

Clusters & Business Networks

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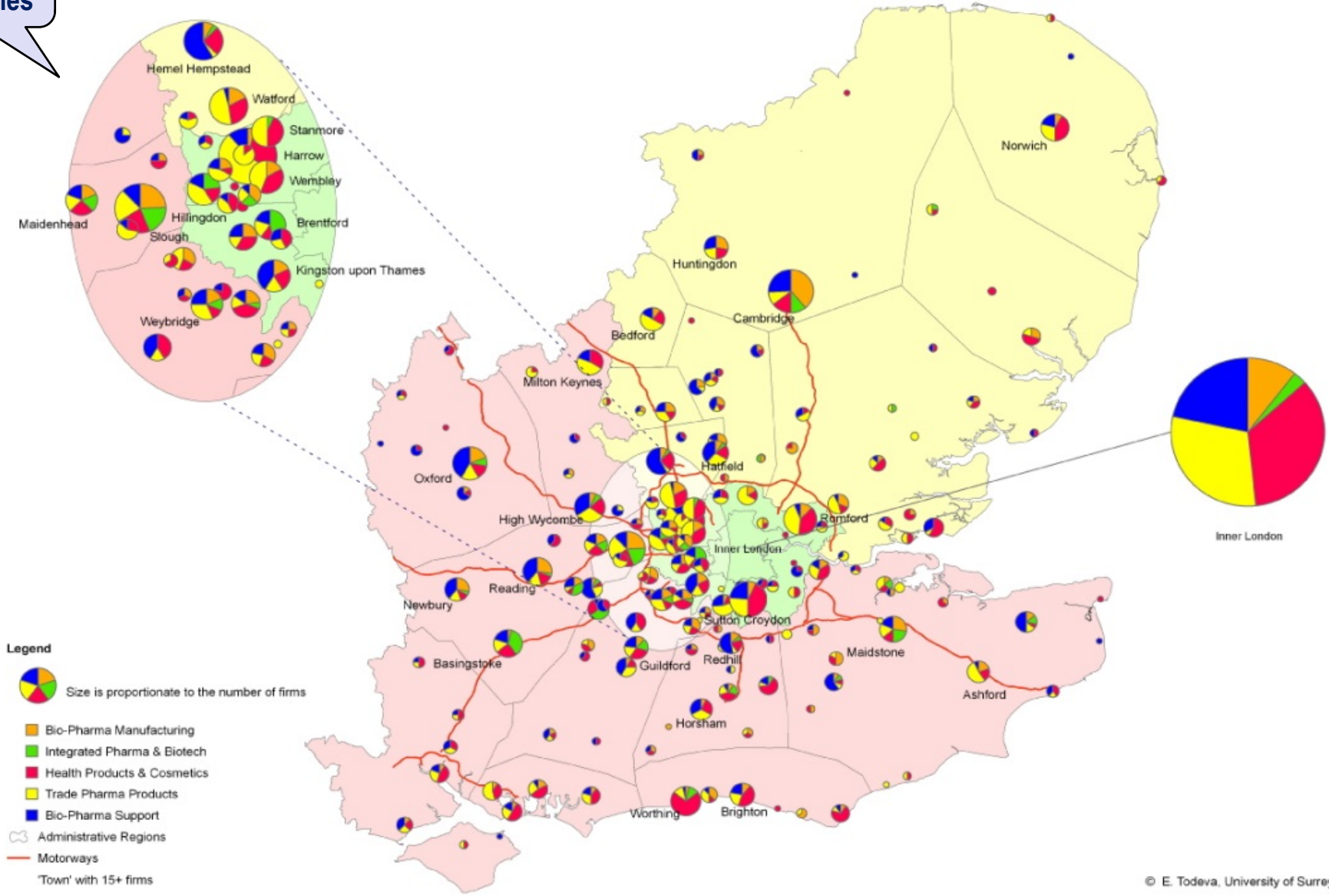
University of Surrey



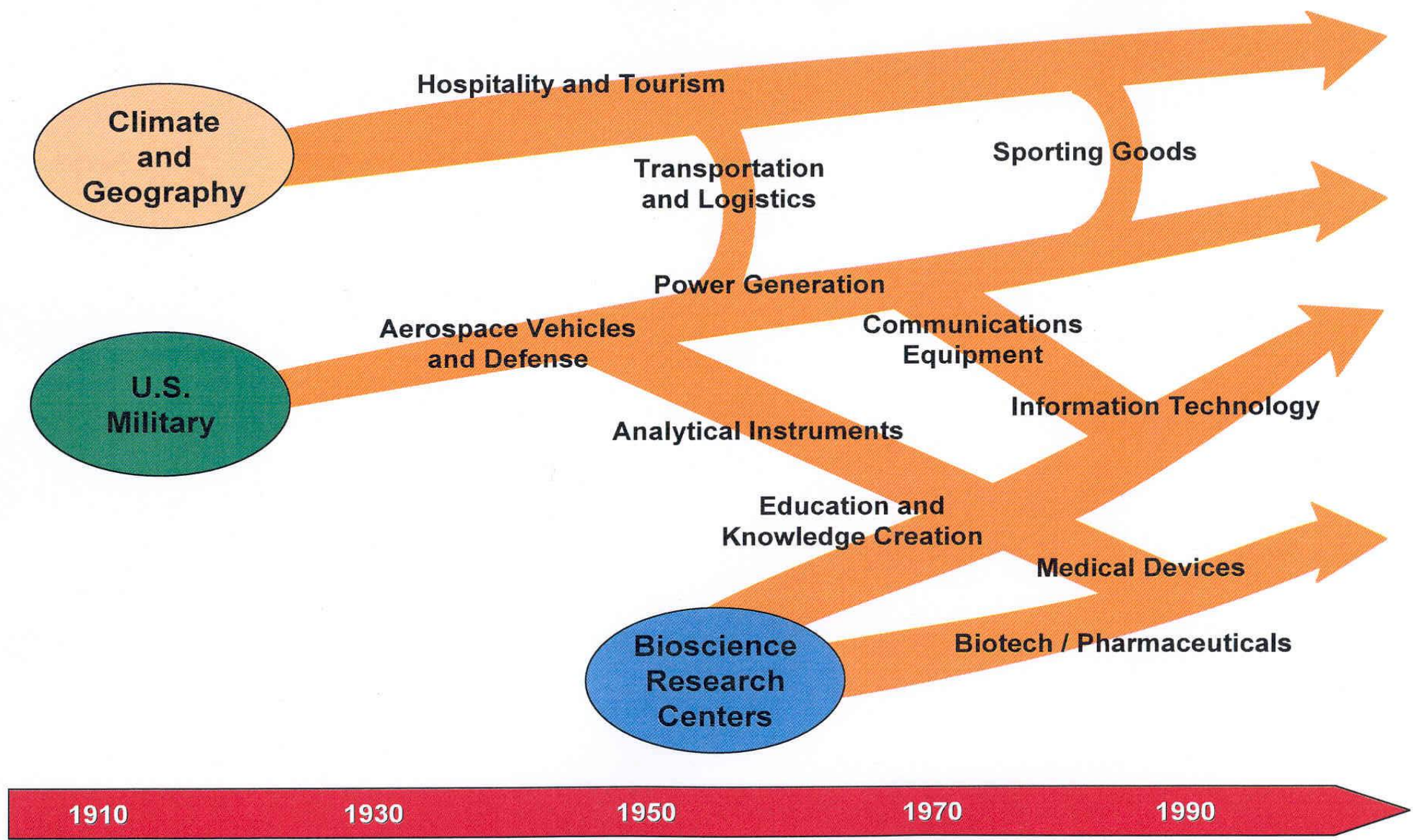
Bio-Medical & Health, Greater South East, 2008

Location Boundaries

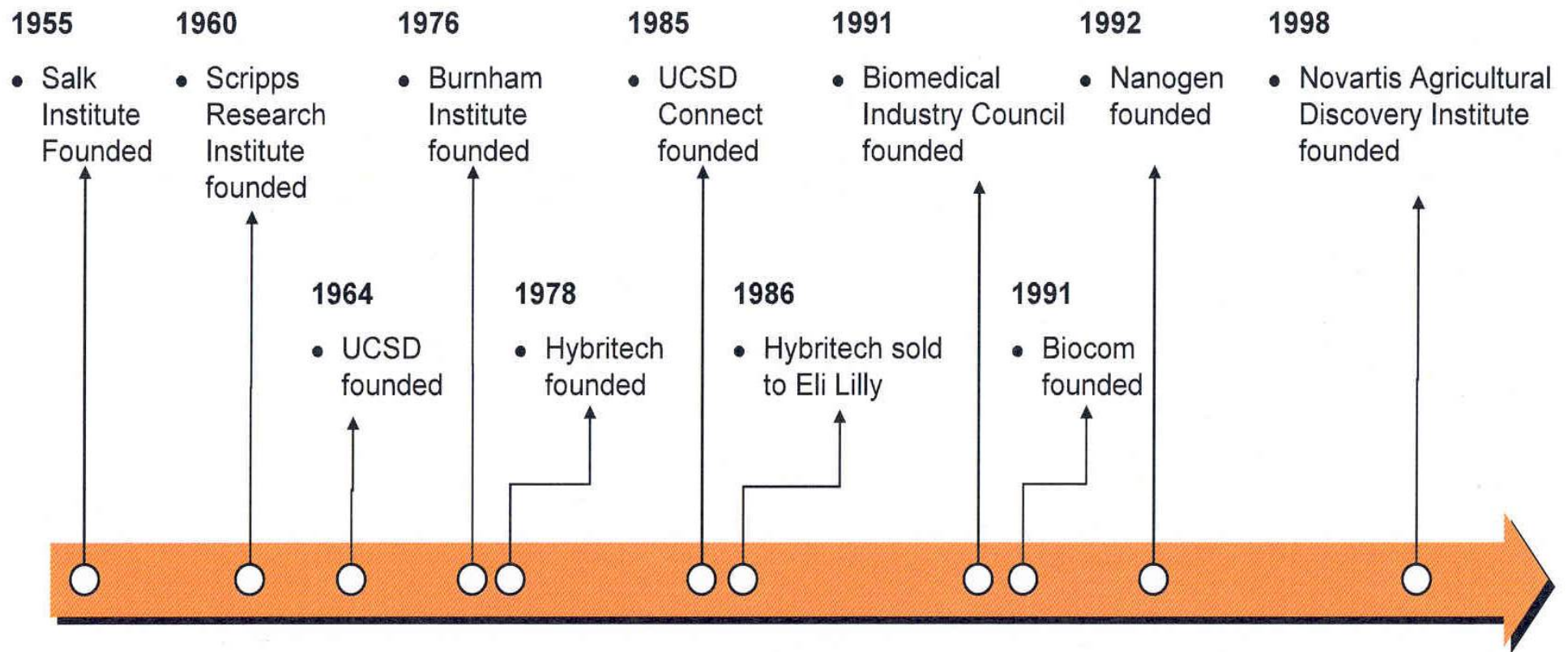
Database Firms 'Locational Concentration Across Regional Boundaries' Greater South East, UK



San Diego Bio-tech (Porter, 2002)



The History of San Diego Bio-tech Cluster



The Chilean Salmon Cluster

⇒ From 0 to 25% of world salmon farming

⇒ Exports: 1985 US\$ 1 mill., 2002 US\$ 1,000 mill.

Policies have evolved over time

⇒ **1978-85 “Initial learning”**: regulation, technology transfer, investment in pre-competitive research

⇒ **1986-95 “Maturing”**: building physical infrastructure, export promotion and marketing, innovation and development of suppliers (cages, nets, food)

⇒ **1996-today: “Globalization”**: productivity increase and technology transfer, environmental management, biotechnology (diseases and genetic handling)

Theoretical Underpinning of Clusters

- Models of industrial organisation
 - Marshalian District (*Alfred Marshall, 1890, 1919*)
 - Flexible specialisation (*Piore & Sabel, 1984*)
 - Positive effect on competitiveness of geographic concentration of similar and inter-related firms (*Porter, 1998, 2000*)
- Spatial agglomerations (*economic geography*)
- Positive externalities and increasing returns on scale and scope (*evolutionary economics*)
- Technological spill-overs (*innovation studies*)
- Territorial specialisation (*competitive strategy*)
- Self-containment and progressive division of labour and collaborative practices across firm boundaries
- Productive specialisation and growing surplus

Economic Development

Old Model

- **Government** drives economic development through policy decisions and incentives



New Model

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration

Sources of Strategic Advantage in the Economy

National Innovation Systems & Policies

University Research

Science Parks

R&D Support

SME Support

Knowledge Networks & Partnerships Support

Innovation, Intermediation & Finance

Definition of Clusters

- **OECD – Clustering is the tendency of vertically and horizontally integrated firms in related lines of business to concentrate geographically**
- **M. Porter (1998) – Geographically proximate groups of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities.**
- **Bergman & Feser (1999) - A group of business enterprises and non-business organisations for whom group membership is an important source of individual competitive advantage. Buyer-supplier relationships or common technologies, distribution channels or labour pool bind the cluster together.**
- **Reolandt & den Hertog (1999) – Networks of production of strongly interdependent firms, linked to each other in a value adding production chain. In some cases they encompass strategic alliances with universities, research institutes, knowledge-intensive business services, bridging institutions (i.e. consultants, brokers) and customers.**

Definition of Clusters

Clusters are agglomerations of firms & institutions, co-located in a geographic area, connected by *value-adding activities*, and with access to benefits from *input/output markets, infrastructure and environmental coordination* via policies (E. Todeva, 2006).

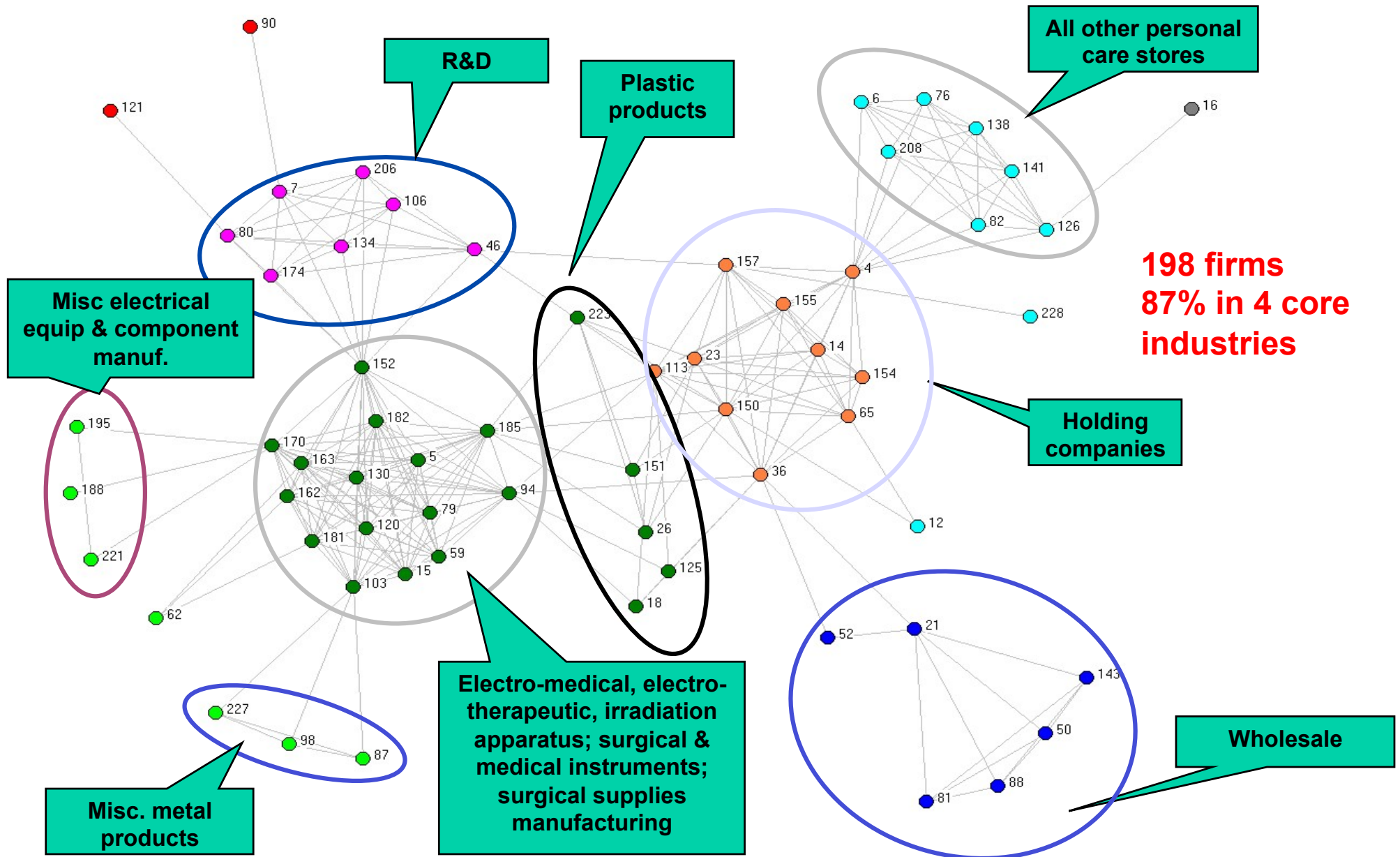
<http://www.surrey.ac.uk/BCNED/>

http://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=1124332

Cluster Value Chain: SURGICAL & MEDICAL INSTRUMENTS MANUFACTURING

(198 firms, ties between firms based on 5 or more shared industry codes)

(87% of firms have the core industry codes: 334510 Electro-medical and Electrotherapeutic Apparatus Manufacturing; 334517 Irradiation Apparatus Manufacturing; 39112 Surgical and Medical Instrument Manufacturing; 339113 Surgical Appliance and Supplies Manufacturing)



Bio-Medical & Health, Greater South East, 2008

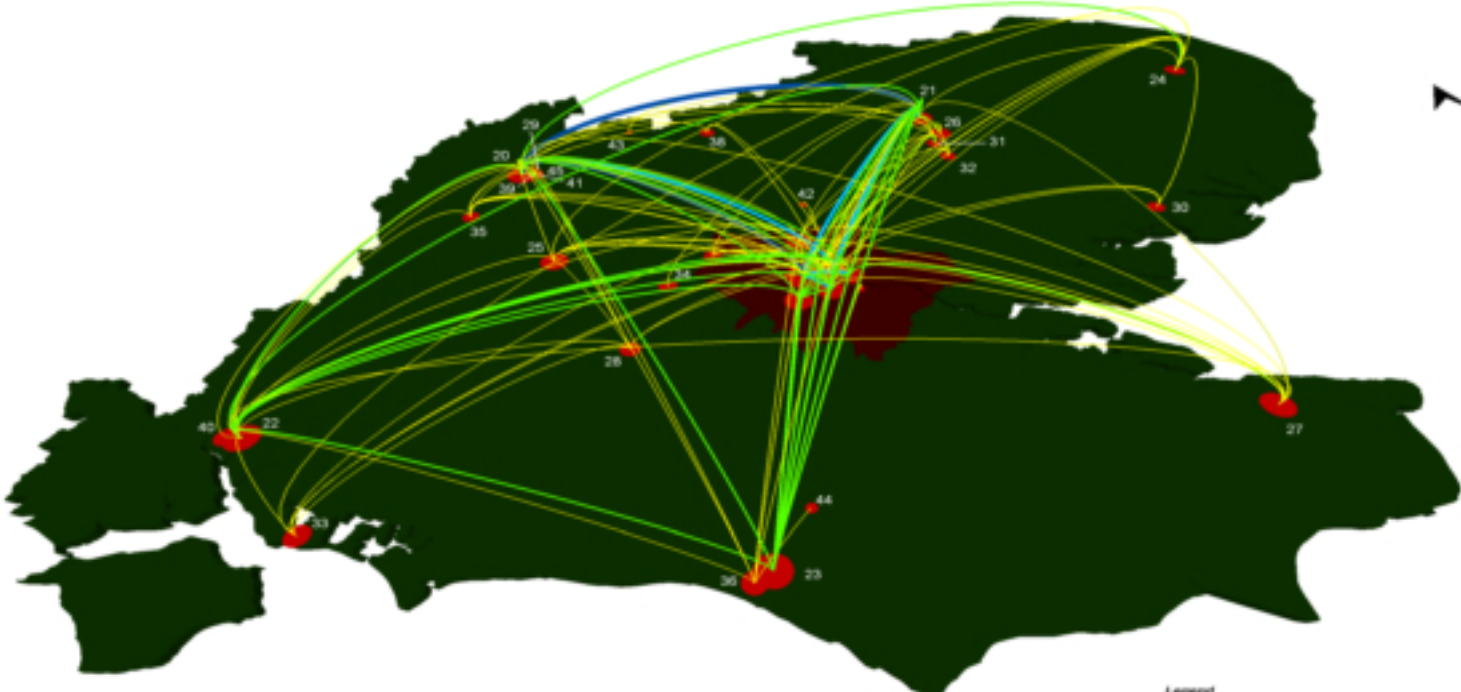
Regional Inter-University Alliances & Partnerships

Database Research Projects 'Regional University Collaborations' Greater South East, UK

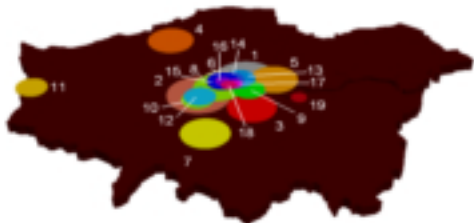
Map of Regional Research Collaborations in Health Technology and Life Sciences Greater South East, UK

Grant Holders - London	Total No Grants
1 University College London	1471
2 Imperial College London	1242
3 King's College London	689
4 Medical Research Council	509
5 Queen Mary, University of London	240
6 London School of Hygiene and Tropical Medicine	238
7 St George's, University of London	134
8 Birkbeck, University of London	119
9 Guy's, King's and St Thomas' School of Medicine	66
10 Institute of Cancer Research	46
11 Brunel University	34
12 Natural History Museum	24
13 City University	22
14 School of Pharmacy, University of London	22
15 Royal Free and University College Medical School	21
16 University College & Middlesex School of Medicine	6
17 Health Protection Agency	4
18 Cancer Research UK	4
19 University of Greenwich	2

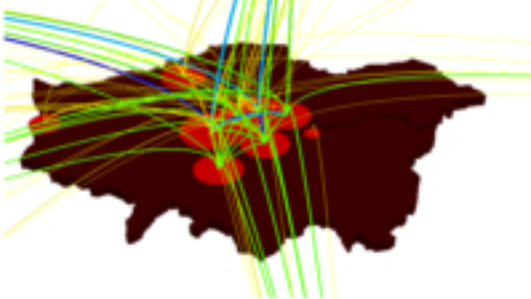
Grant Holders - Rest of GSE Region	Total No Grants
20 University of Oxford	1605
21 University of Cambridge	1510
22 University of Southampton	534
23 University of Sussex	399
24 University of East Anglia	145
25 University of Reading	138
26 Babraham Institute	130
27 University of East	101
28 University of Derby	74
29 Oxford Radcliffe Hospitals NHS Trust	44
30 University of Essex	42
31 European Molecular Biology Laboratory	38
32 Wellcome Trust Sanger Institute	37
33 University of Portsmouth	34
34 Royal Holloway, University of London	32
35 Science and Technology Facilities Council	31
36 University of Brighton	26
37 Histon Park Cambridgeshire	25
38 Open University	24
39 Oxford Brookes University	16
40 Southampton University Hospitals NHS Trust	14
41 Nuffield Orthopaedic Centre, Oxford	9
42 University of Hertfordshire	5
43 University of Buckingham	2
44 South Downs Health NHS Trust	1
45 Oxford Centre for Enablement	1



Grant Holders - London



London Partnership Links



Legend

The thickness of the link corresponds with the number of projects in partnerships between two grant-holders.

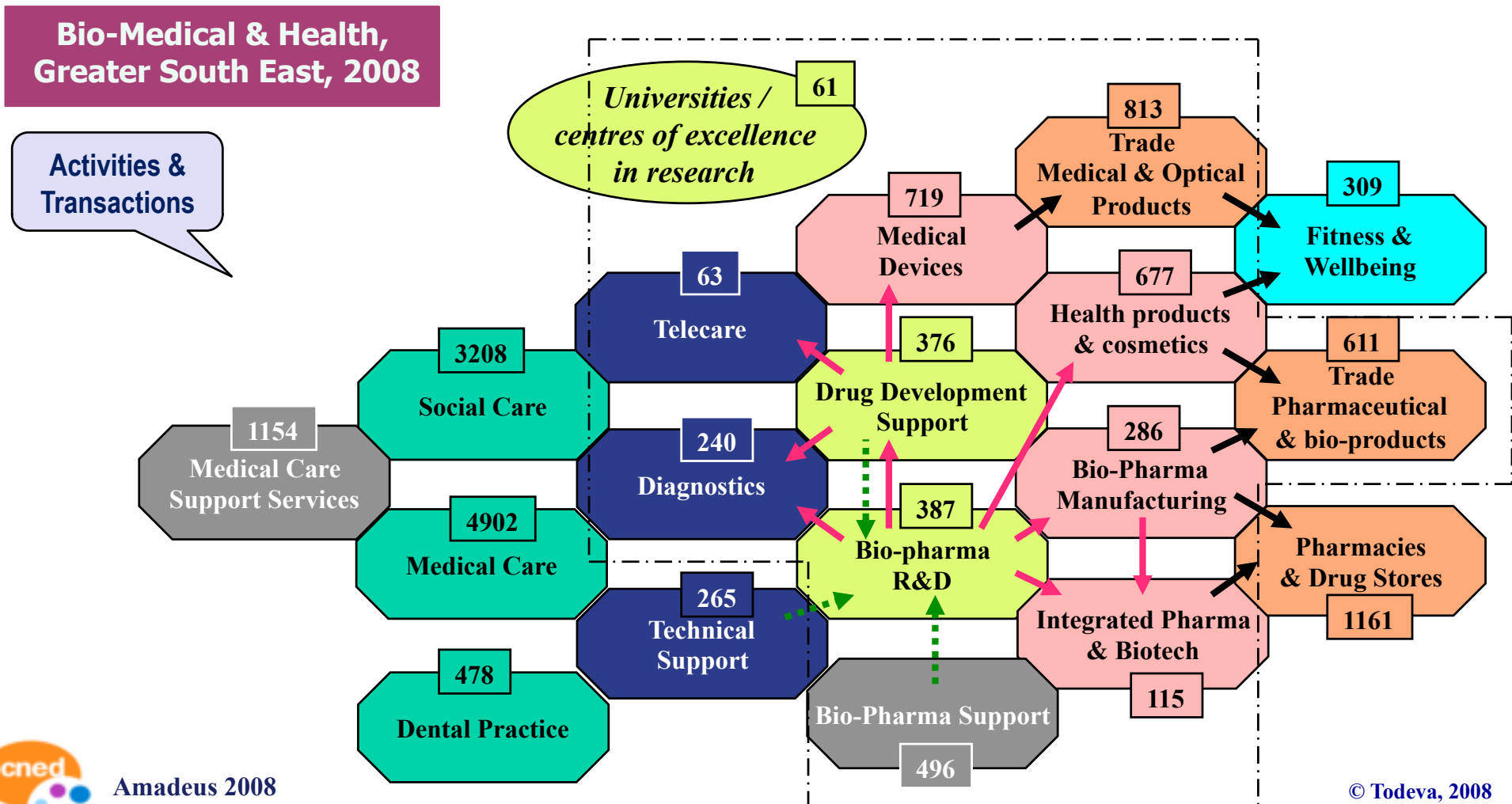
- 1 - 3 partnerships
- 4 - 8 partnerships
- 9 - 14 partnerships
- 15 - 21 partnerships
- 22 - 31 partnerships
- 32 - 44 partnerships

The size of the pie is proportionate to the total number of grants received by each institution.

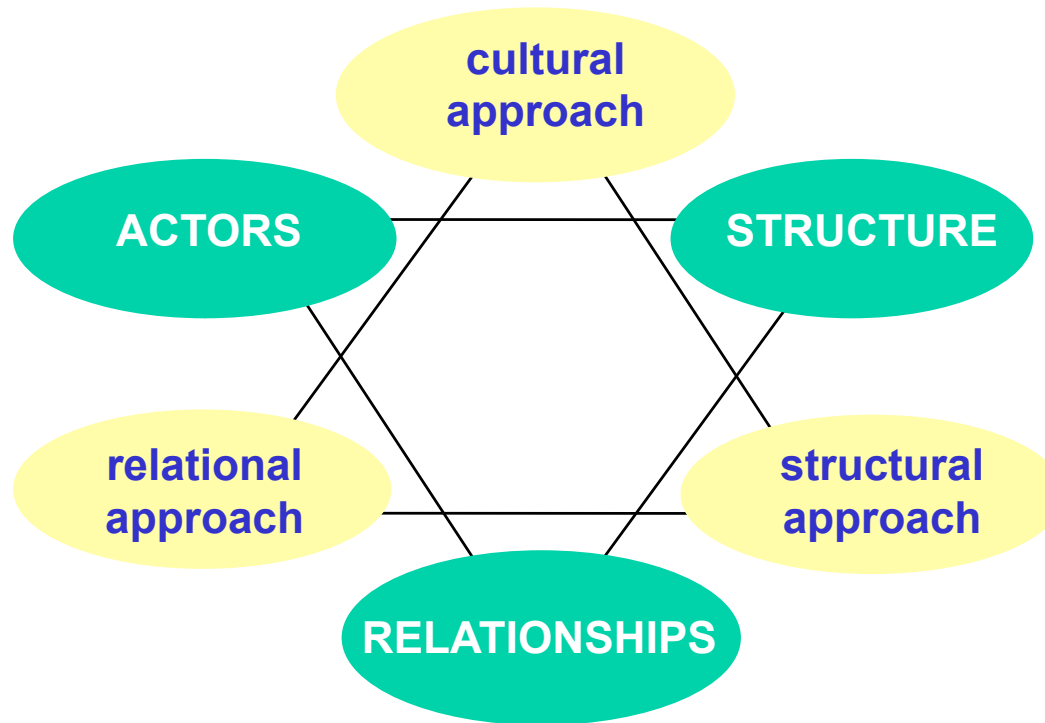
- 1 - 10 received grants
- 11 - 100 received grants
- 101 - 1000 received grants
- > 1000 received grants

- The Use of complementary databases comprising of the entire population of firms and funded research projects
- Developed a Multi-Stage Cluster Methodology for Cluster mapping and analysis
- Investigating Brokerage, Intermediation, & Information sharing across firm / regional / country boundaries

Database Firms
'Concentration of firms in the Value Chain in the Region'
 Greater South East, UK

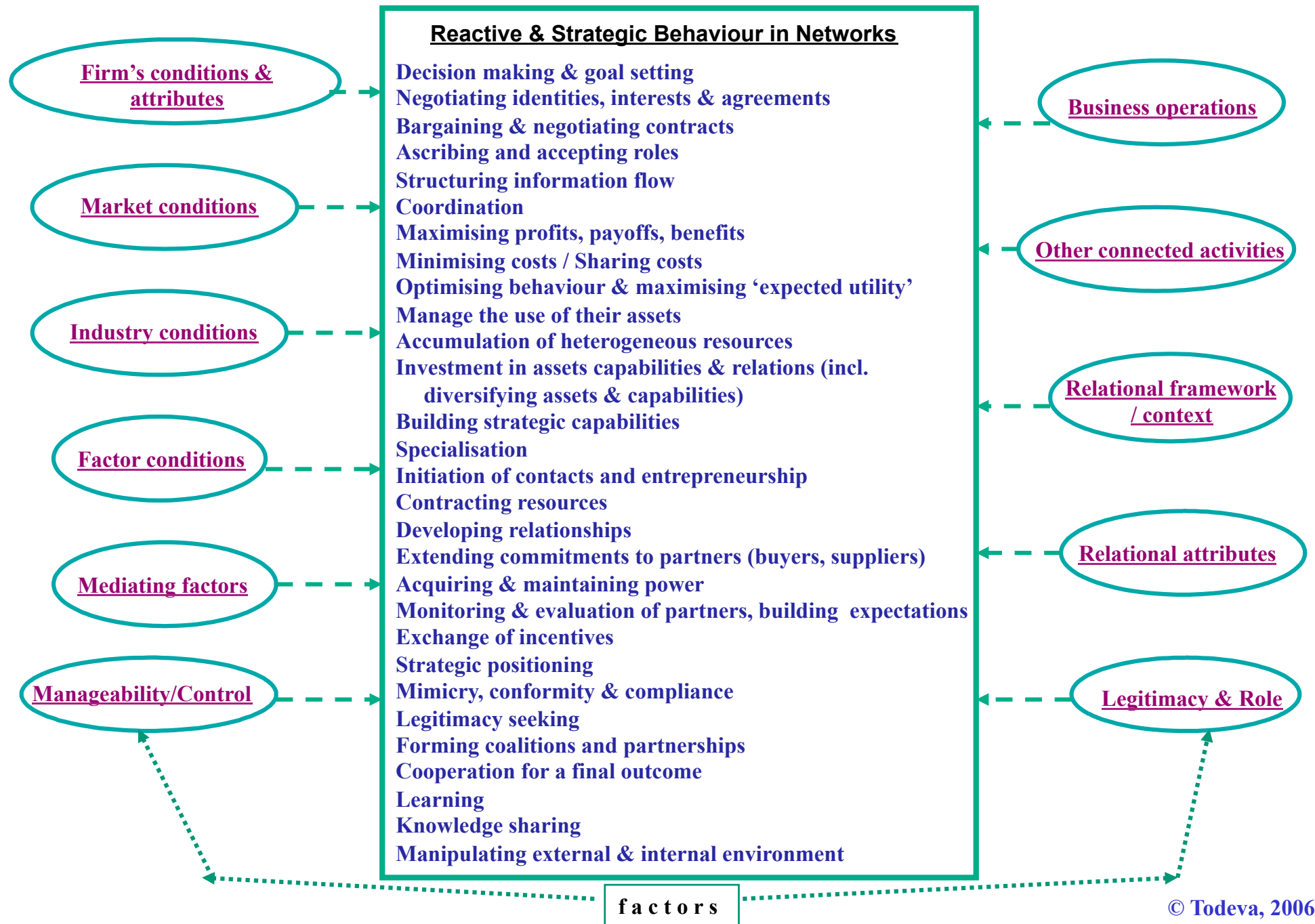


The Network Diamond

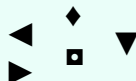
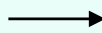
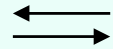
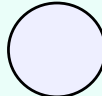
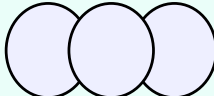
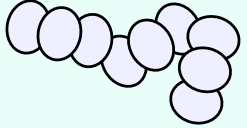


Emanuela Todeva (2006) *Business Networks: Strategy and Structure*, New York: Taylor & Francis.

The Behavioural System of Business Networks



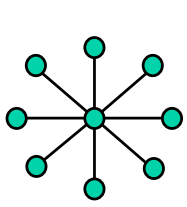
Evolution of Network Relationship

POTENTIAL RELATIONSHIP	Co-presence in a field	Relation / Association between subjects & objects	
PRE-RELATIONSHIP	Initiating a link (including learning about the other)	Knowing someone or something	
INTERACTION / COMMUNICATION LINK	Establishing a relationship (including certain reciprocity)	Mutual recognition between human actors, or interaction with objects	
DYADIC MARKET RELATIONSHIP	Market transaction (including agreement)	Single exchange of resources between human actors	
LONG-TERM RELATIONSHIP	Repetitive transactions (including a partnership agreement)	Repetitive exchanges, employing an object into a process	
NETWORK RELATIONSHIP	Interconnected relationships (including transactions & resource flows)	Community exchanges & interconnected processes	

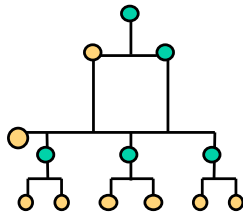
Types of Structural Configurations

hierarchical organisation (Weber, 1947)	
functional organisation	
matrix organisation	
multidivisional organisation (Simon, 1962; Chandler, 1962; Williamson, 1975) trans-national (Bartlett & Ghoshal, 1989)	
horizontal organisation / value-chain, supply chain - through vertical integration of activities (Porter, 1986)	
industry groups (Porter, 1980)	
hybrid organisation (Miles & Snow, 1986, Powell, 1987)	
heterarchy (Hedlund, 1986)	
community / dispersed / distributed	
hegemonic / Ego-centred	
clustered / dispersed / distributed	
circular / regular / small-world	
universal / core-periphery / scale-free	

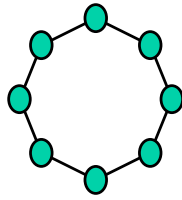
Network Structure



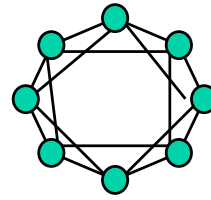
Hegemonic



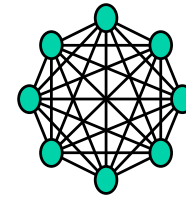
Tree



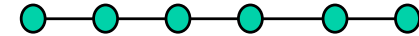
Circular



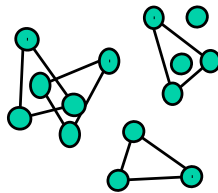
Regular



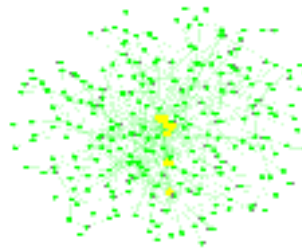
Universal



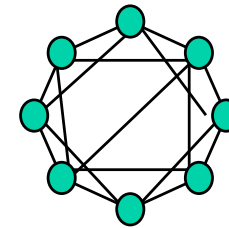
Value Chain



Clustered



Core/Periphery (Scale-free)



Small world

Types of Supply Chain Networks

- **Ego-centred**
- **Dispersed**
- **Project based**
- **Value-chain based**
- **A combination of value-added chains & strategic control networks**

