Aligning University Outputs with the Delivery Chain

Engineering Professors Conference
22nd April 2009, Edinburgh Conference Centre, Heriot Watt University

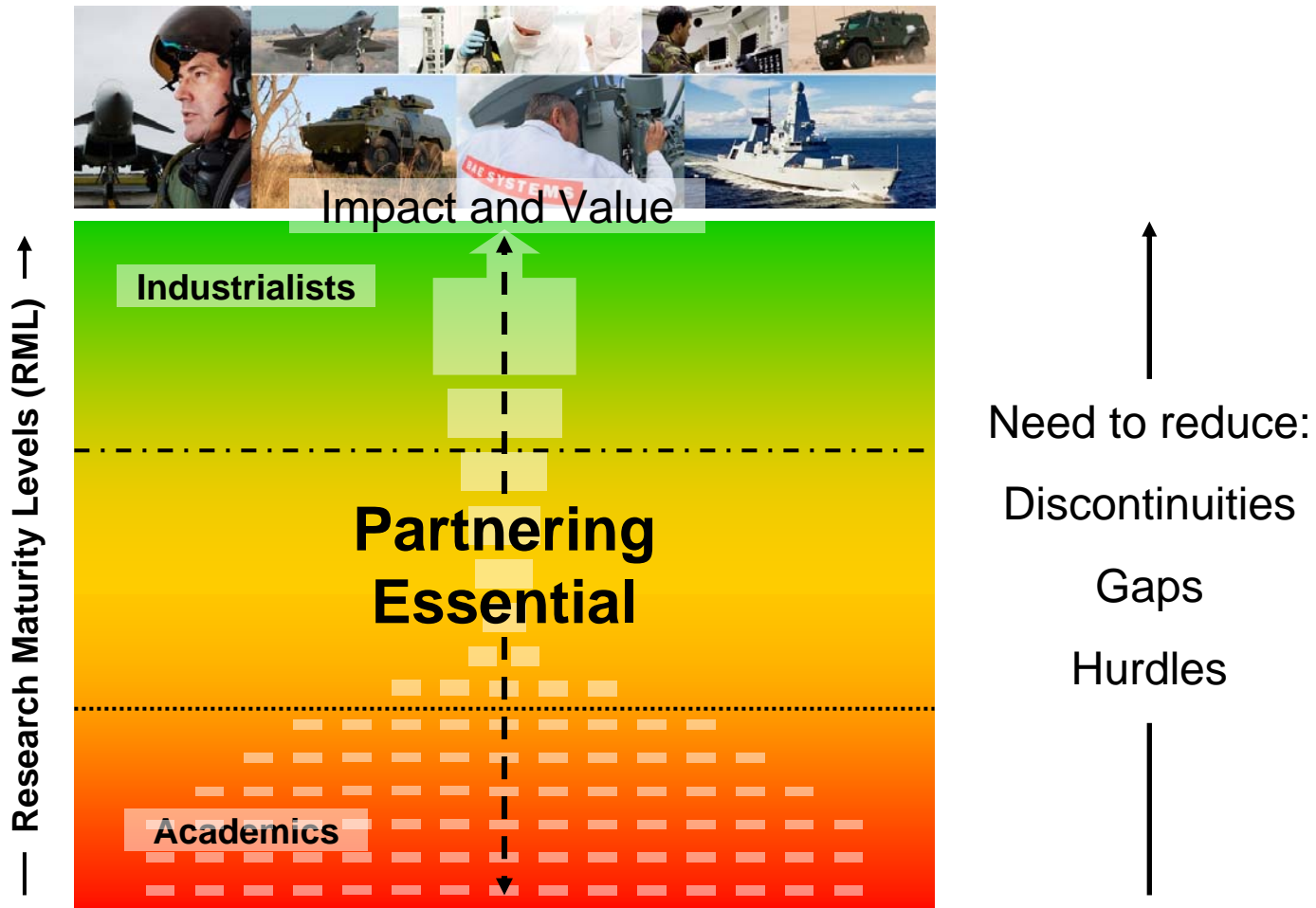John Murphy, Head of University Partnership Programmes
BAE Systems

Shift Happens

The Delivery Chain

Research Maturity Levels (RML) →

Impact and Value

Industrialists

Partnering Essential

Academics

Need to reduce:

Discontinuities

Gaps

Hurdles

BAE Systems Strategic Programmes (subset)

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 – Mar 2011, £7.5+m
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

On the Horizon

- **Autonomous Systems and Products** – Solution Concepts Centre (SCC)
- **Aeronautical Engineering – Long endurance, environmental issues** - SCC
- **Service and Support Solutions** - SCC
- **Distributed Data and Information Systems** – post ALADDIN activities
- **Software Engineering, Structural Engineering** – Springboard Partnerships
- **Suggestions!** – Springboard Partnerships

Areas for Improvement

- Value and impact – improving but some way to go
- Agility and responsiveness – 'Shift Happens'
- Agreed partnership value propositions versus 'marrying for money'
- Engagement, commitment and ownership versus brief encounters
- Funding utilisation - balance of experienced to inexperienced staff
- Awareness and costly wind-up time
- Multi-maturity research activities and research maturity classification

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

Key Operational Objectives

Overall: Establish *delivery teams* with the *skills and capabilities* to address agreed *value propositions and associated metrics*

Capability Anchors for Value: Build partnerships on combined skills, knowledge and capabilities from the pairing of people or teams from the company and universities
- Who want to work together (and have the time)
- Jointly possess the potential to deliver mutual benefit against **agreed value propositions**

Benchmarking and Change: Maintain awareness of internal capabilities, global solution options and relevant university groups to accommodate pace of change, benchmark partners and identify new partners

Exemplary Engagement: Establish a level of company-university engagement to successfully address the value propositions and timescales embracing
- Sufficient skills and experience in engineering and science
- Sufficient management resource and governance

Internal Coordination: Seek internal leverage by sharing information and pooling synergistic needs

Success Factors: Identify and address the critical factors to successfully address the value propositions (utilise check list)

Defining the Formula – Identify the Success Factors

Flexibility – Agility – Responsiveness

Multi-maturity, Multi-disciplinary Activities

Solution Concepts Led – Integration – Exploitation and Impact

Multi-stakeholder-driven formula – Multiple Exploitation Skills and Routes

Shared Risk and Cost

Organisation and Management Structure – Smooth Transition to Maturity

Embedded Applications Knowledge

High Engagement Levels - Team Working (Embedded People)

Integrated Skills Set and Knowledge Base – 'Completeness' and Continuity
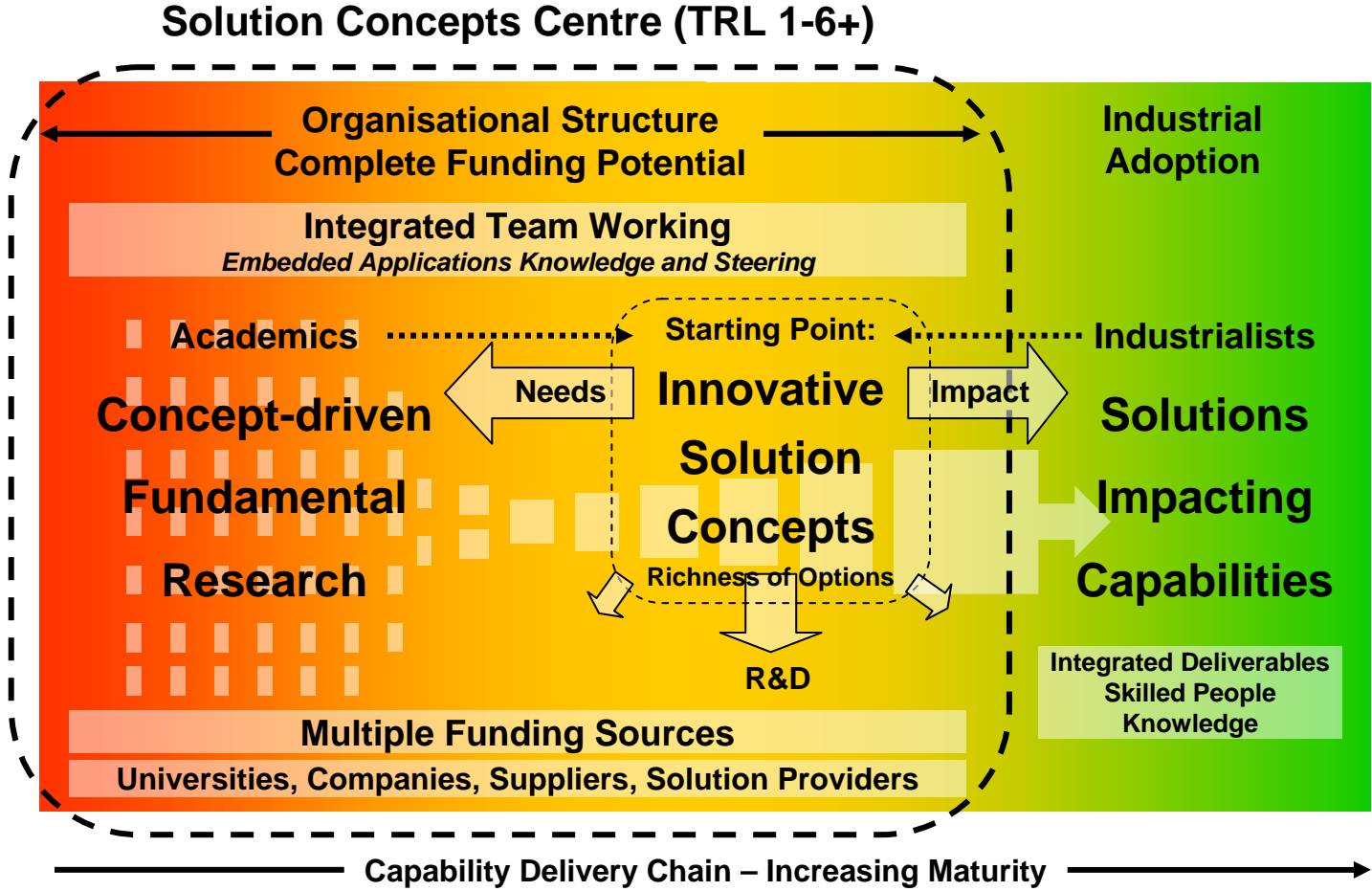
Open Innovation - Strong People Flow - Flexible Secondments

Integrated High Maturity Outputs – More than Technology

Schematic – Solution Concepts Centre

Solution Concepts Centre (TRL 1-6+)

Organisational Structure
Complete Funding Potential

Industrial Adoption

Integrated Team Working
Embedded Applications Knowledge and Steering

Academics

Industrialists

Concept-driven

Needs — Innovative — **Impact**

Solutions

Fundamental

Starting Point:

Innovative Solution Concepts

Impacting

Research

Richness of Options

Capabilities

R&D

Integrated Deliverables
Skilled People
Knowledge

Multiple Funding Sources

Universities, Companies, Suppliers, Solution Providers

Capability Delivery Chain – Increasing Maturity

Summary

- Step changes in experience and engagement needed
- Approach - multi-maturity, multi-disciplinary activities
- Real partnerships rather than 'marrying for money'
- Share risk and cost until route to value identified

Typhoon in-flight Refuelling – Electrostatic Discharge

3D electromagnetic design capability established within 12 months via US university