



# The roles of universities in encouraging innovation and technology adoption

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# KITE

- ▀ University research centre with 26 core staff and around 50 associated members
- ▀ Main research themes
  - ▀ Social and Business Informatics
  - ▀ E-Business
  - ▀ Territorial Governance of Innovation
  - ▀ Universities, Industry and Government
  - ▀ Complex Project Innovation
  - ▀ Enterprise

# Knowledge and the economy

- Expansion in demand for more formal kinds of knowledge
- Commodification and trade in knowledge
- Professionalisation and credentialisation of occupations
- Codification of management procedures
- Growth of knowledge intensive products and services
- Firm competitiveness depends on capability and reputation rather than market position
- This applies to traditional industries and services as much as high technology
- Universities as key knowledge producers have an important role in supporting the knowledge economy

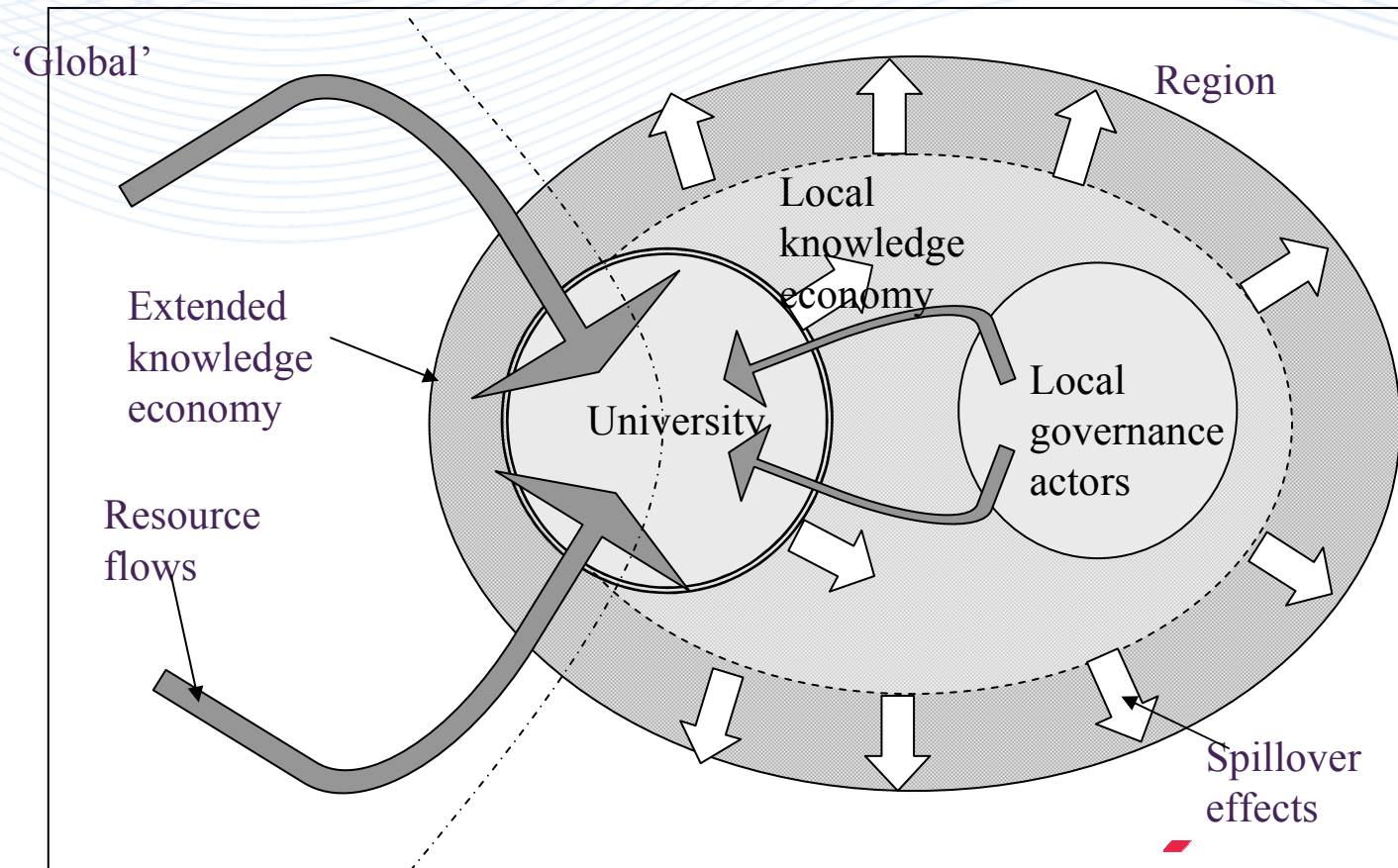
# Innovation is at the heart of the knowledge economy

- ▀ Innovation as ‘profitable change’
- ▀ Products and technologies still important but also processes, services, business concepts, systems, organisations....
- ▀ .....and also in social and public sectors
- ▀ What role can universities play?

# Models of innovation – STI and DUI

- ▀ Science – Technology – Innovation involves formal scientific knowledge, codification and conventional university industry links
- ▀ Learning by Doing – Using – Interacting is based on experience, tacit and embedded knowledge and is typified by learning between firms
  - ▀ (Jenson, Johnson, Lorenz and Lundvall, 2007)
- ▀ A spectrum not alternative models
- ▀ Universities need to work across both of these to collaborate with industry, and emphasis on DUI in social innovation

# Universities and regional competitiveness



# Research links

- Contract research and collaborative research – steadily growing internationally
- Encouraged by national and EU programmes
- Company sponsored centres – issue of secrecy and control of intellectual property
- Service oriented units – industrial design services, CAD centres
- Externally located centres with university involvement – means to circumvent university bureaucracy

# Distinguishing national and regional interactions

- ▀ National links imply competitive, based on excellence, and with a sophisticated partner
  - ▀ The aim is usually to provide direct benefits to the partner whilst benefiting the university in financial or research terms
- ▀ Regional links may be non-competitive, based on proximity and with inexperienced partners
  - ▀ The aim may also embrace achieving regional development improvements for the long term benefit of the university
  - ▀ The financial benefits are likely to be less important than the political objectives

# Knowledge transfer services

- ▀ Focus on disseminating and commercialising existing knowledge
- ▀ What is the focus? Benefiting the region or raising money?
- ▀ Consultancy programmes
- ▀ Awareness raising programmes
- ▀ Patent licensing
- ▀ Service delivery

# Personnel-based interaction

- ▀ People as 'knowledge carriers'
- ▀ Internships and project work
- ▀ Graduate placement programmes
- ▀ Knowledge Transfer Partnerships model (Teaching Company Scheme)

# HE and clusters

Chance

Science-based discoveries

Factor Conditions

Provision of skilled labour  
Research on better exploitation of physical resources  
Knowledge resources

Firm strategy, structure and rivalry

Direct assistance to firm management capabilities  
New business formation

Demand conditions

HE as consumer of specialist inputs  
HE foresight on future demands

Related and supporting industries

Government

Advice on policy and regulation  
Government funding for HE research

HE projects on supply chain development  
Spreading knowledge across supply chains

# Building knowledge clusters

- Across Europe universities are developing specialisations based on local industries
- Research and innovation support aimed at groups of firms with common needs
- Integration of technology and training support
- Stimulating joint working between the firms and collective learning
- Moving beyond individual departments
- Use of cluster-oriented outreach staff

# Case studies from Newcastle



Old industrial city with a new reputation as a centre for creativity



# Coping with transition – post-industrial North East England

- Innovative region of the 18<sup>th</sup> and 19<sup>th</sup> centuries
- Overall erosion of innovative potential during 20<sup>th</sup> century
- New inward investment in 1980s – Asian firms replace Americans
- SME support from local authorities – incubation
- Modest attempts at science park developments
- Riverside regeneration - shift from traditional industries to housing offices and leisure
- Failure of the inward investment approach in Asian downturn and opening of Eastern Europe
- Cluster experimentation in North Tyneside – RSC, building ‘clusters’ from closures

# Development of innovation policy

- Emergence of innovation policies within the Structural Funds in mid 1990s
- Initial round of centres of excellence involving university collaboration and European support
- Regional innovation support
  - Process industries , High volume manufacturing , Engineering design
- Parallel technology transfer activities such as Knowledge House
- Emerging model of regionally focused collaborative activities, targeted at specific clusters, and linked to basic research activities also
- Recognised in Regional Economic Strategy by 'Putting universities at the heart of the regional economy'

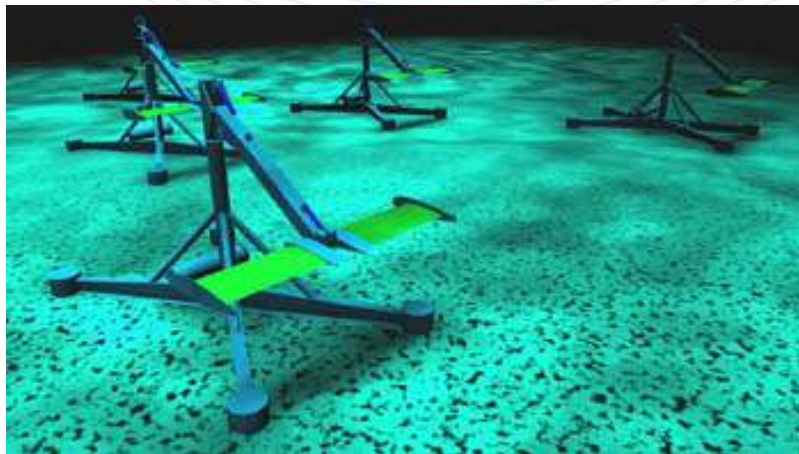
# Ships to offshore to subsea

- Traditional shipbuilding industry in decline for many years
- University had stronger links with Asian firms than local firms
- Some firms and facilities moved into offshore platform production
- Traditional engineering skills provided base for new developments in subsea engineering
- University has recently begun to build links with this new sector

# SMD hydrovision – university spin off



# Tidal Energy Business - Stingray



# Developments from the pipeline to subsea cluster

- Pipeline cluster, Pegasus, identified need for advanced training
- Approached university to establish new degree
- Research into the cluster from PhD, now lecturer in Business School
- Approach from wider subsea firms for new MSc
- New research project to examine collaborations between the industry and education system, and to develop new degree with business school and subsea engineering inputs

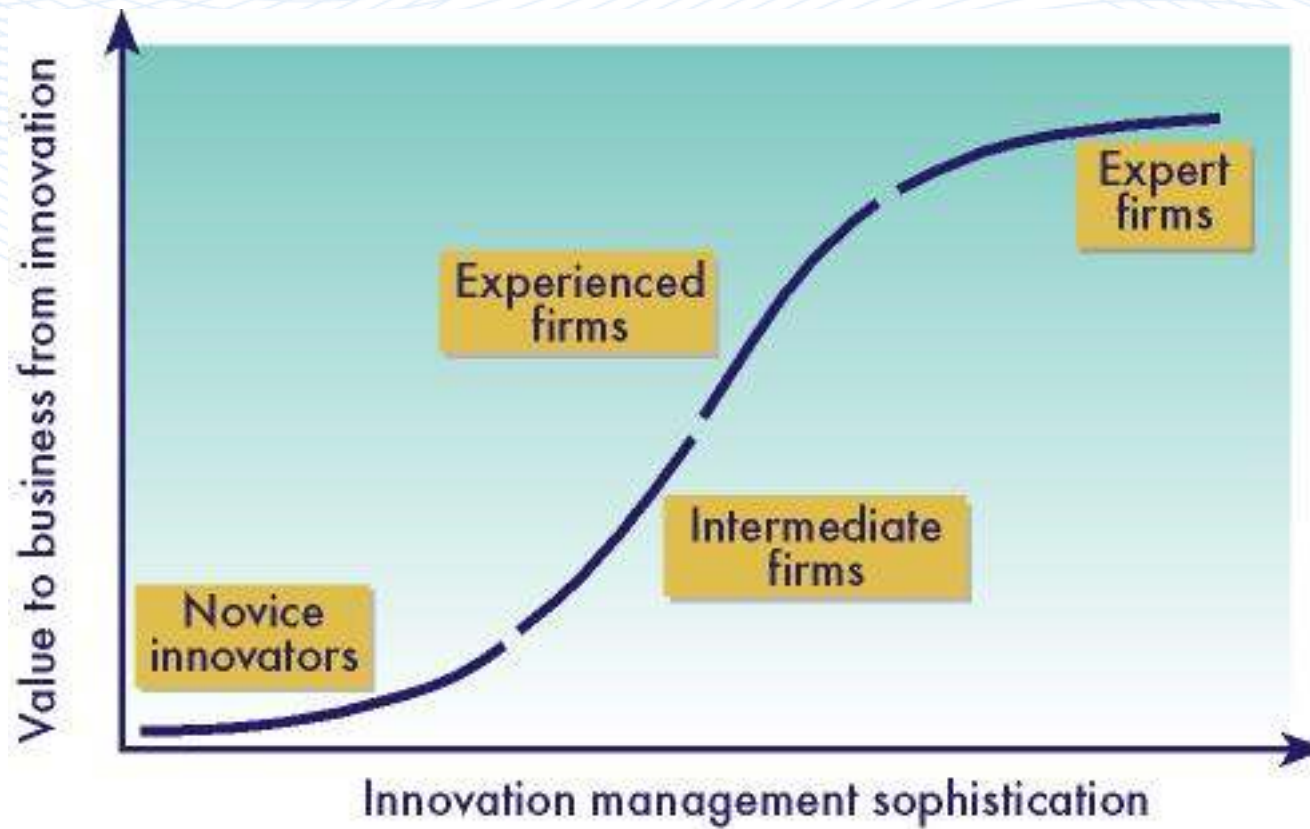
# Knowledge House case study

- Front door for five universities in North East England
- Aimed at SMEs
- Central node and university-based offices
- Helping SMEs to identify problems and needs
- Finding the best people within the universities
- SME chooses who they want
- Small grants to pay for consultancy
- Income in excess of £13m for the universities from over 1,300 projects since 1996, with £7.6m of this coming in the last four years



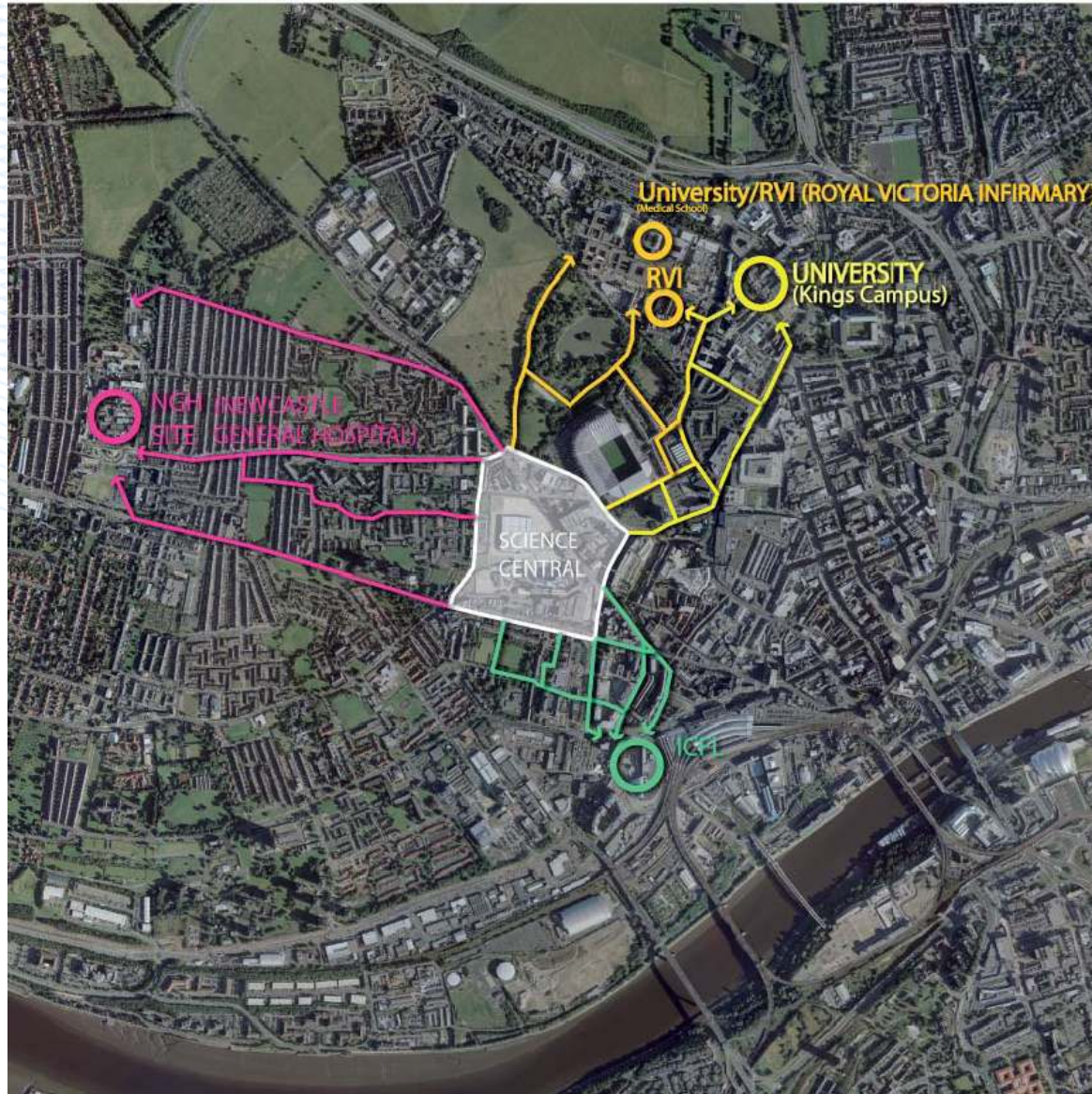
# Innovation sophistication

- How do firms learn to manage innovation better?
- What differentiates good and bad innovation management?
- Not about best practice, but learning processes
- Helping firms to learn, learning from the experience of other firms



# Newcastle Science City

- One of six science cities designated by national government
- Partnership of University, City Council and regional development agency
- 4 science themes – mix of old and new
- Translation research and exploitation
- Campus redevelopment and expansion
- Major physical redevelopment
- Science education and widening aspirations
- Public debate and understanding



# Business School contributions

- Business students and graduates – general and specialised
- Student project work with Science City partners and firms
- Specialised training within university and for business
- Research on innovation and technology futures
- Policy advice and support
- Support for commercialisation strategies and enterprise programmes
- Professors of practice

# Wider dimensions to the university mission

- ▀ Dynamic impacts on the competitiveness of the regional economy
- ▀ Impact on urban and rural regeneration
- ▀ Lifelong learning and employability
- ▀ Culture and the creative industries
- ▀ Social wellbeing and health
- ▀ Sustainability
- ▀ Contribution to regional institutional capacity

# Conclusions

- Universities can be important actors in support for innovation and technology adoption in local industries
- Advantage of multiple services – people, skills development, research, knowledge transfer, support services etc
- Needs change in culture towards responsiveness and shift from disciplinary structures
- Key staff to build the local relationships
- Also needs incentives and funding from government to place engagement centrally in university policy