HUMANE project
Human-centred autonomy

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# HUMANE – what, why and who

A human centred perspective on
› System safety & cyber security
› Legal implications
› Skill sets, competence and knowledge
› Organisational & job design issues

Why?
› Most of the technology is in place…?
› Everyone wants safe and efficient shipping
› How can we support and enable?

## Project leader
› Western Norway University of Applied Sciences, HVL

## Project group
› NTNU Trondheim, Ålesund and Gjøvik
› University of Southeast Norway, USN
› The Arctic University of Norway, UiT
› BW Gas
› Kystverket
› Sjøfartsdirektoratet
› Lloyd’s Register
Why are we unique?

› Human roles in relation to maritime autonomy
› Human-centered approach
› Socio-technical systems view
Forecasting workshops

System safety and cyber security
October 2018 in Trondheim

Legal implications
January 2019 in Oslo
Levels of autonomy… …or a new model?

Where decides

On board

Human

Ashore

AI

Dominant technical view

Different business models
Crewing, skills and competence - drone or expert?

› Automation & advanced IT comes in
  › Keeping and maintaining competence and skill set
  › Human plus Machine – integration - is greater than human and machine
  › Number of sailors may remain the same
  › Or ultra low - more external assistance and decision support
    › Are they drones or experts?

Source: [http://blog.gtec.at](http://blog.gtec.at), michaelcavacini.com
The business case

- Owners are not interested
- Investment
  - Increased cost of equipment
  - Redundancy is expensive
  - Reduced crew costs, but not much
  - Cost means large fleets are needed
  - Retrofit won’t work, only newbuilds?
- Make sure we are not paying for someone else’s gain.

source: microtool.de
Communication and cybersecurity

Communication
› Remote control is not feasible due to lack of communication infrastructure
› We need autonomy AND shore
› Risks of remote access maintenance, people ashore don’t know what’s going on

Cyber
› Cyber security for remote and autonomy – currently mismanaged and misdesigned
› Cybersecurity maturity is low
› Security updates are urgent, high risk of being rushed out without testing

Source: imgflip.com
Summary of challenges and possibilities

- New business cases and models are needed
- Safety and security concerns are real. Addressing them is not trivial or a solved problem
- There is a big difference between technology demonstration and routine use
- Find ways for innovation and standardisation to coexist
- Marine human-centred design — involve people and find ways to iterate within the implementation processes
- Choice of technology will affect manning numbers and skills
- Resilient integrated solutions are not achieved by building and adding