



Defence and Security
Accelerator



Home Office

PYRAMID for avionics and mission systems

Briefing and Q&A Session

14th November 2024



Innovation for a Safer Future

Agenda

Time	Item	Presenter
10:00 – 10.05	Welcome, Housekeeping, Introduction	Robert Hammond-Smith DASA Delivery Manager
10:05 – 10.15	Introduction to DASA	Andrew Peaty DASA Innovation Partner
10:15 – 10.40	Competition Background and Details	Mike Lane RAF Rapid Capabilities Office
10.40 – 10.45	Break - opportunity to submit questions via Slido website sli.do , code #DASACOMP	
10:45 – 11.25	Question & Answer Session	Competition Team
11:25 – 11.30	Wrap Up	Robert Hammond-Smith DASA Delivery Manager

Housekeeping

- Welcome to today's Briefing and Q&A for the new DASA competition:PYRAMID for avionics and mission systems
- Please note your camera and microphone will be kept off.
- The slides and the anonymised questions and answers will be uploaded afterwards to the DASA gov.uk website.
- Discussions will remain at **OFFICIAL**.
- Q&A session will take place after via Slido. To access, go to the website www.sli.do (on a separate tab or device) and enter the code **#DASACOMP**.



Submitting Questions

Please submit or upvote any questions via slido



Scan above, or go to the website sli.do and enter the code #DASACOMP



Introduction to DASA

Andrew Peaty

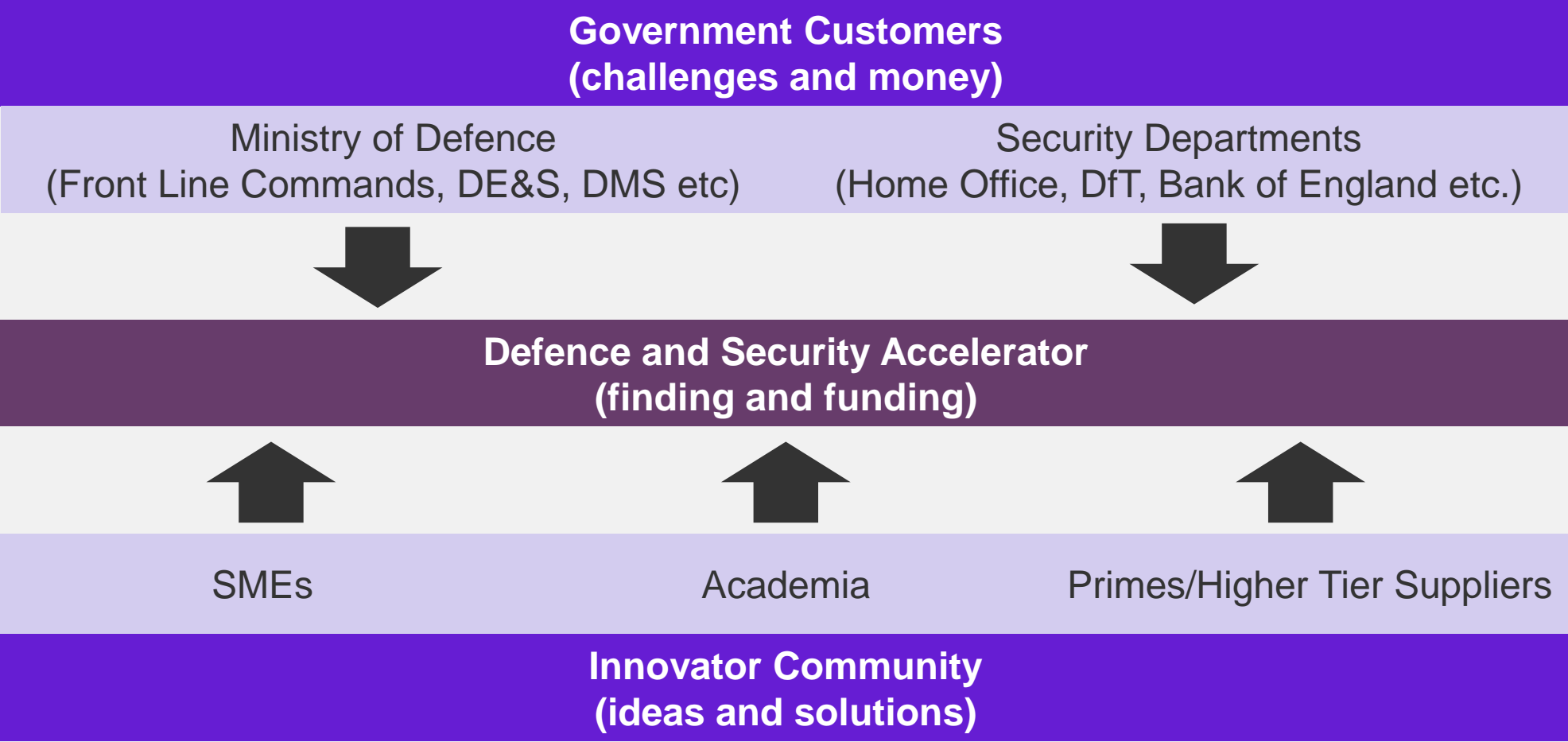
DASA Innovation Partner



Our Mission

The Defence and Security Accelerator (DASA) finds and funds exploitable innovation to support UK defence and security quickly and effectively, and support UK prosperity.

How do we work?



Since 2016...



125

Funding
Competitions



629

Innovators
Supported



1547

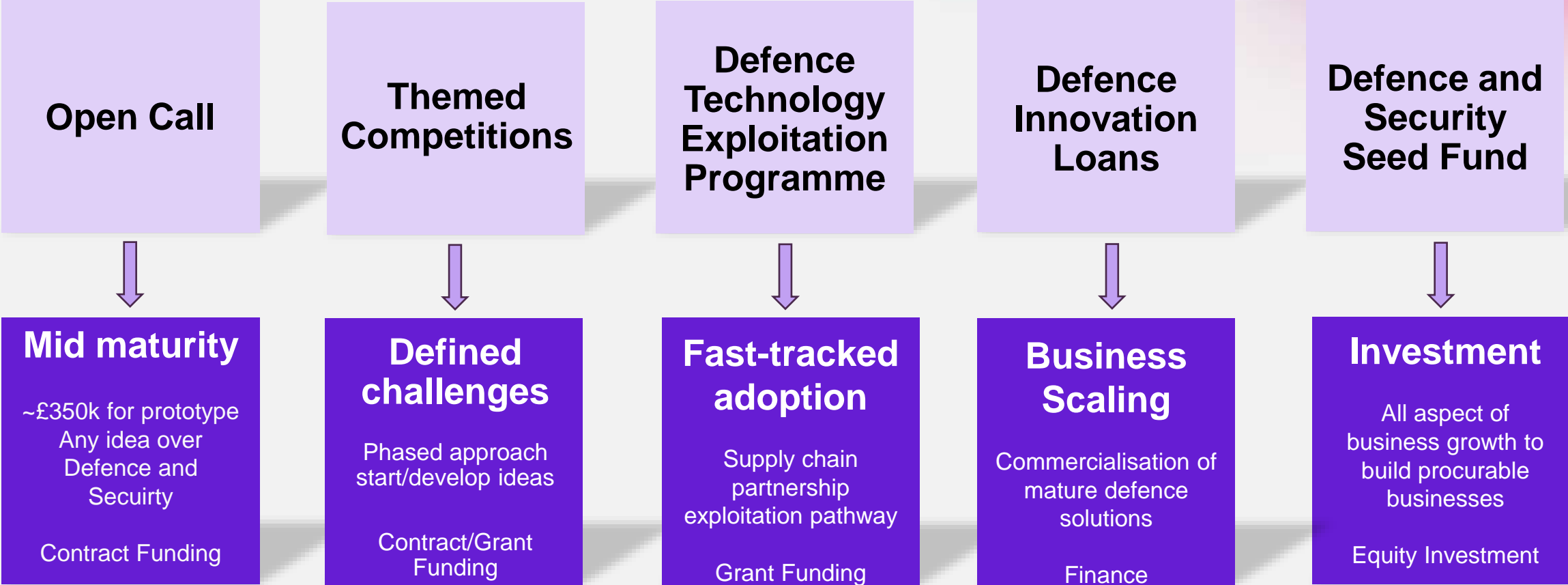
Ideas
Accelerated



£292m

Invested in
innovation

Funding Innovation



Meet the team



Andrew Peaty
West Midlands

Jas Shanker
East Midlands

Clare Green
Yorkshire &
Humber

Duncan Sime
North West

Anna Taylor
North East

Mike Madden
South West



Mark Helliker
South East

Ralph Wilkins
London

Vicki Savage
East of England

Tom Adamson
Wales

Deb Carr
Scotland

Tony Collins
International



DASA Launch - PYRAMID for avionics and mission systems.

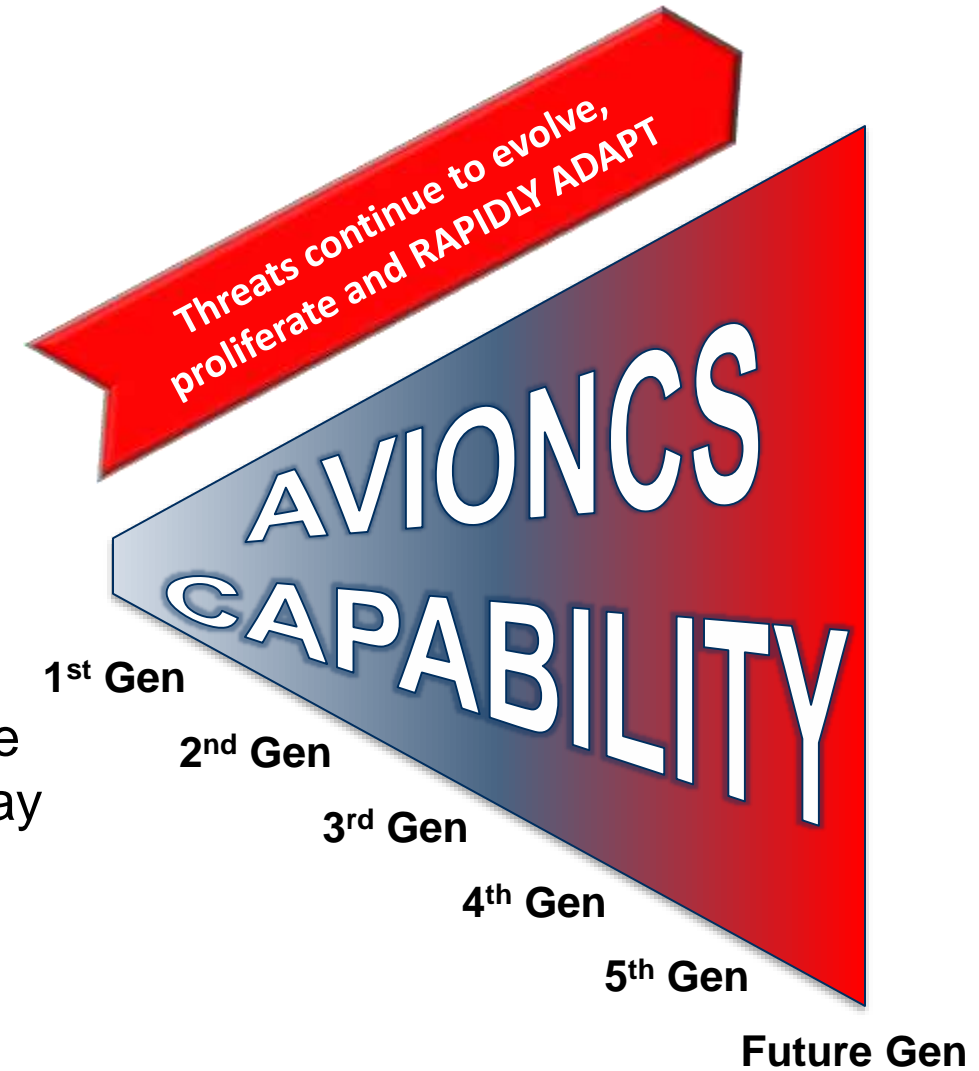
Mike Lane
14 Nov 2024



- PYRAMID is fundamental to the UK MOD's strategy for modular open systems across air programmes to enable rapid adaptability and military advantage.
- Over £200m invested, proven approach, demonstrated to align with key international standards and approaches, compatible with safety and security regulations, provides significant though life benefits, full training course developed, selected for FCAS/GCAP in partnership with Japan and Italy, and is being assessed for other major national and international programmes.
- Focus is now on widespread adoption

This DASA competition provides a tremendous opportunity to support your transition to PYRAMID for new and existing products

- ‘Open Systems Architectures’ proposed as solution to majority of avionics concerns for 30 years plus (but ‘openness’ alone was not always the problem).
- Numerous lab demonstrations, standardisation activities (including ASAAC), research initiatives but each only provided a small step forward.
- Projects were typically based around the requirement for ‘reduced through life costs’ – and the spend to save arguments were generally not successful.
- Technologies to enable obsolescence management and the introduction of new capability were determined to be the way forward.
- **Modularity** was identified as a critical enabler.



- Hardware abstraction (through API standards including ASAAC, POSIX, ARINC 653 and FACE) supported hardware obsolescence mitigation.
- ...but more and more capability was being provided by software and avionics/mission systems applications were growing fast (30m lines of code predicted for FCAS).
- Changes to the software (already a problem) was becoming an even bigger problem.
- Modular (ideally containerised) software was required and UK/France invested in ECOA (European Component Oriented Architecture).
- Middleware solution developed.
- Standard released and freely available.



- But it was recognised that a **Reference Architecture** would enable consistent separation of functionality.
- The concept of PYRAMID emerged in 2014 .
- PYRAMID had a different starting point to predecessor ‘OSA’ projects – technology advantage through ‘Rapid Adaptability to Enable Through Life Capability’.
- It also set out to not just deliver a technical solution, but address all aspects required for successful adoption – and it was properly funded (circa £200m) with an engineering team 150 strong.
- In 2022 PYRAMID moved into the ‘Transition Phase’, with a focus on national and international adoption.
- **This DASA competition is in direct support of this.**



Message from Chief of the Air Staff



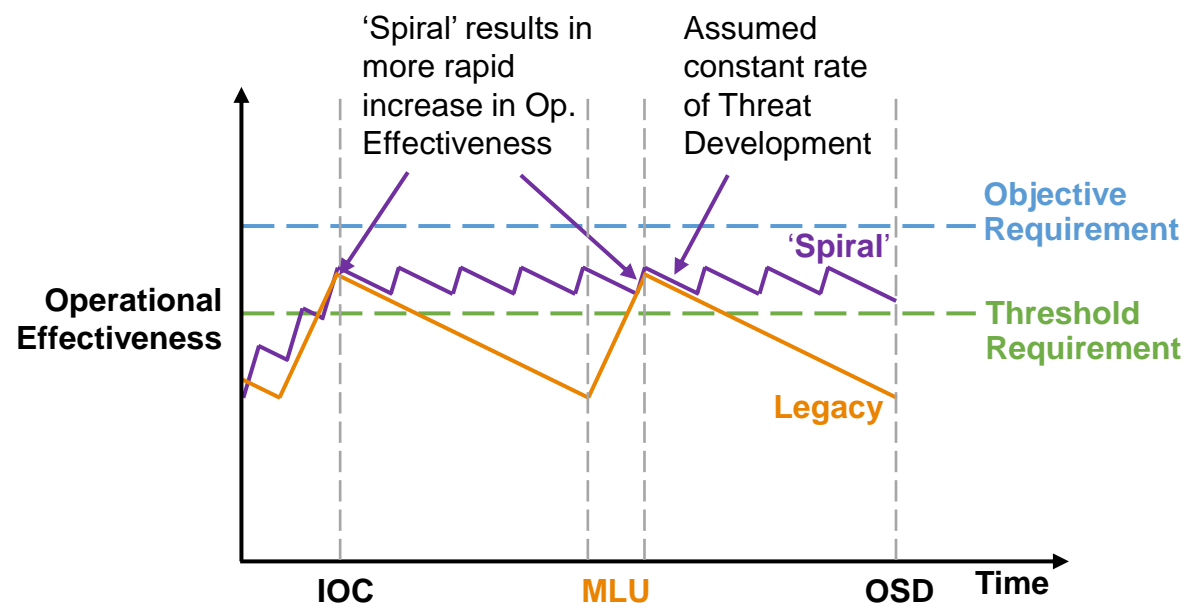
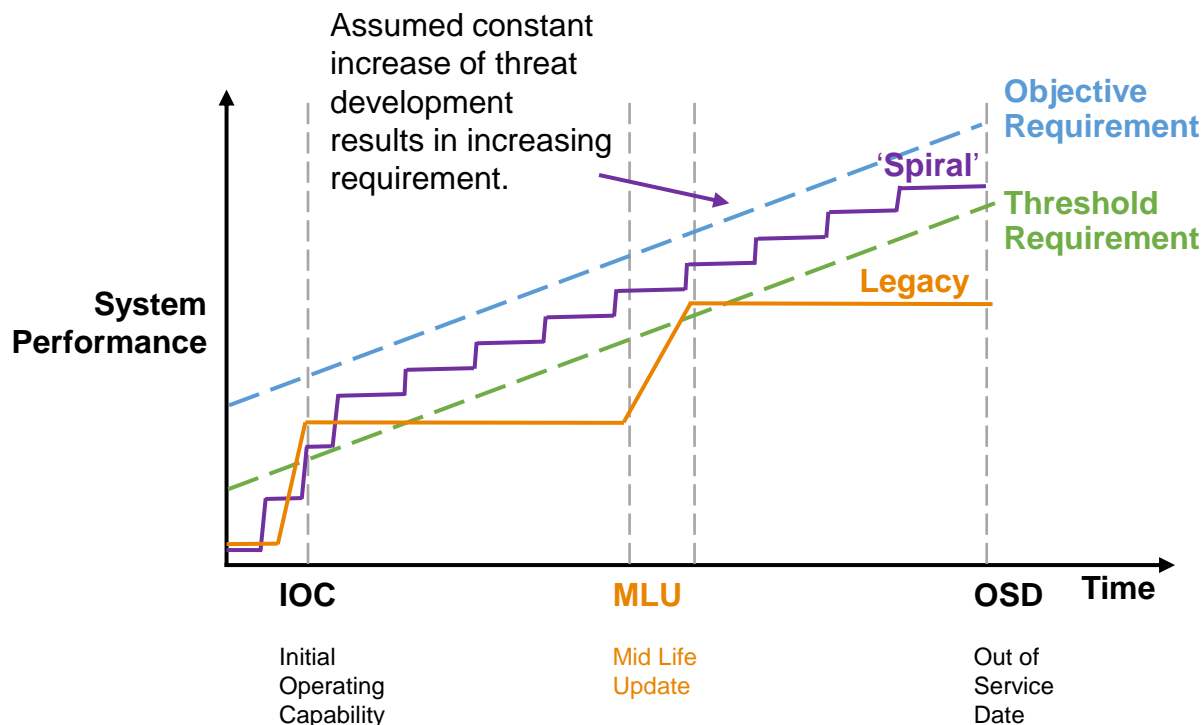
[Air Chief Marshall Sir Rich Knighton – Chief of the Air Staff](#)

Spiral Development – Operational Effectiveness and System Performance



‘Spiral’ would deliver higher average Operational Effectiveness, driven by a greater number and a higher frequency of updates & upgrades, focussed on specific threat developments and enabled by ongoing technology development/maturation.

‘Spiral’ would deliver a higher number (& *rate*) of **functionality & performance** increments, leading to an ongoing increase in overall **System Performance** to counter the Threat and to overcome obsolescence issues, etc.



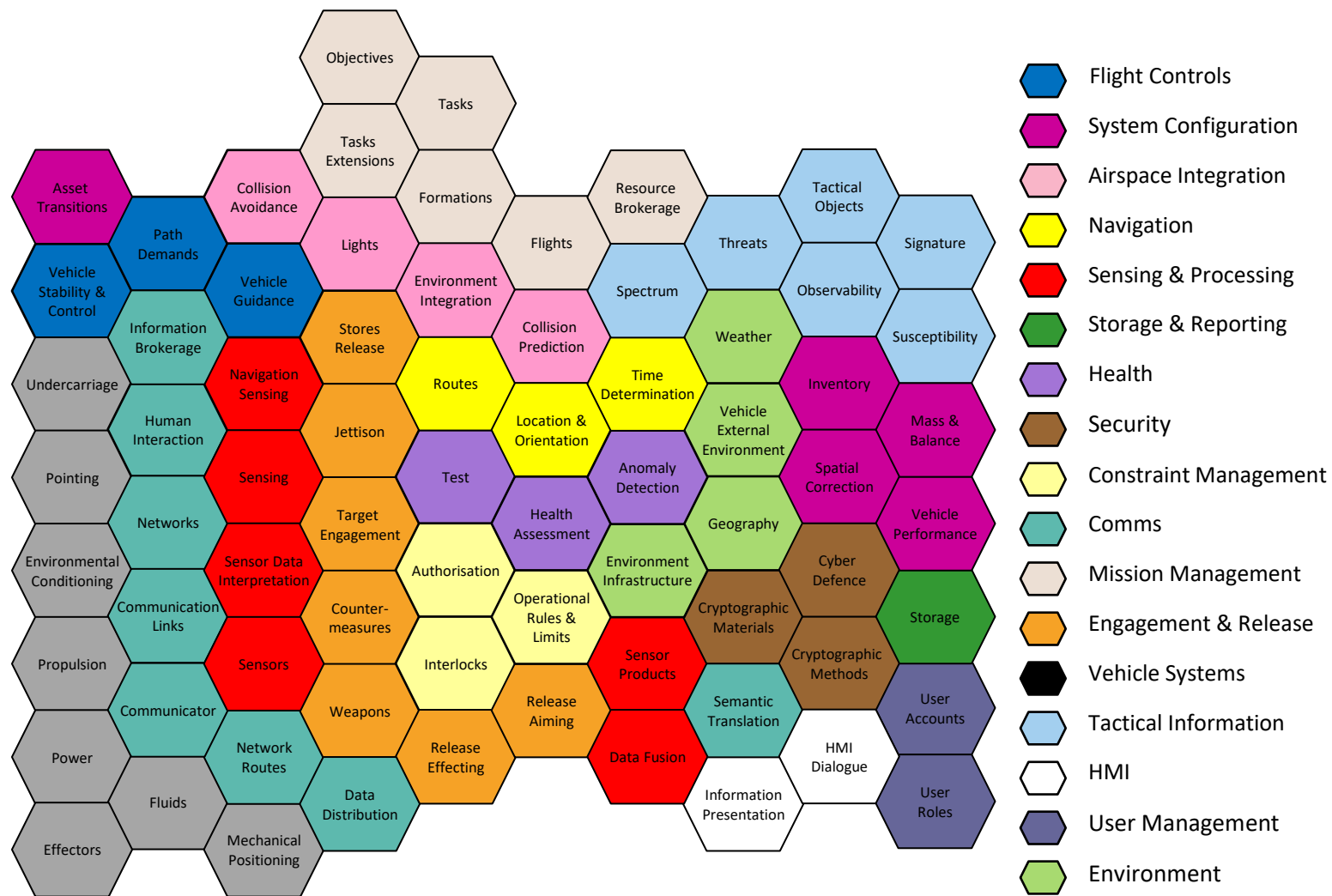
PRA Component Set



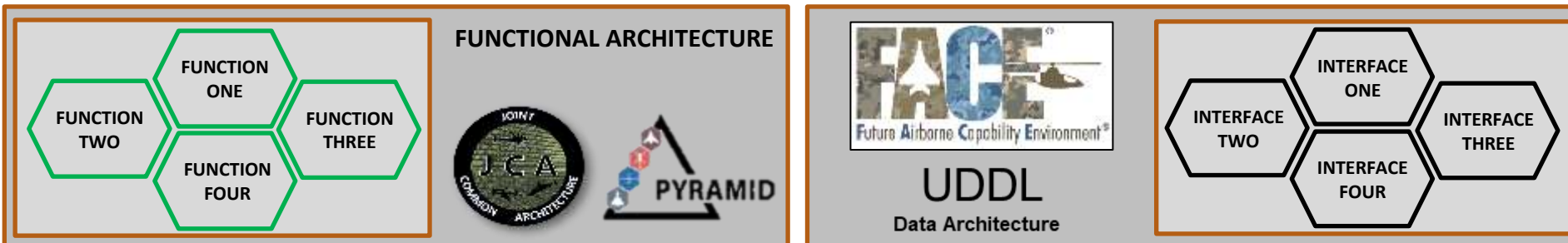
The components in this diagram have been aggregated into traditional systems/sub-systems.

- This is done purely for illustrative purposes to aid reader orientation.
- There is no particular meaning behind where components are relative to other components on the diagram, nor is any component necessarily restricted to only being used in one super domain.

Note: The PRA Component set shown is from PYRAMID Exploiter's Pack Issue 4



ARCHITECTURE FRAMEWORK



INTERFACE



INTERFACE

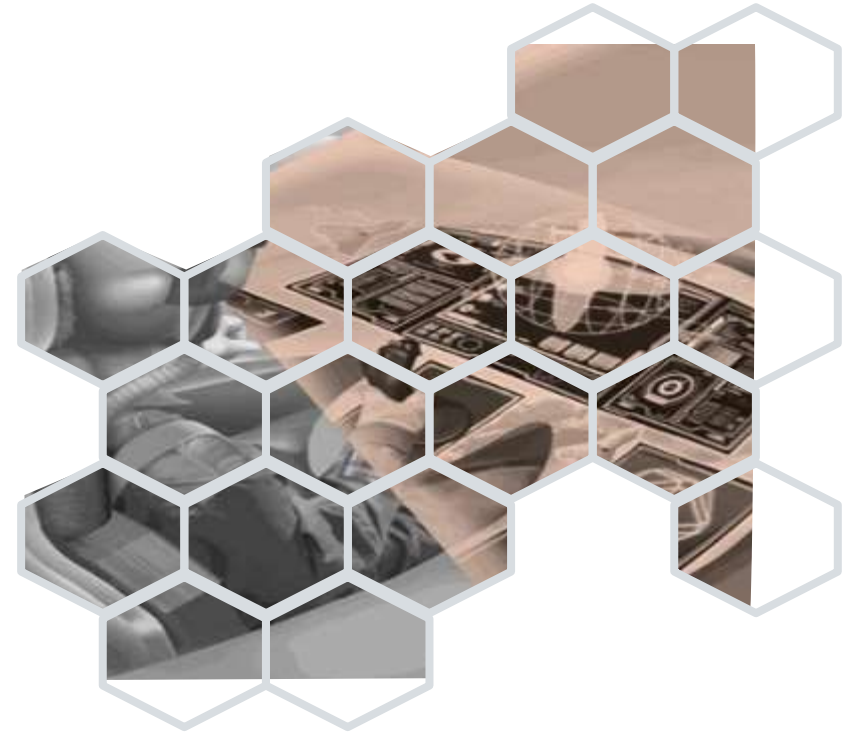


What we have achieved and what we need to do

- PYRAMID Technical Standard developed with associated guidance (currently called the PYRAMID Exploiter's Pack – due to change to PYRAMID Technical Standard in January 2025).
- Approach proven in lab and real developments, demonstrated to align with international standards, be compatible with safety and security regulations to provide significant though life benefits, full training course developed, and has been selected for FCAS/GCAP in partnership with Japan and Italy.
- In 2022 we moved into the transition phase with the focus from moving from 'in-development' to 'in-service'
- Whilst some funding is going into maintaining the documentation and providing training, the focus is on supporting national and international adoption on real programmes (this is how MOD and industry will see the benefits)
- **This DASA competition targets this adoption**

PYRAMID has been 100% funded by MOD and the ownership of IP and User Rights is managed to ensure that MOD's strategy for adoption and exploitation, and that of our partners and allies, are not constrained.

- **MOD IP ownership for the Exploiter's Pack and PRA Model** – the documentation and material required to develop PYRAMID compliant software.
- PYRAMID documentation available at: <https://www.gov.uk/government/publications/pyramid> released under Open Government Licence.
- Specific IP questions should be raised either through the DASA Help Centre (accelerator@dstl.gov.uk quoting the competition title) or through your DASA Innovation Partner.



*PYRAMID adoption is only for UK MOD aircraft. **Not True***

*The PYRAMID Technical Standard is OFFICIAL SENSITIVE and requires signing a complex licence. **Not True***

*PYRAMID compliant systems/sub-systems cannot be integrated into/with non-PYRAMID systems. **Not True***

*PYRAMID is not compatible with other open system standards. **Not True***

*PYRAMID is owned by UK primes. **Not True***

*PYRAMID is only open to organisations within the United Kingdom. **Not True***

*Adopting the PYRAMID technical standard is complex and cost prohibitive. **Not True***

*UK MOD will assume ownership of the IP of PYRAMID compliant components developed. **Not True***

The Requirement (1)



- Details are in the Competition Document (no intention to repeat), but put simply the purpose/requirement is:
 - To provide funding to encourage industry adoption of PYRAMID for new or existing avionics/mission systems
 - thereby enabling MOD and industry to accrue the benefits
 - we accept that there are costs associated with a new approach, and there is some inertia with 'how things are', so we have offered training, engineering support and now some funding to contribute to doing what 'you were going to do anyway but using PYRAMID'
- The funding is **not** for the development of your products, as such.

The Requirement (2)



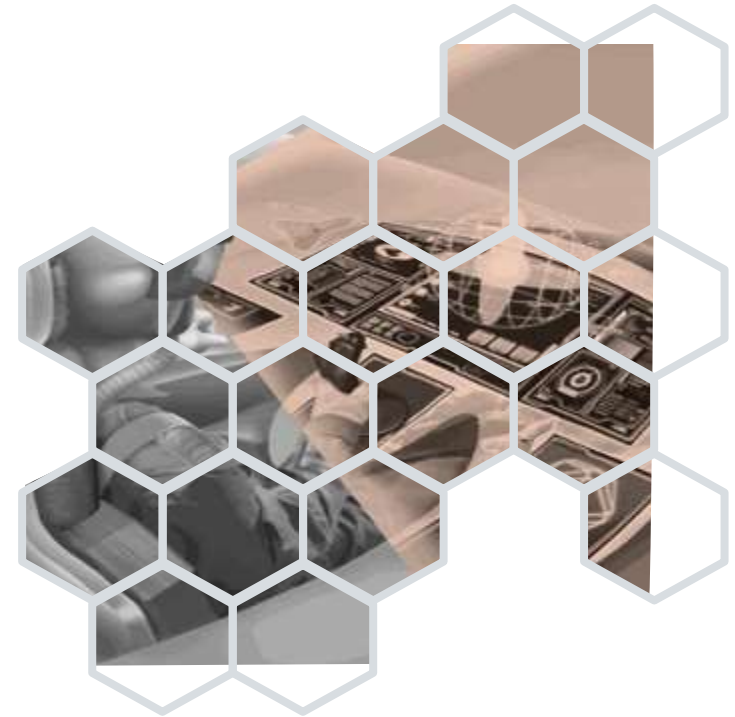
- Provide feedback on your experiences to inform updates to:
 - The Technical Standard and Guidance
 - Training Material
 - The PYRAMID government website
- Whilst not a direct requirement, promotional material and briefings regarding your adoption of PYRAMID would be welcomed
- Classification
 - The PYRAMID Technical Standard, Guidance, and Training material are all OFFICIAL - and need to stay that way so proposed changes must be the same classification
 - Lessons learnt during the application of PYRAMID may well be commercially sensitive but still of interest to MOD
 - Actual software developed may well be (S)

- In addition to standard contract reviews/discussions, the PYRAMID Query Management System has been established to answer specific questions regarding PYRAMID
- Practitioner's Training has been developed (face-to-face and E-Learning), and it is the intention to provide a level of training if required
- Engineering Support – where appropriate, engineering support from 'PYRAMID users/experts' may be requested and MOD will try to make this available through an existing contract

Questions and Discussion

For further information on PYRAMID visit:

www.gov.uk/government/publications/pyramid



Submitting Questions

Please submit or upvote any questions via slido



Scan above, or go to the website sli.do and enter the code #DASACOMP



Closing remarks

- Thank you for attending this Q&A event
- The slides from today's event along with the anonymised questions and answers will be uploaded to the competition page on the gov.uk website in the coming days.
- If you still have questions that you do not want to ask in this open forum we invite you to book a 1 to 1 session with the customer team. Please supply us with as much information as possible when booking your session so that we can make sure the correct people are on the call.
- Slots are available on: -
 - 1 to 1 Session **Friday 22 November 2024**
- The link to these sessions can be found on the competition page on Gov.uk and booking will be possible from tomorrow.



Contact us



www.gov.uk/DASA



@DASAccelerator



accelerator@dstl.gov.uk



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01980 950000 option 3

Thank you for attending!

We look forward to receiving your submissions by
12:00 hrs (GMT) on Thursday 14th January 2025.