A cost capability maturity analysis of the US and European costing communities

Dr Mark Gilmour & Dale Shermon

June 2015

ICEAA Workshop, San Diego, California

© QinetiQ Limited 2015

QinetiQ Proprietary

Content

- Introduction to QinetiQ
- Cost Engineering Health Check
  - What is it?
  - Why do it?
  - How is it typically done?
  - Example Assessments
- ICEAA 2014 Cost Engineering Health Check Results

© QinetiQ Limited 2015

QinetiQ – EMEA Services

Air Division

Maritime Division

Weapons & Land

C4ISR

Security Division

Training

OptaSense®

Procurement
Advisory Services

QinetiQ

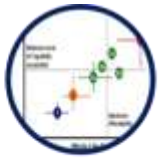
© QinetiQ Limited 2015

Our Team's Capabilities & Tools - Procurement Advisory Services


Requirements & Acceptance


WLC Modelling


Options Analysis


COEIA


Through Life Support

Benefits Analysis


Strategy Devt / Wargaming


Technology Management

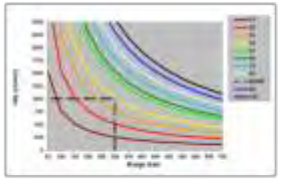
Legacy & Market Surveys


Risk Management

OSCAM
(Operating and Support Cost Analysis Modelling)


FACET
(Family of Advanced Cost Estimating Tools)

RMM
(Risk Maturity Model)


Joint Utility Model


EVC
(Economic Value Chains)


Industry Standard Toolsets

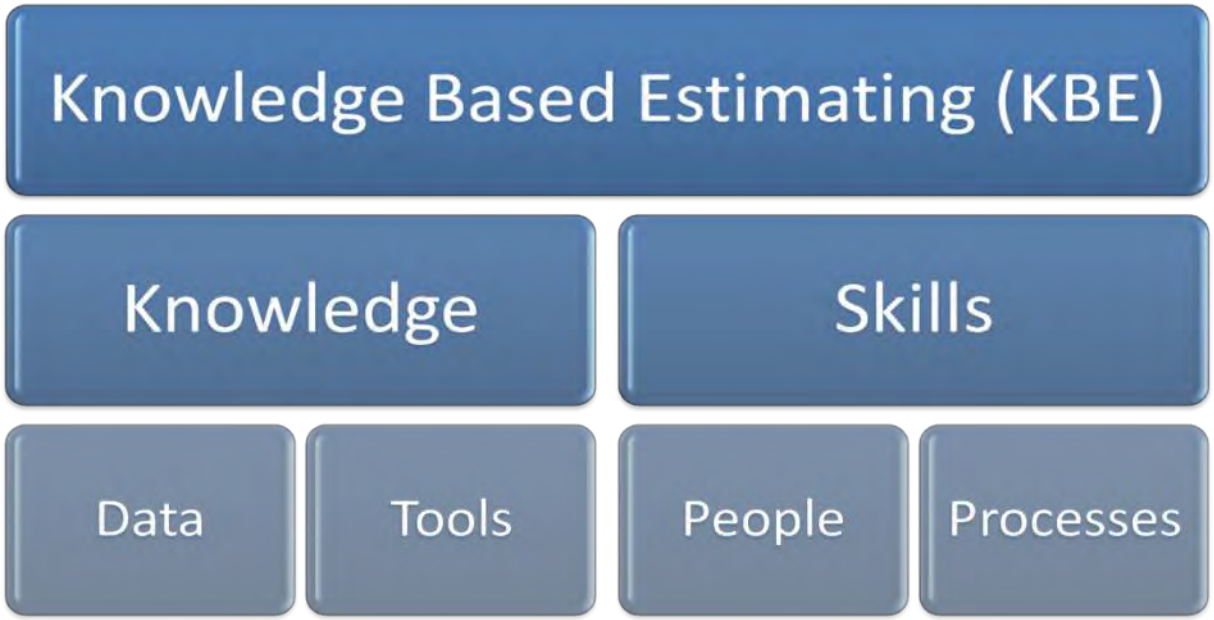
- Over 150 highly skilled and experienced subject matter experts
- 70%+ Professional Accreditation
  - AcostE, APM, Prince2, MSP, ICEAA
- Based across 5 UK Sites
  - Deployed internationally
- Average experience of 10 years
- Over 40% PhD / MSc qualified
- Skills deployed on over £75Bn of Defence Programmes

QinetiQ

© QinetiQ Limited 2015

Cost Engineering Health Check – What is it?

- A standardised competency assessment framework
- Based on QQ Knowledge Based Estimating Philosophy
- Provides an objective evidence based audit against both best practice and industry standard.



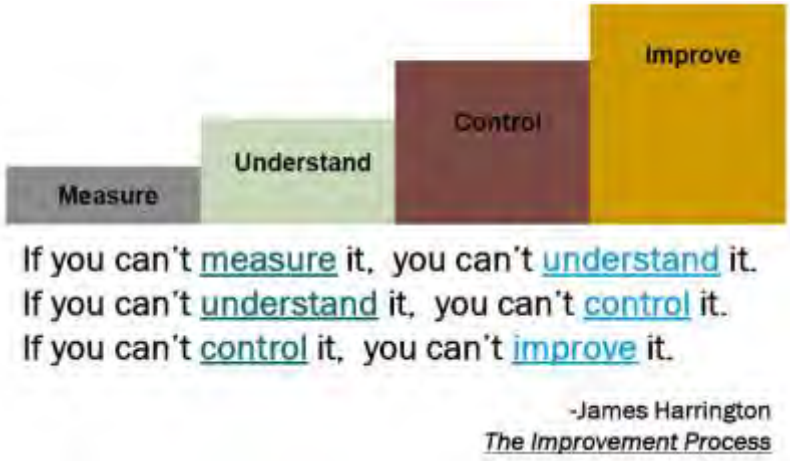
Identifies strengths and weaknesses in costing capability, including 'intangible' enablers

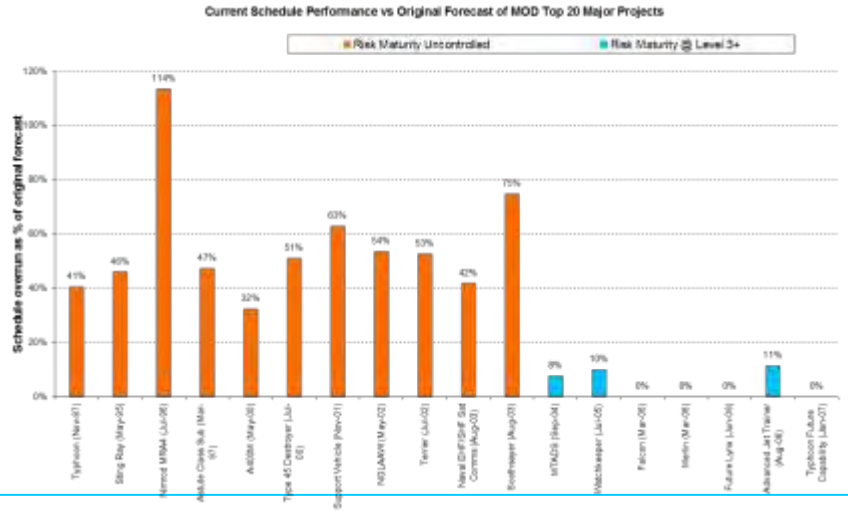
- Stakeholder engagement
- Culture

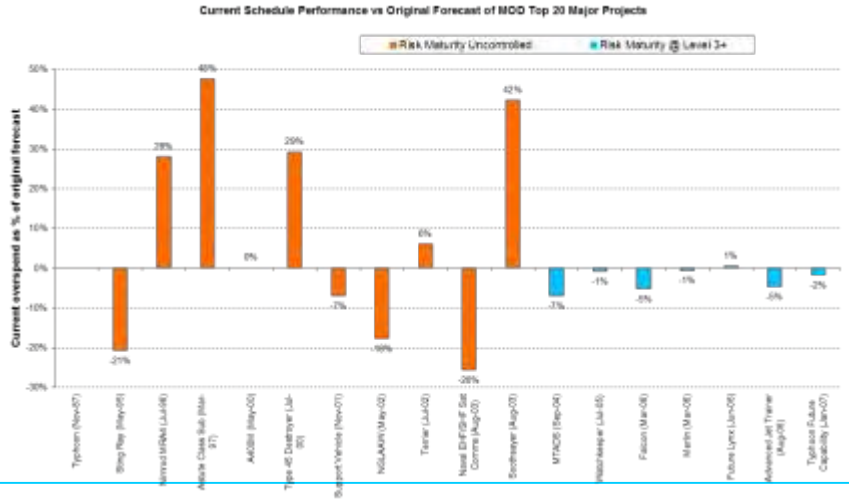
© QinetiQ Limited 2015

Cost Engineering Health Check – Why do it?

- How good is your estimating capability?
  - Benchmark against best practice
- How do you compare with your peers?
  - Benchmark against industry standards
- How can you improve?
  - Focus resources towards areas identified as weak







© QinetiQ Limited 2015

Cost Engineering Health Check – Why do it?

Another problem is the significant capability deficiencies in the IPT……In particular we found insufficient financial skills. The costing and estimating groups had been cut down to save money…

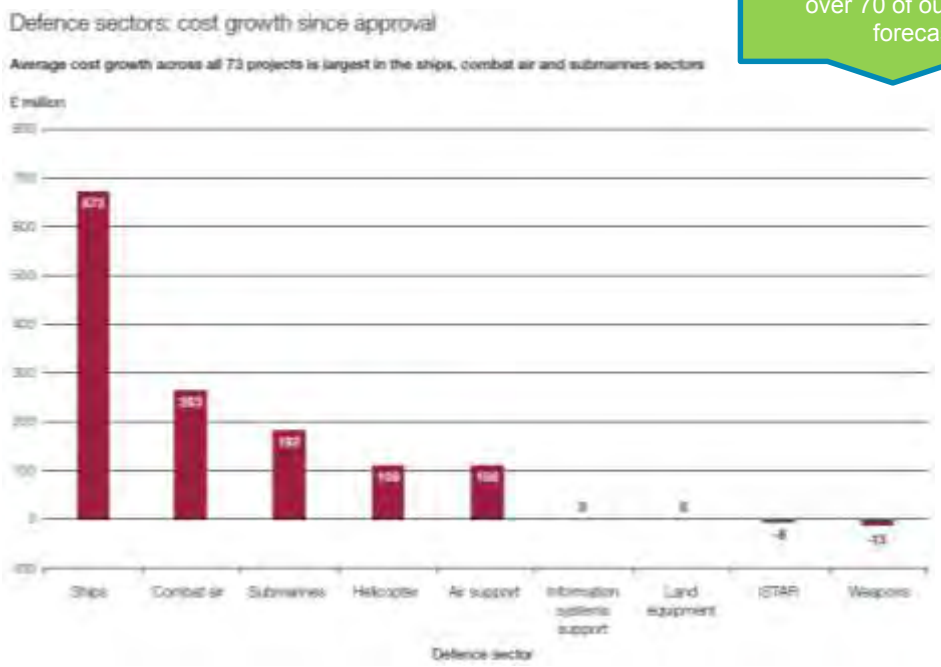
I would have liked to have the time resources to do more international benchmarking on a quantitative basis…..some quantitative measurement may have flushed out some further efficiencies

Bernard Grey , UK MoD Chief of Defence Materiel, in *An expert view on Defense procurement,* McKinsey

Poor forecasting is an entrenched problem, leading to poor value for money and taxpayers bearing the costs. Since 2010, over 70 of our reports have identified forecasting weaknesses

there is insufficient information to assess the quality of departments' forecasting…..teams lack a consistent approach to assess and compare the quality of programme forecasting.

National Audit Office 2014, *Forecasting in government to achieve value for money*



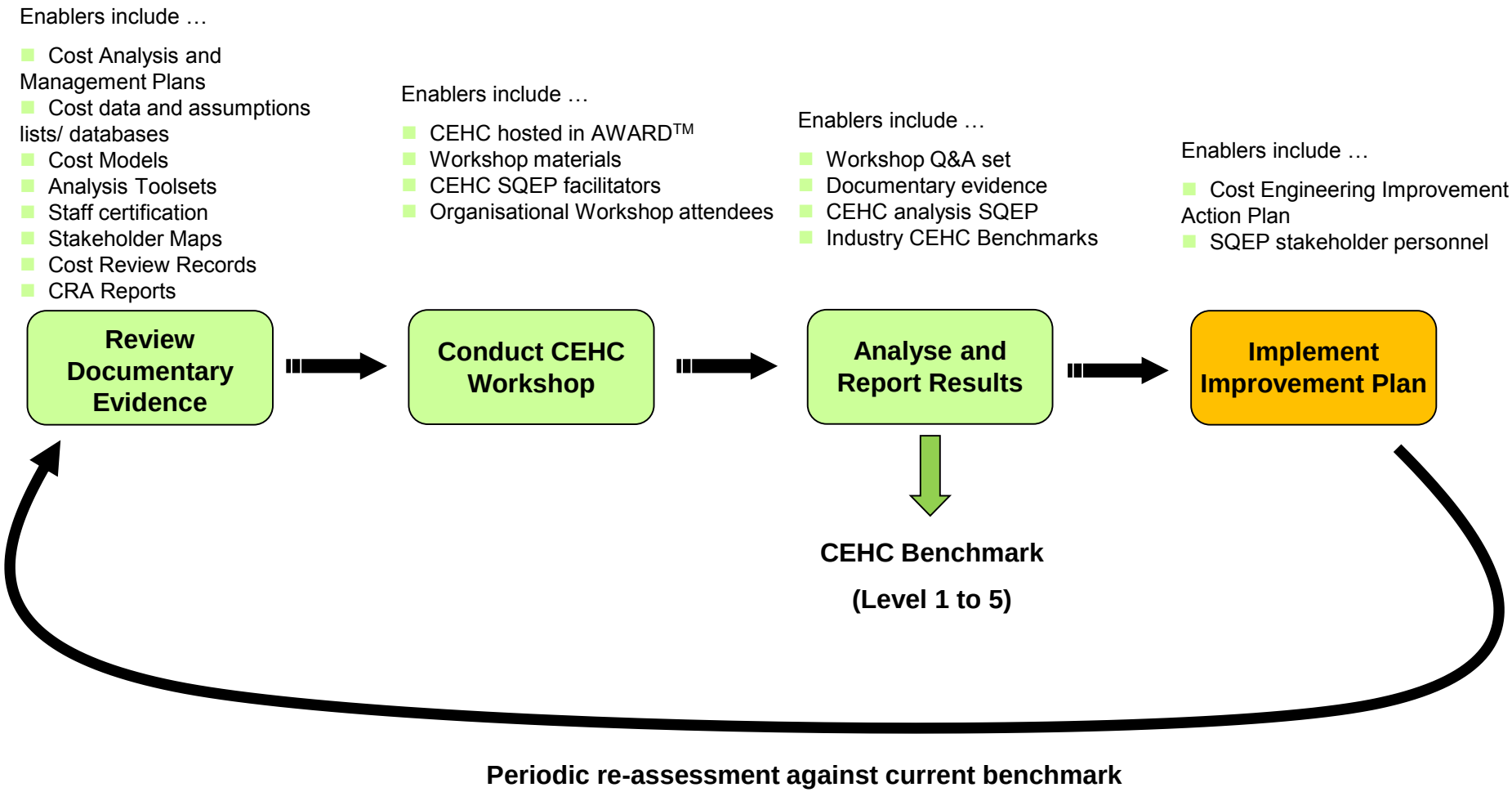
The Department should ensure all project teams are applying good practice in cost and risk modelling to help develop its understanding of aggregate risk across the Equipment Plan.

Public Accounts Committee , 2014. ***MoD Equipment Plan 2013-2023***

Source: NAO Major Projects Report 2013

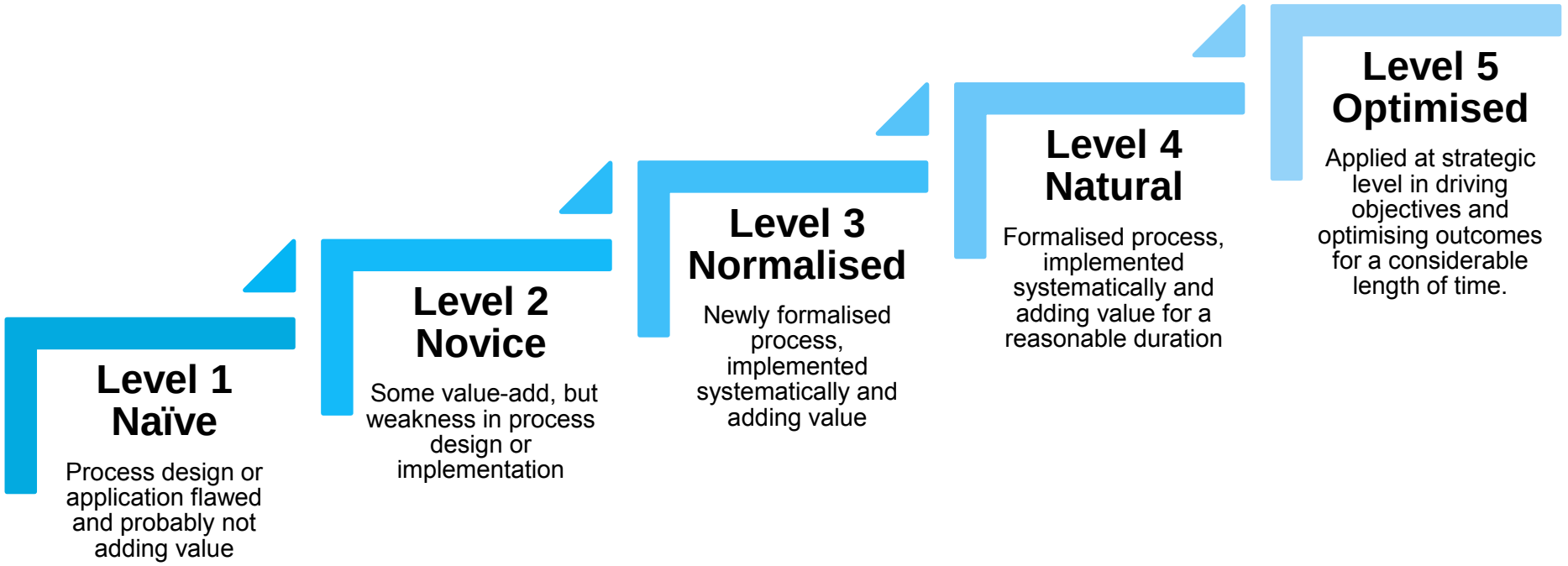
© QinetiQ Limited 2015

Cost Engineering Health Check – How is it typically done?



© QinetiQ Limited 2015

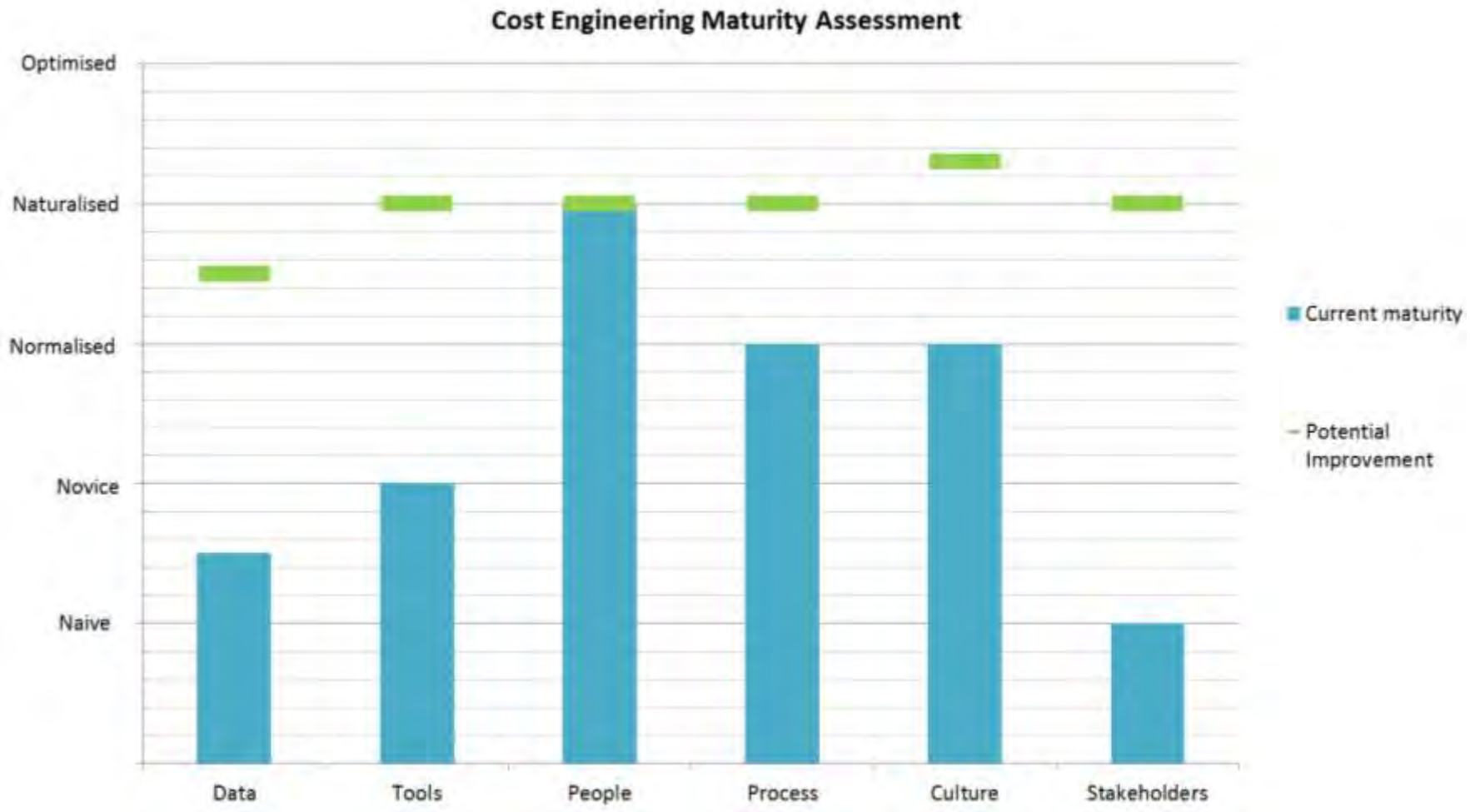
Cost Engineering Health Check – How is it measured? - Maturity Levels



© QinetiQ Limited 2015

QinetiQ Proprietary

Organisational Maturity Assessment – Example Output



"An organisation is only as strong as its weakest element"

© QinetiQ Limited 2015

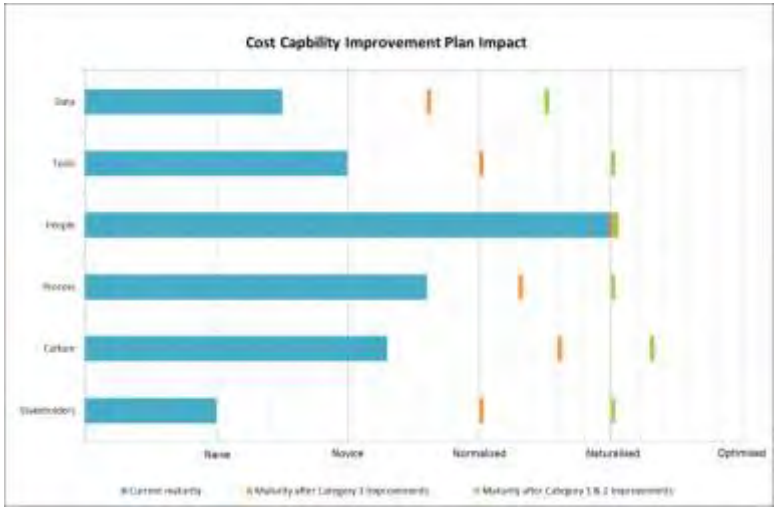
Organisational Maturity Assessment Cost Engineering Improvement Action Plan

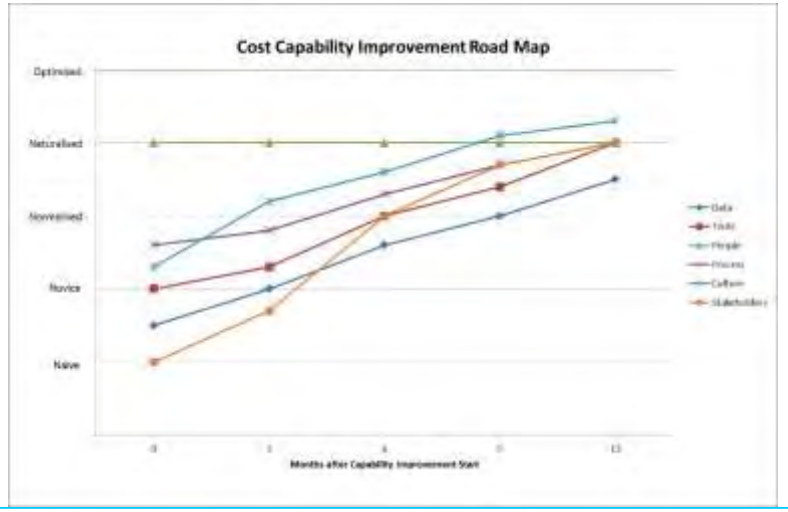
Category 1 Recommendations - these will act to support a Cost Engineering Capability that's enables the development and generation of credible estimates

ID	Recommendation	Difficulty to Implement	Impact on Capability
R1.2	Provide staff access and training to commercial parametric models	Medium	High
R1.2	The organisation should mandate a consistent approach for including of cost and schedule risk within their cost estimates	Easy	High
R4.3	The organisation should develop a data dictionary for use in archiving historic costs and technical information	Easy	High
R3.1	The organisation should recommend an authoritative source for escalation rates (or develop their own authoritative source).	Easy	High
R1.4	The organisation should create an independent cost model verification and validation cell for the review of all costs being provided to management	Medium	High

Category 2 Recommendations – these will act to support a Cost Engineering Capability that enables the development and generation of credible estimates, has the confidence of management and wider stakeholders and is posed to avail of best in class engineering approaches and new evolving principles.

ID	Recommendation	Difficulty to Implement	Impact on Capability
R3.2	Expose key customer to cost approach and methodologies	Medium	Medium
R1.6	Encourage staff to participate in professional costing organisations conferences and international conferences	Medium	Medium
R2.3	Ensure interfaces between the organisational cost analysis process and other analysis process are clear and sufficient for the transfer of information	Easy	High
R1.1	Stakeholders should be engaged to understand to fully understand the types of decisions that they are using cost information to inform, and costing outputs should be aligned to these.	Easy	High





© QinetiQ Limited 2015

Cost Engineering Health Check – How was it assessed for ICEAA?

- Conducted a Lite version with sample questions using e-voting
  - 9 questions from a database of 60
- Held open discussion amongst the ICEAA group
  - Why did people answer as they did?
  - Were the results as expected?
- ICEAA results summarised and compared against best practice and industry averages
  - ICEAA vrs Europe Individual perspective comparison
  - ICEAA vrs average Organisational Assessment comparison

© QinetiQ Limited 2015

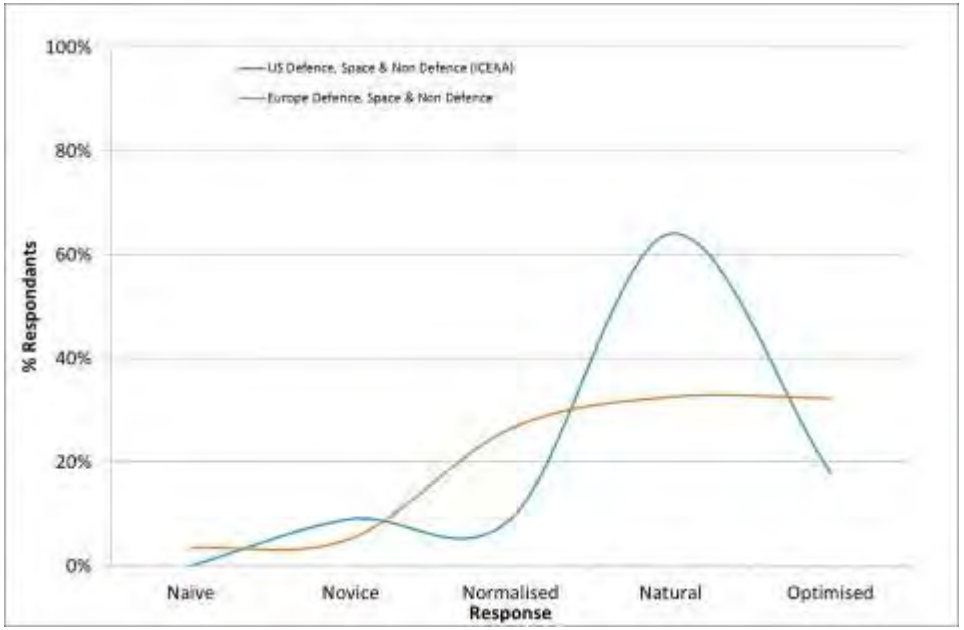
ICEAA Results – Individuals Perspective

Question: (A1)

- What is the nature of the senior management's involvement in cost engineering?

Conclusions:

- US report greater level of management engagement in cost engineering than European Colleagues
- US responses reflective primarily of government defence bodies. Likely that the responses would have been lower had there been grater industry representation



Recommendation:

- European managers can take lead from US DoD management style
- European organisations need to provide their estimators with greater direction on how they want their estimates conducted

© QinetiQ Limited 2015

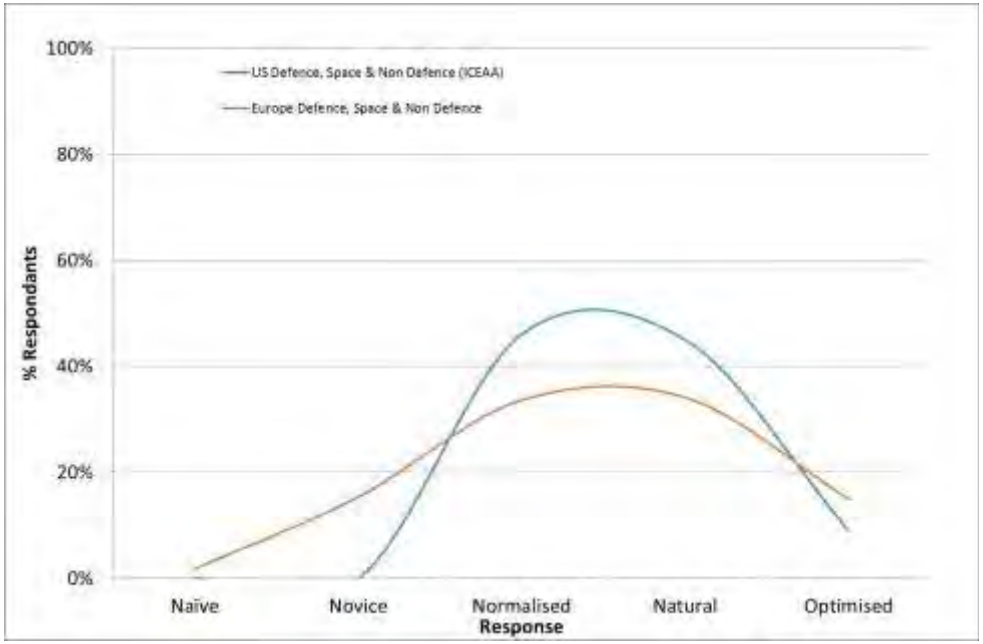
ICEAA Results - Individuals Perspective

Question: (A5)

- How well does the cost engineer understand their project and the way that it functions?

Conclusions:

- US reports higher level of technical competency of their estimators in their project technical domain
- Both US and Europe report having limited amount of competent estimators who also have deep technical expertise of all aspects of their projects
- UK want estimators that can apply estimating skills across all domains



Recommendation:

- Unrealistic to expect all estimators to be technical SMEs in their respective domains.
- Understanding of cost drivers is key

© QinetiQ Limited 2015

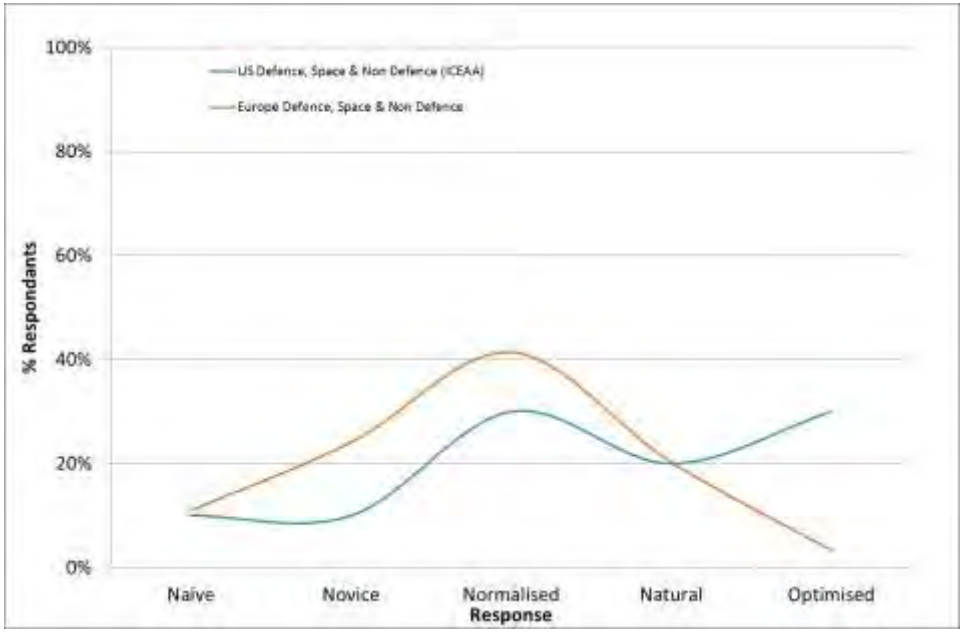
ICEAA Results- Individuals Perspective

Question: (B1)

- Does the project gather historical financial data for cost estimating purposes?

Conclusions:

- US organisations are typically gathering cost data for the purposes of estimating in a meaningful manner, citing NASA and DoD requirement.
- The question remains as to how useful the stored data has proved.
- US scores would have been similar to Europe if the study had been run 10 years ago



Recommendation:

- Europe to recognise the importance of providing estimators with the 'raw materials' to create credible estimates
- Europe to learn from recent US initiatives

© QinetiQ Limited 2015

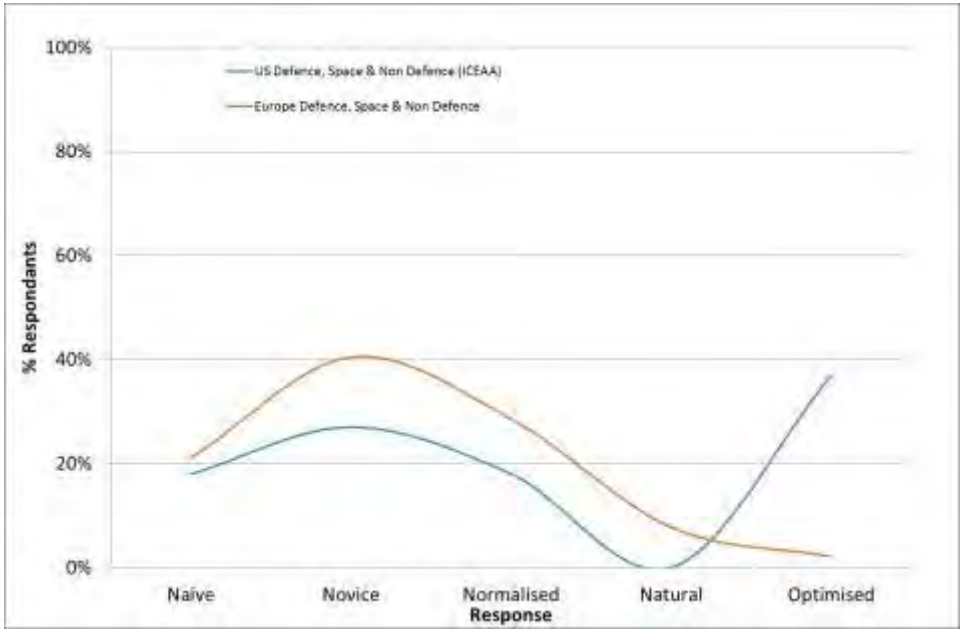
ICEAA Results- Individuals Perspective

Question: (B3)

- Does the project store technical information for the purposes of future cost estimates?

Conclusions:

- Data available in US but requires 'leg work' to interrogate corporate systems
- Concern with quality of technical data from such data sources
- Contracting mechanisms impact on data access i.e. DoD pays for data rights on Ships as they maintain them, in air domain maintenance is typically outsourced and thus data not available



Recommendation:

- Both UK and US organisations need to do more to provide estimators with the 'raw materials' to create credible estimates

© QinetiQ Limited 2015

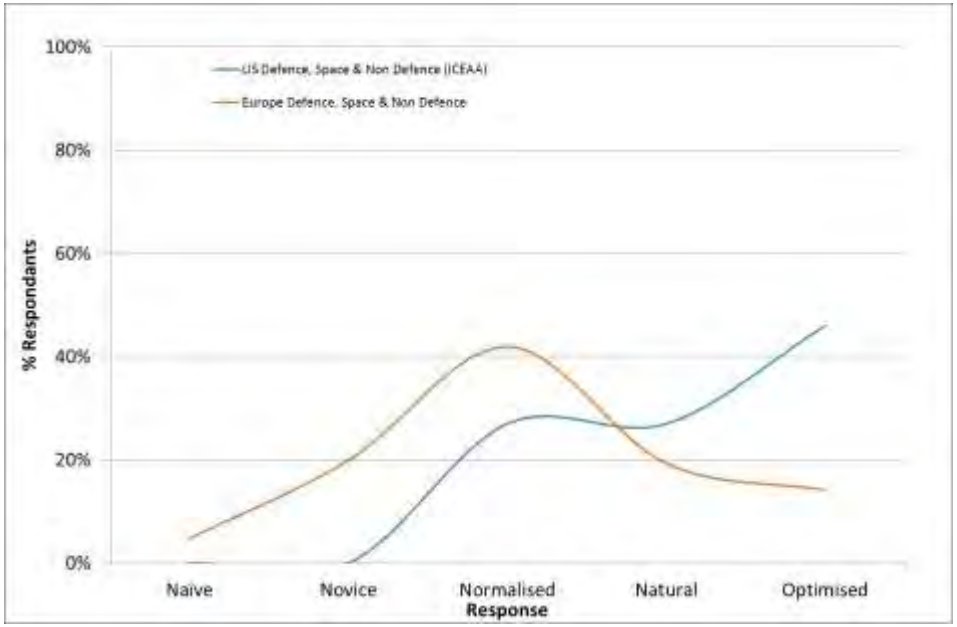
ICEAA Results - Individuals Perspective

Question: (C5)

- Does the project consider software estimating tools necessary?

Conclusions:

- US report greater level of uptake in software cost estimating tools than Europe
- There remains a 'fear' in European organisations of software costing
- Whilst US organisations have invested in software estimating they have yet to learn that software is expensive, and budget accordingly
- Software is less critical in space systems as it is easier to modify post launch

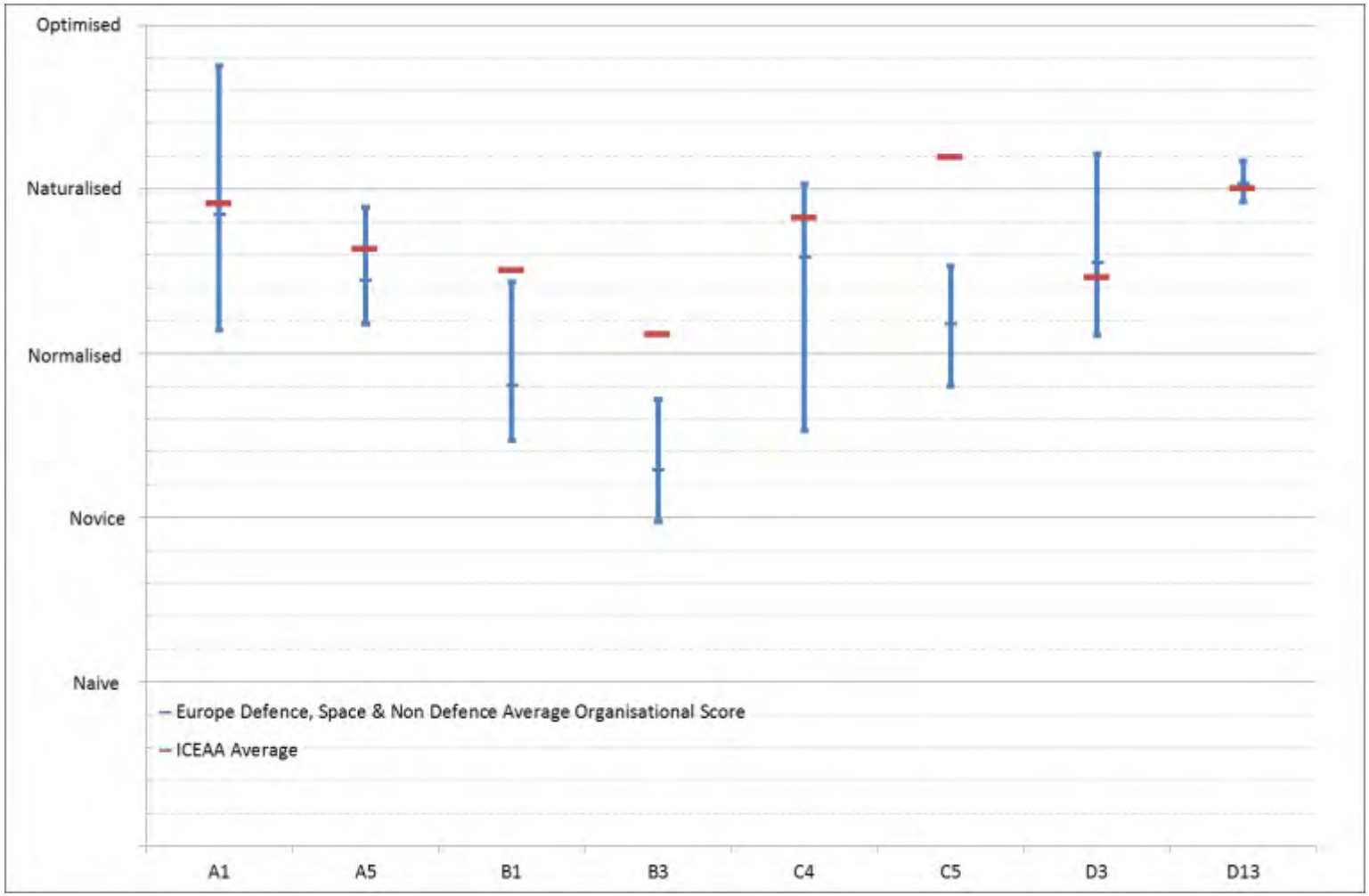


Recommendation:

- Both US & Europe need to be more attuned to software cost growth
- Europe need to place grater emphasis on software cost tools

© QinetiQ Limited 2015

Summary – ICEAA Responses compared to Average Organisational Maturity Assessments



© QinetiQ Limited 2015

Conclusions

- There are lessons that Europe and US can share with each other to enable an increase in costing capability across the profession as a whole
- Areas that Europe can learn from US
  - Gathering & storing historic financial data
  - Gathering & storing historic technical data
  - Application of software estimating
- CEHC provides an effective framework for highlighting areas for improvement, and focusing resource against development of these areas

© QinetiQ Limited 2015

QinetiQ Proprietary

QinetiQ

www.QinetiQ.com

"People Who Know How"

QinetiQ
Building 240
The Close
Bristol Business Park
Coldharbour Lane
Bristol BS16 1FJ
United Kingdom

Tel +44 (0)117 953 8462
Mobile +44 (0)7770 620435
mwgilmour@QinetiQ.com
www.QinetiQ.com

Dr Mark Gilmour

QinetiQ

© QinetiQ Limited 2015