A Perspective on Innovation

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What is innovation

- New technologies
- New business models
- Explosive growth, winner takes all sectors
Universities

- Culture very good
- Academic professor, entrepreneur professor
- Serving / disrupting / creating new industry
- Becoming institutional and less flexible
- Huge emphasis on commercialisation
Industry

BERD: Business enterprise expenditure on R&D, 1999 and 2009 (as a % of GDP)

- Business R&D low
- UK has small number of large companies doing R&D
- UK has large share of R&D by foreign firms
- UK has lowest share of govt support for independent SMEs (3.5%)

Alan Hughes & Andrea Mina, The UK R&D Landscape, CIHE UK-IRC, CBR, Cambridge
Industry

A substantive decline in funding of University R&D
Loss of Corporate Labs
Yet more business disruption across many sectors!
Intellectual Property

- Patents, copyright, trade secrets
- Importance of each varies with sector and business model
- Patent world is complex, confusing, combative, unpredictable, expensive
- Some progress to improve situation
Money is an expensive product
Traditional Venture Capital model is not working
Angels and Super Angels appear to be doing well
New models: Crowdfunding

Kauffman Foundation, Lessons from 20 years of investments in VC Capital Funds
Fiscal Policy and Tax

- CGT Tax rate for entrepreneurs is (almost) ok
- R&D Tax Credits are all excellent
- Patent box idea is interesting
- System is complex, keeps changing
1 – ARM

- Microprocessor architecture - 30 years from first concept
- Technology rooted in symbiotic industry/university/finance situation
- Corporate spin-out
- Innovative business model and relentless execution
- Dominates low-power CPU architecture with 35Bn+ instances made
2 – Xen

- Virtualisation software
- Technology based on long-term university practical expertise
- Xen.org open-source “hypervisor” developers platform
- Xen Source Inc start-up with $6M of US VC money
- Sold after 3 years in 2007 for $500Mio on small revenues
- Now a widely used technology in the cloud
3 - VNC

- Remote graphical access
- Technology based on long-term industry/university expertise
- Open Source release
- RealVNC start-up organically grown
RealVNC – new products

Access from Tablet and Smartphone

Access to Tablet and Smartphone

Access through the cloud

Access built into processor

Automotive
RealVNC

- 250M+ open source licences, 100K paying customers
- Any device, across any network, in any combination
- The world's most ported piece of software?
- Profitable from day one, 90% of revenues from export
- Business model to match unique circumstances
4 - Ubisense

- Real-time 3D location system based on ultra-wideband radio
- Up to 15cm accuracy at fully managed reliability levels
- Scalable in coverage and scope of application
BMW Car Plant, Germany
(Final Assembly Tool Assistance)

Quick facts
Installed area: 1.7km of line
Sensors: 350
Accuracy: <30cm in 3D
Reliability: 99.9998%

- Tracking tools on complex production line
- Automatically programs tools for each car
- Eliminates barcode scanning
Ubisense Funding

2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

July: Founded
June: IPO on AIM

F&F £1.6m Equity
F&F+ £1.6m Equity
F&F++ £1.6m Equity
F&F++ £2.0m CL
F&F £1.0m CL
HSBC £1.0m Loan
Pre-IPO £5.0m
IPO £5.0m

F&F – friends and family
CL – convertible loan
Ubisense

- Rooted in 20 years of Industry / University research
- Setting standards for Real Time Location Systems
- Sells to the largest manufacturing companies
- Intersection of computing / manufacturing
The University/Industry Interface

• Collaboration
  – Low barrier, low cost (revolving door)
  – High barrier, high cost (turnstile)

• Should there be a market?
  – Companies stepped back
  – Universities conflicted

• Simple rules and practices
  – Universities to make publicly funded IPR available at no extra cost
  – Would incentives be required?
  – Example rules for shareholding or licence: 5%, 1% Dilution Protected, 1%DP+1%DP Gift
  – Qualifying companies

• Technology transfer offices to be privatized and compete on value added
  – Implementing turnstile
  – In difficult position and measured on surrogates
  – Privatise, no privileged access, compete, raise money, assess on real contribution
Industry: Innovative Organisations

- Create private but independent industrial innovation centres
- Two companies anticipating industrial landscape changes
- Create strong teams in one place
- Do what you cannot do right now with people who will not work for you
- Innovate business models as well as technology
- Olivetti/Oracle/AT&T Cambridge was a previous example
Funding of University Research

- Research Assessment
- Research Councils
- Universities
The Engineer in Government

- How do we ensure decisions are well informed and wise?
- Create the post of Chief Engineering and Technology Advisor - a CTO for UK plc
- Always have at least one engineer or technologist in the Cabinet
In Conclusion

- Great Universities
- Great companies big and small
- Great engineering and technology tradition
- Great role models
- A Great Professional Body – The IET
- The future looks great