



Algorithm Exploitation for Defence

An industrial viewpoint and steps to success

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AEUK/15/2108

...a sound decision

 **ATLAS ELEKTRONIK UK**
A company of the ATLAS ELEKTRONIK Group

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ATLAS ELEKTRONIK UK

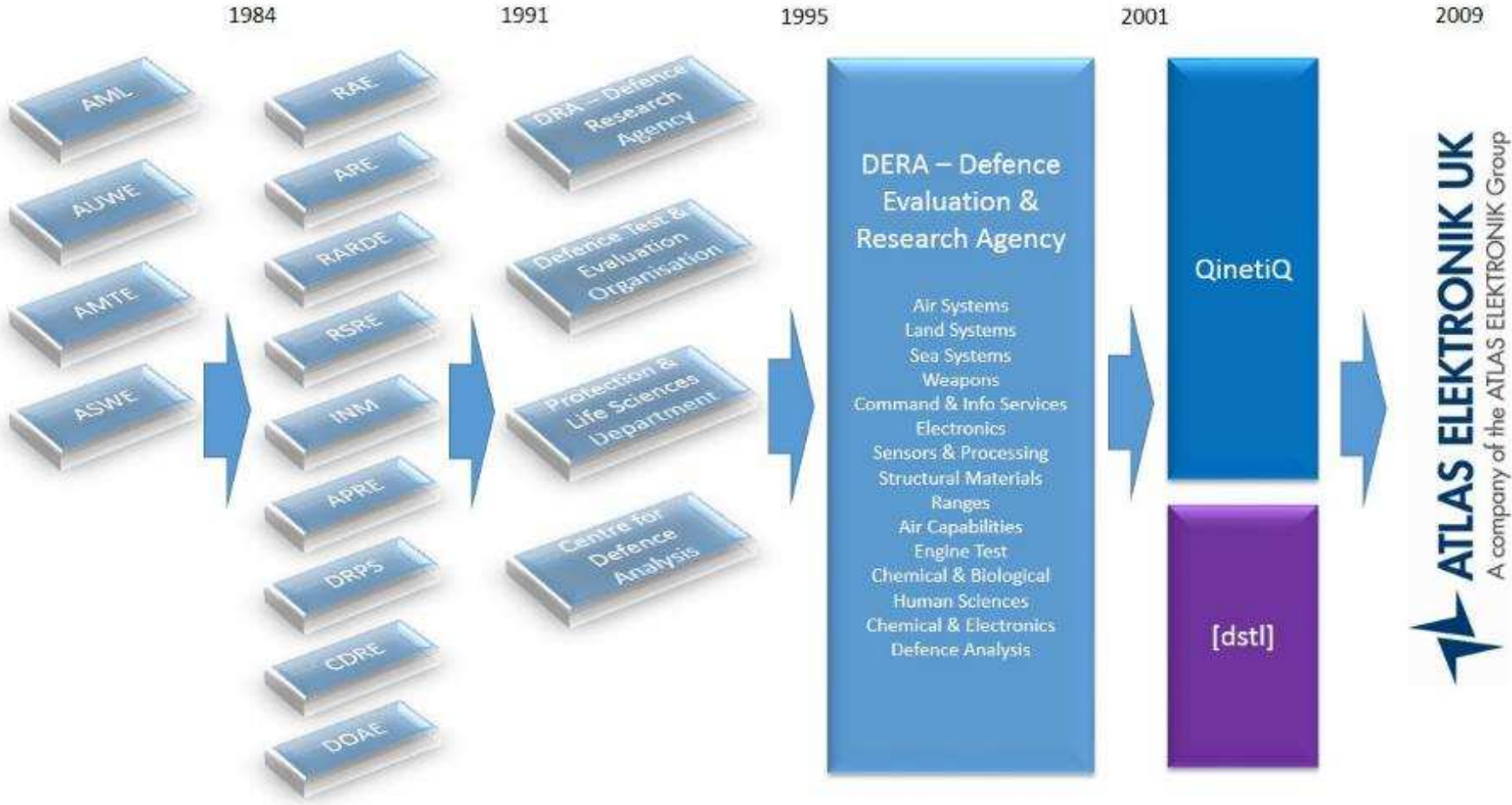
“Leading supplier of new technology for underwater systems”

“Since 2009 our company has transitioned from being a traditional R&D house to one having a balanced portfolio of R&D, technology demonstrators, products and their associated support. We are proud to have made this transition in both the UK and international markets.”



AEUK/15/2108

ATLAS ELEKTRONIK UK Evolution – Our Heritage



ATLAS ELEKTRONIK UK

Surface Ships



Production & Infrastructure



Submarine Systems



Engineering



MOD Research and Advice



Services & Support



Technology Exploitation – What does it mean?

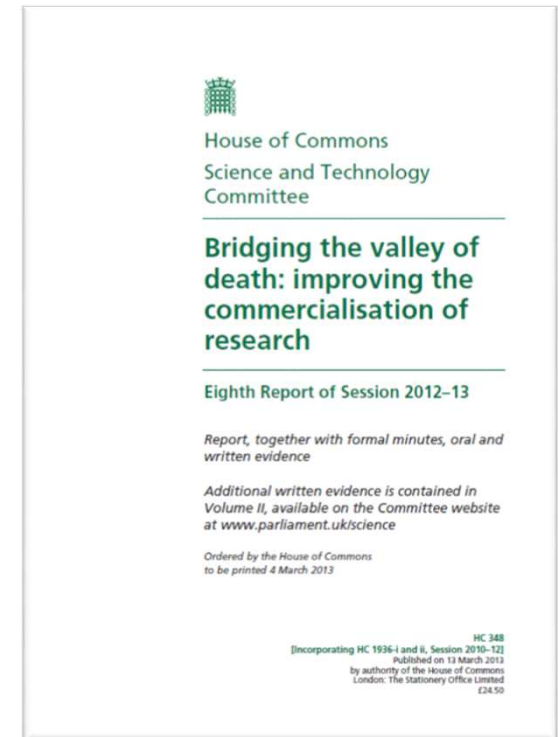
- Exploitation

- “The action or fact of treating someone unfairly in order to benefit from their work”;
- **“The action of making use and benefiting from resources”.**

- Technology / Research Exploitation

- The action of making use and benefiting from technology
- The ‘pull through’ of technology in to a fielded product or equipment

- The ‘Valley of Death’ and how to bridge it



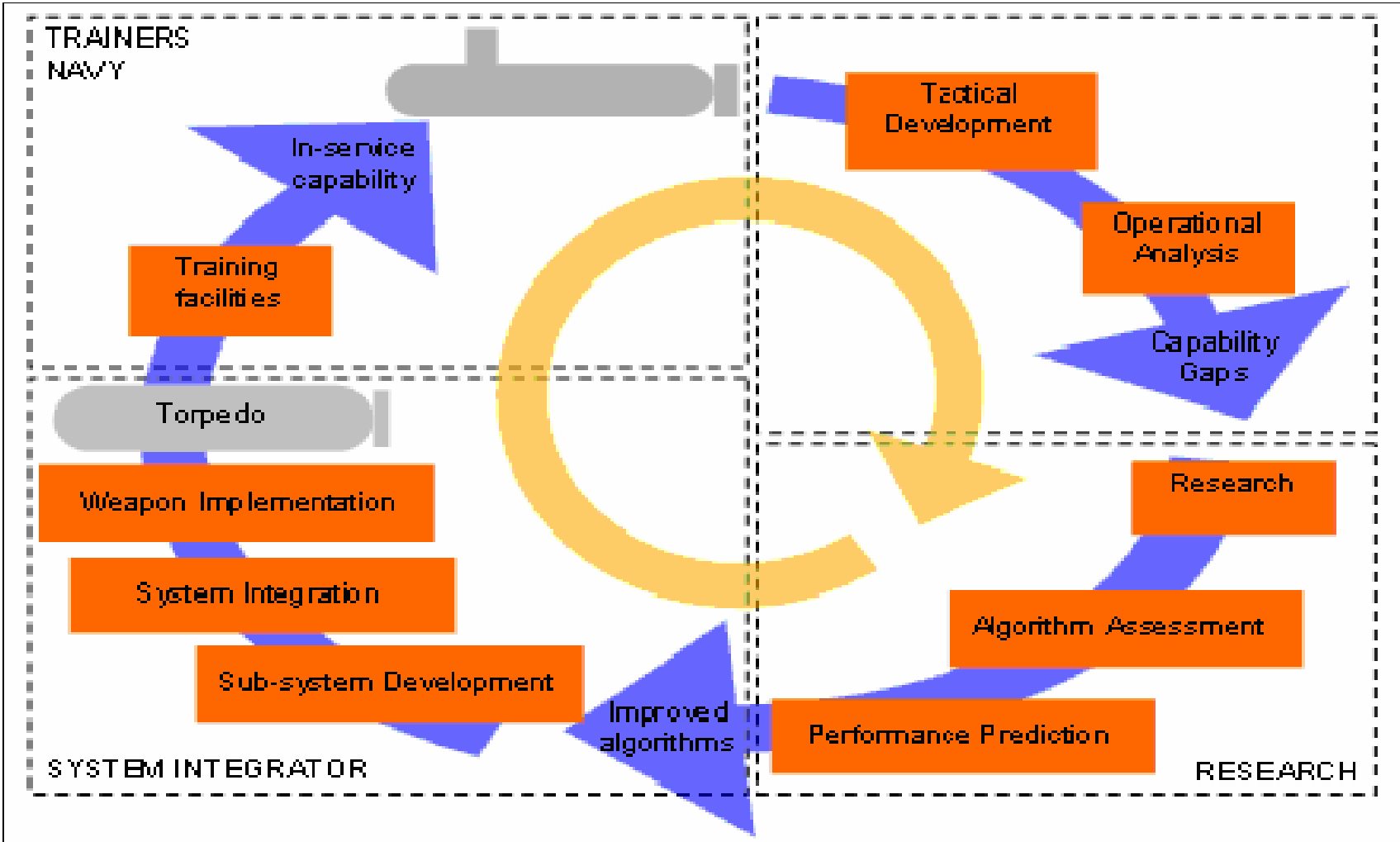
Technology Tension

- **Technology Sponsor**
- Political & Financial Support
 - **Return on investment**
 - Capability
- **Technology Adopter**
- Technology Pull
 - Profit vs Risk
 - Reliable performance
 - **Meets requirements**
- **Technology Supplier**
- Technology Push
 - Advanced technology
 - Up hold reputation
 - Maintain R&D funding
 - **Art of the possible**

“The Valley of Death”

“Technology Utopia”

Understanding the Technology Insertion Cycle



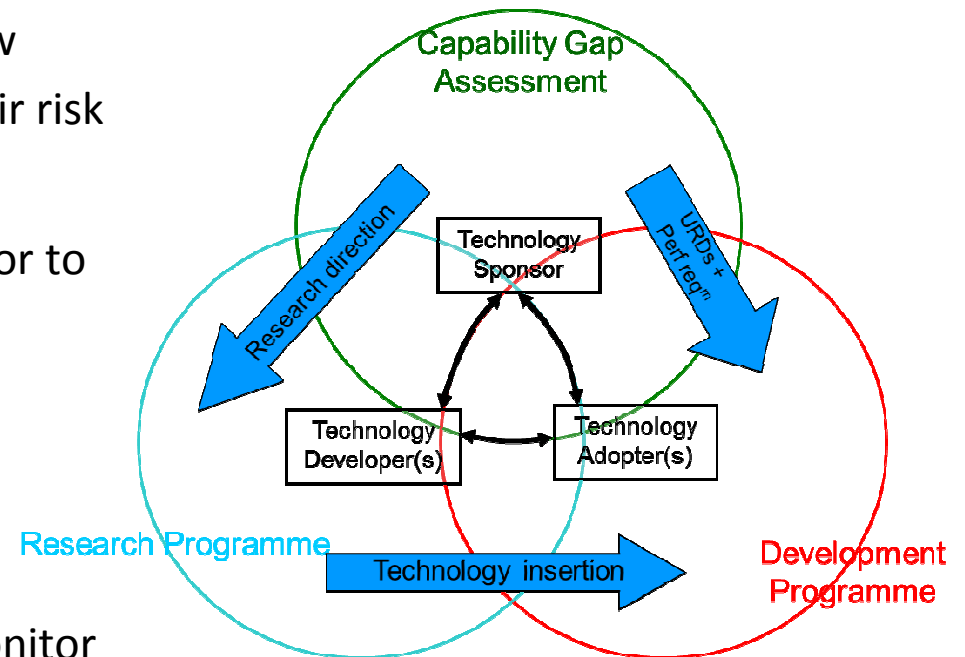
Steps to Success

- 1 – Vision
 - A clear vision of what is possible
 - A technology champion(s) the drive and direction to achieve the vision
- 2 – Relationships
 - MOD Customers
 - Capability Sponsor
 - DE&S
 - Dstl research customer
 - System Supplier



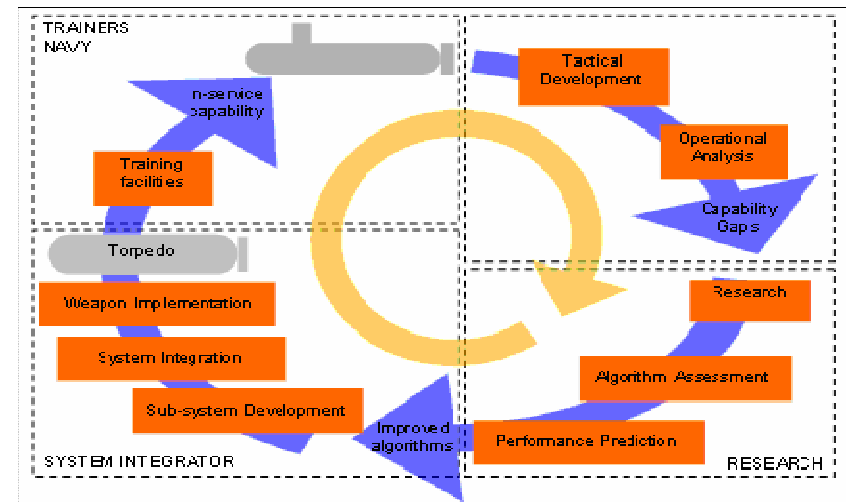
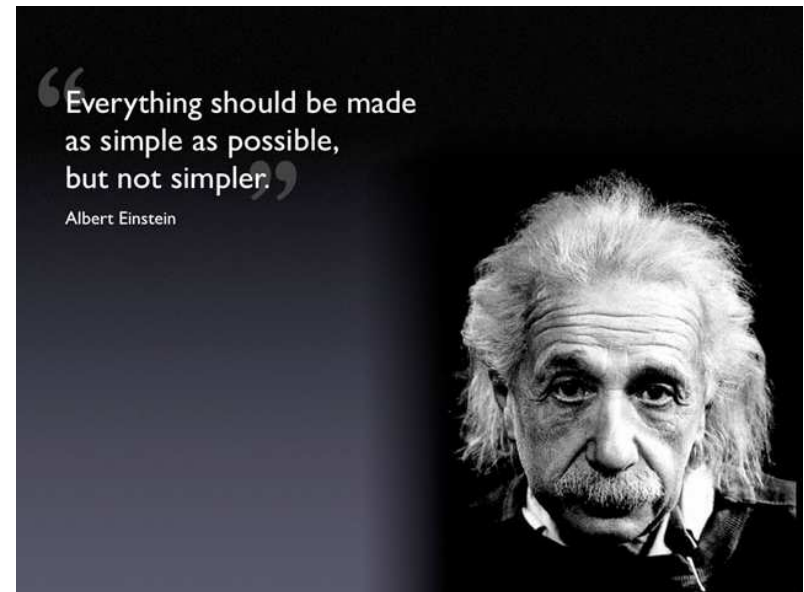
Steps to Success

- 3 – Influence requirements
 - System suppliers will only take on a new technology if it is needed to reduce their risk to meet the requirements
 - Demonstrate the art of the possible prior to the business case / requirements being developed
- 4 – Use an technology exploitation framework
 - Discuss, quantify, agree, record and monitor
 - Stakeholder buy in
 - Influence requirements
 - Set the expectations early



Steps to Success

- 5 – K.I.S.(S)
 - Keep It Simple
 - Novelty does not always mean complexity
 - Complexity = Cost + Risk!
- 6 – Use common tools
 - Common tools across whole life cycle
 - Reduces re-development & re-work
 - Results can be directly compared
 - Benefits can be clearly demonstrated



Steps to Success

- 7 – Be prepared for dead-ends and delays
 - Some things just won't work
 - Some things are ahead of its time
 - But... It will probably be revisited when the rest of the world catches up
 - Some things will end up in an unexpected place!
 - Document and publish so we learn lessons and make the most of future opportunities



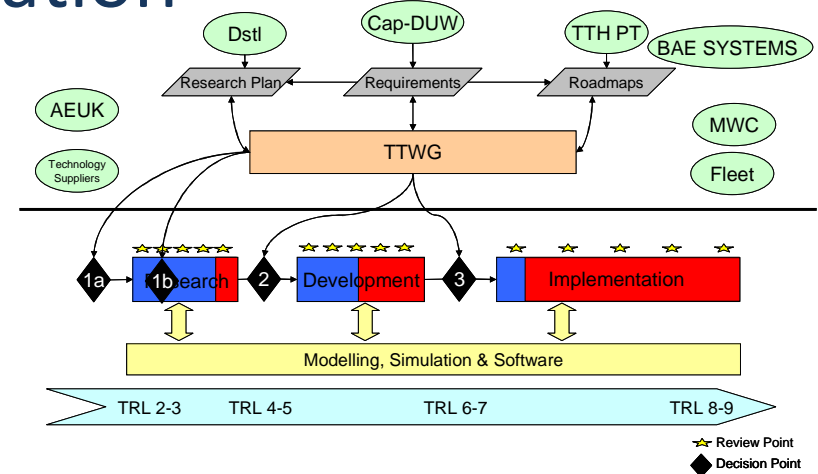
Case Study - Torpedo Technology Exploitation Process

- UK Torpedo Programmes
 - Spearfish Heavyweight Torpedo
 - Sting Ray Lightweight Torpedo
- AEUK are now key technology suppliers to Spearfish Upgrade
 - DSP Software
 - New Algorithms
 - Acoustic Stimulation
- So how did this happen?



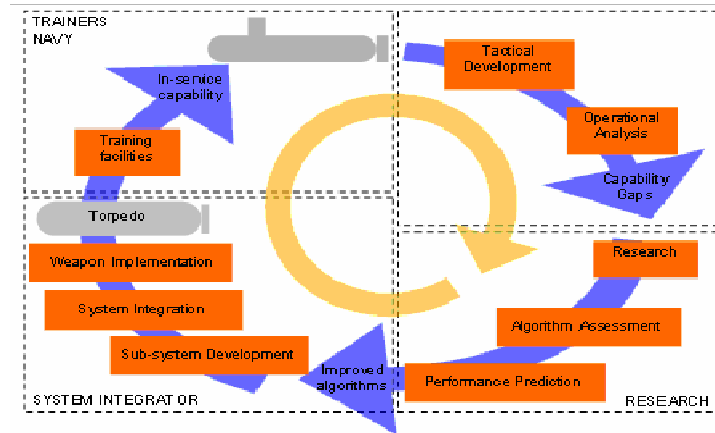
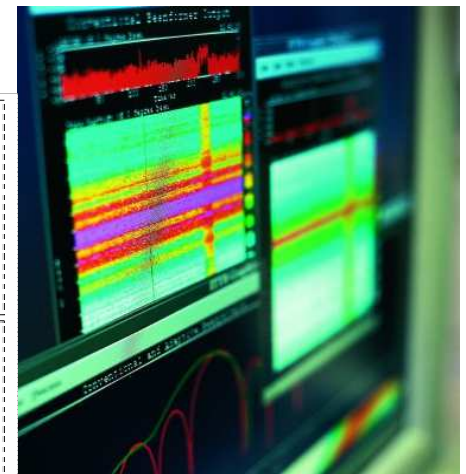
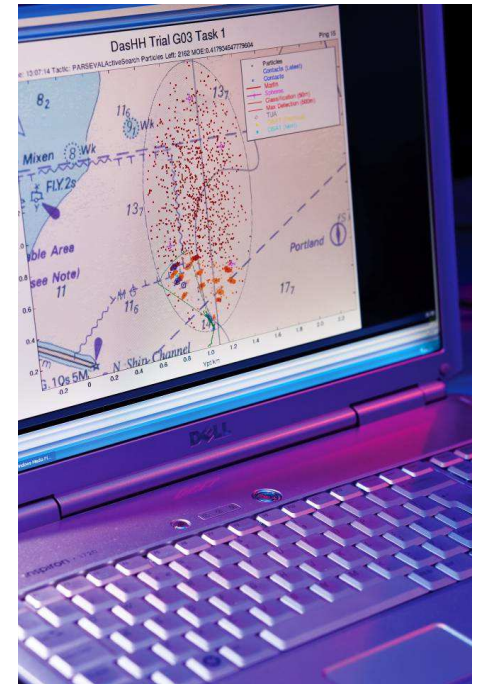
Torpedo Technology Exploitation

- Relationships
 - Formation of TTWG
- Influence requirements
 - Understanding capability gaps
 - Not developing technology in isolation
- Technology Exploitation Framework
 - Torpedo Technology Exploitation Process
 - Short, medium and long term planning
 - QFD analysis to aid algorithm selection
 - Provided an audit trail to link to requirements



Torpedo Technology Exploitation

- K.I.S.(S)
 - Novel configurations of existing algorithms
- Use common tools
 - Nereus, ODIN used throughout lifecycle
 - Torpedo Algorithm Database
 - DasHH Demo
 - Open System Architecture



Torpedo Technology Exploitation - Result

- Algorithms & technology successfully transferred from research to equipment
- AEUK
 - Robust business
 - Maintains our expertise – can be applied to other projects
- Prime contractor
 - Meets requirements with best balance of cost & risk
- MOD
 - A capable system that meets the users operational needs
 - Return on S&T investment
 - Maintains UK Sovereign intellectual capability

Algorithm Exploitation for Defence - Summary

- Algorithm Exploitation is an achievable challenge
- It won't happen by itself
- Relationships & Requirements are key



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