



EPCC

Professor Arthur Trew
Director, EPCC
A.S.Trew@ed.ac.uk
+44 131 650 5025

- mission

“to be the premier European computational science centre”

- the European equivalent of one of the big US centres, eg San Diego Supercomputer Center



- think globally, act locally





- vital statistics:
 - founded in 1990
 - 75 staff
 - £5M turnover, 90+% external
 - required to break-even year-on-year
- multidisciplinary and multi-funded
 - ... with a large spectrum of activities
 - ... and a critical mass of expertise

- 4th generation national facility managed by Edinburgh
 - HPCx + HECToR = £150M
 - HECToR 275 + 175 Tflops
 - Most powerful computer in the UK
 - 16 + 24th in the world
 - ... to be used for a wide variety of physical, engineering, environmental and biological projects
 - ... opportunities for industry involvement
 - through facility access, or ...
- 
- A photograph of a server room with rows of black server racks. The racks are arranged in a long aisle, and the floor is light-colored. The ceiling has recessed lighting. The racks are filled with server components, and some have red doors. The perspective is from the end of the aisle, looking down the length of the room.

- EPCC is about people, rather than facilities

- 75 staff – PhD's + industry experience

- 95% turnover externally-generated

- divided equally between academic R&D and technology transfer



Academia

H/w capital
Domain expertise

Computer
cycles



Potential
business

Cost-effective
evaluation

Leverage

Exceptional
Discounts

HPC
Suppliers

End-user
Industry



USA:

- o Cisco Systems Inc
- o Sun Microsystems Inc
- o IBM Corporation
- o Oracle Corporation
- o Hewlett Packard
- o Microsoft
- o Xilinx Corporation

UK:

- o Almont Engineering Ltd
- o Altamira Ltd
- o Aman Aromatics Ltd
- o Callander Sawmills Ltd
- o Calman Ltd
- o CB Technology Ltd
- o Centre for Customer Awareness Ltd
- o CERN
- o Cheltenham & Gloucester plc
- o DTI
- o Digital Bridges Ltd
- o Elektrobit Ltd
- o First Group plc
- o Golden Grub Ltd
- o High Speed Productions Ltd
- o Integrity Solutions Ltd
- o IP Technology Ltd
- o Ironside Farat Ltd
- o Jardine Technology Ltd
- o Pepper's Ghost Productions Ltd
- o Radar World Ltd
- o Red Lemon Ltd
- o Rosti (Scotland) Ltd
- o Quadstone Ltd
- o SCI Ltd
- o Scottish Enterprise
- o The Crown Office
- o TSB Bank Scotland Ltd
- o UK Meteorological Office
- o Upstream Systems Ltd
- o Alpha Data Parallel Systems Ltd
- o Nallatech Ltd

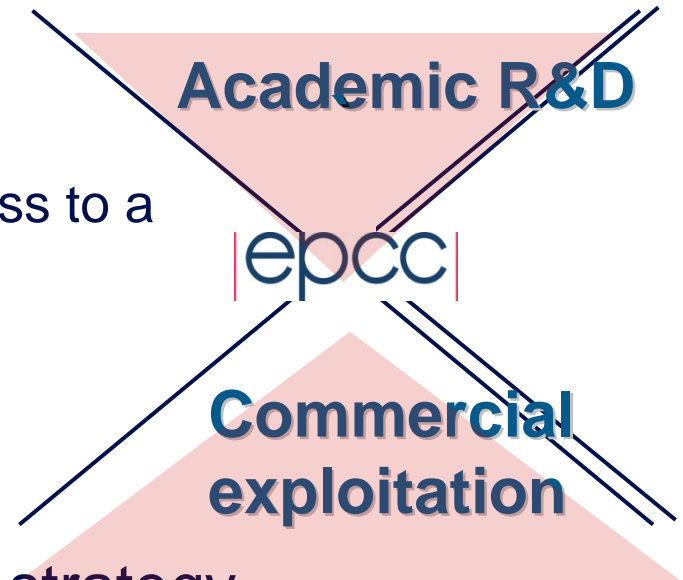
Europe:

- o European Commission
- + many EU project partners

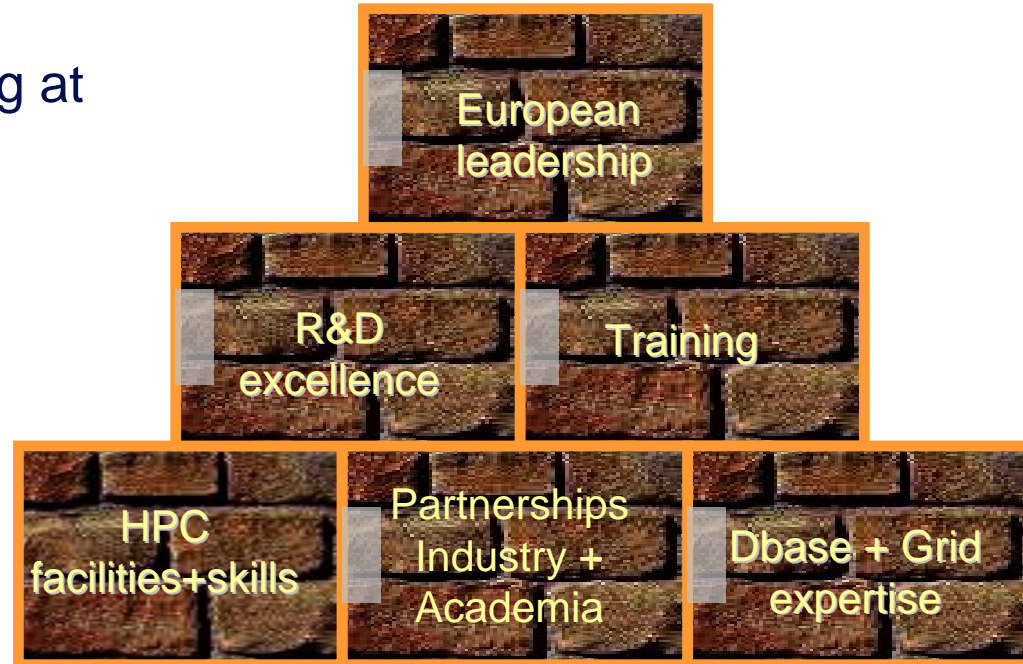
Japan:

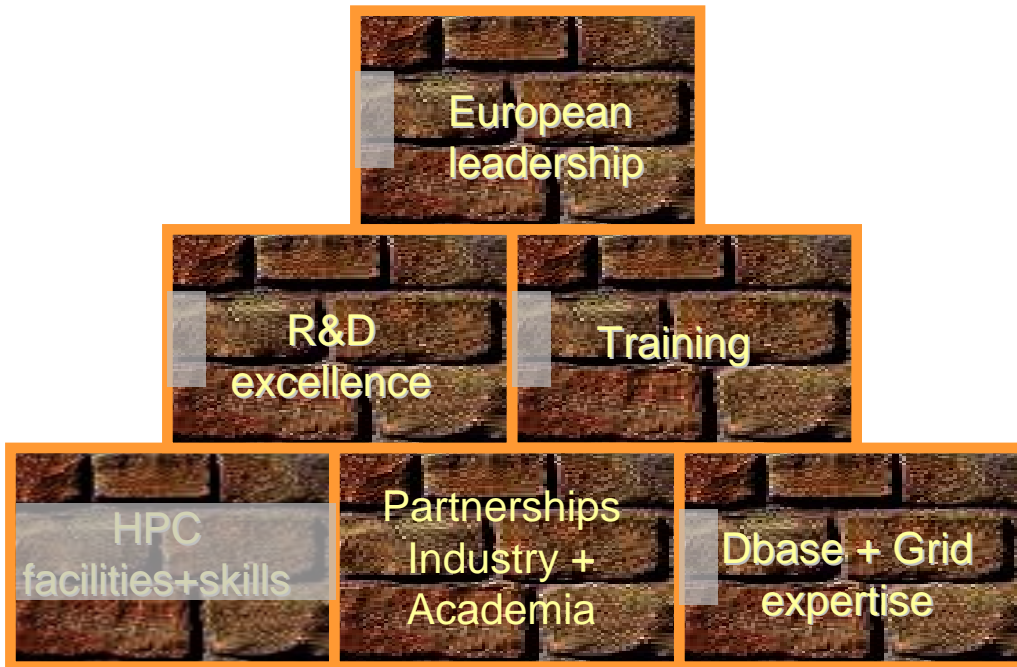
- o Hitachi
- o NEC Europe
- o Fujitsu Labs Europe

- company projects based on delivering business benefit
 - not pushing a particular technology
 - based within the University we have access to a wide range of leading-edge expertise
- delivered on time, on budget and to specification
- ... and in the context of the client's IT strategy
- however it is hard for, especially, small companies to engage
- need for public-private shared-benefit scheme



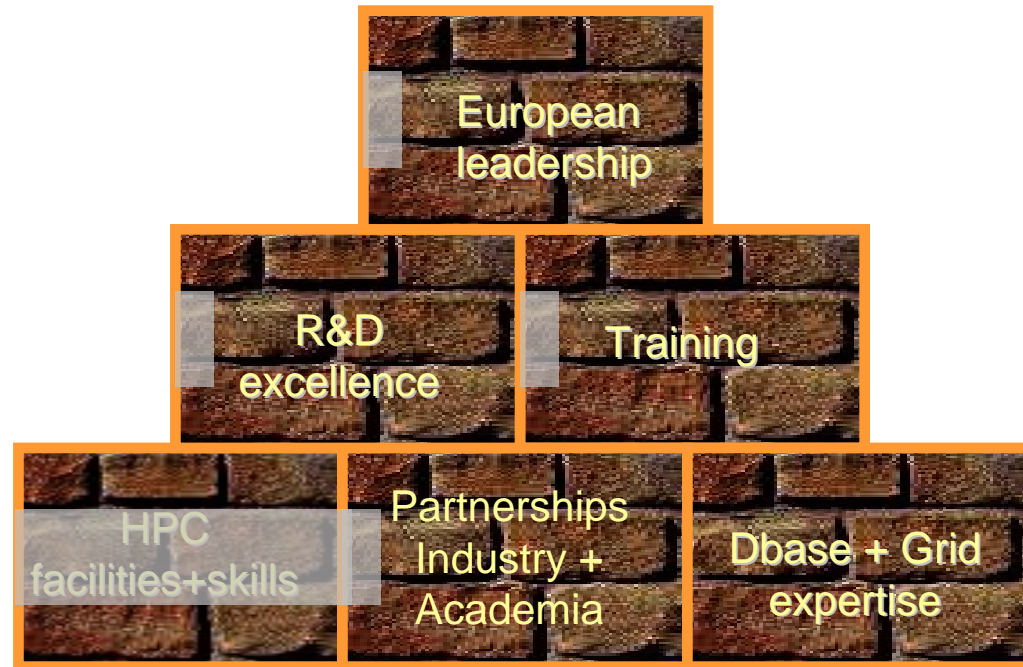
- EPCC leads research computing at Edinburgh:
 - Edinburgh researchers
 - UoE HPC service
 - Blue Gene
 - national research groups
 - QCDOC
 - HECToR
 - European researchers
 - HPC-Europa visitor programme
- widest range of facilities in any European university



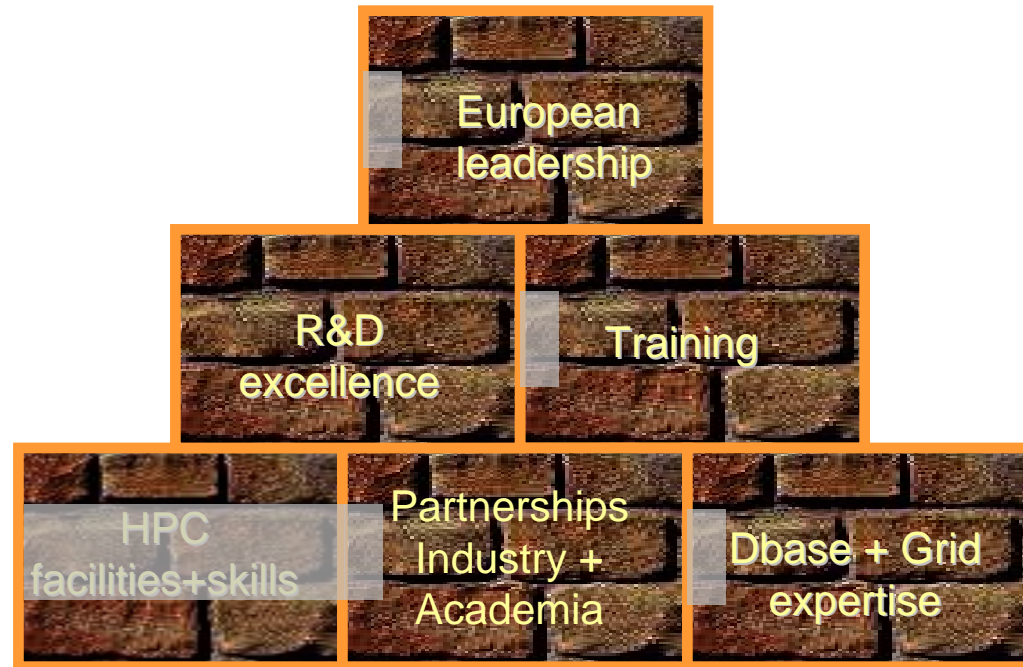


- project-based consultancy to industry and commerce
- 75 clients in past 3 years
 - Large enterprises...
 - eg, IBM, Oracle, UKMO, Sun, C&G, AEA, Cisco
 - ...to local SMEs
 - eg, Weidlinger, Quadstone, Jardine, Arran Aromatics ...
- funded by business, DTI, SE and EU
 - judged by SE “the best example of commercialising the science base in Scotland”
- industrial work generates 50% of revenues

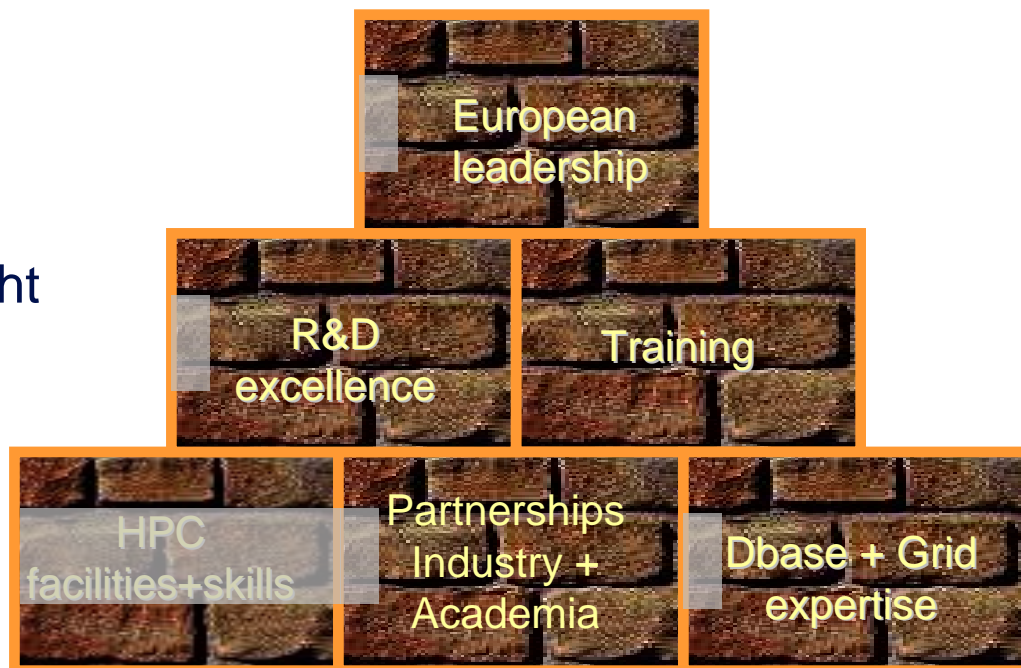
- middleware:
 - OGSA-DAI: most successful UK middleware development
 - QCDGrid: developed for UKQCD, deploying in medicine ...
- applications:
 - EdSkyQuery – used in Sloan Digital Sky Survey
 - Mouse Atlas – 3D imaging for embryo development
 - Gene Expression – linking databases worldwide

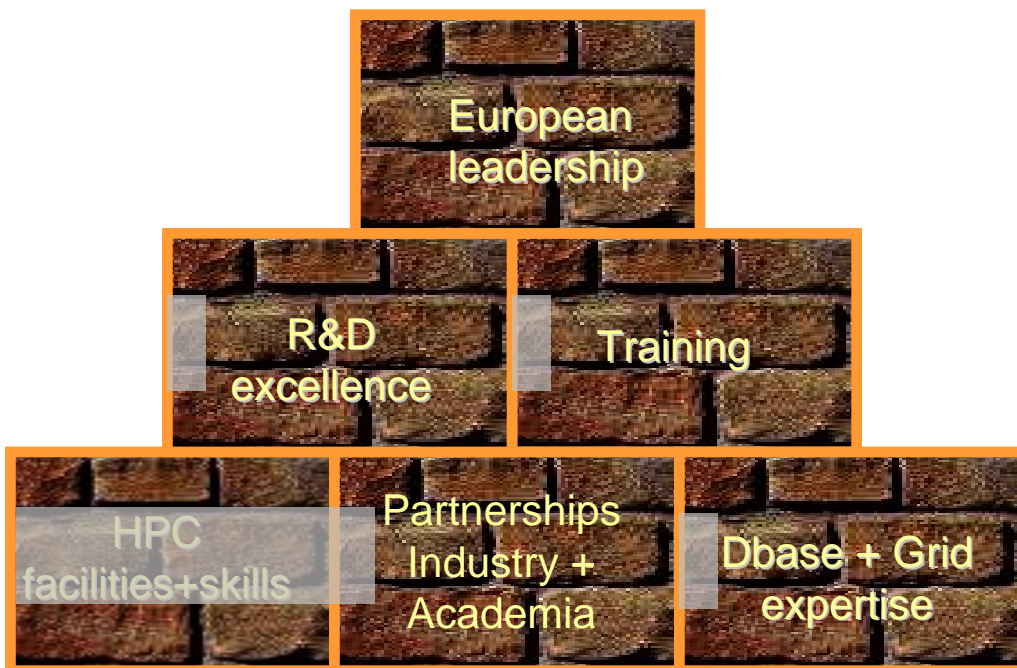


- computational techniques
 - programming techniques
 - numerical algorithms
 - languages and standards
- applications:
 - cosmology: Virgo
 - particle physics: QCD
 - materials: RealityGrid
 -
- measured by:
 - papers in journals and at international conferences
 - RAE return
 - 22% of UoA 19 in 1996 & 2001

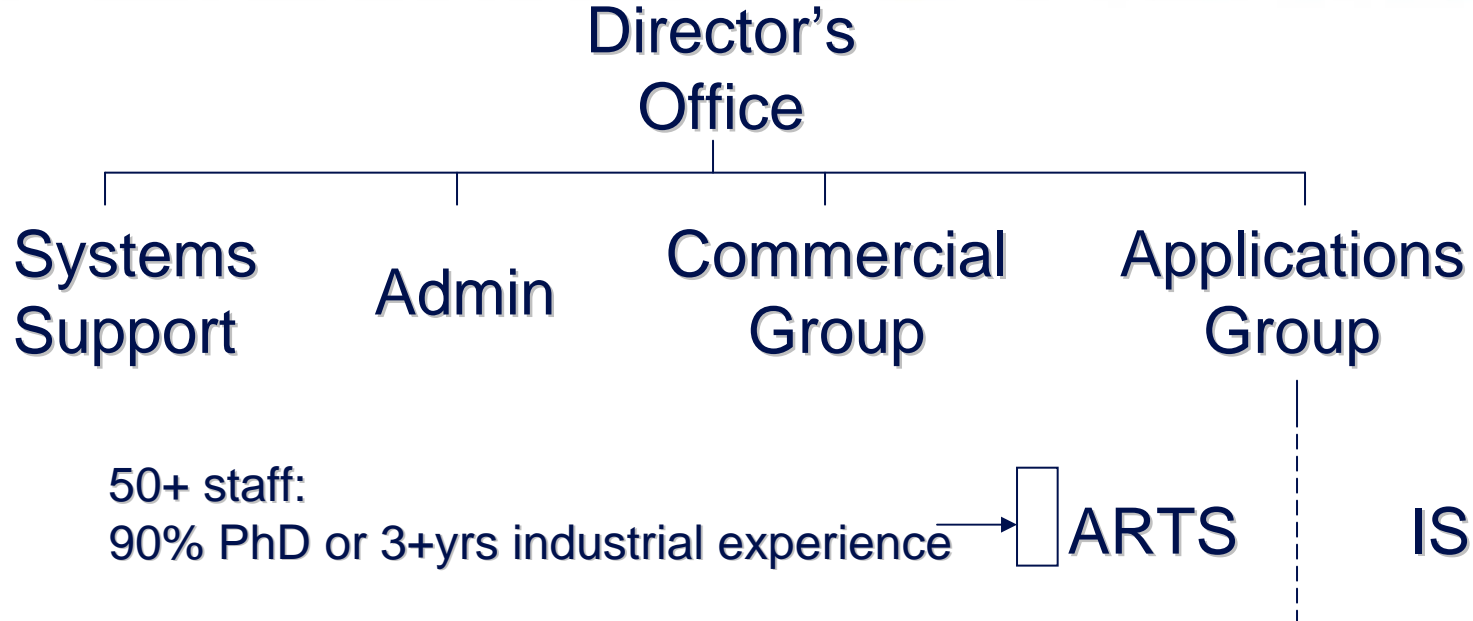


- Centre of Excellence in HPC Training
- MSc in HPC
 - one of first in world
 - funded by EPSRC
 - now extended as part of taught PhD programme
 - supported by industry
 - excellent practical grounding
- increasing activity in undergraduate teaching in Physics
 - Computational Simulation
 - PFiP
 - Cosmology
 - ...



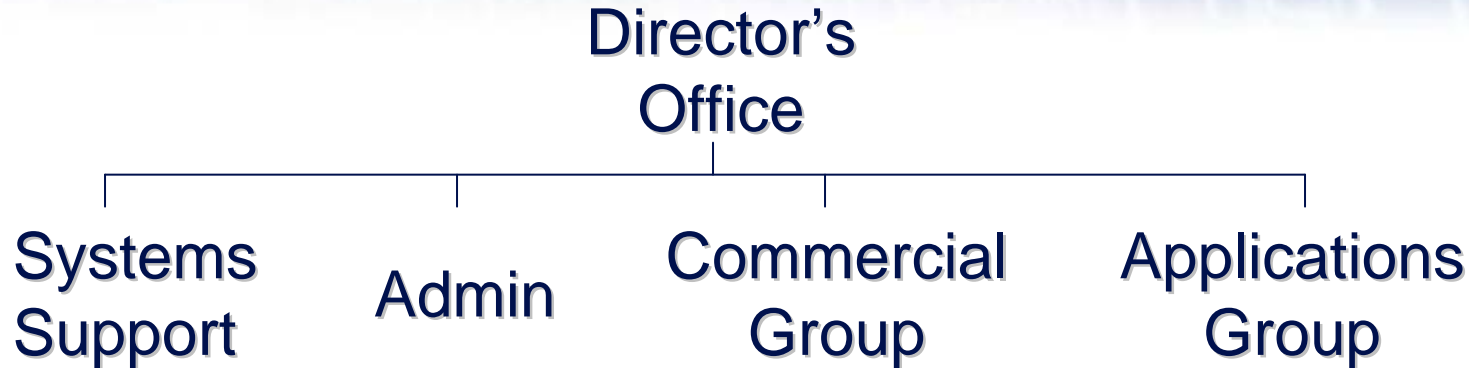


- HPC-Europa
 - funded by EU since 1993
 - repeatedly reviewed to be the leading computing programme
 - ~50 visitors pa, each for 1-3 months
 - collaborative research with all Schools
 - visitors from almost every European country
- ENACTS
 - EPCC led Round Table of European HPC & Data Centres
 - assessed impact of emerging technologies for scientific computing eg, *Grid computing*
 - set model for I3 in FP6
- IST (industrial) projects
 - Gridstart: co-ordination of **all** EU Grid development projects
 - NextGrid: disseminating best-practice tech transfer in Grid
- DEISA
 - supercomputing metacentre
- PRACE



- all of AG's activities are closely integrated
 - ... and professionally-run – eg. PRINCE2 for project management
- matrix management and scheduling of staff effort allows
 - optimal use of resources
 - learning from others' experiences
 - shared processes and procedures
- effective management and coordination is critical

- staff skills are our most valuable asset
 - so, have to be used effectively and developed
- almost all staff have open-ended contracts
 - those that do not are working towards these
- we provide CPD
 - co-ordinated by Staff Development Manager
 - monitored by annual/bi-annual appraisal
- no staff contracts linked to project funding
 - challenge for management to ensure continuity
 - never had to lose a technical member of staff
- matrix management, thus, the vital tool



- Commercial Group (4.5 FTE) provides business generation and client management
 - works to business target: currently £1.75M pa
- IS staff charged at “commercial rates” - £90k pa + PM
 - ... now, eroded such that it provides only minimal headroom
- actively seeking ways to improve o/h returns
 - must never try to compete on lowest common denominator
 - have to stay at the high-value end
 - commensurate with being university-based