

Making Sense of Clusters

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October 2009

Clusters in three words:

- Ideas
- Relationships
- Place

Roadmap

- **Definition: What are Clusters? Why do firms cluster?**
- **Analysis: Finding clusters**
- **Action: Working with clusters**

I. Why Cluster(s)?

What are they? How do they work?

What Kind of Economy?

- While most jobs and businesses in every state area are the same
- Restaurants, grocery stores, hospitals, beauty salons,
- About a third differs: Traded sector

Traded Sector Drives Growth

Most jobs are here: schools, hospitals, grocery stores, restaurants



But firms in this sector drive the economy

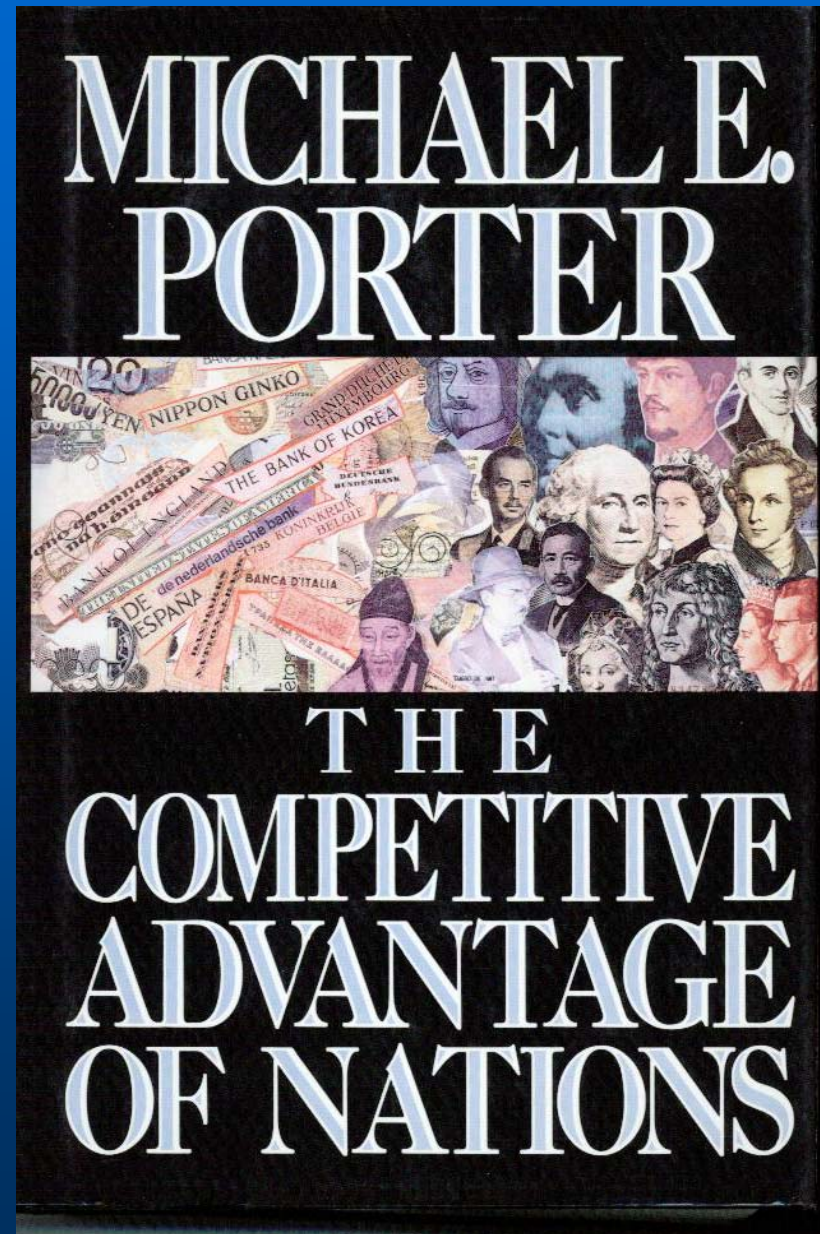
Defining Industry Clusters

Clusters are geographic concentrations of interconnected companies and institutions in a particular field, including:

- suppliers of specialized inputs, machinery, services**
- distribution channels and customers**
- manufacturers of complementary products**
- companies related by skills, technologies or common inputs**
- related institutions such as research organizations, universities, standard-setting organizations, training entities, and others**

Porter: Clusters

- Starts from the business strategy standpoint
- Says Economic success isn't random
- Similar and related businesses draw advantages from proximity
- Clustering holds for most “traded” goods: autos, carpets, RVs, others



What makes Clusters Tick?

Rivalry & Cooperation

Inputs



Customers

Suppliers

Source: Michael Porter, Harvard Business School

Oregon's Microbrew Cluster



An Oregon Cluster

DESCHUTES  BREWERY

ROGUE™



FULL SAIL
BREWING COMPANY



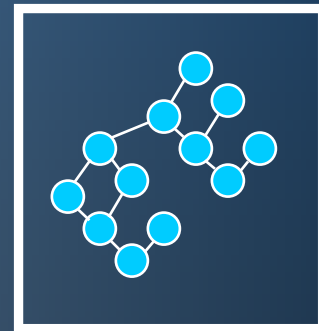
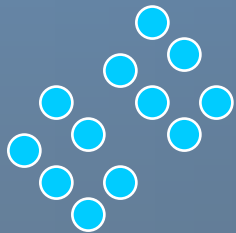
Micro-foundations of Clusters

- Labor Market Pooling
- Supplier Specialization
- Knowledge Spillovers
- Entrepreneurship
- Path Dependence and Lock-In
- Culture
- Local Demand

Stages of Clustering

- Concentrations of firms and workers
- Awareness, Conscious Action & Communication
- Formal Organization

A Cluster Continuum



Concentrated

Connected

Organized

Many Different Kinds of Clusters

- **Buyer-Supplier and Value Chain**
- **Inter-Firm Relationships**
- **Geographic Extent**
- **Level of Activation/Awareness**
 - Working, Latent, Potential
- **Cluster Life Cycle- Phase**
 - Embryonic, Growing, Mature/Declining, Renewing
- **Other Issues**

II. Finding Clusters

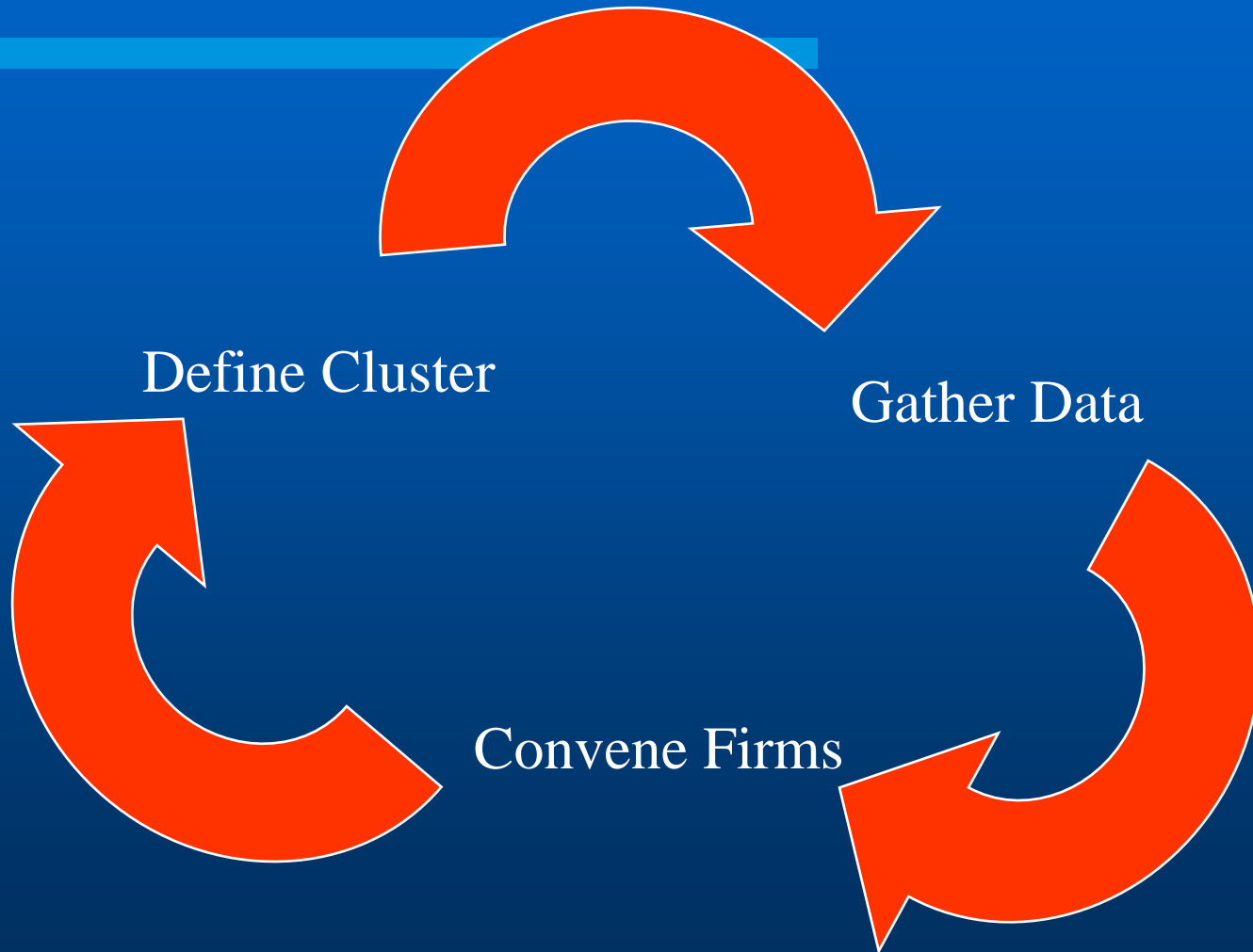
- **Applying our definition to the real world**
- **Quantitative and Qualitative Techniques are complementary**

Cluster Mapping

- A few places are well explored
- Outlines are (mostly) clear
- Much detail is still unknown



Cluster Analysis Cycle



Sectors are not Clusters

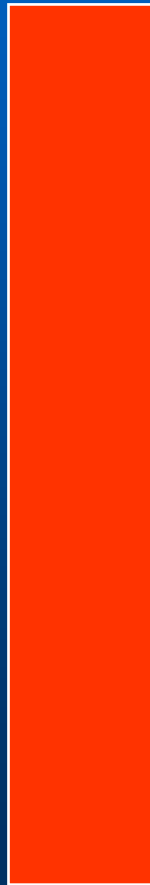
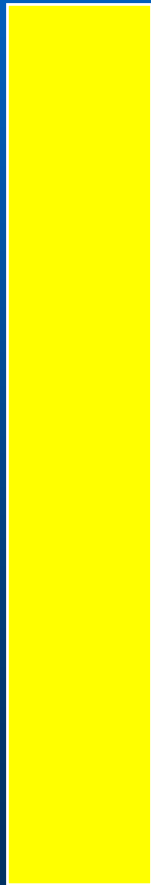
SECTORS

Most quantitative analysis relies on data organized according to the SIC or NAICS classification schemes to define industries

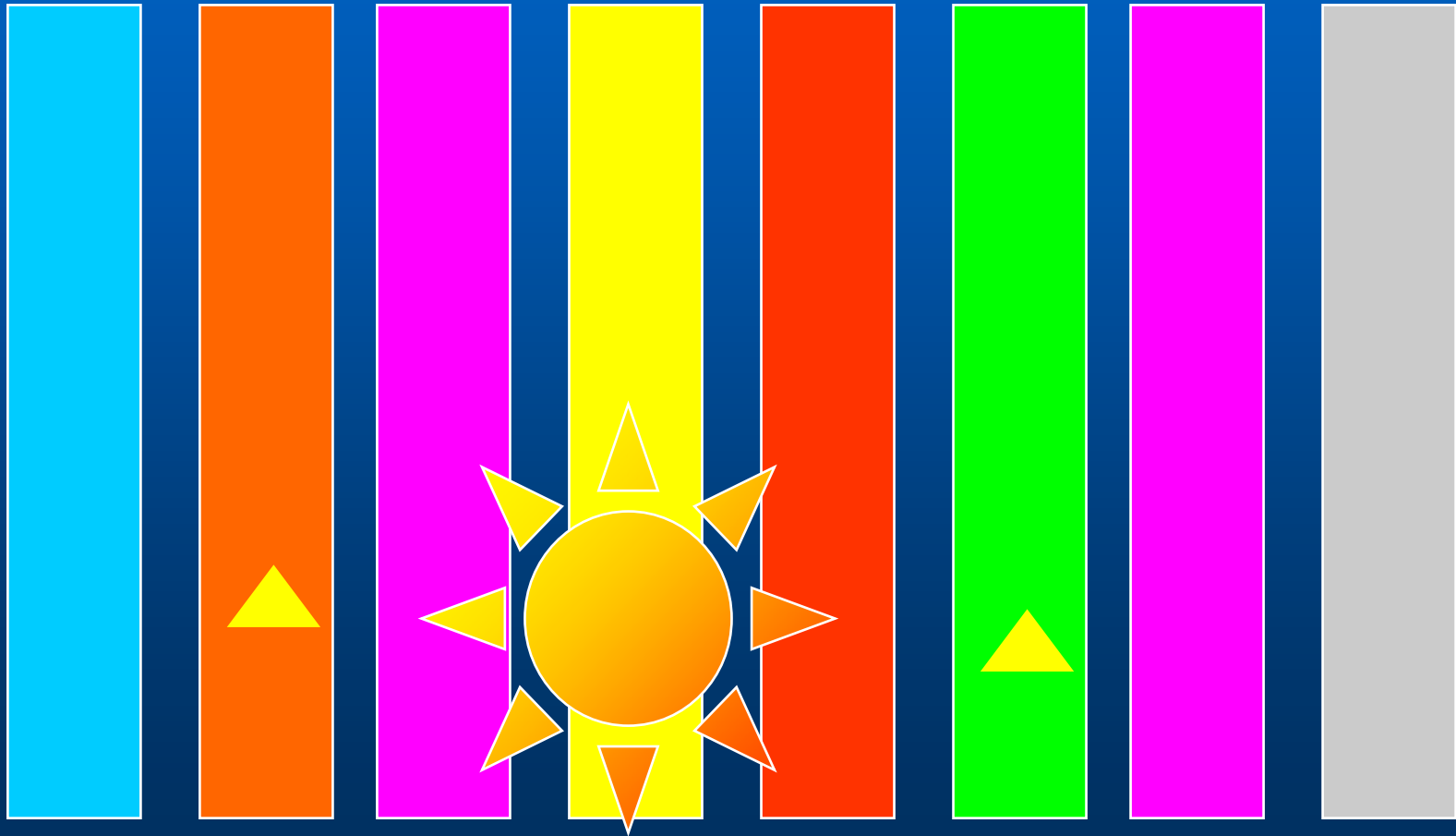
CLUSTERS

Qualitative analyses define clusters according to local relationships. Cluster theory maintains that clusters cut across sector lines; many clusters are highly specialized

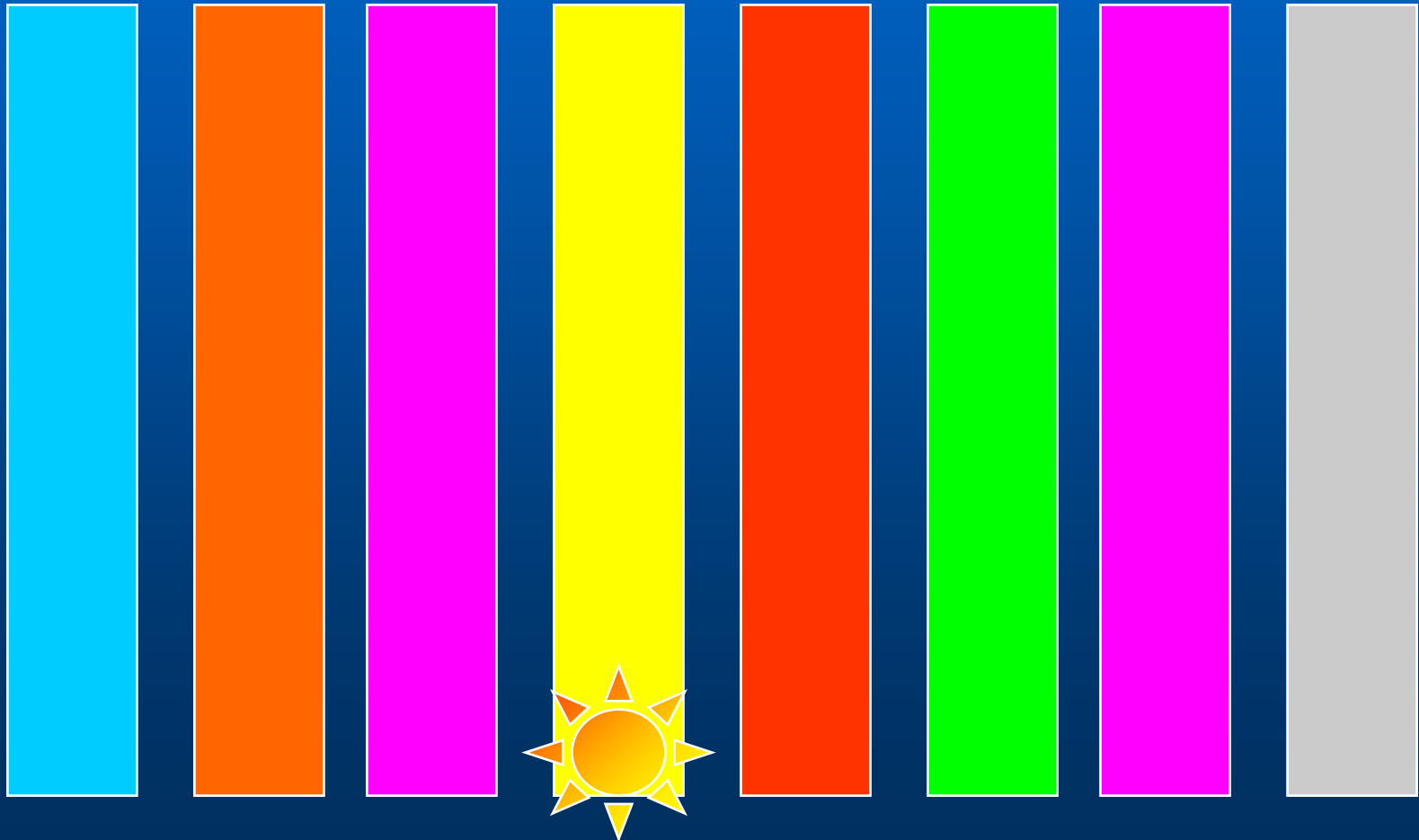
Sectors



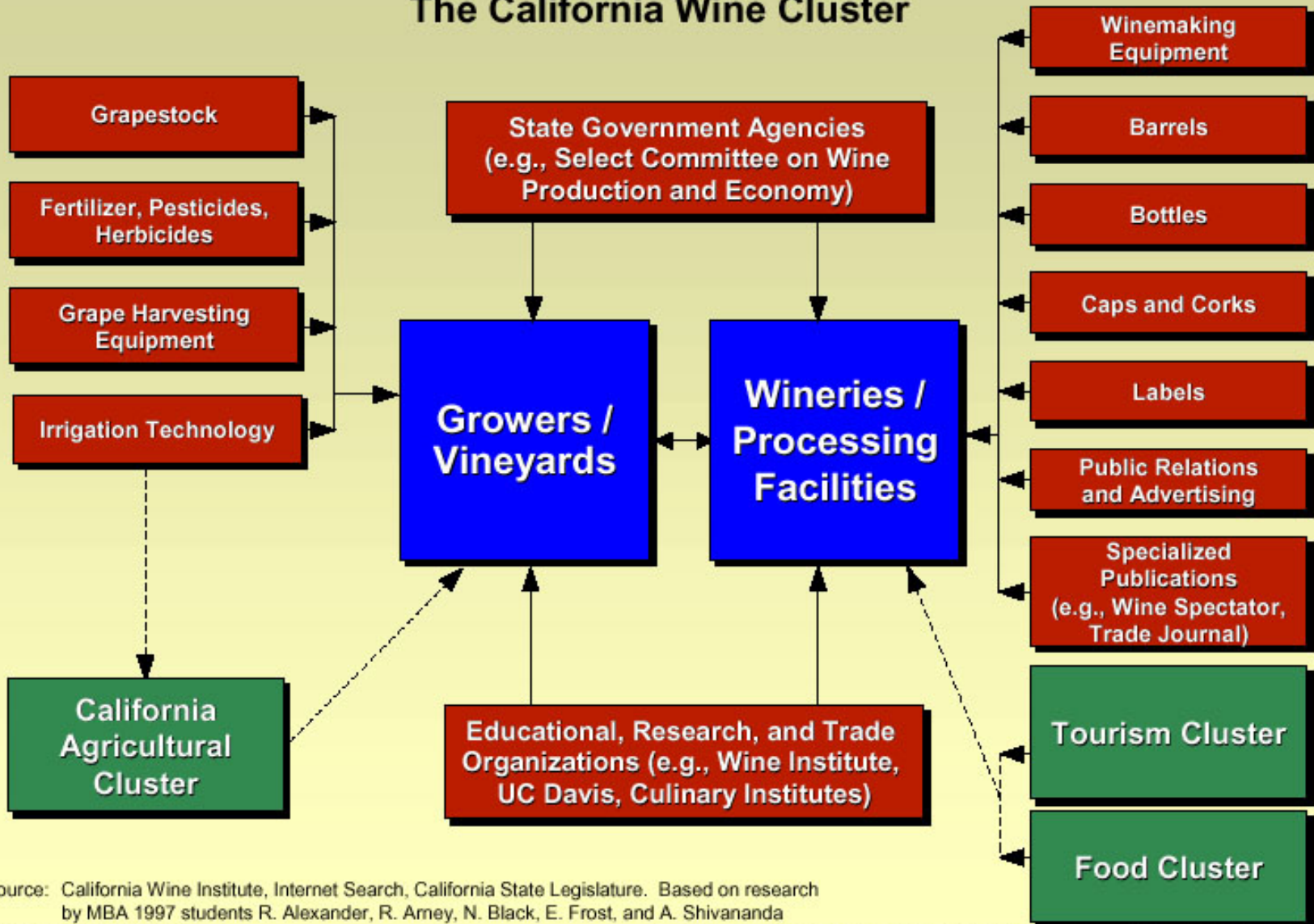
A Cluster can span sectors



Or be a small part of a larger sector



The California Wine Cluster



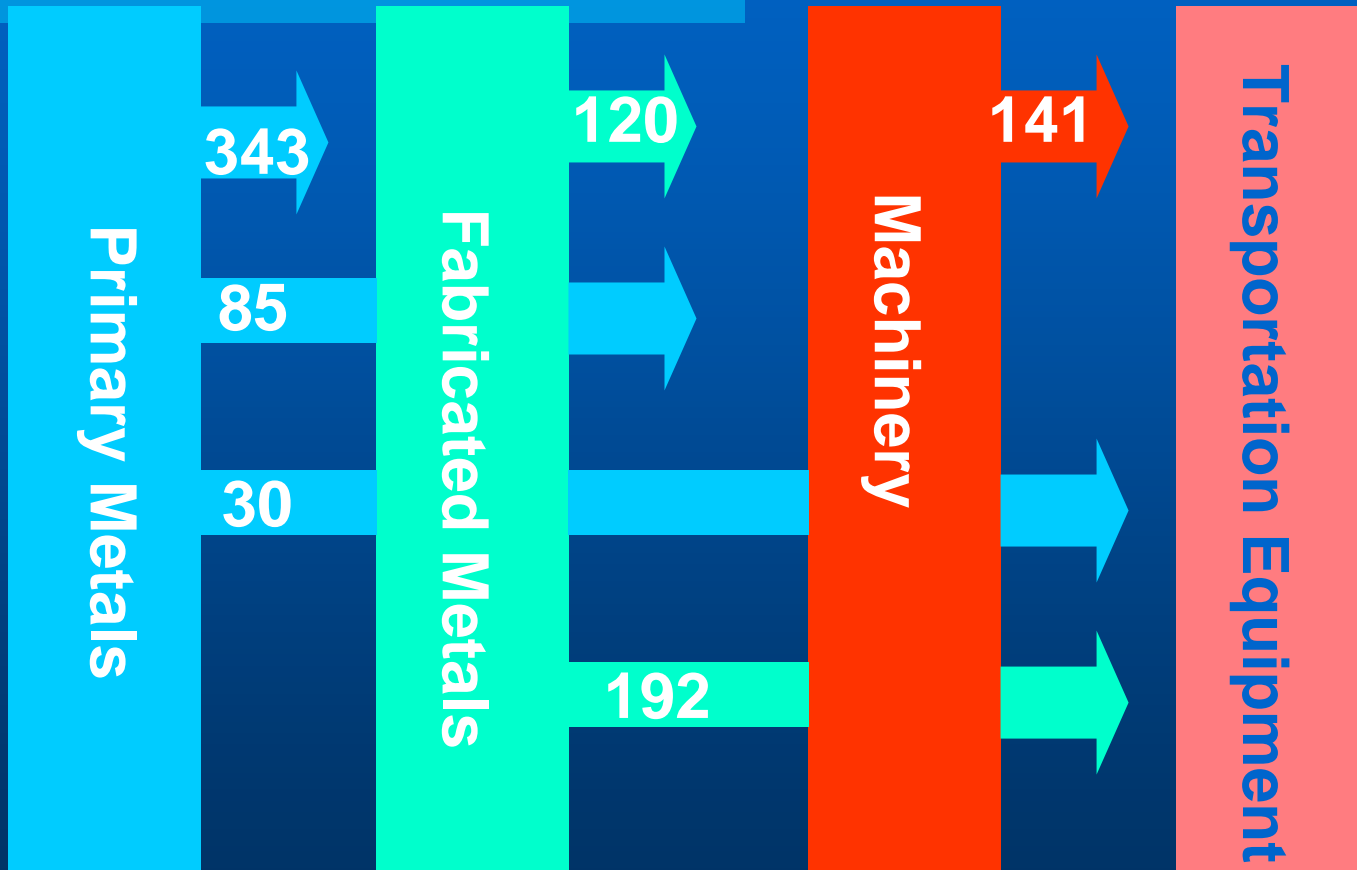
Source: California Wine Institute, Internet Search, California State Legislature. Based on research by MBA 1997 students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda

Regional Foundations of U.S. Competitiveness

3 Copyright © 2001 Professor Michael E. Porter, Council on Competitiveness, Member Companies Group, L.P., and other F500/USF

Source: Michael Porter

Metals Industry Value Added Chain



Estimated Inter-Industry Purchases, \$ Millions, 1992

Athletic Apparel & Footwear

- Nike, Adidas, Columbia
- Nearly 10,000 employees
- Leading center for design
- Attracting others, creating startups



Nursery Products

- \$800 million annual sales
- 1,000 producers
- Economies of scope



Micro foundations

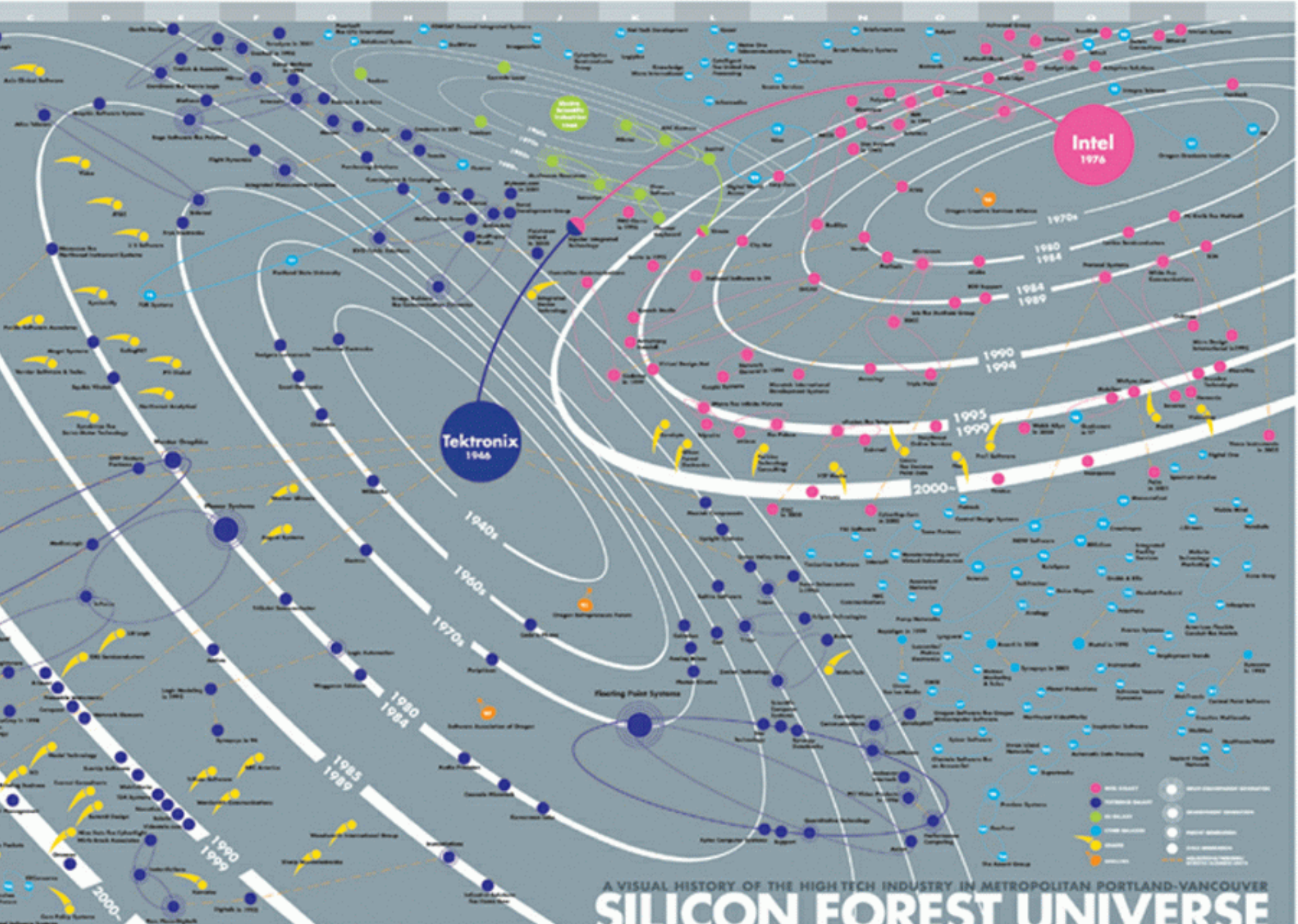
- Relatively little effort to characterize the different sources of cluster advantages across clusters, over time and among geographies
- The “Murder on the Orient Express” problem: All factors potentially contribute to clustering

Different Explanations for the Same Clusters

- Silicon Valley Explanations
 - Subsidies from defense spending (Markusen)
 - Local higher education spillovers (Rogers and Larsen)
 - Unique business culture and relationships (Saxenian)
 - Extraordinary academic leader (Krugman)
 - Long history of radio & television (Sturgeon)

Top Down v. Bottom Up Approaches

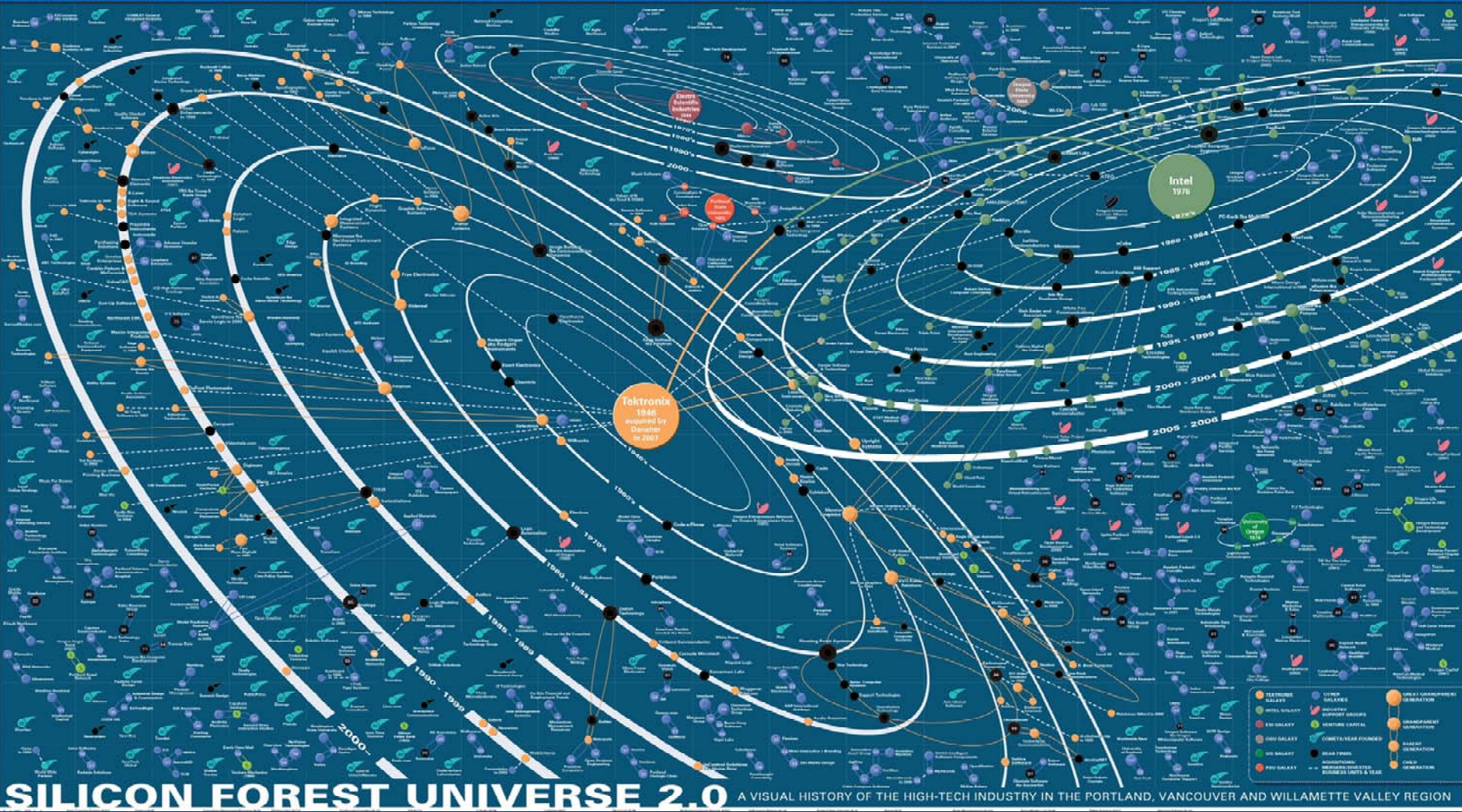
Characteristic	Top Down	Bottom-Up
Approach	Quantitative	Qualitative
Principal Data	Secondary Data	Primary Data
Methodology	Statistical Modeling	Case Studies
Industrial Proximity	Classification System	Descriptive
Scope	Nationwide, Multi-Industry	Local, Single-Cluster
Dominant Logic	Deductive	Inductive
Measures	Employment, Patents, Wages, Sales	Relationships, Institutions
Findings	Broadly Applicable	Narrowly Limited



A VISUAL HISTORY OF THE HIGH TECH INDUSTRY IN METROPOLITAN PORTLAND-VANCOUVER

SILICON FOREST UNIVERSE

The universe is expanding



SILICON FOREST UNIVERSE 2.0 A VISUAL HISTORY OF THE HIGH-TECH INDUSTRY IN THE PORTLAND, VANCOUVER AND WILLAMETTE VALLEY REGION

III. Action

Working with clusters

Clusters as a Framework for Policy

- **An organizing principle for engaging a region in a discussion of its economic strengths and weaknesses**
- **A flexible tool at the intersection of analysis and policy-making**
- **Best efforts integrate quantitative and qualitative methods**

Policy Measures and Micro-Foundations

- **Labor Market Pooling:** Labor market information, specialized training
- **Supplier Specialization:** Brokering, recruiting, entrepreneurship, credit
- **Knowledge-spillovers:** Networking, public sector R&D support
- **Entrepreneurship:** Assistance for start-ups, spin-offs
- **Lock-In:** Work to extend and refine (and recombine) existing distinctive specializations
- **Culture:** Acknowledge and support cluster Organization
- **Local Demand:** Aggregate and strengthen local demand

Wishful Thinking

- **Generally not possible to create a cluster where none exists**
- **Policy should focus on conditions for cluster growth, revival, and creation**
- **Identifying emerging clusters should be a priority**

Get Real

- **Assess your cluster's competitive strength**
- **Benchmark against leading clusters elsewhere**
- **How is your cluster different or better?**

General Policy Approaches

- Improve the technical support services
- Invest in social capital and social infrastructure
- Empower and listen to cluster leaders
- Encourage cross-fertilization of ideas across clusters
- Recruit companies that fill gaps in cluster development
- Develop and organize supply chain associations
- Support employee/entrepreneurs

After Rosenfeld (2002)

Gaps remain in many cluster efforts

- **Goals of economic development not aligned with clusters**
- **Programs still oriented to “one business at a time”**
- **Staff and management not recognized or rewarded for cluster work**
- **Cluster information is ad hoc, not systemic**

Integrating clusters into economic development

- **Make cluster success an economic goal**
- **Design programs that reward collaboration**
- **Reward and recognize managers and employees for cluster successes**
- **Provide ongoing information and training**
- **Create a cluster network to share ideas**

IV. Biotechnology

Industry Segmentation

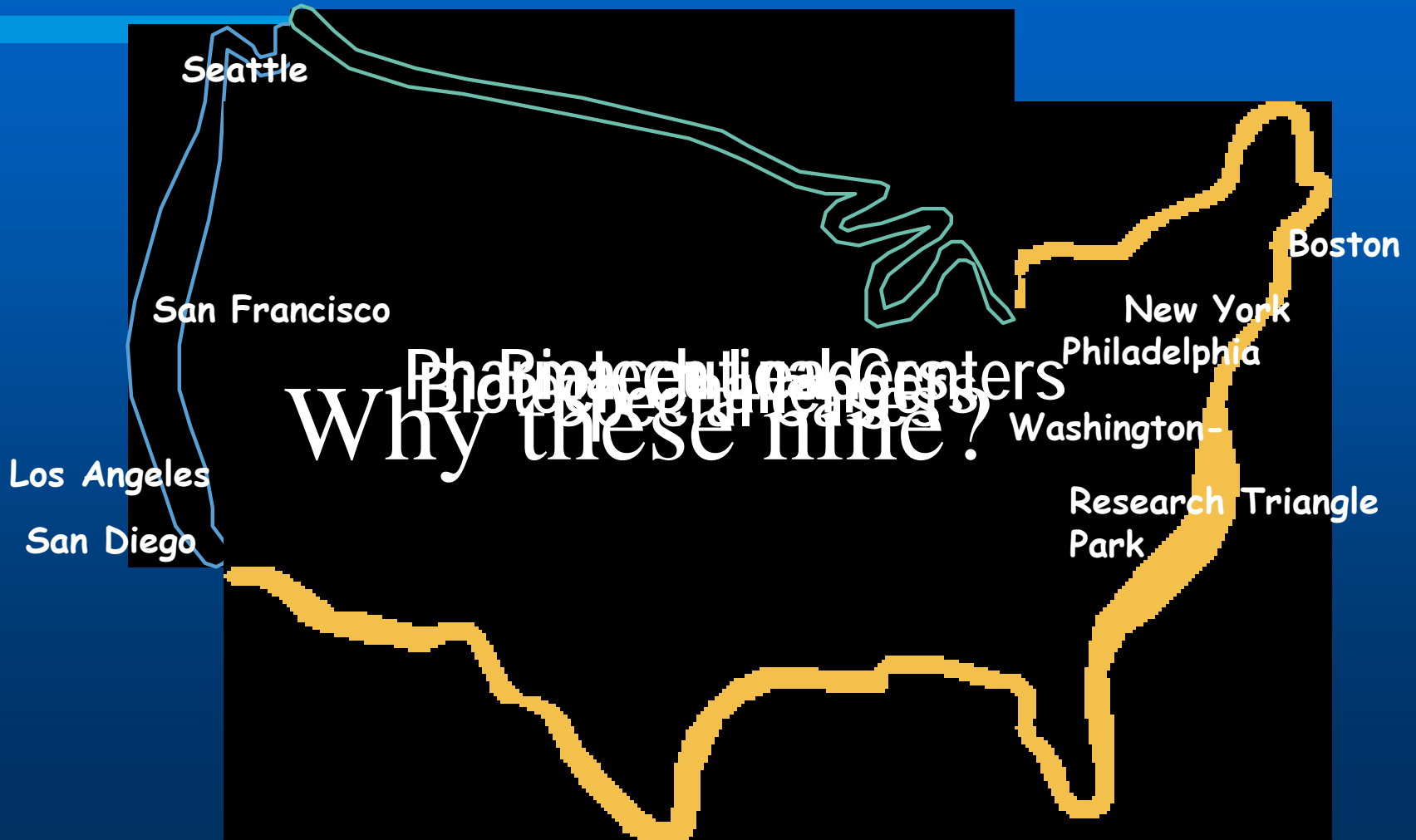
Pharmaceuticals

- ◆ Very large, global firms
 - ◆ Top ten average \$15 billion sales
- ◆ Assets are products, distribution, manufacturing expertise
- ◆ Very Profitable

Biotechnology

- ◆ Small, mostly single establishment firms
 - ◆ Top ten average \$700 million sales
- ◆ Principal assets are people, research and future potential
- ◆ Lose Money

Nine Metros Dominate



Two Pillars of Biotech Development

Research

- NIH Grants
- Patents

Commercialization

- Venture Capital
- R&D Partnerships
- Startup Firms
- Established Firms

Leaders vs. the Pack

Average Levels of Activity

Metric	Top 9 Centers	Bottom 42
NIH\$ (millions)	812	104
Patents	2,641	263
Venture Capital	957	27
R&D Alliances	1,089	11
New Firms	35	2.3
<u>Large Firms</u>	<u>24</u>	<u>1.5</u>
<hr/> Biotech VC Firms	47	4

Research Dispersing

Top 9 Centers Share

1980s

1990s

NIH\$

63%

59%



Patents

71%

68%



Commercialization Concentrating

Top 9 Centers Share

1980s

1990s

Venture Capital*

81%

86%



R&D Alliances*

89%

96%



New Firms

61%

77%



*Base data from early to mid-1990s www.impresiconsulting.com



For More Information

www.ImpresaConsulting.com