

Ship Intelligence



Liiketoimintaan kasvua datan analysoinnilla
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Digitalisation

- Everything Connected to Everything – Everywhere, all the time
- “Internet of Things”, “Industry 4.0”, “Big Data”
- Consumer market leading the way
- New business opportunities and players
 - Amazon, Airbnb, Über, Spotify, ...
- Data = value



What is Ship intelligence



Health management



Optimisation & decision support



Remote & Autonomous solutions



**OBJECT
DETECTION**



INTERNET OF THINGS



**SATELLITE
COMMUNICATIONS**



BIG DATA



**AUTOMATION &
ROBOTICS**



**APPLICATIONS &
CLOUD**

Enabling technologies



Rolls-Royce

Low cost airlines

Internet sales and marketing

Standard - new efficient fleet



Lean organisations

Point-to-point

High utilisation rate of fleet



Time of market introduction

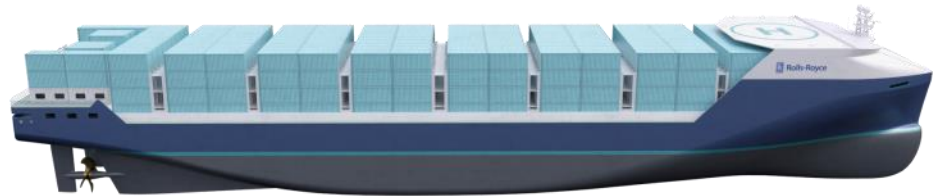
Low cost airlines, 2000

- Market dominated by old players with high debt and old fleets
- High fuel prices
- High “land” personnel costs
- Rise of internet market place



Smart Low cost shipping, 2020

- Market dominated by old players with high debt
- Digitalisation, IoT
- Crewing cost & availability
- Environmental regulations



Remote & Autonomous Operations


Looking at solving challenges of customers through co-design & through deep understanding of the underlying issues.

Approach

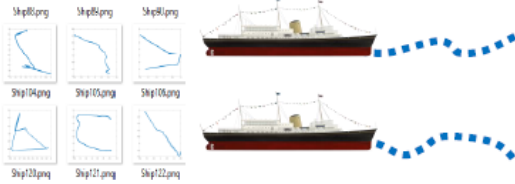
1. Create trust to technology for crew onboard through advisory solutions (no control functions, only information)
2. Demonstrate automation through linking the advisory information to controlling (remote/automatic control)
3. Autonomy (mission execution)

Majority of addressable areas are within the dynamics of operation/mission. I.e. system fundamental design is according to A but it is used according to B and C.

Data Based Learning - Example

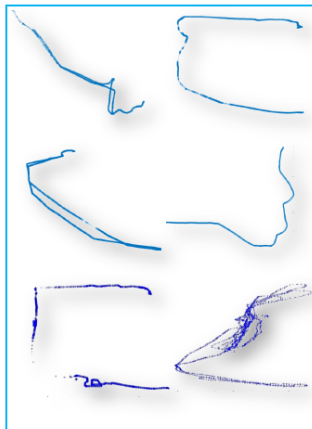
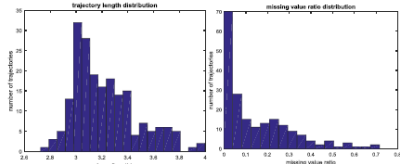
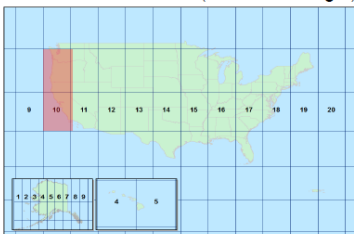


- Adjust model at each time step
- One model only for one ship
- Need lots of data from target ship for training
- No information sharing



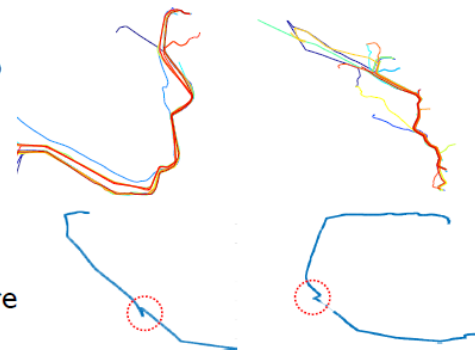
- Learn once, use all the time
- One model for all ships
- No data from target ship for training
- Information sharing

Source: Marine Cadastre (marinecadastre.gov)



► Trajectories clustering to detect regular traffic routes and patterns

► Anomaly detection before path prediction



Rolls-Royce

Ecosystem for Autonomous Ships

Finland aims to operate world's first autonomous ship system in 2025



Image © Rolls-Royce



”The best way to
predict the future
is to **create**
the future”



Rolls-Royce