HPC Industrial Engagement Initiatives: 
*Dreams, Myths, Realities*

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@hpcnotes
Proven HPC software performance results

- Over the last 6 years
  NAG HPC services have delivered
  - >80 software innovation projects
  - ~30 applications improved
  - ~80% achieved >2x performance
Proven HPC training results

- Over the last 6 years
  NAG HPC services have trained
- >2000 course attendees
- Fortran, C/C++, OpenMP, MPI, CUDA, ...
- profiling, optimisation, scalability, ...
Proven HPC consulting results

- Over the last 6 years
  NAG HPC services have helped
  - users of petascale supercomputers
  - evaluate/adopt GPUs, Xeon Phi, ...
  - advise on HPC strategy, procurements, ...
NAG HPC Services & Solutions

Software innovation services

• Improve performance, scalability, capabilities, ...
• Evaluate & adopt new technology: GPU, Xeon Phi, ...

Training, advice and support

• For HPC users, programmers, managers, buyers, ...

Strategy & planning

• Procurement, HPC service provision, etc.
• Application & technology roadmap planning
**Results: business value & science impact**

**Faster, more capable R&D process**
- More R&D output from a given compute resource
- Faster time to solution
- Step change in fidelity or capability of modelling

**Focus on customers & business**
- Rely on NAG for the underpinning HPC expertise

**Plan and use HPC with confidence**
- Rely on NAG for impartial advice and experience
Why engage with industrial users of HPC?

because HPC delivers impact + value + ROI to science and business

Lots of evidence, case studies, successes - e.g.:

http://www.hpcuserforum.com/ROI/
http://www.hector.ac.uk/casestudies/
http://www.compete.org/about-us/initiatives/hpc/success%20stories
Why engage with industrial users of HPC?

Political necessity

New source of income
HPC for industry is not new ...

- HPC centres around the world have tried engaging with industry for years
  - Success stories of real partnerships are still rare
  - Not many HPC centres with significant & profitable industry income
  - It is hard work and different to business-as-usual

Trusted experts in HPC & software innovation | professional services, training & impartial advice | Results Matter. Trust NAG.
Typical HPC industry engagement model??

- **Supercomputer Center**: Has all the HPC expertise (and is the only source of HPC expertise)
- **Industrial User**: Does “outreach” rather than “business development” or “sales”
- **Computational science**: Has “partners/collaborators” rather than “customers”

- **Cycles / Consulting**
- **Money**
Many suppliers of HPC services

- Publicly funded
  - NCSA, OSC, DoE labs, EPCC, Hartree, etc.

- Specialist HPC companies
  - NAG, Red Oak Consulting, ...

- Commercial
  - Cray, IBM, CSC, HP(EDS), AWS, ...

- In-house
IISW Survey Data

- International Industrial Supercomputing Workshops (IISW)
  - HPC centers involved in industry engagement
  - IISW-4 at SurfSARA Amsterdam in 2013
- (Anonymous) survey of participants run each year
Charge for HPC system time (US c / core-hr)
Charge for HPC consultants

US $k / person-year

Don't sell | <140 | 141-190 | 191-240 | 241-290 | 291-340 | >340

US $k / person-year
Charge for courses

- Full market rate
- Nominal fee
- No charge
- Don’t allow industry
- Don’t run courses
Typical annual income from industry (US $m)
Requirement for regional focus

- Only local
- Local focus, but can do global
- No location requirement
Which part of company do you engage with?

- Researcher/user
- HPC service in R&D
- HPC service in IT
- non-HPC part of IT
Challenges working with industry

- Competition from other centres
- Finding staff
- Securing contracts
- Finding industry partners
- Cultural differences
- Confidentiality
- Timescales/deadlines
- Networking
- S/w licences

Legend:
- Red: Limiting
- Yellow: Major but not stopping us
- Grey: Problem, but can cope
- Green: Not significant
**Summary**

1. Industry engagement is hard work

2. Need to commit & invest (e.g., sales effort)

3. Recognise different needs, culture, processes, ...

4. If (when) it works – it delivers real value to industry
Results Matter. Trust NAG.

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