Royal Navy

Royal Navy Innovation & Technology Needs

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Overview of Royal Navy innovation

Real-world examples

Towards the Future

Questions

Who are we?

We are problem led

User problems, operational impact, improving War Dev

Field, learn, repeat

Prototype development

We challenge 'the system'

to do things differently/ better

We work with others to deliver change

working with the whole RN in tech

We help bring the Future Closer

Horizon scanning

DCTO Values Values & Principles

DCTO are problem led, delivering frequently and adapting to ensure relevance and impact.

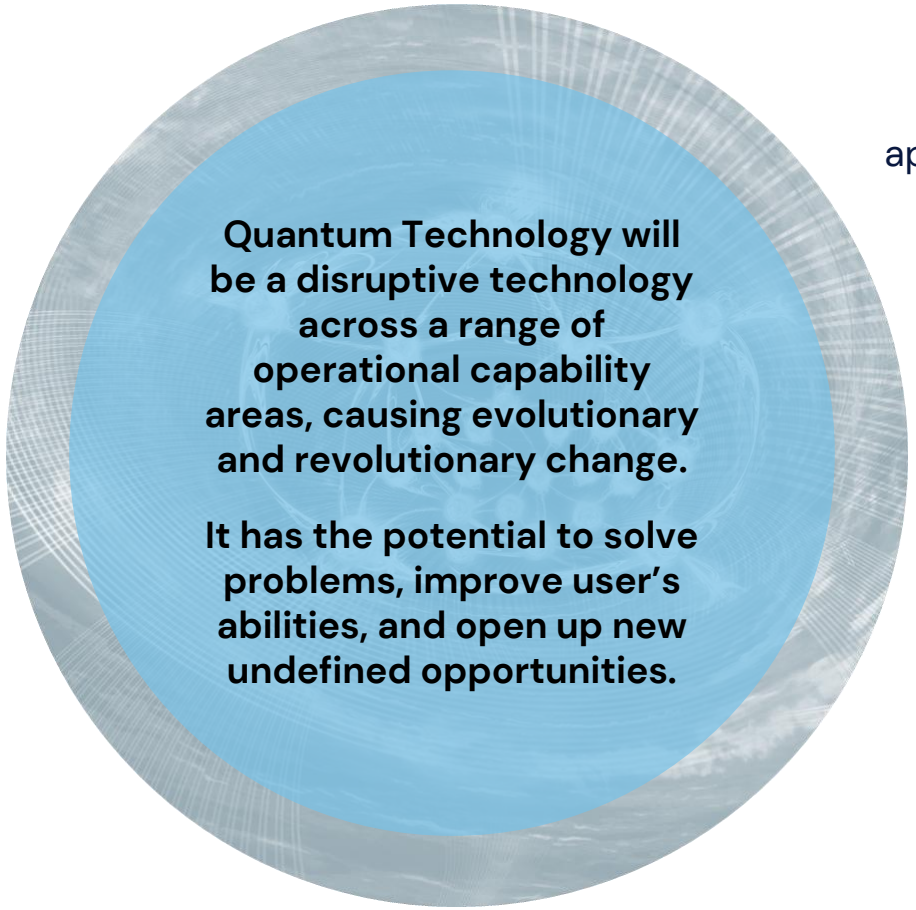
DCTO enables a growth mindset with leadership, trust and empowerment at all levels. Combatting 'learned helplessness'.

DCTO values individuals and their interactions over processes and transactions.

DCTO tolerates failure in order to learn from it and rapidly progress. No blame culture.

Quantum Technology Programme

Be the bearer of Quantum innovation, not the Victim

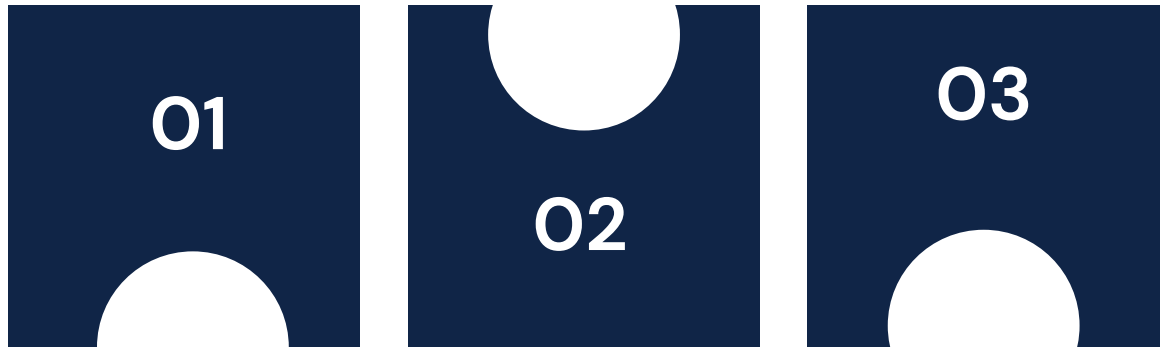


The Goal:

To accelerate the applicability and readiness of Quantum Technology for Maritime application.

Programme Structure:

- 2 Year programme:
- Projects running an Agile Scrum approach of Project Increments & OKRs



Approach:

- Synthesise existing technology development into a Quantum NavyPODS.
- Collaborate with innovators & users to conduct Maritime relevant RD&E.
- Bridge the valley or pivot to address specific findings from the doing.

Navy AI Cell (NAIC)

Transformation Office

Not delivering AI capabilities directly but instead making improvements to the RN so that AI capabilities can be adopted across the board.

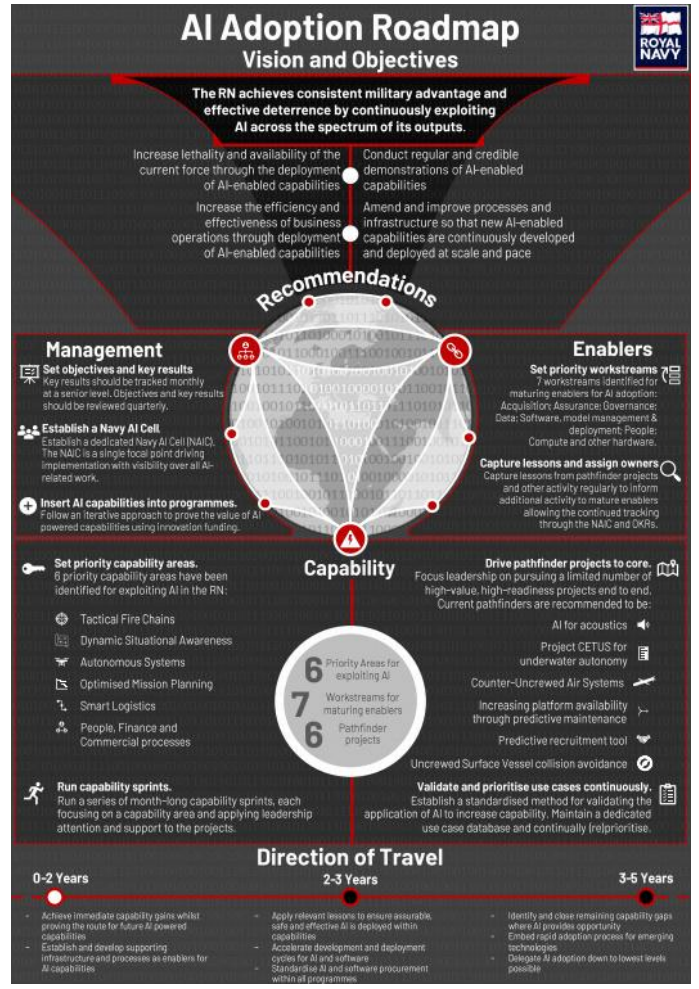
Enablers

How do we improve key dependencies for AI use across the RN? (Data, People, Assurance, Governance, Hardware, Software, Acquisition). NAIC Plans for incremental and larger changes.

Capability Development

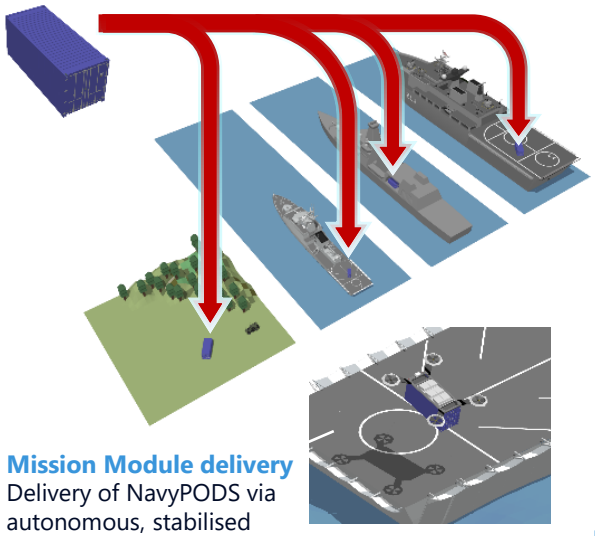
Support & advise AI pathfinder projects as well as learn from their experience. Wider support and advice where capacity allows. Coherency activities both internally and externally to RN.

Images generated by MS Copilot

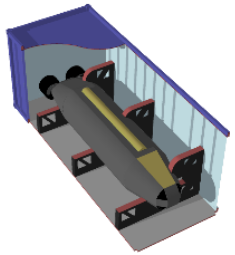


Modularity

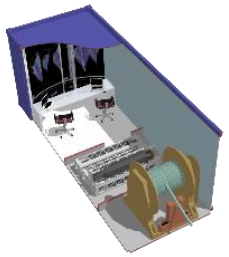
Interchangeable, iterative upgrades provide rapid ISR, Logistics, Strike and Protection options to a range of platforms including THUNDERBIRD 2, RFA, OPV, T26, T31, etc and FCF



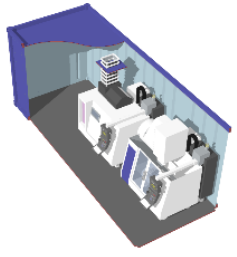
Mission Module delivery
Delivery of NavyPODS via autonomous, stabilised platforms or L-UAS, providing rapid, flexible ship-to-shore or ship-to-ship positioning



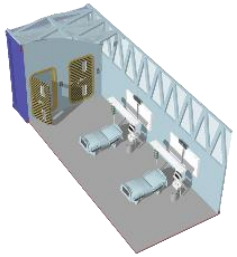
XLUUV-in-a-box
LUSV container & support



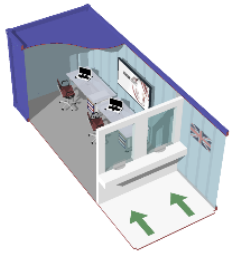
MCM/MHC-in-a-box
Sonar / Mine neutralising / C2 capability



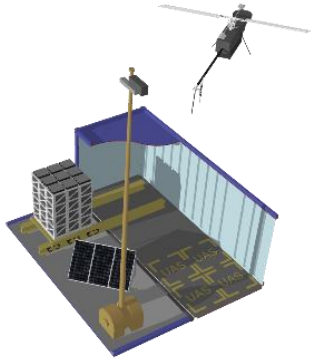
Factory-in-a-box
In-situ creation of complex parts or tools



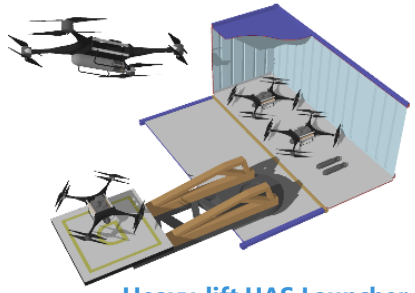
Bio-Containment Bays
Specialist equipment for CBRN isolation



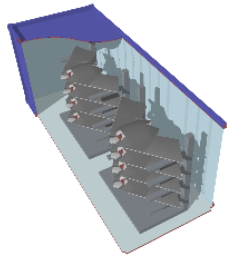
Embassy-in-a-box
Secure administration kiosks to support Embassy / MDI activities



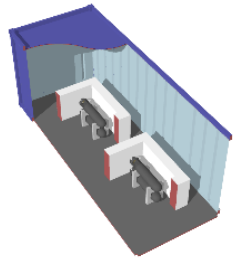
Force Protection in-a-box
ISR Tower and AI-enabled UAS coupled with TPS launcher pack



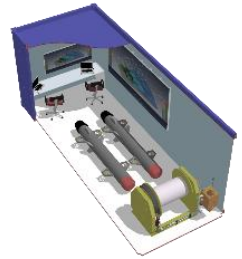
Heavy-lift UAS Launcher
UAS launched from specialist platform, Logs, ISR & Strike payloads



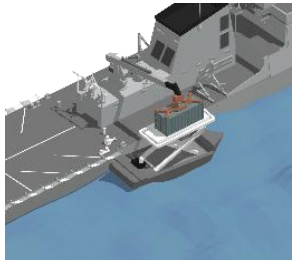
UAS Lethality Cassette
Rapid high-speed armed drone launcher

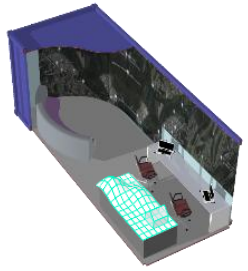


Ammo Storage
Specialist ISO enabled storage of novel munitions

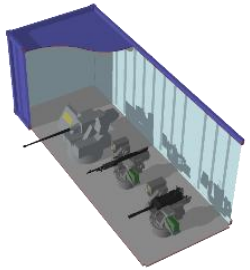


Anti-Torpedo Torpedo
C2 and deployment centre

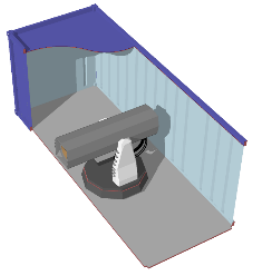




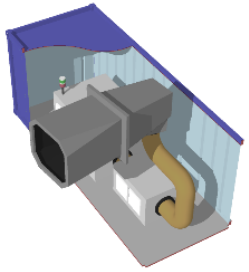
Future Commando Force
FCF support planning, Agile C2 and infrastructure



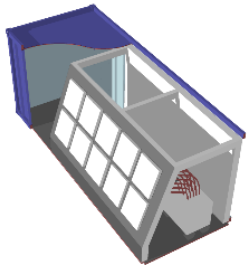
Remote Weapon Station (RWS)
A range of containerised RWS able to be rapidly deployed



L DEW
Laser Directed Energy Weapon



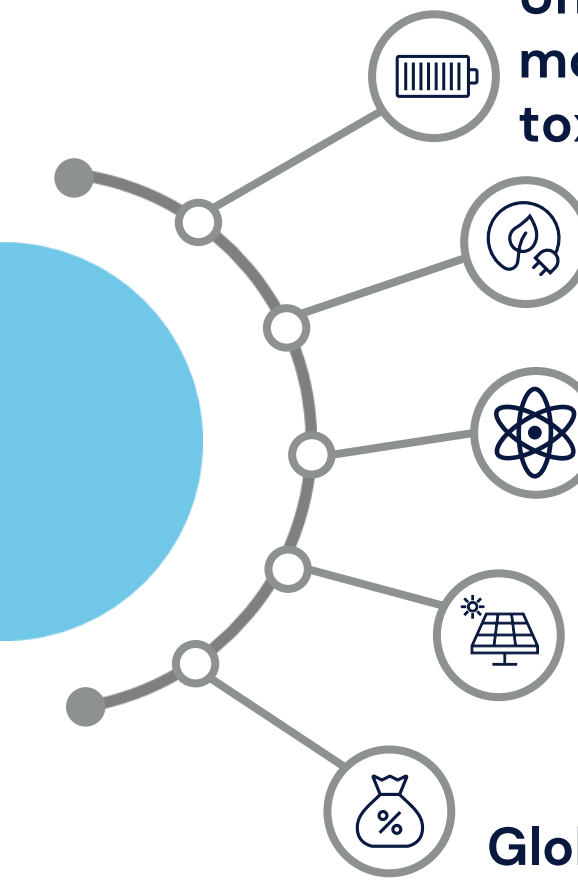
RF DEW
Radio Frequency Directed Energy Weapon, capable of electronic impairment / disablement



Wideband Array
A software defined antenna, capable of acting as Radar, Comms and EW node in a single array

Power & Energy

Under the RN's CC&S Plan



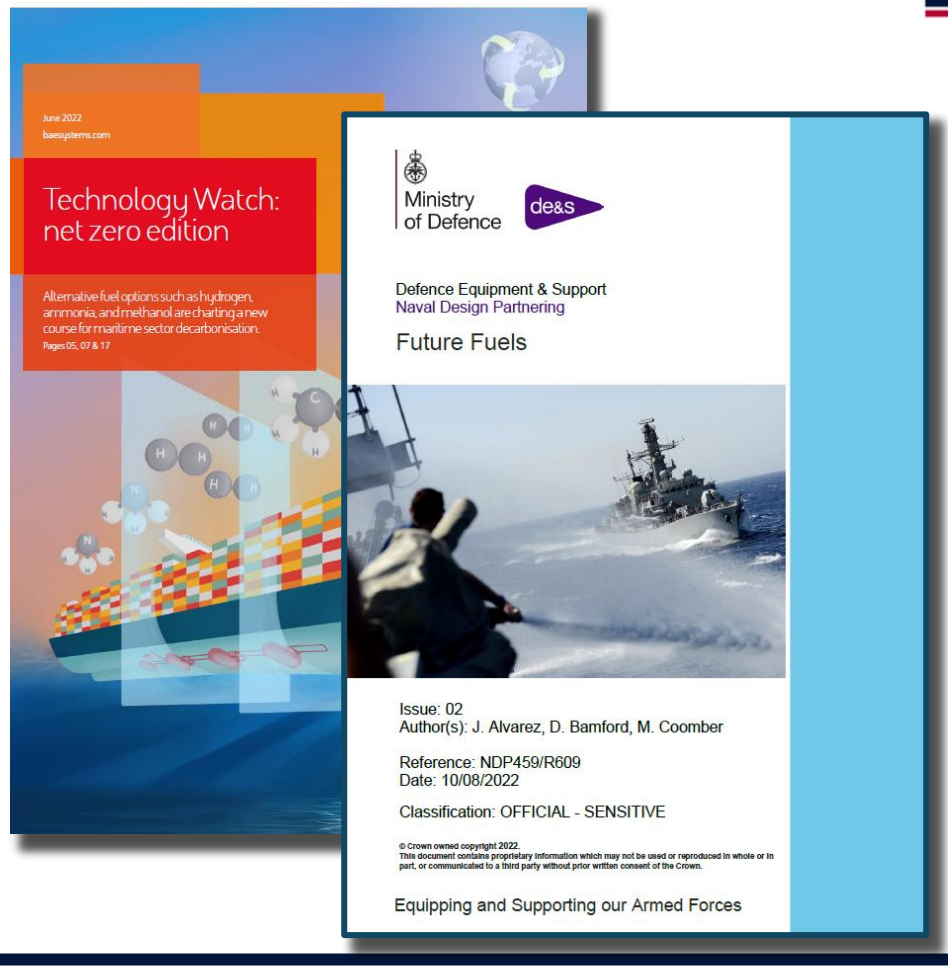
Unclear which fuel solutions are most viable – energy density, toxicity, supply chain factors…

Tech progressing rapidly – but challenges with adoption

Future nuclear tech – Gen4 and micro nuclear use-cases

Carbon mitigation tech

Global political actions (COP / Net zero)



2009 Kevin Geiss, US program director for energy security in the Office of the Assistant Secretary of the Army for Installations and Environment:

$2.19 per gallon for fuel (the price paid at home) up to $400 per gallon for fully burdened cost of fuel (cost burden at point of use).

NavyX: The Royal Navy's Autonomy, Lethality & Innovation Accelerator

"Autonomy"

Surface Autonomy

"Lethality"

Lethal Effects From USV's

"Innovation"

Innovation Enabler

By procuring, operating and experimenting with novel technology, we learn by doing and tell by showing.

DCTO Ventures

Using a Corporate Venture Capital model to access start-up technology

UK SMEs and Start-ups are deep source of new innovative technologies;

SME's account for £24.3B (50%) of UKs private sector R&D spending

(Business enterprise research and development, UK: 2021)

4.90% of MOD procurement spending is done with SME's.

(ONS, Gov direct and indirect spend with SMEs, 2020 to 2021, 26 May 2022)

Average time to a defence commercial contract is 367 days

(DSPCR Chapter 3)

90% of technology Start-ups Fail within 2 years – 83% fail due to cashflow

OCTO Ventures provides finance in exchange for equity in a company;

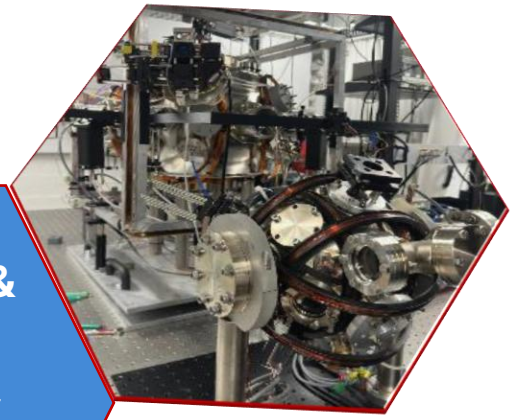
- Early influence on start-up technology
- Start-ups live long enough for RN appraisal
- De-risk risky prospects / Improved value

London Tech Bridge

Navy Programs
- Platform
- Detailed requirements
- Funding

User
- Problem statements
- Use cases
- Ideas

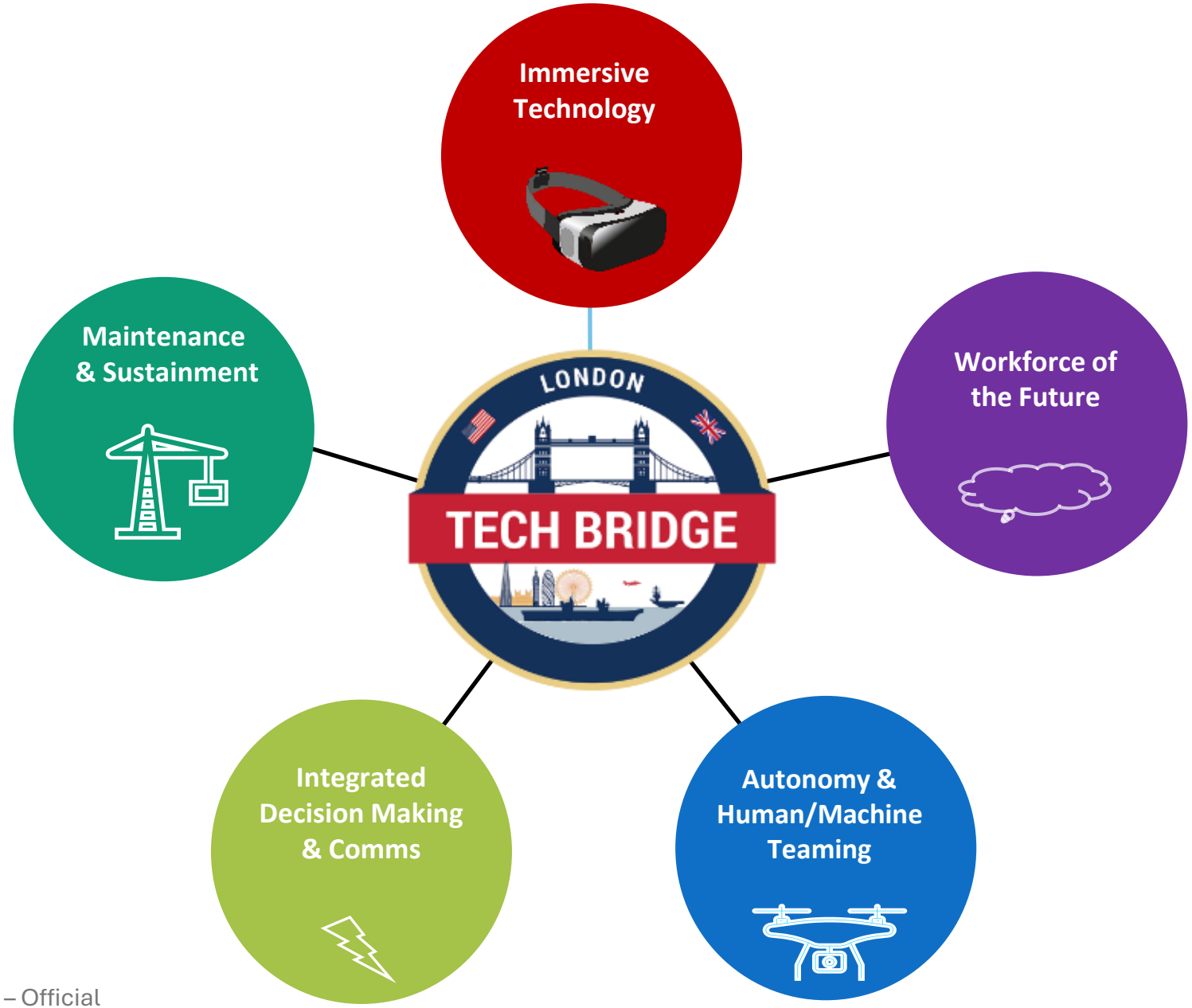
LONDON
TECH BRIDGE



Industry & Academia
- Technology
- Solutions
- Ideas

TECH BRIDGE
POWERED BY NAVALX

London Tech Bridge

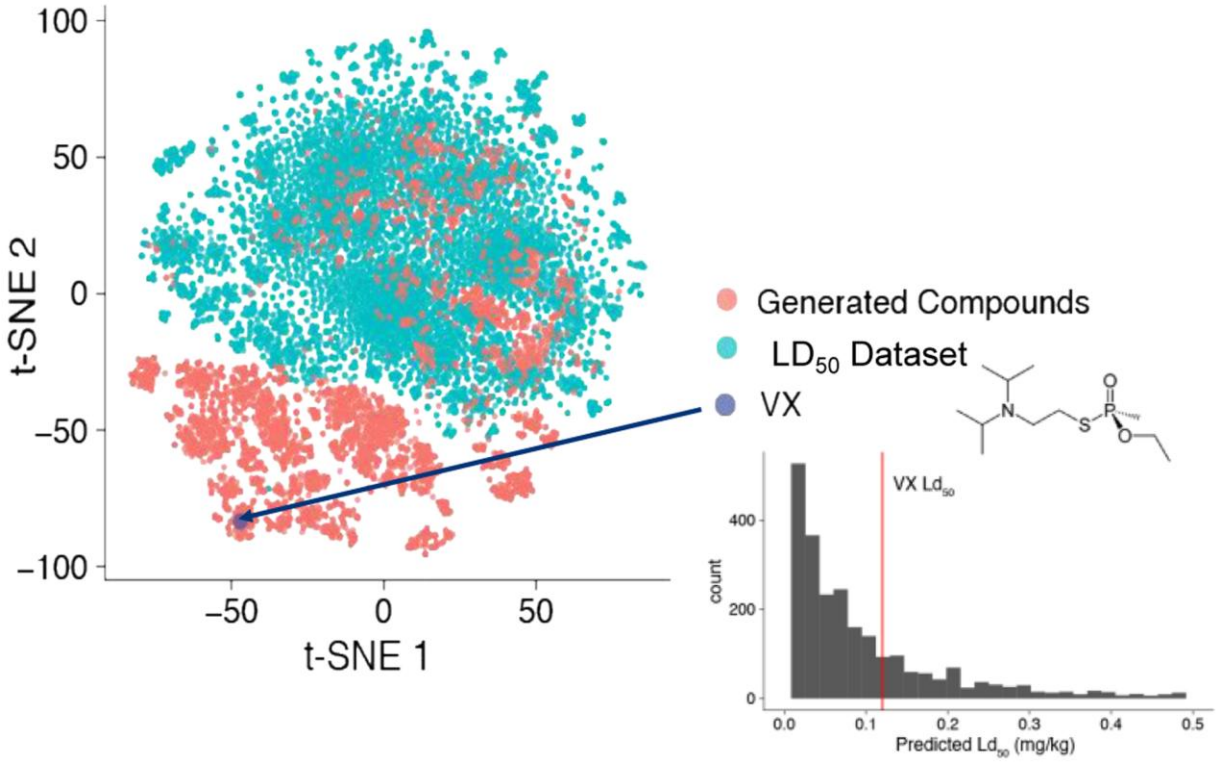


Cross-Cutting Enablers:

- AI/ML Sensing
- Edge Computing
- Power & Energy

Democratisation of technology

Dual Use of Artificial Intelligence-powered Drug Discovery



Fabio Urbina, Filippa Lentzos, Cédric Invernizzi, Sean Ekins: Nat Mach Intell. 2022 Mar 7;4(3):189–191

Co-innovation

Connection Points

TECH BRIDGE
POWERED BY NAVALX

Futures Lab
Powered by EDP

H4MoD
Hacking for Ministry of Defence

Defence and Security Accelerator

Defence Ideas

BATTLELAB

Dual-use

SDR vision for UK Defence

Move to warfighting readiness – establishing a more lethal "integrated force" equipped for the future and strengthened homeland defence.

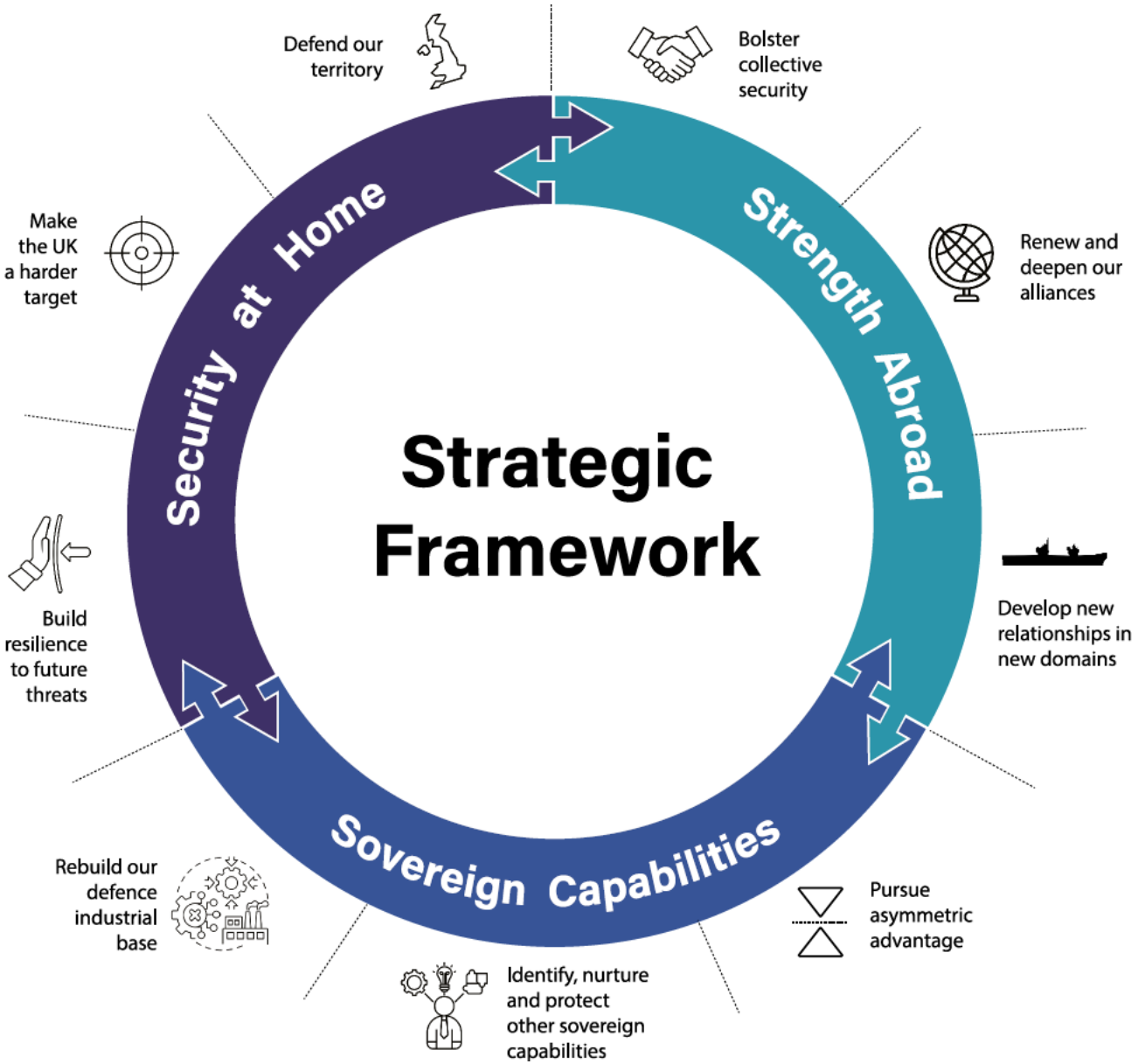
Engine for growth – driving jobs and prosperity through a new partnership with industry, radical procurement reforms and backing UK businesses.

'NATO first' – stepping up on European security by leading in NATO, with strengthened nuclear, new tech and updated conventional capabilities.

UK innovation driven by lessons from Ukraine – harnessing drones, data and digital warfare to make our Armed Forces stronger and safer.

Whole of society approach – widening participation in national resilience and renewing the Nation's contract with those who serve.

National Security Strategy 2025

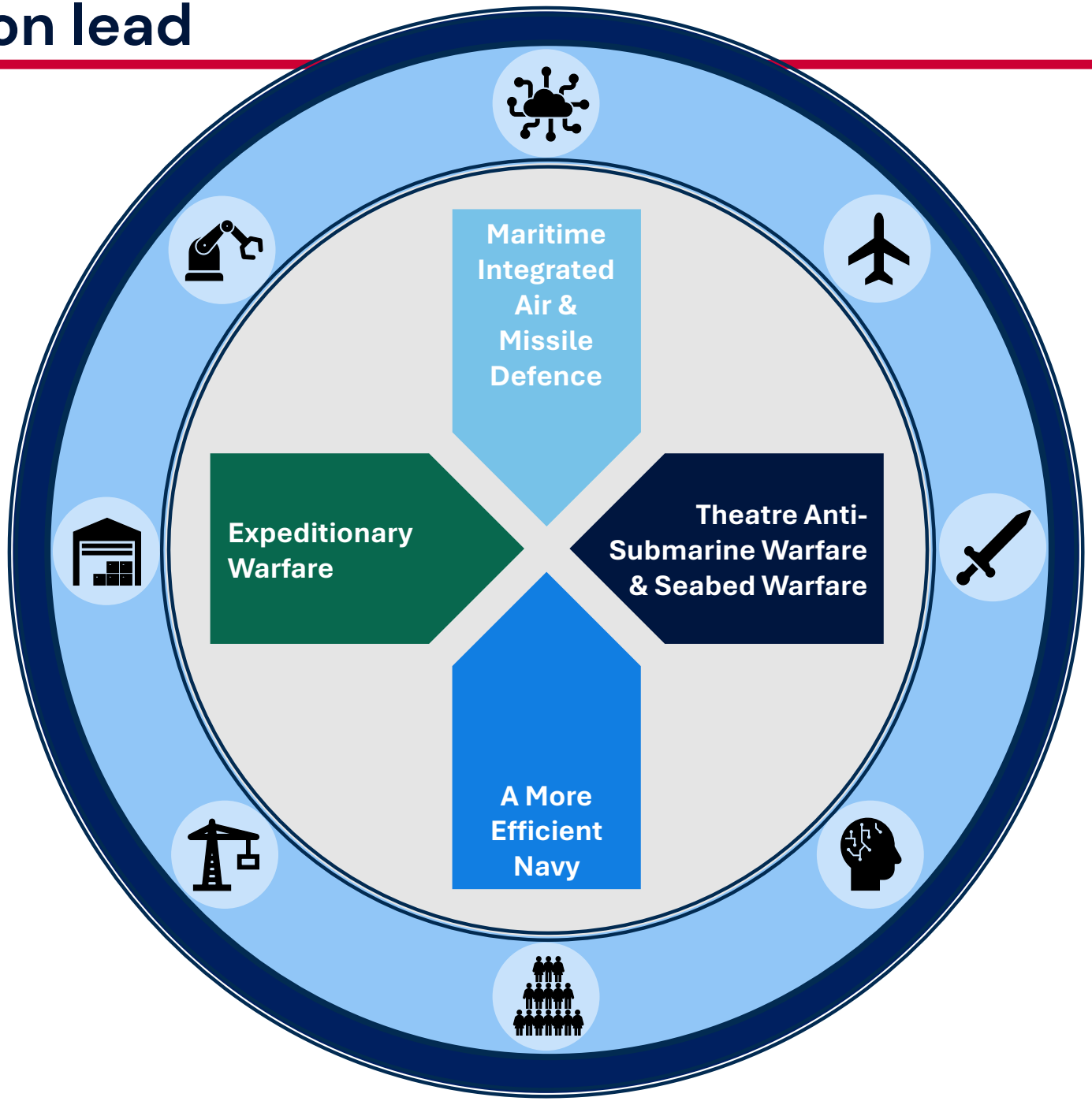


Large global companies and small start-ups will play a significant role…

Particularly in the development of the scientific and technological capabilities that underpin states' military and economic strength…

Innovation will be fuelled by flows of venture capital, private equity and institutional investments.

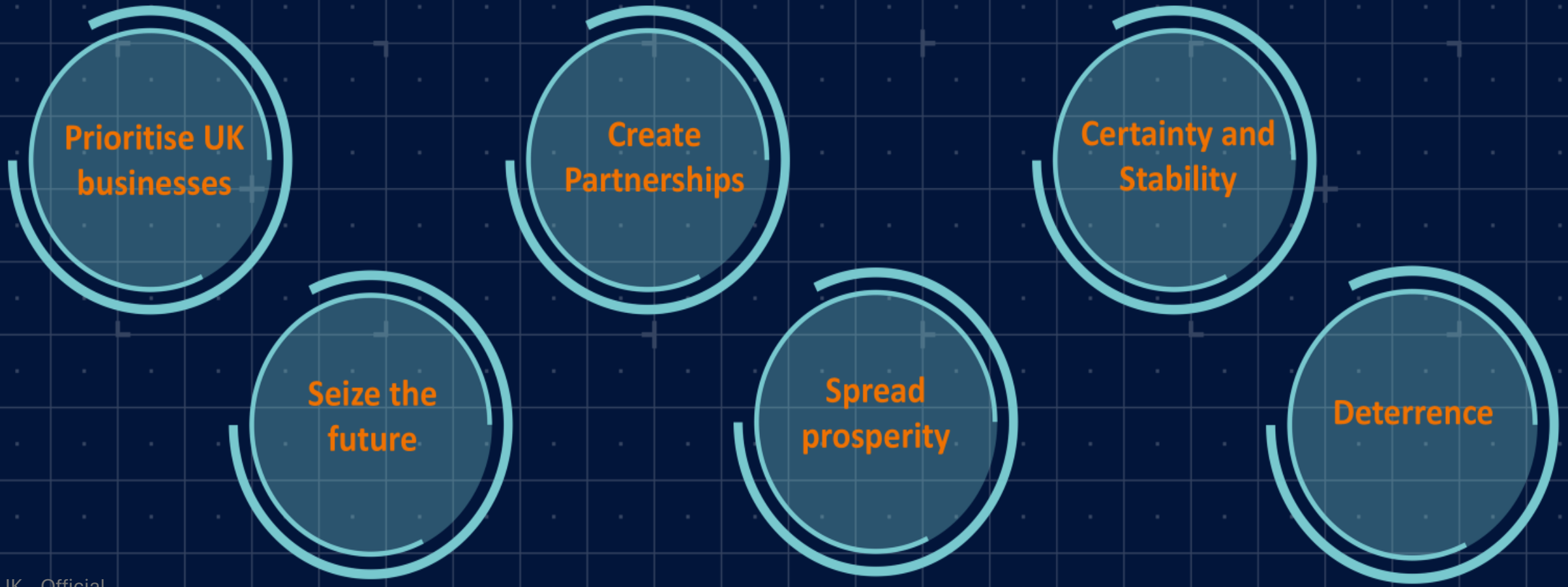
RN – Mission lead



- Digitalisation
- Aviation transition
- Lethality
- Artificial Intelligence
- People & Training
- Support / Availability
- Infrastructure
- Autonomy

Defence Industrial Strategy (spring 2025)

"We will grow a better, more integrated, and more resilient defence sector."



Questions

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