



Networks and Sensors in Defence Applications

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The role of the RAO

Define -

Contract -

Manage -

delivery of the non-nuclear research
programme



Meeting Defence Needs

- Defined in terms of Capability - not Technology
 - Look for the most cost effective way
 - Through life
 - System integration / upgrade considerations
- Research Funding for Technology
 - Maintain awareness / evaluate emerging technologies
 - Support military specific applications
 - Risk reduce / demonstrate solutions to endorsed requirements
 - Develop / sustain skill and knowledge base



Disclaimer

- The possible applications mentioned or discussed in this talk are for illustrative purposes only. None of them refers to a current or planned endorsed capability need
- The purpose of the talk is to illustrate the thought processes and research and development route through which technology may be matched against need.

Possibilities for exploitation of networked sensors



- Monitoring cleared / sanitised areas
- Broad area threat surveillance (Persistent or short term)
- Remote area / route activity surveillance
- Synthetic Aperture / Array sensing
- Human performance monitoring (personal area network)

System / Technology considerations



- Size
- Specificity / Sensitivity
- Power source / drain
- RF Bandwidth / spectrum / range
- Requirement duration / device life / cost per use
- Self / mutual location & orientation
- Delivery method / weight / volume / obtrusiveness
- Robustness / Reliability / Tamper-resistance



For example

- Monitoring cleared / sanitised areas. (Silent Sentry).
 - An imaginary requirement
 - To provide covert and immediate warning to own forces operating within 1km of any activity in areas potentially open to hostile forces but previously searched and found to be free of threat .
 - Placed rapidly on completion of search.
 - Minimal / no evidence of presence
 - No post-deployment recovery
 - At least 8 hours of unsupported automatic operation



Considerations - device

- Disposable = Cheap
- Unobtrusive = Small (or disguised)
- Rapidly deployable = Robust, self-initiating
- Detection mechanism
 - Thermal, acoustic...
 - Autonomous, co operative
- Power supply and use
 - Battery, fuel-cell, harvesting
 - Always on vs wake up



Considerations - system

- Number / density
 - Range & sight-line vs distribution density and pattern / randomness
- RF range, connectivity, compatibility, vulnerability, covertness
- Network needs / constraints
 - Local and broad area.
- Warning declaration granularity / specificity / confidence



Road-mapping

- Can't answer all the questions in one go.
 - Plan for growing Technology and System readiness level
 - Road-mapping moves through
 - feasibility,
 - options identification
 - down-selection
 - technical demonstration
 - production
 - Introduction to service
- www.ams.mod.uk/ams/content/docs/trm/trm.pdf
or Google: MoD roadmapping



Getting on the map

- Competition of Ideas
- Defence Technology Centres
 - Electromagnetic Remote Sensing (EMRS)
 - www.emrsdtc.com
 - Data and Information Fusion (DIF)
 - www.difdtc.com
 - Systems Engineering and Autonomous Systems
 - www.seasdtc.com
- Network and Information Sciences International Technology Alliance (NIS ITA)
 - http://domino.research.ibm.com/projects/titans/www_titans.nst/pages/about/html
 - Or Google “ ibm ita “



Competition of Ideas

- Aims are to:
- Increase access to invention and innovation, by:
 - Using processes and language that more people understand
 - Describing broad areas of defence need in ‘problem space’
- Provide a better mechanism for responding to people or organisations with ideas

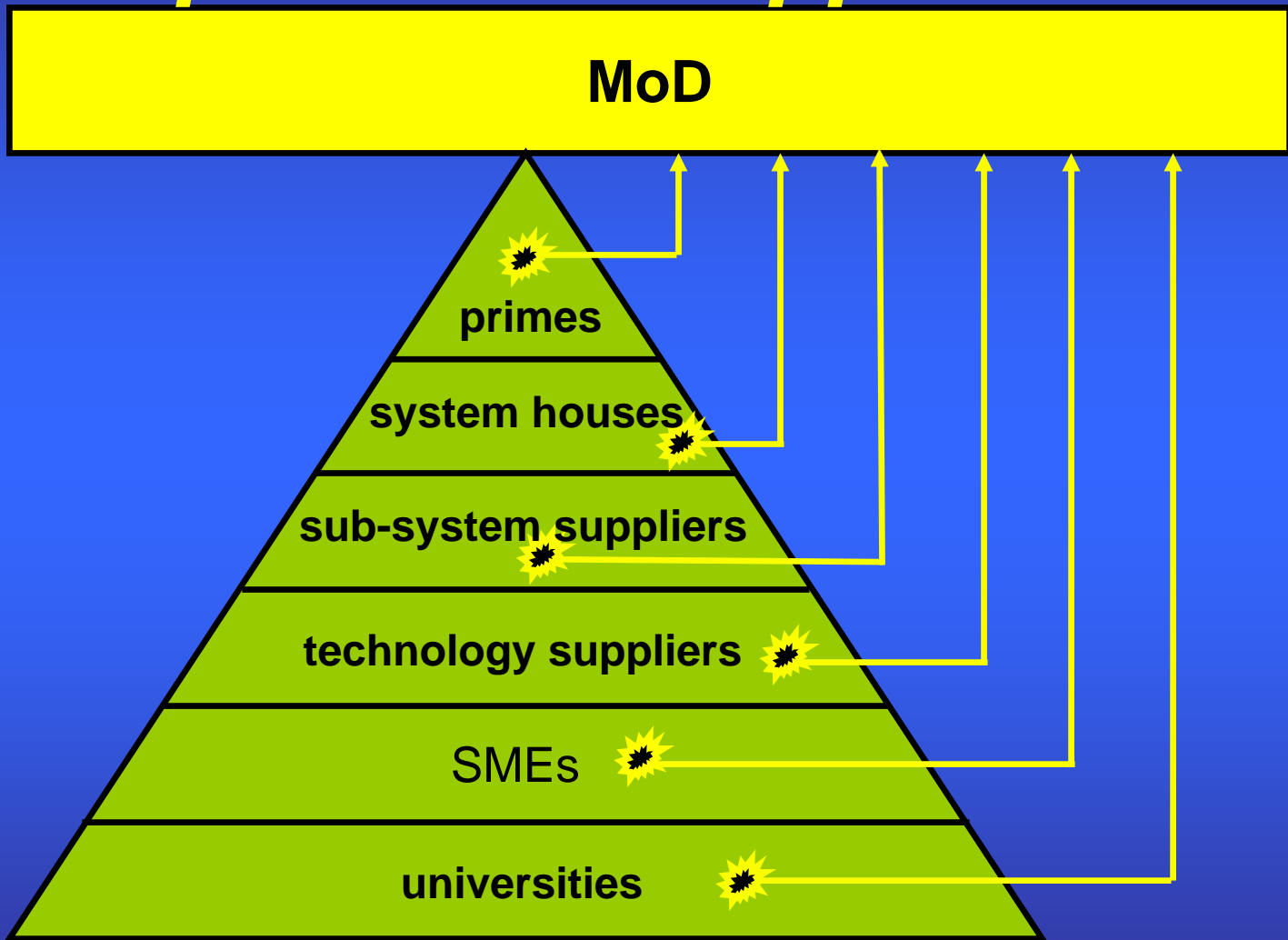


Competition of Ideas

- A process to gather, assess and exploit good ideas
- An opportunity for suppliers/partners large and small to make proposals for MoD funded research
- MoD will guide but not constrain scope and topics
- Single process across research programme
- Proposals (short) judged against clear criteria such as utility to defence, innovation and potential exploitation
- Proposals judged best will be funded



Open to All Suppliers





Competition of Ideas

- One element of wider procurement strategy
- Does not substitute for supply chain management
- But it will:
- Inject targeted investment to kick-start important innovations
- Stimulate innovation throughout the supply chain
- Help innovators understand and connect with MOD's supply network



Competition of Ideas

- Call for Proposals against four themes:
 - Prediction of Intent
 - Automatic Object Recognition
 - Ad-hoc Networks
 - Protection
- Guidance (not constraint) provided on both functional and technology axes, also illustrative scenarios
- Structured template for technical proposals
- Straightforward commercial approach



Defence Technology Strategy

A new technology strategy for defence

- Is focusing on science, technology, skills and facilities needed for defence
- Is highlighting areas where MOD will depend strongly on expertise generated in Universities, for example:
 - Generic Signal Processing
- Implementation plans being developed
- Will be published on 9th October 2006



Questions ?

