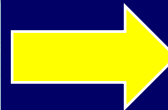


Session 3 – The Human Machine Interface



e-Navigation

Definition:

*“the harmonized collection, integration, exchange, **presentation and analysis** of maritime information onboard and ashore **by electronic means to enhance** berth-to-berth navigation and related services, for safety and security at sea and protection of the marine environment.”*

e-Navigation (IMO vision)

1. Shipboard navigation systems

- Integration of ownship sensors
- Supporting information
- Standard user interface
- Comprehensive systems for managing guard zones and alerts

Core elements include:

- High-integrity electronic positioning (e.g., GNSS)
- Use of ENC's and ECDIS
- An analysis capability to reduce human error

“All while actively engaging the mariner in the process of navigation while preventing human error.”

Prioritized Solutions

In July 2013, five (5) were prioritized and 'endorsed' by IMO NAV 59:

S1 Improved, harmonized and user-friendly bridge design

S2 Means for standardized and automated reporting

S3 Improved reliability, resilience and integrity of bridge equipment and navigation information

S4 Integration and presentation of available information in graphical displays received via communication equipment

S5 Information management

S6 Improved access to relevant information for Search and Rescue

S7 Improved reliability, resilience and integrity of bridge equipment and navigation information for shore-based users

S8 Improved and harmonized shore-based systems and services

S9 Improved communication of VTS service portfolio

As of April 2014...

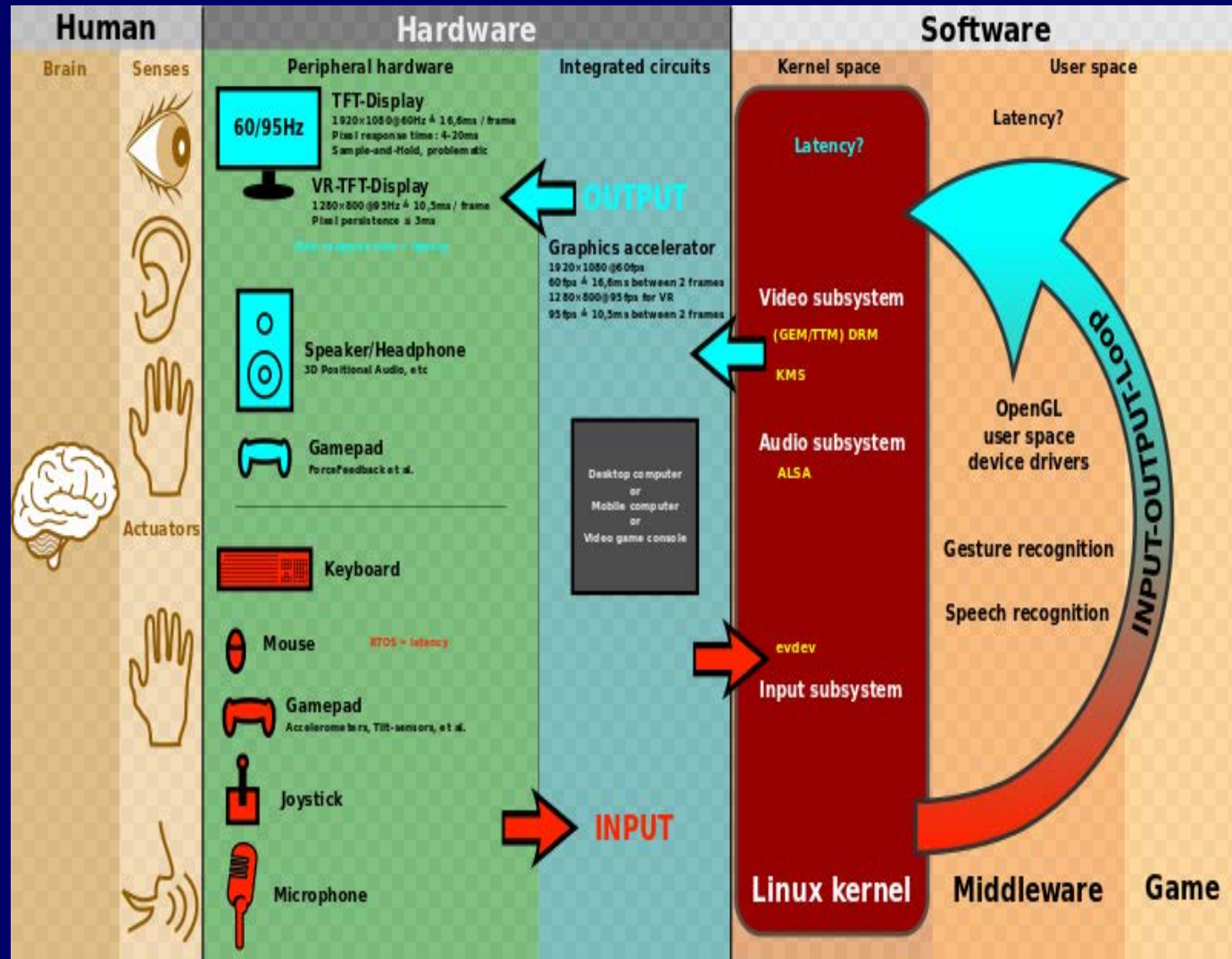
Ongoing IMO Activities (by e-Nav Correspondence Group)

- Identification of Risk Control Options (RCOs)
- Formal Safety Assessment (FSA)
- Risk and cost/benefit analysis
- Maritime Service Portfolios (MSPs)
- Draft Guidelines on:
 - Human Centred Design (HCD) for navigational equipment/systems
 - Usability evaluation of navigational equipment
 - Software Quality Assurance (SQA)
 - Harmonization of test beds reporting
- Strategy Implementation Plan (SIP)

Human-Machine Interface

“where the human and the machine meet”

- The area of the human and machine that interact during a given task.
- Interaction can include touch, sight, sound, heat transference or any other physical or cognitive function.



Human Factors

A discipline of study that deals with human-machine interface.

- Includes psychological, social, physical, biological and safety characteristics of a user and the system
- Sometimes used synonymously with ergonomics, but ergonomics is actually a subset of Human Factors.
- Also known as Human Engineering or Human Factors Engineering

Thinking Like a Mariner...

Mariners vs. Developers

“A system is only as good as who is using it, and what it is being used for.”

“Give a good system to a mariner, and they will figure out how to use it better than those who developed it.”

Capt. Lee Alexander, USN (ret)

Maritime Information – The “Wants”

“I don’t want more information, I want better!”

“Don’t tell me what was, tell me what is -- or will be.”

Capt. Jean-Luc Bedard, Port of Montreal

Electronic Chart - a paradigm shift.

“With paper charts, you have to figure out what is your position and what to avoid. With ECDIS, it shows you where you are -- and where it’s safe to go.”

Capt. Dave McLeish, USCG (ret)

Portable Piloting Units

“Never do something with one of these systems that you would not do without it.”

Capt. Wayne Bailey, Delaware River Pilots

Session 3 - "Mariner - Machine Interface"

