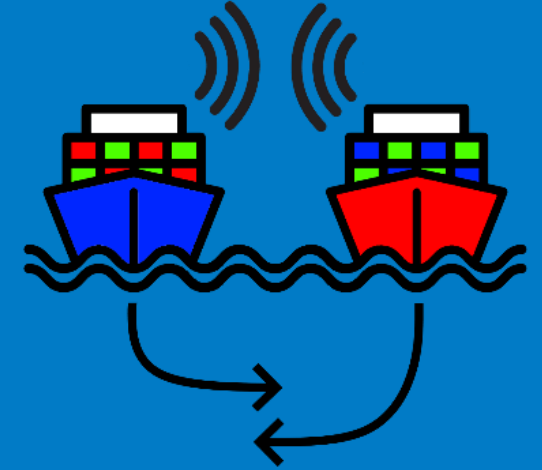




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Intention sharing

Patrick Potgraven









Development: the upswing of the trackpilot

- > Trackpilot:
 - Gives a sailing track to the destination
 - Manouvres the ship as much as possible on that track
- > A trackpilot knows where and when the ship will be
- > End 2022, ca. 600 trackpilots were implemented in Western Europe
- > Three (known) producers:

argonics





Research question to MARIN

- > Would sharing of sailing intentions be beneficial for the safety and efficiency on the fairway?



MARIN: Literature study

- › Concept is far from new: (Efficiensea, Monalisa 1, Accseas, Monalisa 2, Efficiensea 2, STM Validation, STM Balt Safe)
- › For application in sea shipping
- › Concepts tested on strat. & tactical level
- › HMI rather complex
- › Beneficial for safety
- › Preference for VDES above MC

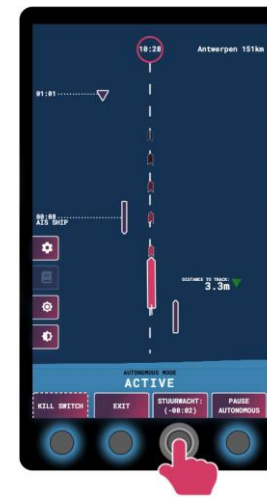




Intention sharing: setting up a simulator study

- › Starting points:
 - Intention sharing on inland waters
 - Join in on the development of the trackpilots and involve suppliers
 - Leave the HMI to the suppliers
 - Test with the help of simulators





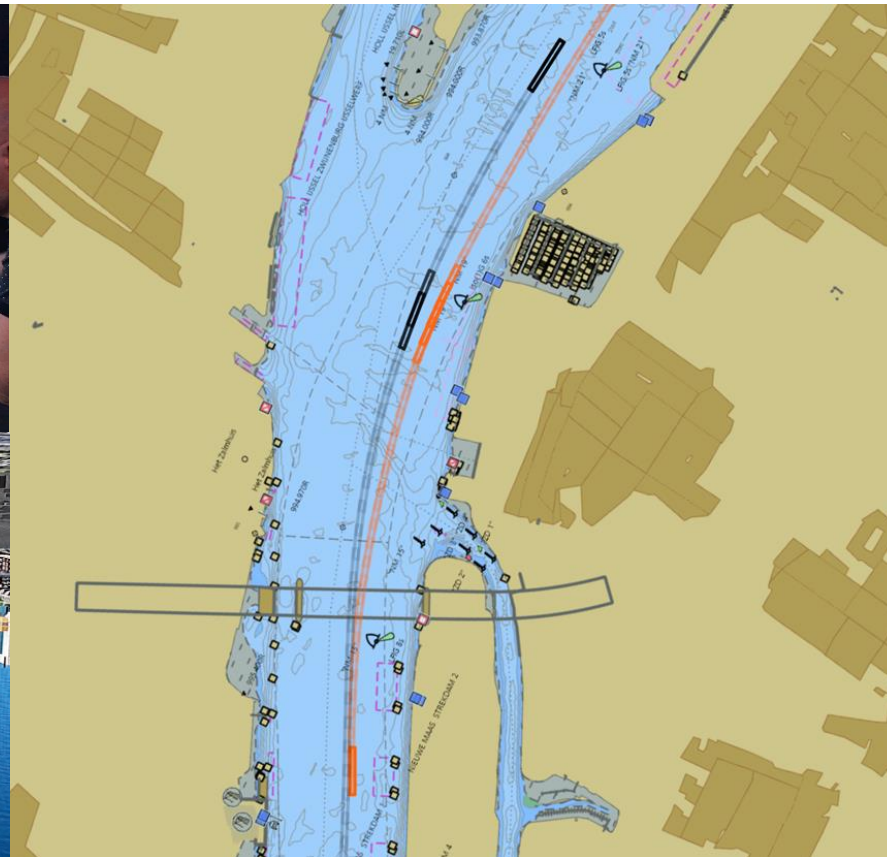
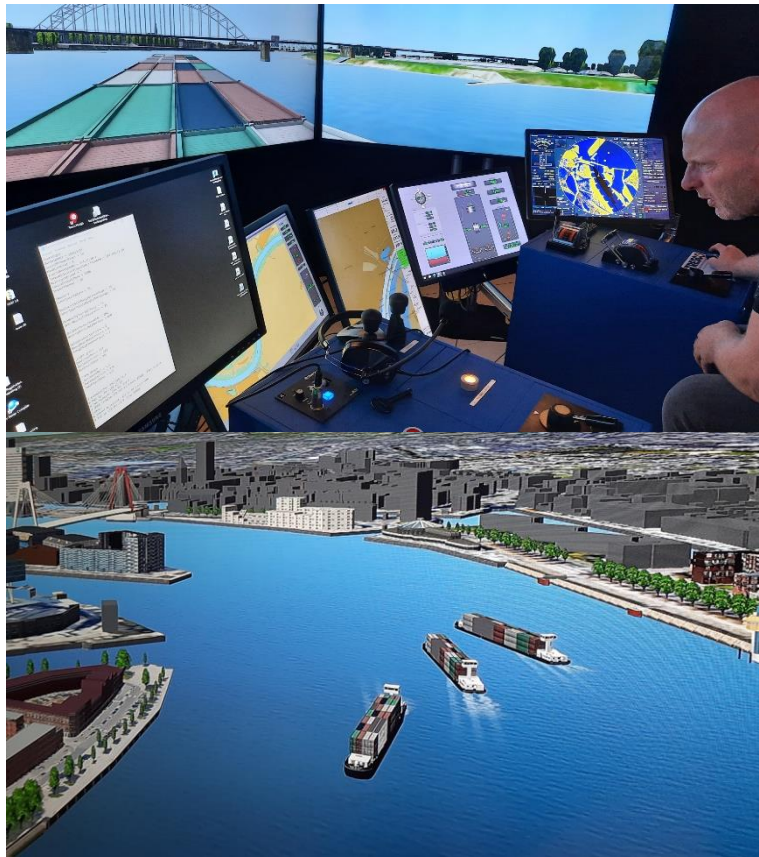
Sharing intentions – project partners

- > Participating trackpilot suppliers:
 - Shipping Technology
 - Agonics
 - Tresco
- > They developed:
 - Disseminating data on intentions out of their trackpilot
 - Showing the intentions of participating other ships on their trackpilot





Simulations at MARIN -1-





Simulaties bij MARIN -2-

- > 2 days
- > 3 simulators in one common world
- > 8 scenarios from realistic to less realistic
- > 6 skippers sailing the same scenarios, both with and without sharing sailing intentions
- > A short learning period for the skippers
- > Sailing on the trackpilot as much as possible, changing speed whenever necessary



Survey results - observations

- > Skippers needed help to learn to use the system
- > During the simulations, sharing intentions was used better more and more
- > Skippers did anticipate more with intention sharing
- > They used VHF less
- > Skippers may assume that other traffic may react on their information





Survey results

- › Sharing intentions has the potential to cope with traffic situations more safe and more efficient:
 - It supports situational awareness
 - It gives a pair of extra eyes, especially in poor visibility situations
 - It changes the navigation task
- › When taken into account:
 - The dependency that might occur
 - unjustified trust in the system
 - Assumptions about how other traffic will react when you share intentions



Recommendation to the use of the trackpilot

- › Build a safety case, containing
 - Performance criteria
 - Risk inventory and assessment
 - Human performance assessment
- › Verify the safety case
- › Create a 'best practice' for HMI and control of the HMI



Recommendation to Intention sharing

- › Define an operational concept
 - Support situational awareness with the projection of intentions
 - Define operational procedures for intention sharing
- › Create a well designed userinterface
 - Only show relevant information
 - Let the user be in control
 - Take care information shown is very clear
 - Create an adequate error handling

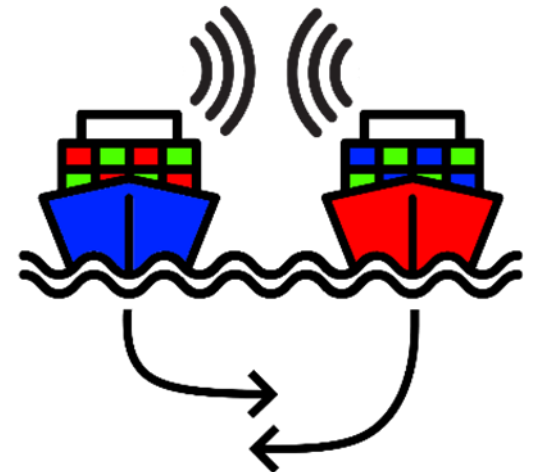
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Follow up

- › Best practice trackpilots
- › Implementation of Intention sharing:
 - Take a step back and document goals, means and limitations
 - Specify the requirements for information and security
 - Define an adequate information exchange protocol
 - Finalise the concept and carry out a real life pilot project





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Questions & discussion

