User-centered design of remote-pilotage: work styles to be considered
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Definition of pilotage

Traditional pilotage

• Helping a vessel to a port or through an archipelago from onboard the vessel

• Pilotage Act 2010/1050, 7 §: the pilot’s job is to be an advisor to the ship’s captain while the ship’s captain is responsible of the vessel during pilotage

Remote pilotage

• Helping a vessel to a port or through an archipelago from somewhere else than onboard the vessel

• Requires new technology-mediated solution
Methods and theoretical background

User-centered design
  • Refers to the design of solutions that correspond with the desires, needs and capabilities of the users, making the system easy to learn and pleasant to use (Gould & Lewis, 1985)

Qualitative semi-structured interviews
  • Six pilots and two other marine professionals were interviewed

Core-task analysis (Norros, 2004)
  • Suitable method for studying safety-critical work
  • Framework for understanding and evaluating working practices by analyzing complex, uncertain and dynamic content of the work
# The initial model of work styles

Two work styles from the perspective of the pilot and the ship’s captain during pilotage

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<tr>
<th>Work style</th>
<th>Perspective</th>
<th>Details</th>
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| Submissive  | Ship’s Captain       | 1. The submissive captain  
Gives the responsibility to the pilot;  
Reduces own participation and concentration;  
Obeys pilot’s orders “blindly”             |
|             | Pilot                | 2. The submissive pilot  
Acts as an advisor and expert of the local waters and their navigation;  
Monitors the ship’s captain’s compliance with given instructions |
| Dominating  | Ship’s Captain       | 3. The dominating captain  
Takes the responsibility;  
Concentrates on the task;  
Prefers that the ship crew handles the vessel |
|             | Pilot                | 4. The dominating pilot  
Takes the command;  
Navigates the vessel by physically taking control of the steering devices |
Conclusions

Two distinctive work styles in pilotage

- Even when there are deviations from the official practice, traditional pilotage works as long as someone takes the lead
  - the pilot can adjust his/her work style to correspond with the captain’s work style

Remote pilotage restricts the pilot’s style into the submissive one, and this can turn out to be a problem if the ship’s captain also has a submissive work style

- Needs of the “submissive captain” have to be carefully considered and further studied in order to develop a safe and user-centered remote-pilotage solution
Thank you!