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Science Cities: Prototypical or Atypical?

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Science Cities – an evolving concept

- 'Technopoles' concept (late 1970s) - planned developments usually promoted by central or regional governments to foster regional development through co-location/cross-fertilisation of universities, research institutes, high-tech firms, financial and professional institutions.

- Urban growth poles associating innovation and regional development to promote economic revitalisation → the perceived image of the productive space of the 21st century

- Interplay between:
  - Technological revolutions (IT, biotech, genetic engineering)
  - Globalisation – accelerated by European integration.
  - Knowledge economy – knowledge as main driver of innovation and competitiveness, new organizational forms (vertical disintegration, horizontal networks, flexible specialisation, delocalisation and outsourcing, etc.)

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Cities, regions and economic development

- More flexible in adapting to change in markets, technology, culture – compensate national governments' failure to fully control functional processes that shape economies, society
- Less power than national governments, greater capacity to generate targeted development projects, foster firm-formation and SME growth, create wealth
- Foster the creation of innovative milieux – synergies among social, institutional, economic and territorial structures
- Linear → interactive innovation models → RIS

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1. Linear-Model Innovation Complexes

- **France**: Grenoble, Sophia Antipolis
  - Weak connections with and minimal learning from local industry, mistrust between innovative large firms and local research institutions, marginal innovation networks, vertical links, no horizontal links, no local labour market, poor mobility.

- **Japan:**
  - **Tsukuba (Public Science-led)** - vertical links, no connections with universities or industry, no spin-off firms, little synergy
  - **Kansai Science City (Private-Sector Initiative)** – not a pole, but urban network of 12 Science City areas, large firms, collaboration
  - **Sendai (Public-Private Initiative)** – 12 universities, 2 industrial parks, private investment – few linkages between large firms and local firms, few spin-off firms from universities or S&T institutes

2. Interactive-Model Innovation Complexes

- **Germany: North Rhine Westphalia**
  - Integration of local actors into a regional network ('regional conferences', regional fora*),* NRW Technology Programme – Technology Centres

- **Austria: Technical University of Graz**
  - 1993 partnership between the university and the local council, 5 technology parks for new start-ups, many from graduates

- **Oulu Technopolis Finland**
  - Largest concentration of high-tech firms in the country, around the University of Oulu Technical Research Centre, Technology Park and Medical Science Park → virtuous circle between large telecom firms, start-ups and the university

- **Linköping University, Sweden - Foundation for Small Business Development (SBIL), Centre for Innovation and Entrepreneurship (CIE)**
  - Tradition of technology transfer through spin-offs, many from academic staff, Ericsson, Saab, building and supporting networks of technology-based entrepreneurs

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UK Science Cities

- 2004-2005 – Birmingham, Bristol, Manchester, Newcastle, Nottingham, York Science Cities
- ‘Science City’ - UK model for targeting S&T investment in cities with strong science-based assets (e.g. a major university or research excellence centres), with high potential to attract a critical mass of innovative businesses and become drivers of regional growth
- Spearhead the Government’s campaign to build Britain's knowledge economy
- Nomination criteria:
  1. Concentration of world-class scientific research in the university sector
  2. Concentration of innovative R&D in industry

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Newcastle Science City (SC)

- Newcastle Science City Partnership:
  - Newcastle City Council – SC at the heart of the city regeneration strategy
  - Newcastle University – SC as the focus of the ‘Excellence with a Purpose’ mission
  - One NorthEast (local RDA) – SC as the focus of regional economic strategy

- Over £100 m committed to SC projects in the region’ s existing strengths:
  - Stem Cells and Regenerative Medicine
  - Ageing and Health
  - Molecular Engineering
  - Energy and Environment

- Acquisition of a 19-acre site in the city centre to be used as a platform for research, teaching, training, business support

- Prospects for a Development company for private & public investment in translational research and commercialisation of science

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Newcastle University – SC pillar

- Member of the elite Russell Group of leading research-intensive UK universities
- Member of **N8** alliance of research-intensive universities in Northern England (Newcastle, Durham, Lancaster, Leeds, Liverpool, Manchester, Sheffield, York) → comparable critical mass to that of Oxbridge and London, and US universities
- Move towards the 'entrepreneurial university' status:
  - Business links: **'**Knowledge House' network, Commercial Development Team (IP protection for academic spin-offs)
  - Professors of Practice
  - ENOVA Tripos Model for HE Reform

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Professors of Practice

- Key part of the Newcastle Science City Programme
- Generally accomplished people with excellent business skills, technical expertise and research interests
- High-tech entrepreneurs with strong academic credentials (PhD)
- Dual roles: integrate business and academic worlds, narrow the university-industry divide → turn a conflict of interests into a confluence of interests

Professors of Practice

- 4 PoPs already recruited on a half-time position in the Business School (min. 2 days/ week) in the SC areas: Stem Cell and Regenerative Medicine, Biomolecular Engineering, Ageing and Health, Energy and Environment
- Liaise with other University departments and schools, with external partners, e.g. One North East and with the private sector.
- Expected to contribute to some or all of the following:
  - Awareness-raising within the University of user needs, public engagement and commercial strategies
  - Teaching, seminar programmes
  - Communication and marketing strategies
  - Policy formulation
  - Knowledge transfer activities
  - Shaping the relationships between the Science Community and the Business School.

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Professors of Practice

ENOVA Tripos Model for HE Reform

- Promotes a new model of higher education:
  - Arts and culture
  - Sciences and engineering
  - Business (entrepreneurship and innovation)

- Introduces a general education element in the relatively narrow, specialised UK HE programmes → students must be trained as 'generalists-specialists', technically literate business people, globally-oriented entrepreneurial scientists and engineers

- Provide students with understanding of at least one language and a culture distinct from their own → language, culture, business and innovation as epicentre of global networks

- Requires internal re-organisation at the university level, must be embedded within a wider strategy

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- SC general goals:
  - Develop new industries as a national policy
  - Regenerate a declining or stagnant region
  - Develop innovative environments
- Clear development strategies, strategies, synergies among network actors
- Strong research and entrepreneurial capacities of local universities or new academic institutions
- Clusters of high-tech firms that have regeneration capabilities as earlier successes are superseded
- Strong local leadership to gather resources, translate R&D into growth
- Create platforms for dialogue between knowledge, innovation and governance stakeholders – ‘consensus spaces’

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