

User-centered design of remote- pilots: 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

Work style	Perspective	
	Ship's Captain	Pilot
Submissive	<p>1. The submissive captain Gives the responsibility to the pilot; Reduces own participation and concentration; Obeys pilot's orders "blindly"</p>	<p>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</p>
Dominating	<p>3. The dominating captain Takes the responsibility; Concentrates on the task; Prefers that the ship crew handles the vessel</p>	<p>4. The dominating pilot Takes the command; Navigates the vessel by physically taking control of the steering devices</p>

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!