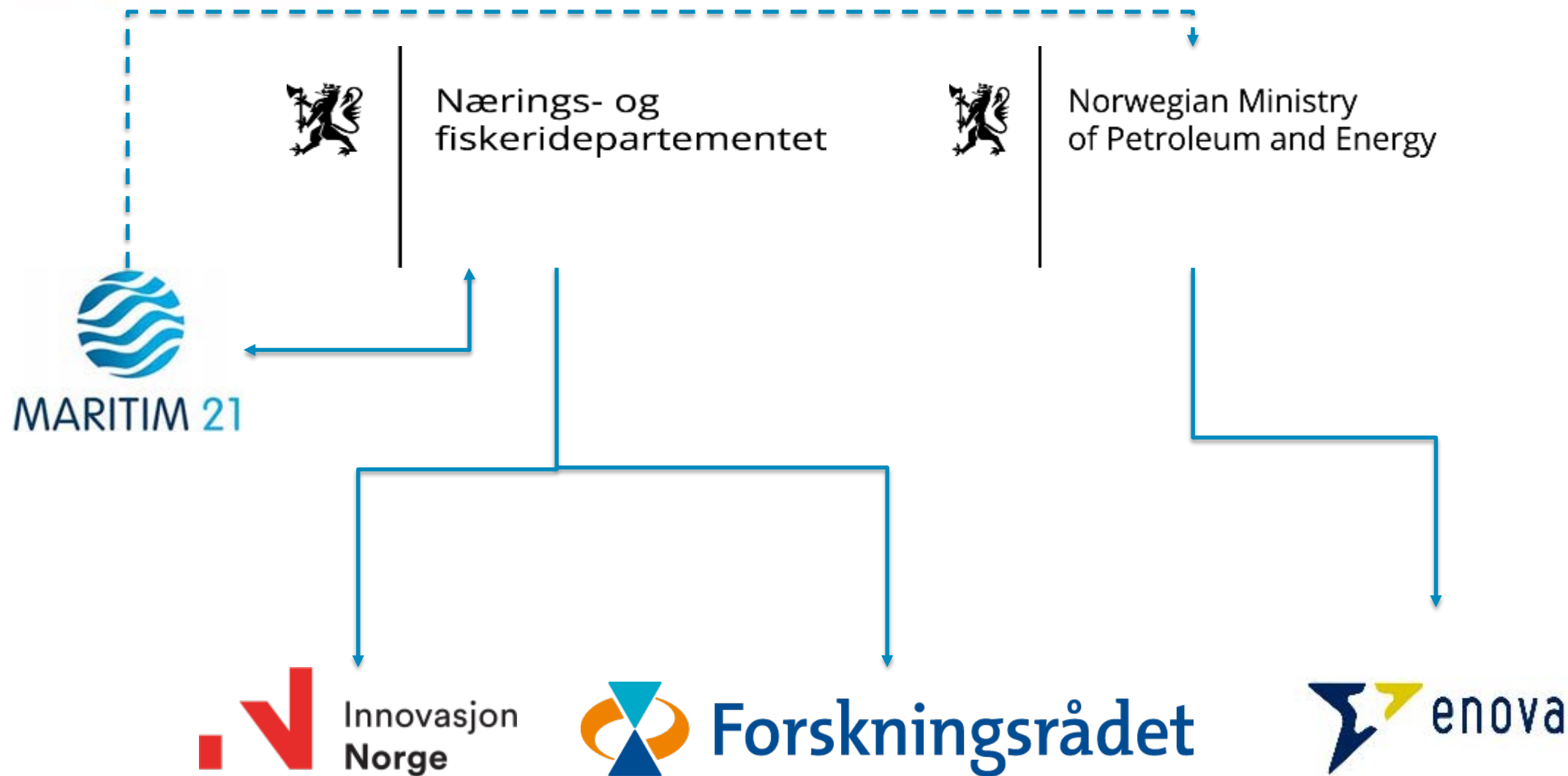
the United States, 

Singapore 

Sweden and; 

Norway 

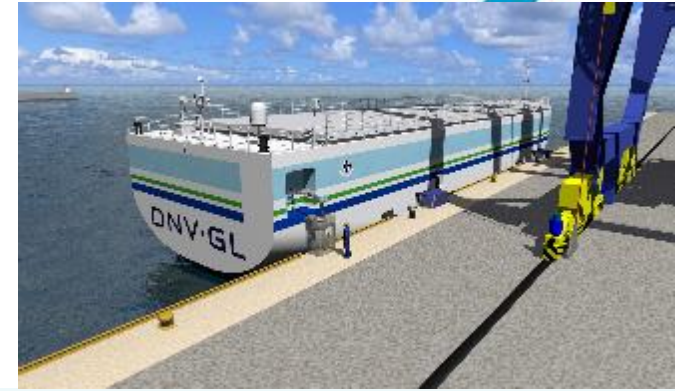




# Projects in progress

- SIMAROS - (DNV GL)
- ROMAS - (DNV GL)
- Open Bridge (VARD)
- ASTAT - (Kongsberg Seatex)
- SAREPTA (SINTEF OCEAN)
- EGNSS H2H (SINTEF OCEAN)
- Autonomous Zero emission container ship (DNV GL)

Among others



# Projects

- Yara Birkeland
- Hrønn
- Ferries for people- and bike (in narrow straits)





Kilde: Kongsberg



Kilde: Rolls-Royce

# NFAS Norsk Forum for Autonome Skip



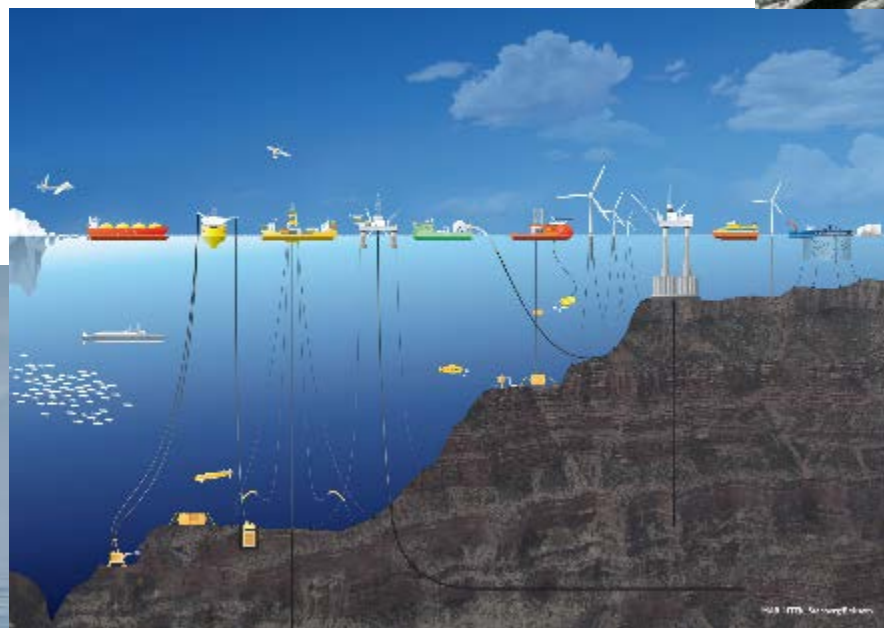
Kilde: DNV GL



Kilde: Maritime Robotics

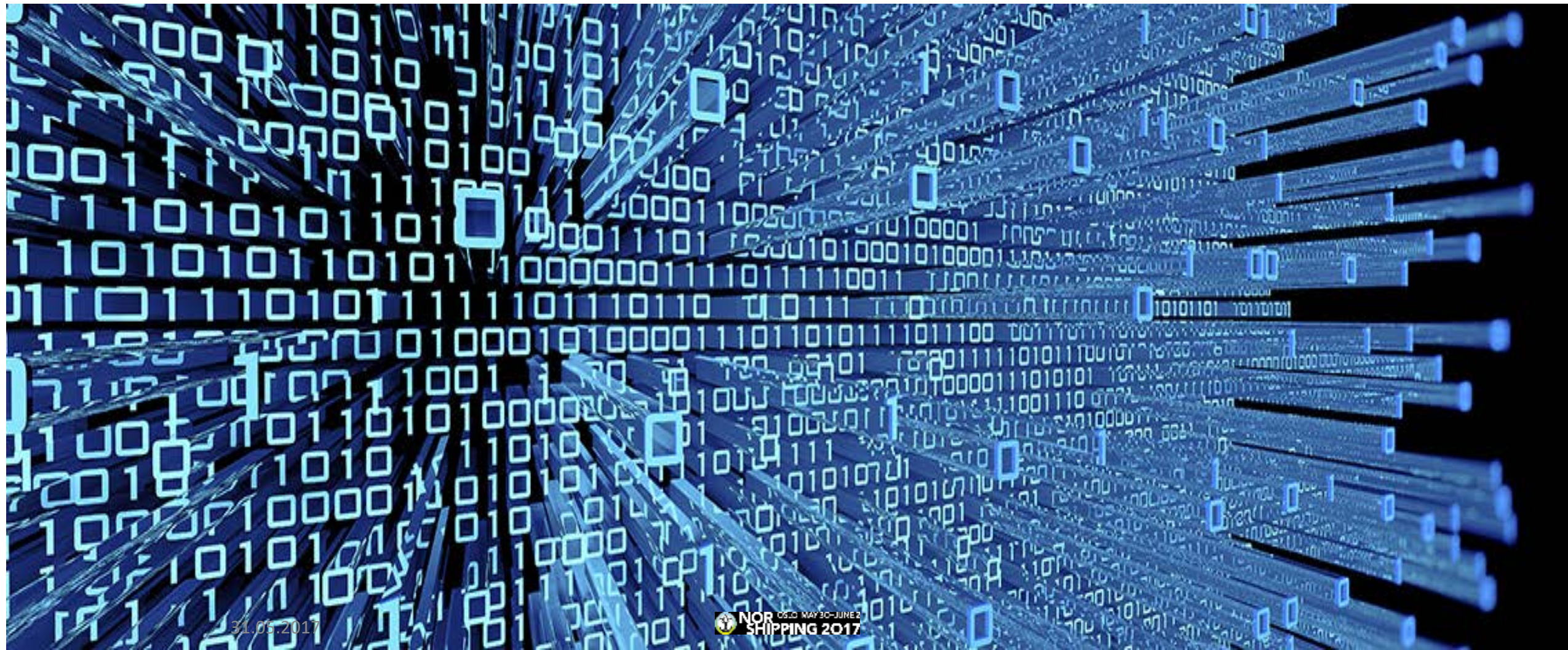
# Norwegian Maritime Authority

- Supporter of;  
innovation,  
new technologies,  
environmental solutions and  
e-navigation





## Summary - autonomous system





# Thank you for your attention.



Any Questions?

Visit us at  **NOR** OSLO MAY 30-JUNE 2  
**SHIPPING 2017**

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