

Excellence and Relevance for Impact

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Professor John Murphy
Head of University Partnership Programmes, BAE Systems



Introduction

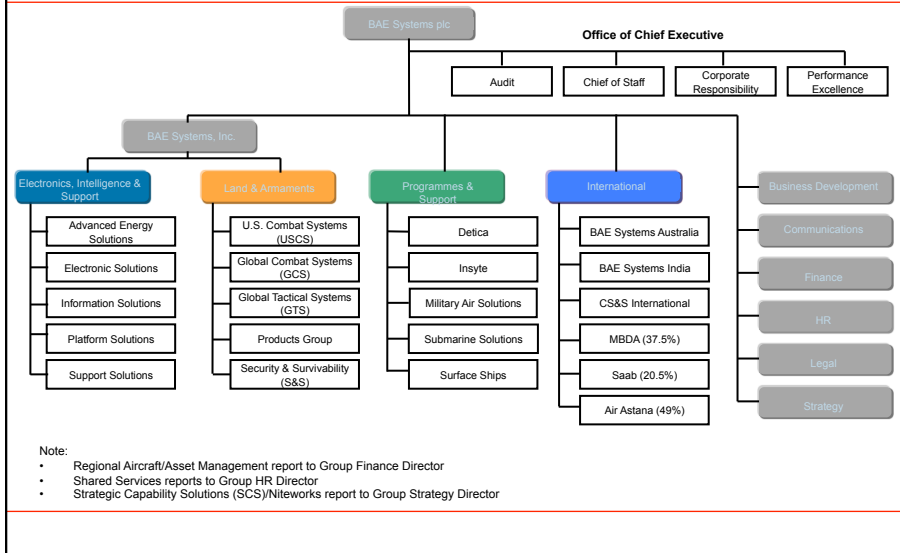
BAE Systems is the premier global defence, security and aerospace company delivering a full range of products and services for air, land and naval forces, as well as advanced electronics, security, information technology solutions and customer support services.

Key Facts

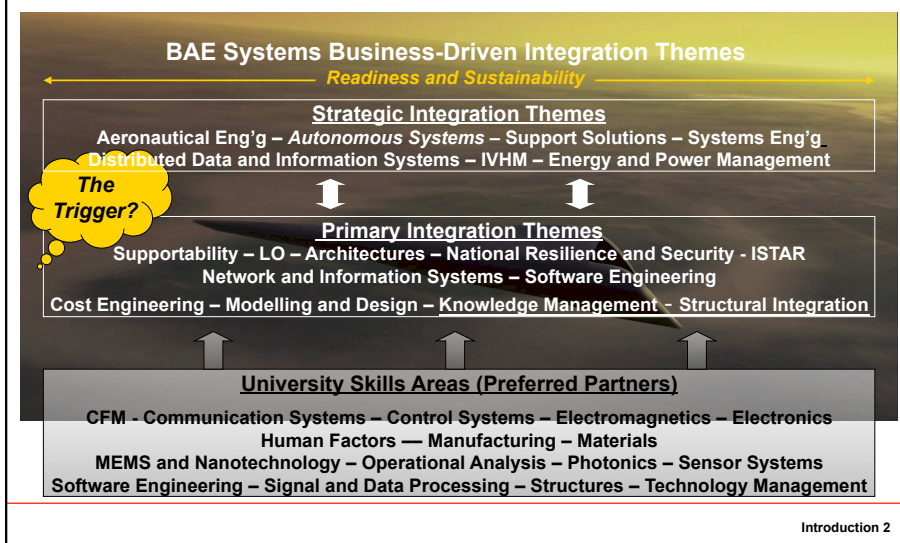
- 2nd largest global defence company
- 105,000 highly skilled people
- Global capability
- Customers in over 100 countries
- Annual sales exceed £18.5 billion
- 200 inventions patented in the US and the UK every year
- Operations in seven home markets



Organisation Structure 2009



Breadth and Depth through Partnering



Some Areas of Interest – scope for Excellence + Impact

- Intelligent Systems / Data Systems / Networks, Information and Security, Command and Control
- Through Life Capability Management
- Modelling and Behavioural Science
- Photonics and Electronic Systems
- Knowledge Management
- Classification and Tracking
- Reconfiguration
- Information Security
- Handling very large data sets
- Functional materials
- Wireless operations
- Cost Modelling and Prediction
- Reducing the Cost of Repair
- Non-lethal weapons

Overview – Main Programmes

Business Grand Challenge Programmes with EPSRC

Aeronautical Engineering: FLAVIIR

Business Challenge

Flapless, maintenance-free UAVs

5yr programme: July 2004 – 2009 ~£6.5+m

Cranfield, Imperial, Leicester, Liverpool, Manchester, York, Warwick, Swansea, Southampton, Nottingham

Decentralised Data and Information

Systems: ALADDIN

Business Challenge

Disaster Response and Recovery

5yr programme: Oct 2005-2010 ~£5.5+m

Southampton, Oxford, Bristol Universities, Imperial

Systems Engineering: NECTISE

Business Challenge

Are you ready for NEC?

5yr programme: Oct 2005 – July 2009. ~ £4.8m

Loughborough, Cranfield, Leeds, Leicester, Manchester, Cambridge, York, Bristol, Queen's University Belfast

Support Solutions: S4T

Business Challenge

Enhanced Support Operations

2yr programme: Feb 2008 – 2010, ~£2m

Cambridge, Bath, Exeter, Cranfield, Loughborough, Leeds, Nottingham, Salford, Queens

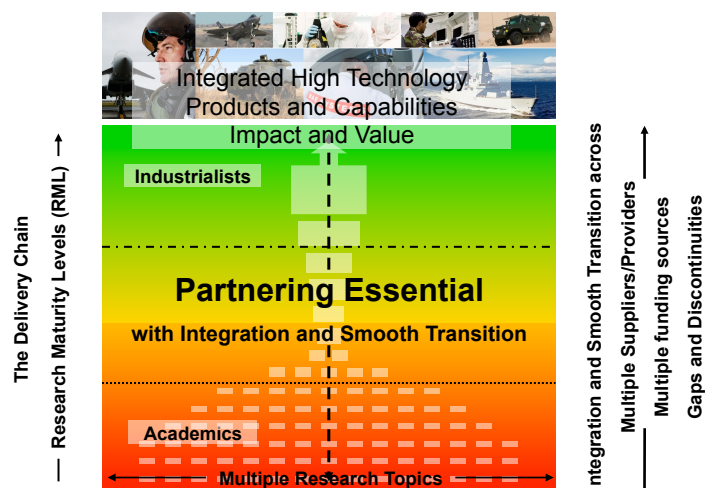
New / On the Horizon

- UCLan – Energy and Power Management
- New strategic partnership with the Research Councils
- Intelligent and Autonomous Systems
- Service and Support Solutions – following on from S4T

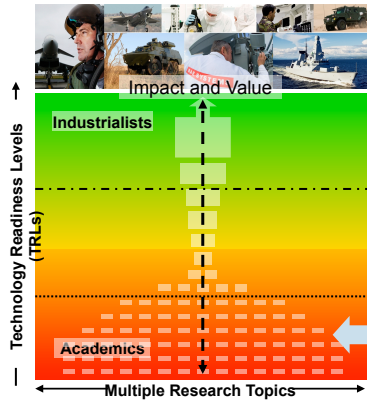
Main Areas for Improvement

- Quality engagement by the right people e.g. long hand-over problems
- Funding utilisation - balance of experienced to inexperienced staff
- Setting expectations for all stakeholders
- Awareness and costly wind-up time
- How we address our needs and how we do research!
- Continuity of ownership

From Research Initiation to Impact and Value



The Nature of the Research



Issues

- Understanding the challenges and objectives
- Understanding what skills are needed
- Understanding the nature of the research
- Misuse of the TRL scale
- Setting expectations

The nature of research

- Multi-disciplinary – now well understood and partly implemented
- Multi-maturity – poorly understood

Do we need to change the way we do (some) research?

US Mission-led agencies fund considerable fundamental research that delivers **publications + impact**

US BAE Systems staff have far more publications with universities than UK staff (source Cambridge)

Solution Options - Acquiring Capabilities and Technologies

Approach

- Acquire, Education and Training or Research?
- Knowledge / Technology Transfer - What is already available?
- If research is needed
 - Who has the ability to do it?
 - Who is tuned to our problem space

Considerations

- Low TRL research is high risk, costly with low probability of delivery
- Tuning to our problem space – time, funding and barriers

Providers

- In-house research engineers
- Supply chain
- Central Research Centre
- US Universities
- UK universities
- Others

Strategic Emphasis

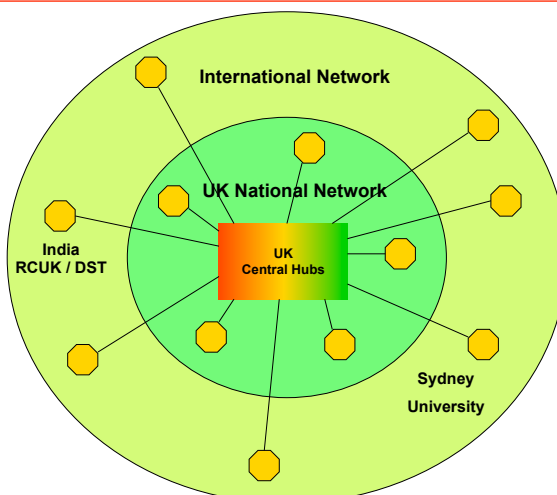
Delivery of *value to the company, our customers and our partners* through *timely capability improvements* from our university sector interactions embracing

- ★ • Global awareness of potential solutions and sources
 - Identification of 'best' solution options for business needs
- ★ • Exemplary partner engagement and team working
 - Shared risk and cost until a clear route to exploitation
 - Stability for continuity of delivery against areas of strategic importance

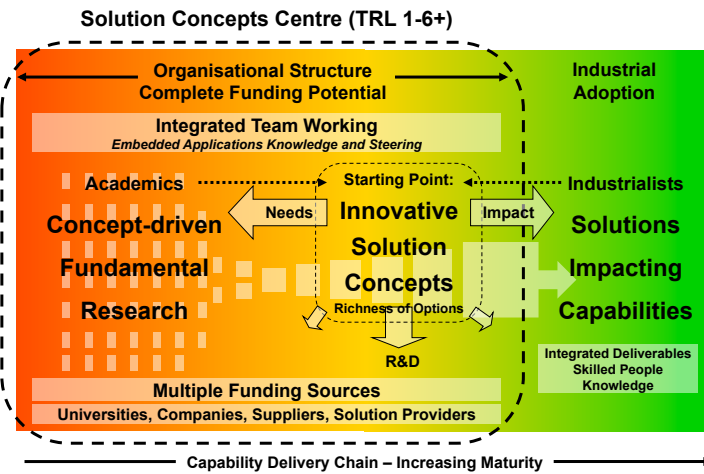
Note: Capability embraces people (with knowledge, skills and experience), product, processes and systems

Addressing Requirements 4

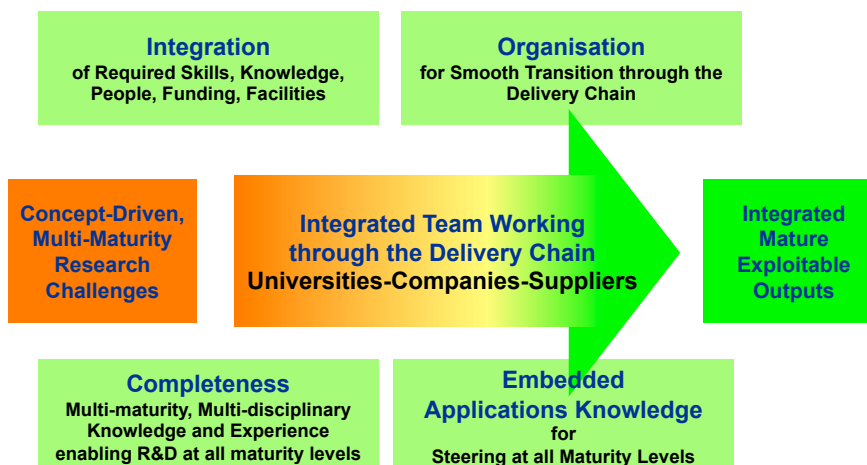
Intelligent and Autonomous Systems – SCC + Network



Schematic – Solution Concepts Centre



Key Characteristics



Summary - for achieving Excellence with Impact

- More relevant fundamental research – tuning for take-up
 - Global monitoring and awareness
 - Advanced Executive Packages, Knowledge Transfer
 - Research to fill gaps and feed the above
 - Understanding research and the skills needed
 - Step changes in engagement and team working
 - Particularly for long hand-over problems
 - Programme management by people with relevant knowledge
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