



NAVY OPERATIONS HEADS UP INTERFACE

PROBLEM

Information ergonomics (that is – information that is readily available, timely, and digestible) is of critical importance in all aspects of maritime operations.

The past five years have seen significant advances in Augmented Reality (AR) technology. The opportunity exists for Navy to capitalize on these advances to create systems that better provide information to its operators in such a way that improves operational and safety outcomes.

There are numerous operations and vocations within a ship that could benefit from improved information ergonomics. Project NOHUI will begin with providing simple, unclassified navigation information such as speed, heading, bearing to Navy navigators and ship drivers. However, Project NOHUI can expand into other knowledge domains, including but not limited to:

- Naval Warfare operations
- Engineering maintenance and repair
- Damage Control and onboard emergency management
- Aircraft launch and recovery control
- Medical assistance and surgery
- Stores management

NEED/RELEVANCE TO DEFENCE

Information ergonomics directly contributes to Navy's ability to operate effectively – thereby resulting in a Naval force more able to attention mission success. More broadly, many areas of defence have an interest in better information exploitation in contested environments. Improving human computer interfaces, will provide Navy units the edge they need to achieve mission objectives, potentially in a contested environment. Furthermore, improved information appreciation will likely have safety benefits as operators are more able to judge and assess evolutions that involve levels of risk.

RESEARCH QUESTION

1. Will Navy operators perform better with the assistance of an AR heads-up display?
2. Are these improvements measurable? (i.e., user feedback, measurement of stress, cognitive load, etc.)
3. How can an AR system be integrated into different Navy platforms?

EXPECTED OUTCOMES

1. Determine if a Heads Up Display capability is useful for Navy operators as measured against defined, assessable outcomes.
2. Deliver user requirements and research to an appropriate organization for further development and integration into navy units.
3. Disseminate research and development findings to other defence stakeholders to assist in the whole of enterprise AR development.

METHODOLOGY/ APPROACH

It is proposed that Project NOHUI follow a Rapid Prototyping project construct. The project team should generate a project that works “just enough” to test included features, then return to development to refine features from operator metrics and feedback, as well as include other techniques and technologies in service of human centered design.

PROJECT NOHUI PROJECT PLAN

1. Establish the project team and set the project agenda.
2. Consult stakeholders, with a focus on Navy Operators, to ideate product features.
3. Consult experts to explore solutions to technical issues. These issues include but are not limited to:
 - a. Classification and Emission Security issues.
 - b. Integration into ship's systems across different classes of ship.
 - c. Interface creation with a focus on Human Centered Design.
4. Rapid prototype a NOHUI using Microsoft HoloLens, or other appropriate AR system.
5. Test initial prototype on appropriate navy vessel or site. Initial test sites could include
 - a. The bridge simulator at HMAS Watson.
 - b. Armidale Class Patrol Boats.
6. Gather feedback from testing and assess against project agendas, return to step 4 as required to update and test system as required by new findings and new operating environments.
7. Conclude project under the following conditions:
 - a. it is determined that Project NOHUI is not producing a useful tool for the Navy Operators. Close Project.
 - b. It is Determined that Project NOHUI is producing a useful tool for Navy Operators. Investigate paths to commercial development and broader Navy integration.
 - c. It is determined that Project NOHUI is producing a useful tool for Navy Operators AND that scope of trials should be expanded. Return to step 1, set new agenda, continue through project lifecycle Note: Any other useful information discovered through the project lifecycle not directly relating to Project NOHUI outcomes will be fed back to DIN for further investigation.