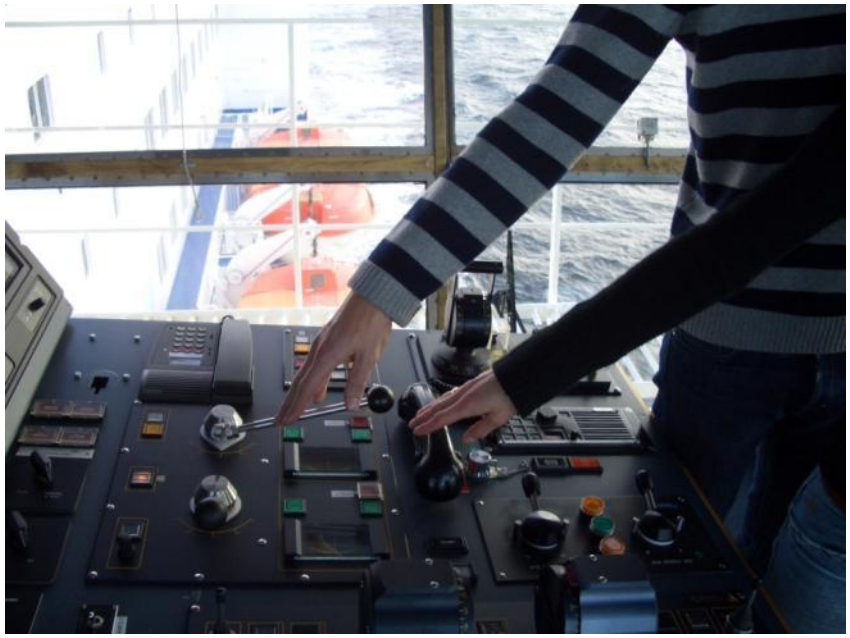
E-navigation underway

LIGHTHOUSE
N 57°42.4' E 011°56.2'

LIGHTHOUSE MARITIME COMPETENCE CENTRE

Have we addressed Human Element user needs?

Maritime Human Factors



Margareta Lützhöft
Shipping and Marine Technology
Chalmers University of Technology, Sweden

Shaping ships for people

Human Element

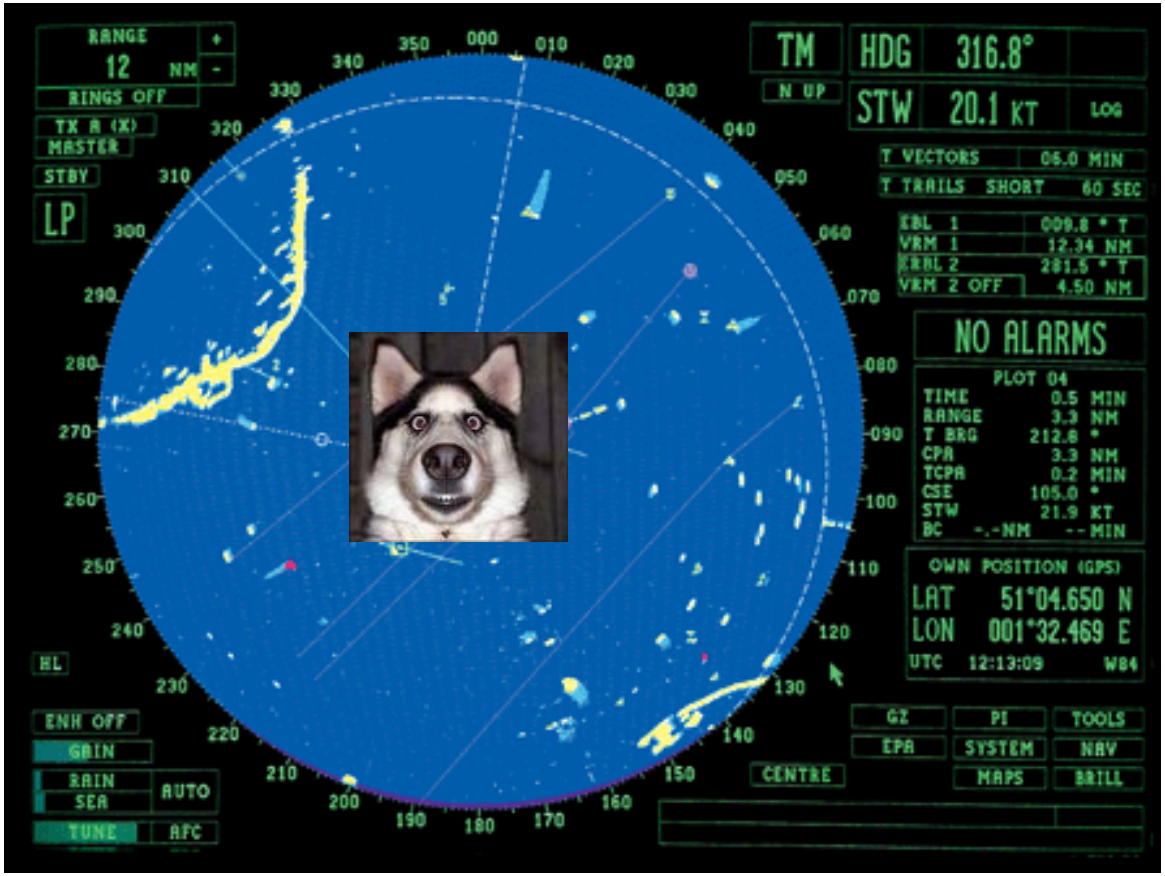
- The Humans
  - Crew; deck AND engine…
  - VTS
  - Pilots
  - Etc…
  - Parts of a socio-technical system

Need vs. want

"Customers sometimes do not know what they want. It can be dangerous to just listen to what users say they need."

JOHN SEELY BROWN, co-chairman of the Deloitte Center for Edge Innovation, a research and consulting organization in Silicon Valley.

“I want my dog in the background”



Relevant information

It's about asking the right questions

- What do you want?
  - Seafarers are not designers, programmers etc
- What do you need?
  - Tell me about your job and how I can support it

Studies show: all maritime users need

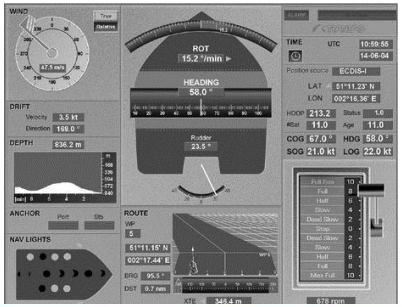
- Overview – joint SA
- Communication
- Reliable systems/information/sensors
  - Reliable: consistently safe
- Trust: social and technical

- All high-level concepts – no silver bullet

Relevant = want or need…or "can do"?

- "Makes **key** information available"
- "…permanently providing **valid** information on the operation of ship systems"
- "…a consolidated picture of **pertinent** navigation information…"
- "**Innovative** concentration of navigational data"
- "…everything is also more graphically, more **clearly** and in a more modern way displayed"

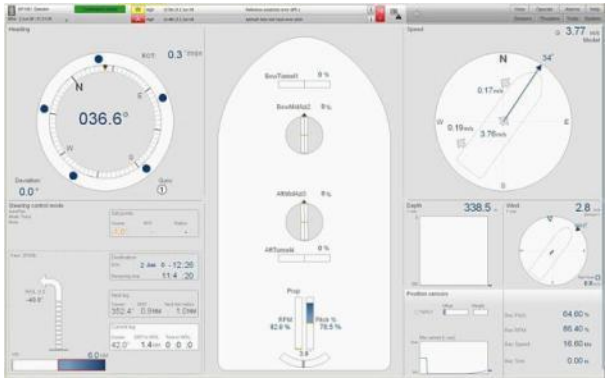
Time & Position
Heading
Engine Telegraph
048.1
Speed (KN)
Wind
Depth
48.7m
Rudder Order/Response
Propulsion Rem. Ctrl

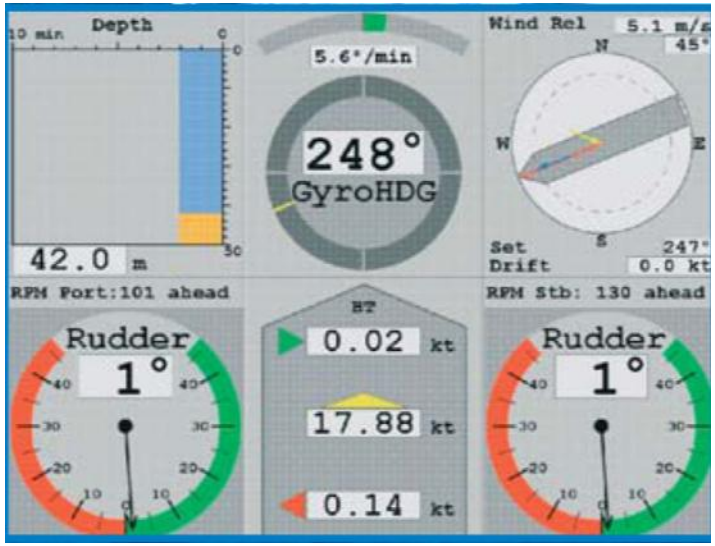

WIND
ROT
HEADING
DRIFT
DEPTH
ANCHOR
NAV LIGHTS
ROUTE

WIND
True
ALARM
Safe scale changed
TIME
UTC
11:06:32
24-08-01
THRUSTER 1
THRUSTER 2
ROT
HEADING
COG
SOG
HDG
LOG
DRIFT
Direction
Velocity
DEPTH
ANCHOR
Port Rudder
Stb Rudder
Full Sea
Full
Half
Slow
Dead Slow
Stop
Max Full

R.O.T.
RADIUS Ctrl
HDG
LOCAL TIME
DATE
23 Oct 2003

14:50:56
13-06-2007
COG:
Info
Diepte
Waypoints
Meteo
DGPS1
SOG:
LAT:
LON:
Pegels
Trip
Afst.:
Tijd:
Gem.:


036.6°


Depth
5.6°/min
248°
GyroHDG
42.0 m
Wind Rel
Set
Drift
RPM Port:101 ahead
RPM Stb: 130 ahead
Rudder
1°
0.02 kt
17.88 kt
0.14 kt

Factors contributing to failure

- Situations requiring rapid response
- Challenge of managing concurrent tasks
- Equipment failure and design flaws
- Misleading or missing cues normally present
- Plan continuation bias
- Stress
- Shortcomings in training and/or guidance
- Social/organizational issues

Dismukes, Berman, Loukopoulos

Design and then train?

- STW Sub Committee in May 2012: ECDIS Model Course…less than 40 hours including robust evaluation will not meet STCW requirements.

- ‘basically, the operation of the system is intuitive, in comparison to other manufacturers. A short introduction is sufficient to understand the basic functions…’

REUTERS/Stephen Lam/Files

Addressing user needs…?

- Research shows engineers are intelligent and creative but have little empathy
- Situations, tasks, cues, plans, social and organization…
  - Not the average engineer's experience and knowledge
  - Context of use
- Harmonization is key
  - Task-centered design
  - Socio+technical
  - Job and tool should be designed concurrently

…an ECDIS…this screen is more user-friendly… we can work like we did in the paper chart…can be used for planning

Take-home points

- E- is more than navigation
- User needs not wants
- Context of use
- Design before training

- Support innovation, allow inheritance

- Overview
- Communication
- Reliability
- Trust
- Harmonization

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LIGHTHOUSE Founder

CHALMERS

UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

SVERIGES REDAREFÖRENING