Tensions in naval ship design

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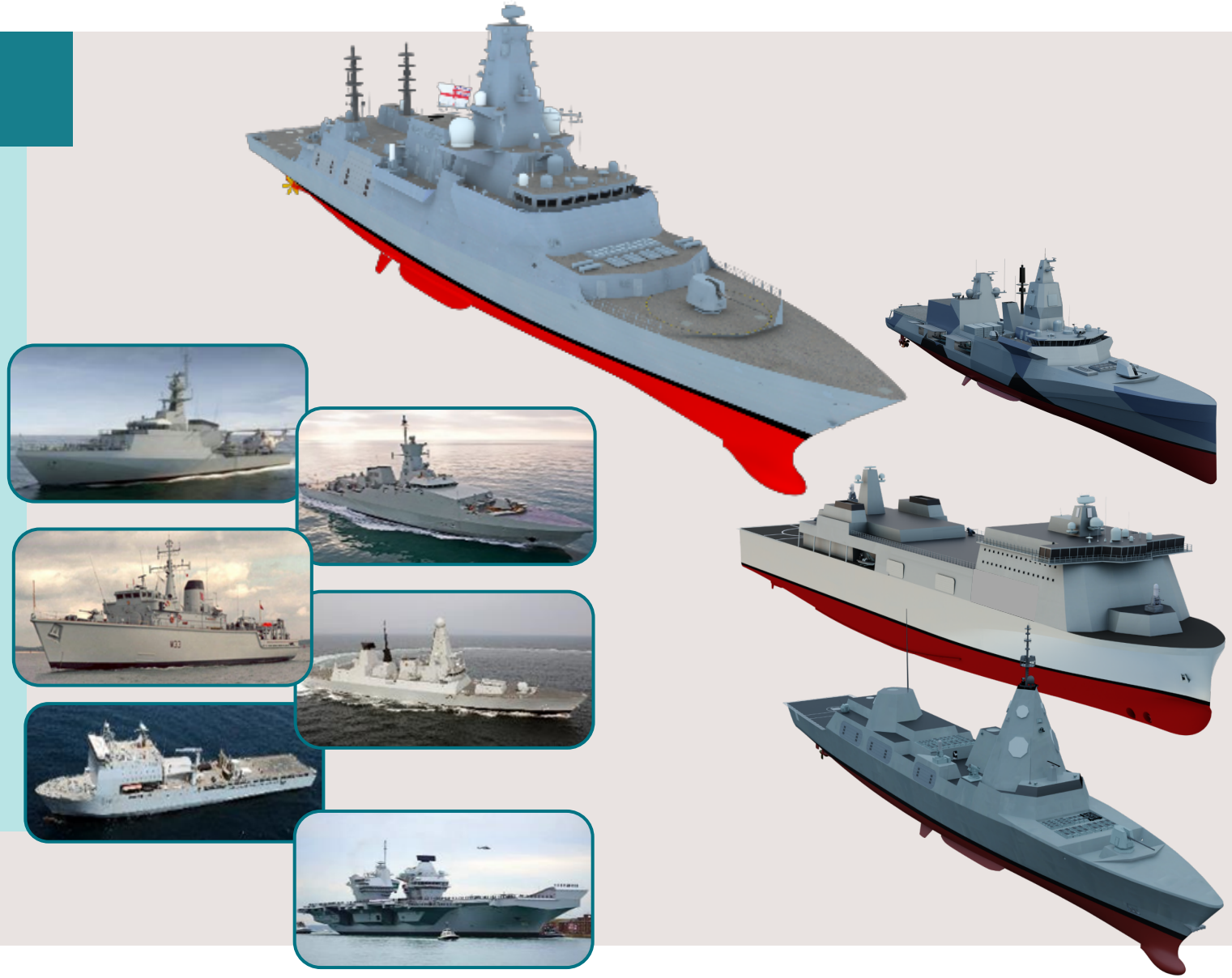
Introduction

The presentation will cover:

- Re-cap “Future Trends in Naval Ship Design”, CNE ‘23
- What has changed?
- Technology impacts on naval ship design
  - Centralised vs distributed capability
  - Optimised vs traditional crewing
  - Design for X
- Future Technology



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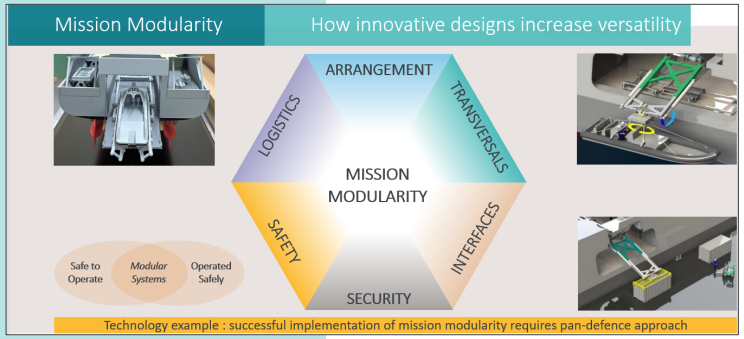
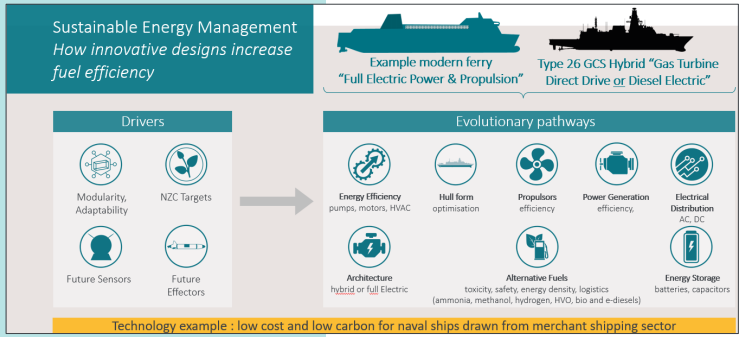
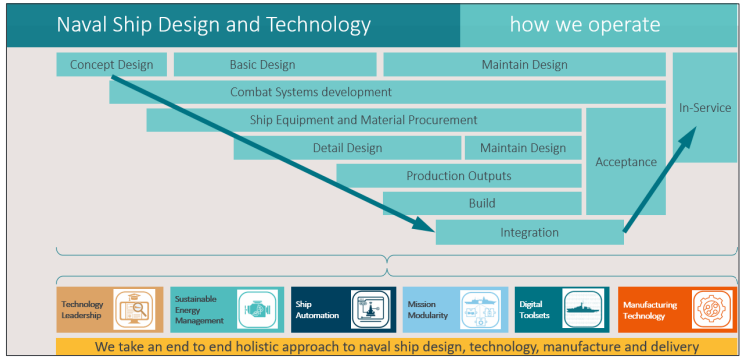
“Future Trends in Warship Design”, CNE, 2023

1. an end to end holistic approach to naval ship design, technology, manufacture and delivery is needed
2. research and technology must be mapped to evolving Customer priorities
3. successful implementation of mission modularity requires pan-defence approach
4. low carbon naval ships must draw from the merchant shipping sector







Key themes in “Future Trends in Warship Design” paper, 2023 remain valid

What has changed?

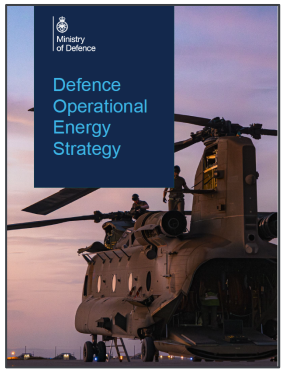
World Events

- Ukraine
- Gulf
- Israel / Gaza

- Resilience – need to maintain capability over long periods
- Evolving threats – asymmetric threats, innovative strategies
- Rapid agility – adapt and respond quickly, layered defence
- Co-operation – multi-national coalitions, interoperability

Defence Command Paper – update after 2 years

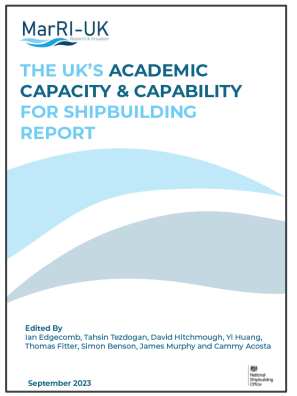
Policy– *energy as a weapon*



Defence Operational Energy Strategy, 2023:

- Operational advantage through energy

Sector capability – *co-operate for an enduring solution*



MarRI-UK report, Sept 23

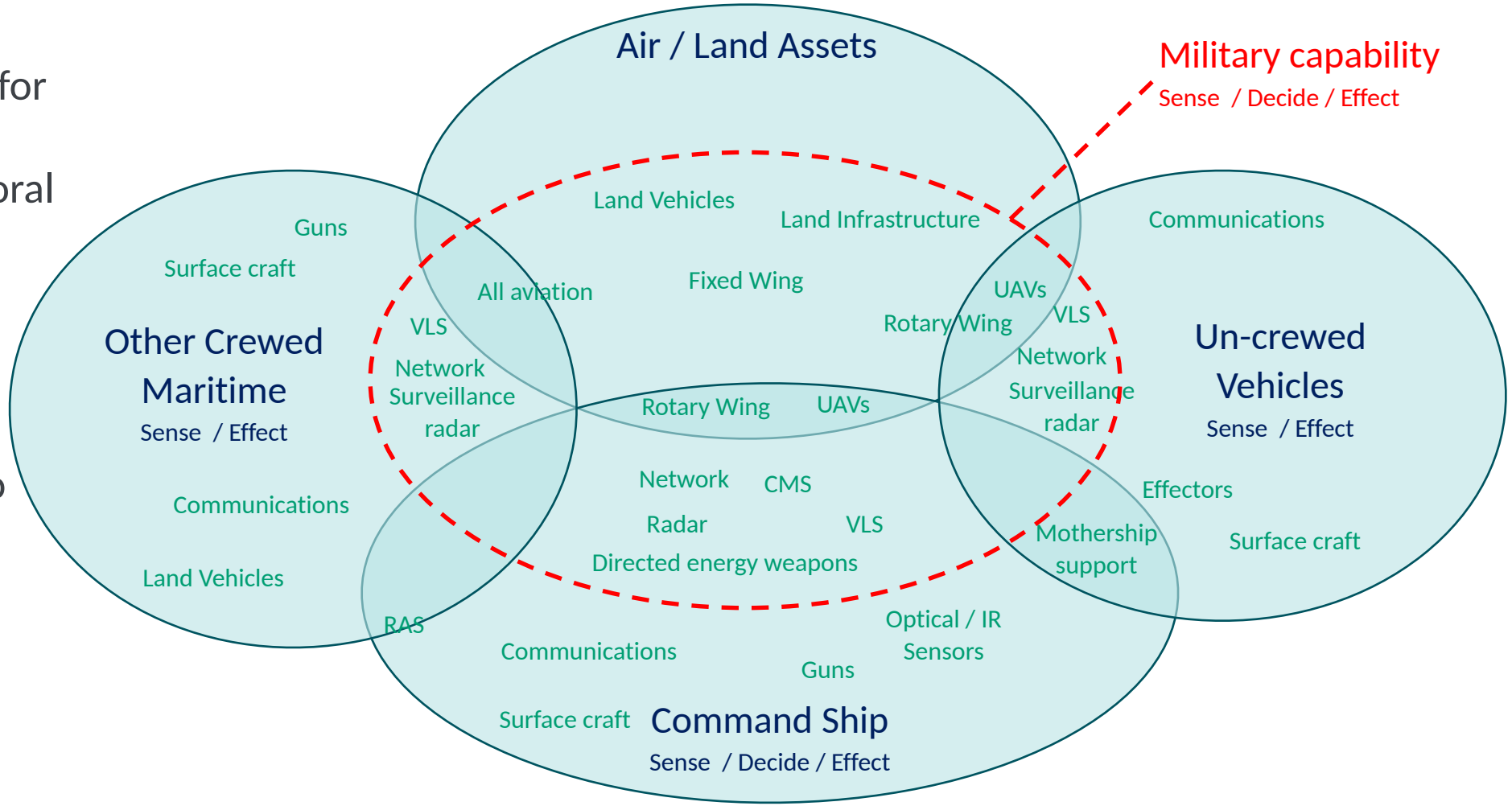
Focus areas:

- Autonomy
- Decarbonisation
- Digital
- Manufacturing
- Supply chain

World events has accelerated the need for change

Centralised evolving to Distributed

- Distributed capability for anti-air warfare, mine countermeasures, littoral strike
- Layered defence, or “horses for courses”
- Networking
- Adaptability – quick to deploy
- Interoperability NATO physical (L&R, boats, aviation, UAVs)



Networking and interoperability for dispersed capability, using multi-function naval ships

Optimised vs Traditional Crewing

Optimised crewing

- Increased automation (& UPC)
- Culture for damage control

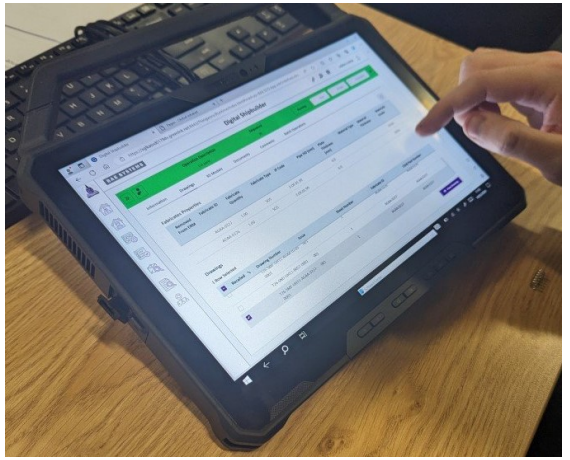
Traditional crewing

- Crew-in-the-Loop
- Resilience at long term high tempo

Automation and cultural change are all required to optimise crewing, while retaining the ability to surge

Design for X

Design for Capability
- Ship safety
- Adaptability
- Survivability (cost-effective)



Design for Build
- Build safety
- Infrastructure (new build hall, panel line, digital shipbuilder)
- Pre-launch outfit (modules, lock out,
- Procurement

Design for Support
- Access
- Removal routes
- Working at height
- Spares
- Future support strategy

Design for Cost
- Build strategy
- Design strategy (co-operation, toolsets, communication)
- Supplier involvement (design, data, services)

Maximising value for money for customers is a multi-faceted challenge that requires tempo in ship design

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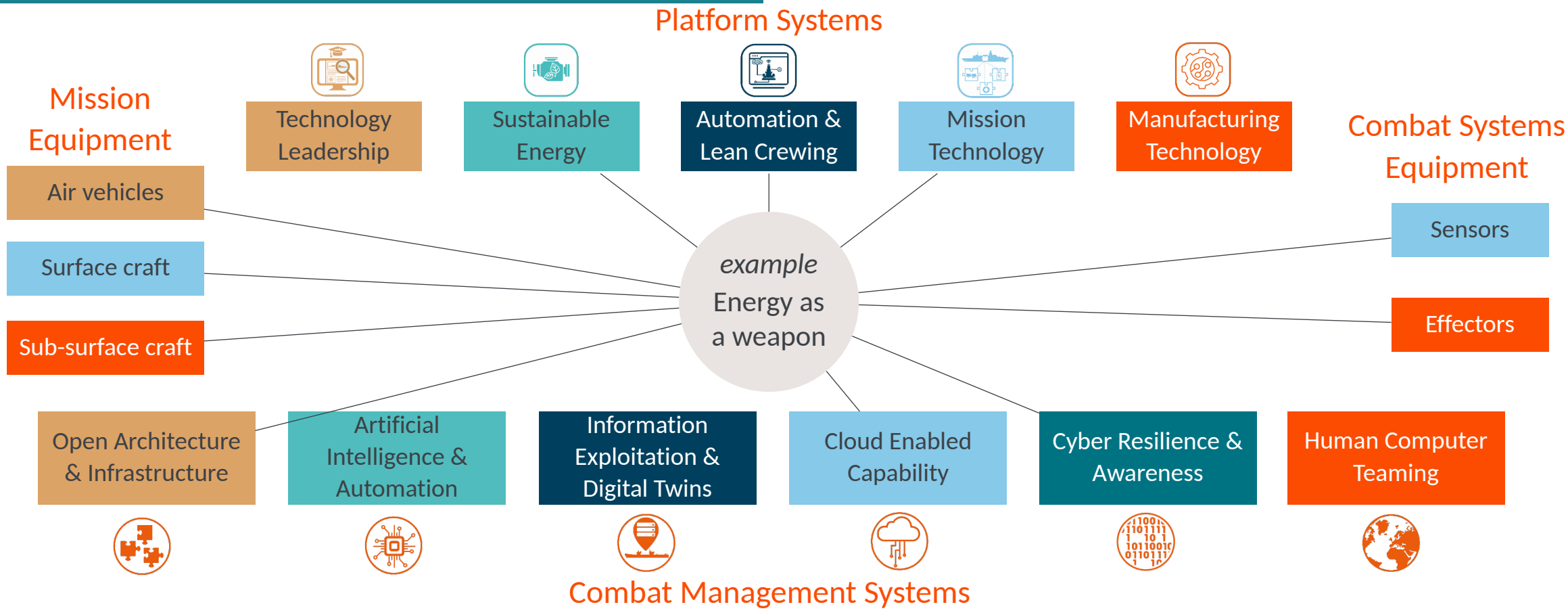
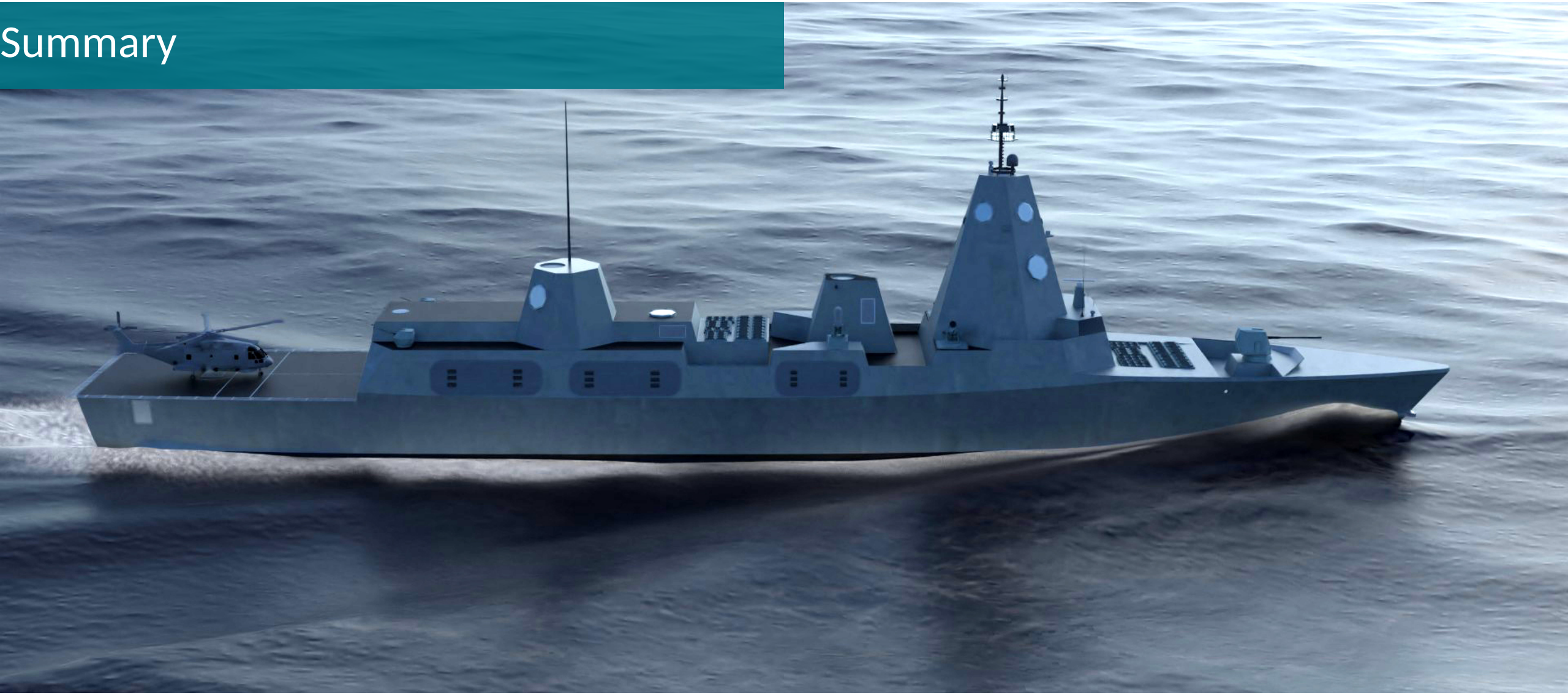
Naval Ships Technology example



Achieving multi-discipline aspirations requires new forms of co-operation between suppliers

Summary



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