

**RFI0029**

**REQUEST FOR INFORMATION**

**NavyX Augmented Reality in Ships Bridge Operations**

**RFI Title:** Augmented Reality in Ships Bridge Operations

**Issue Date:** 21/11/2023

**Reference:** RFI0029

**Version:** 1.2

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# Introduction

This Request for Information (RFI) is not a bidding opportunity but a means by which industry and other organisations can provide information. Any resulting procurement activity will be conducted competitively.

**Please note: this RFI is an information gathering exercise, no further discussions with industry are planned at this stage however any future procurement activity will be advertised in line with public procurement regulations on the Defence Sourcing Portal and Contracts Finder.**

# Background

NavyX is the Royal Navy’s Autonomy, Lethality and Innovation accelerator that focuses on the adoption of cutting-edge technology and fostering a culture of experimentation and collaboration. It serves as a hub for naval experimentation and technological advancement, actively engaging with industry, academia, and startups to identify, develop, and test emerging technologies. By doing so, NavyX aims to enhance the Royal Navy's capabilities and stay at the forefront of naval warfare through the rapid integration of new solutions and ideas. NavyX's platform, the Experimental Vessel Patrick Blackett (XV PTBK), is intended to foster innovation and development by housing, showcasing, and supporting evaluation, trialling, and experimentation of new capabilities, technologies, and ideas. Augmented Reality (AR) is being introduced to commercial ship bridge systems and maritime test platforms to improve naval safety, Situational Awareness (SA), and overall efficiency. AR provides enormous potential to supplement conventional decision support on the naval bridge both in Peacetime and Wartime. By making information currently available on disparate systems such as spatial positions visualised on two-dimensional maps more immersive for the end user by being available in their field of view can improve performance and decision-making and reduce human error, making it a valuable technology to explore. As RN is becoming increasingly lean crewed NavyX seeks to explore the AR Bridge concept for use on Naval platforms to optimise the capability to understand the environmental picture and support operations.

NavyX are seeking information to explore the potential applications of AR technology on Naval Ship Bridges. Our primary aim is to gain a comprehensive understanding of the latest advancements, capabilities, and use cases of AR in the maritime industry. Through this RFI we are reaching out to technology providers, research institutions, and experts who can share insights and knowledge about AR Bridge technology. We are not seeking procurement at this stage but rather looking to gather insights that will inform out strategic decisions on the following:

* **Technology Specifications:**
  + What AR hardware and software (e.g., Human-Machine Interfaces) solutions does your company offer for maritime applications (e.g., navigation, communication integration and tracking)?
  + Has your company explored the use of “head up display” in the maritime environment?
* **Research, Use Cases and Benefits:**
  + Provide examples of successful implementations of AR technology on ship bridges?
  + What academic research has been done on the effects of data displayed in the AR bridge environment?
  + Explain how AR can enhance safety, efficiency, and decision-making in the context of lean crewing?
* **Integration and Customisation:**
  + Can your AR system integrate with existing ship systems and navigation equipment?
  + How flexible is your AR technology in terms of customisation to meet the specific needs of the crew and different ship bridge layouts?
* **Training and Support:**
  + What training and support services are available for NavyX and crew members to effectively use AR systems?
  + How do you address potential issues related to skill fade and overreliance on AR?
* **Regulatory Compliance:**
  + What certifications or regulatory compliance standards do your AR systems meet for maritime use?
  + Have you got experience of regulation blocking the implementation of an AR solution?
* **Maintenance and Reliability:**
  + How do you ensure the reliability and durability of AR systems in maritime environments, including exposure to harsh conditions?
* **Cost:**
  + What are the costs ranges that NavyX can expect to be associated with implementing AR technology on a ship bridge, including hardware, software, training, and maintenance?
* **Privacy and Data Security:**
  + Explain how your AR systems handle data privacy and cybersecurity concerns, especially when capturing and processing sensitive information.
* **Future Developments:**
  + What future developments or enhancements can NavyX expect from your AR technology for ship bridges, particularly in light of increasing automation?

# RFI Intended Outcomes

This RFI aims to achieve the following outcomes:

* Gain a comprehensive overview of the current state of AR technology as it relates to Ship Bridge and its potential use cases, such as navigation assistance, safety enhancement, training, communications, maintenance etc.
* Collect information on successful implementation of AR in the maritime industry, including insights into potential operational benefits, challenges and limitation associate with implementation and regulations.
* Gain insight into possible security considerations.
* Gather insight on cost ranges to not only deliver best value for money for Defence but also enable the implementation of an enduring AR Bridge solution.

# RFI Procedure

Responses to this RFI will be reviewed by Subject Matter Experts (SMEs) from different functional areas within Navy Command Headquarters (NCHQ). If upon review of your submission any clarifications or additional information is required, you will be contacted using the details provided in your RFI response.

Any details provided in response to this RFI will be used for information purposes only and will not be used to determine the potential Suppliers who will be invited to bid, should the Authority proceed to tender. The results and analysis of this RFI shall not constitute any form of pre-qualification exercise.

Any formal procurement process will be undertaken in accordance with the relevant Procurement Law. Nothing in this RFI, or any other engagements with Industry prior to a formal procurement process, shall be construed as a representation as to the Authority’s ultimate decision in relation to the future requirement.

# How To Submit Responses to This RFI

Respondents should provide responses in accordance with the format provided in **Annex A** (below) quoting the RFI reference on all documentation and emails**.**

Organisations may submit answers to one or more questions, only one response form is required.

Please do not submit additional documents such as company overviews, the purpose of the RFI is to collect information related to the AR Bridge capability, any additional documents will not be included in the review process.

Any responses received after the deadline will be passed to the SMEs for information, however they may not be included in the RFI review meetings which are to be held immediately following the deadline.

Once completed, please return electronically to the e-mail address shown below (see *Contact*) no later than **12pm, 19th December 2023** Responses will be acknowledged electronically by return e-mail.

# Confidentiality and Proprietary Information

No information included in your response, or in discussions connected to it, will be disclosed to any other third party. Proprietary information, where included, should be kept to minimum and must be clearly marked.

**For the purposes of this RFI, any documentation submitted should be classification OFFICIAL.**

# Costs of Preparing Your RFI Response

Any costs relating to the preparation and submission of a response to this RFI are the sole responsibility of the respondent.

# Contact

Quoting the RFI reference, please submit:

* Any requests for clarification.
* All the responses to this RFI.
* Any questions regarding Classification of document(s) intended for submission.

Please submit all documents to: [NAVYCOMRCL-RFI@mod.gov.uk](mailto:NAVYCOMRCL-RFI@mod.gov.uk)

# Annex A

**RFI0029 NavyX Augmented Reality in Ships Bridge Operations**

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| --- |
| **Respondent Details** |
| **Company/Organization Name** |
| **Company/Organization:** [INSERT HERE]  **Company/Organization Website Address:** [INSERT HERE] |
| **Nature of the Company/Organization** |
| [INSERT HERE] |
| **Size of the Company** |
| [INSERT HERE] |
| **Name of Company/Organization Representative Completing the RFI** |
| [INSERT HERE] |
| **Contact Details** |
| **Email Address:** [INSERT HERE]  **Telephone Number:** [INSERT HERE]  **Company Address:** [INSERT HERE] |

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| **Response Form** |
| **Technological Specifications** |
| **What AR hardware and software (e.g., Human-Machine Interfaces) solutions does your company offer for maritime applications (e.g., navigation, communication integration and tracking)?** |
| [INSERT HERE] |
| **Has your company explored the use of “head up display” in the maritime environment?** |
| [INSERT HERE] |

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| **Response Form** |
| **Research, Use Cases and Benefits** |
| **Provide examples of successful implementations of AR technology on ship bridges?** |
| [INSERT HERE] |
| **What academic research has been done on the effects of data displayed in the AR bridge environment?** |
| [INSERT HERE] |
| **Explain how AR can enhance safety, efficiency, and decision-making in the context of lean crewing?** |
| [INSERT HERE] |

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| **Response Form** |
| **Integration and Customization** |
| **Can your AR system integrate with existing ship systems and navigation equipment?** |
| [INSERT HERE] |
| **How flexible is your AR technology in terms of customization to meet the specific needs of the crew and different ship bridge layouts?** |
| [INSERT HERE] |

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| **Response Form** |
| **Training and Support** |
| **What training and support services are available for NavyX and crew members to effectively use AR systems?** |
| [INSERT HERE] |
| **How do you address potential issues related to skill fade and overreliance on AR?** |
| [INSERT HERE] |

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| **Response Form** |
| **Regulatory Compliance** |
| **What certifications or regulatory compliance standards do your AR systems meet for maritime use?** |
| [INSERT HERE] |
| **Have you got experience of regulation blocking the implementation of an AR solution?** |
| [INSERT HERE] |

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| **Response Form** |
| **Cost** |
| **What are the costs ranges that NavyX can expect to be associated with implementing AR technology on a ship bridge, including hardware, software, training, and maintenance?** |
| For example: <£100K, £100K-500K, £500K-£1M, £1M-£5M, >£5M  [INSERT HERE] |

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| **Response Form** |
| **Privacy and Data Security** |
| **Explain how your AR systems handle data privacy and cybersecurity concerns, especially when capturing and processing sensitive information.** |
| [INSERT HERE] |

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| **Response Form** |
| **Future Developments:** |
| **What future developments or enhancements can NavyX expect from your AR technology for ship bridges, particularly in light of increasing automation?** |
| [INSERT HERE]  *Please note that innovative solutions are most welcome, even if they do not meet all the requirements above, we would welcome the opportunity to consider the positives and negatives.* |