Innovating the Green Economy in California

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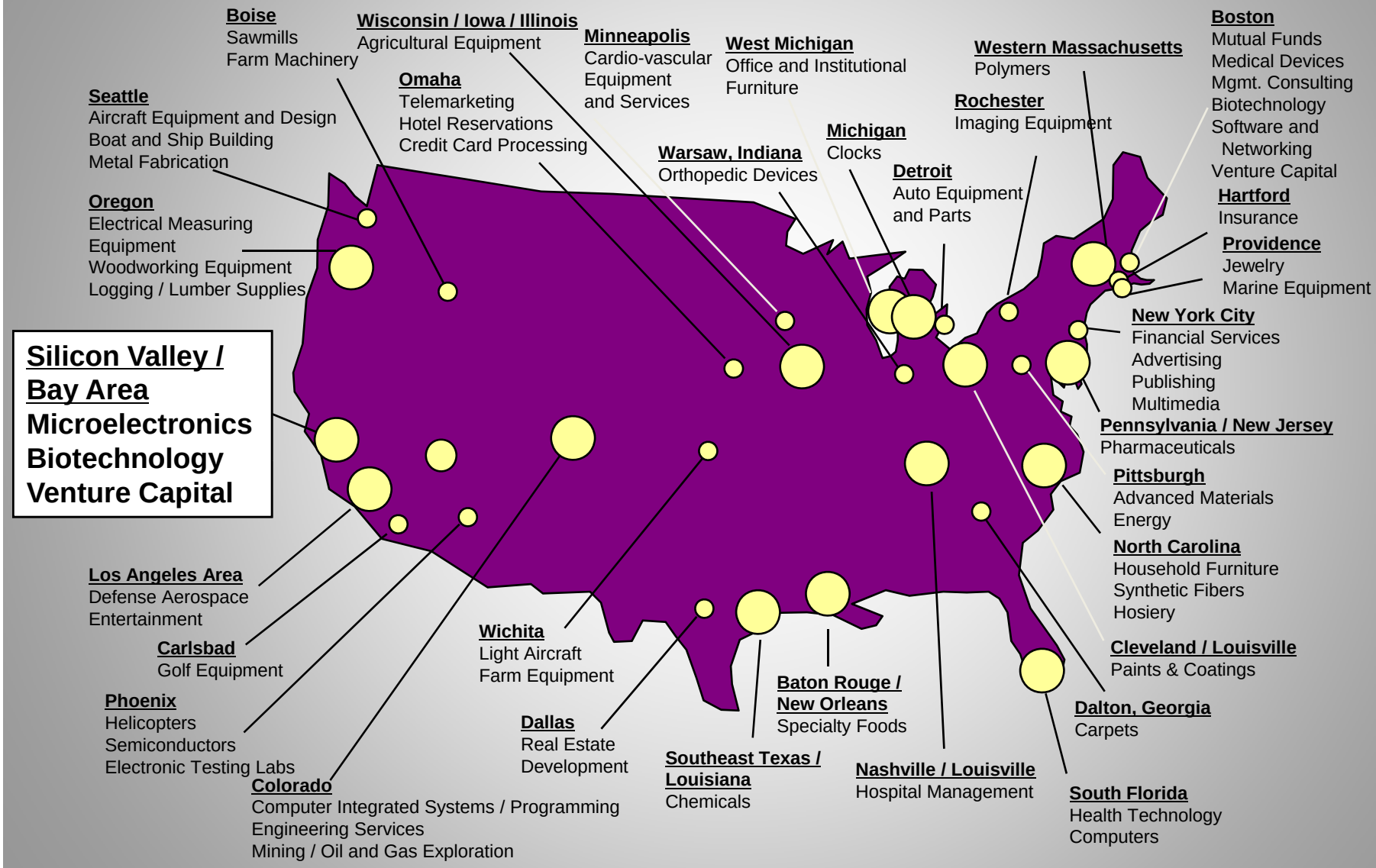
Lester Center for Entrepreneurship & Innovation

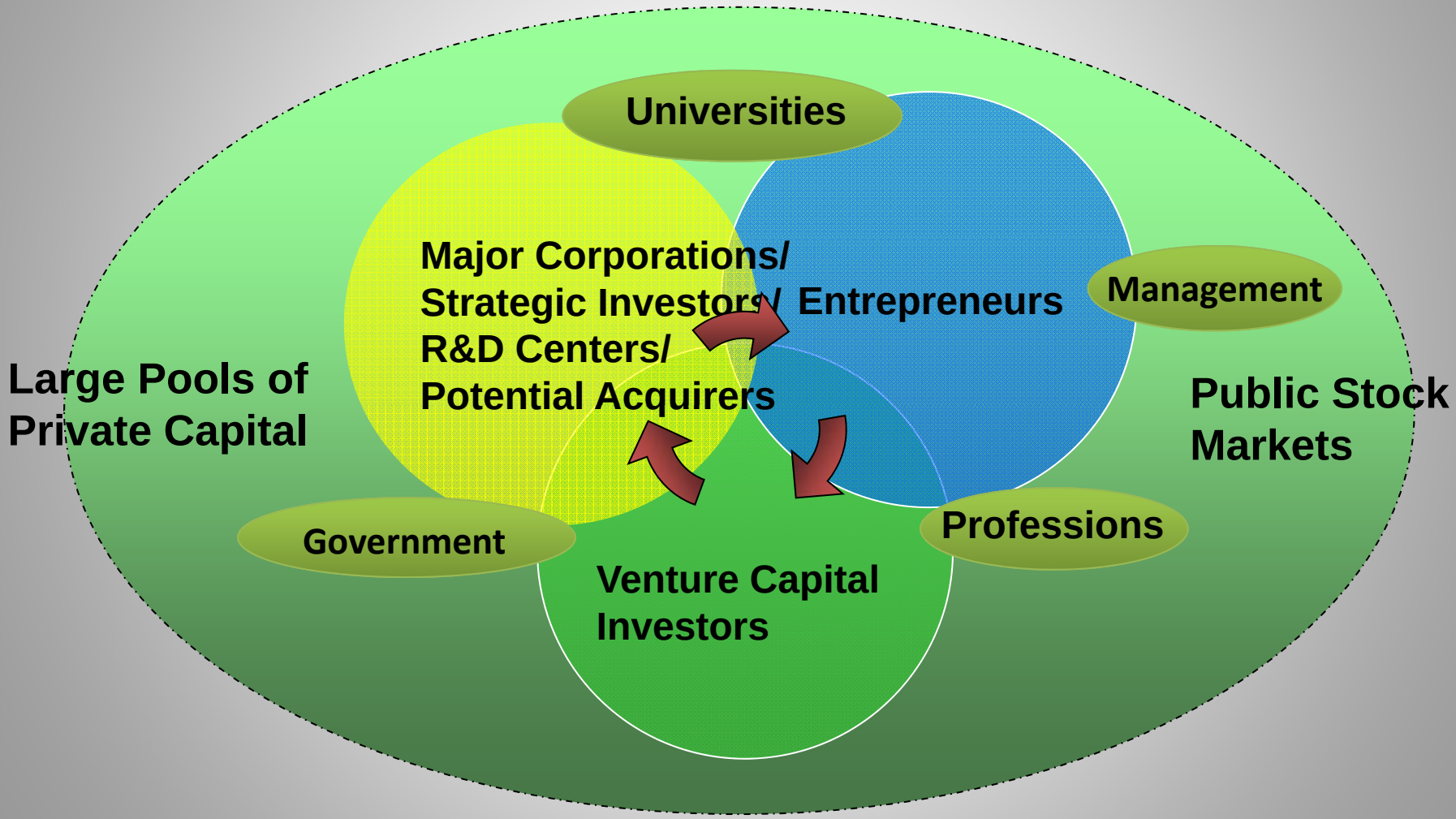
Innovating the Green Economy in California

- Why here?
- Why now?
- How is it different?
- The role of the University
- The role of government
- Challenges ahead
  - Is there a market?
  - How do you stage risk?
  - How do you prove business models?

Overview of Clusters of Innovation Theory
Each Regional Economy Has A Unique Mix of Clusters

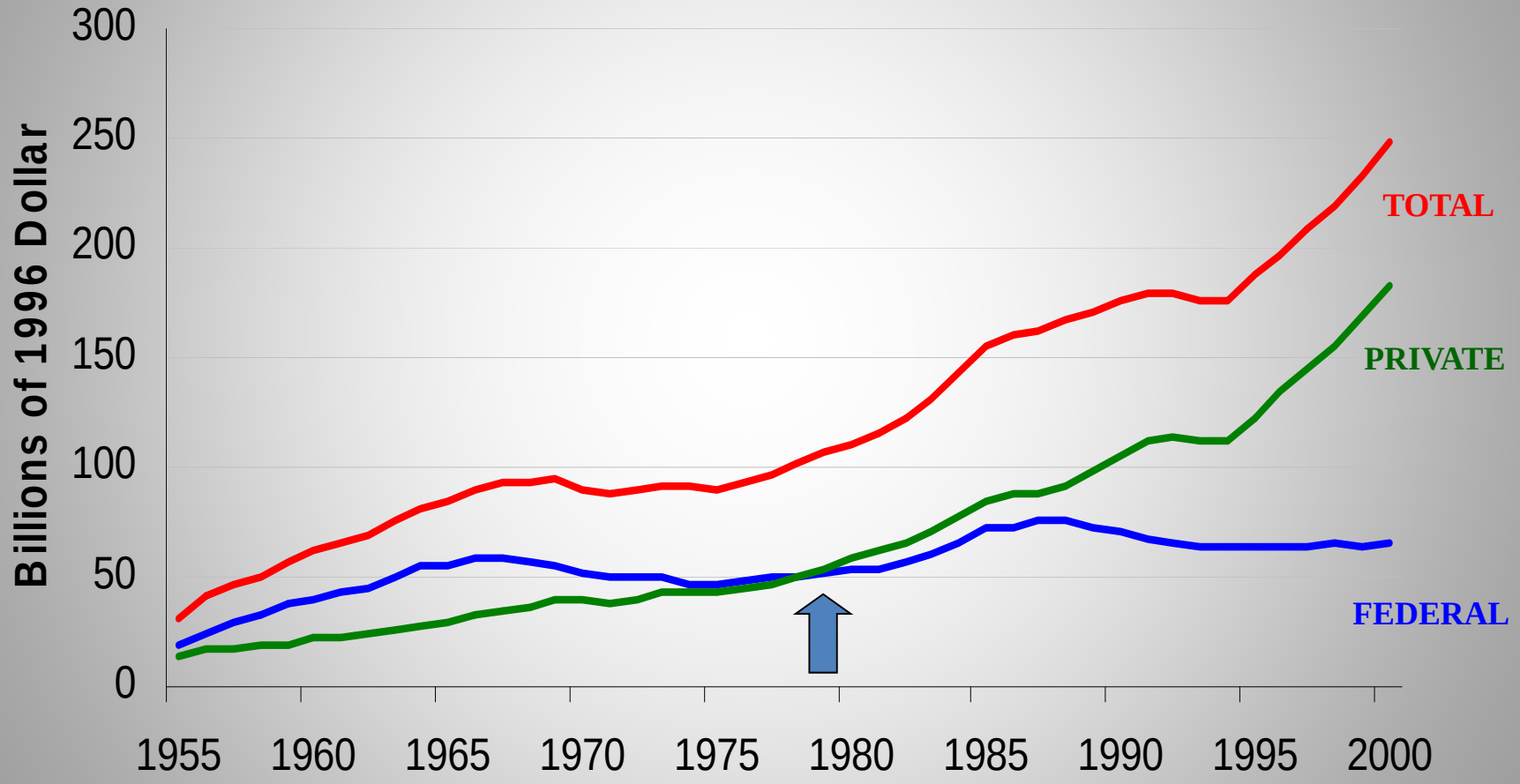


The Innovation Engine of Clusters of Innovation



U.S. Example:

Private R&D Spending Increasing



Note: Expenditures are deflated using the GDP implicit price deflator.
Source: National Science Board (2000) and Economic Report of the President (2002)

The Proportion of Research Expenditure at Our Largest Corporations is Decreasing

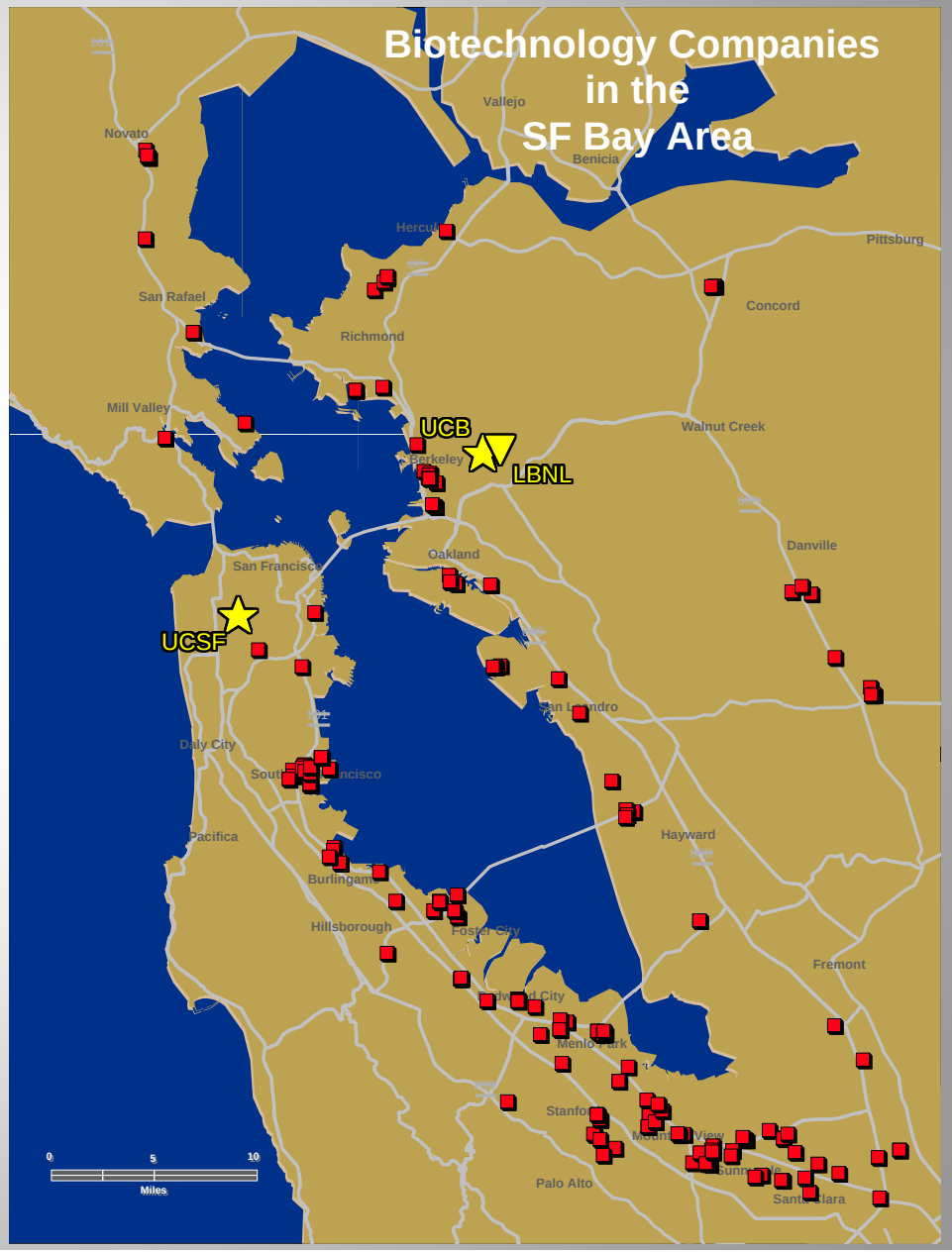
Company Size	1981	1989	1999	2000
<1000 employees	4.4%	9.2%	22.5%	22.4%
1,000 - 4,999	6.1%	7.6%	13.6%	15.4%
5,000 - 9,999	5.8%	5.5%	9.0%	8.4%
10,000 - 24,999	13.1%	10.0%	13.6%	14.4%
25,000+	70.7%	67.7%	41.3%	39.5%

Original - H. Chesbrough, 2003 Updated J. Engel 2009

Source: *National Science Foundation, Science Resource Studies, Survey of Industrial Research Development, 1991,1999 and 2000.*

Overview of Clusters of Innovation Theory
Location Example: BioTech and Proximity to Research Institutions

- **As of July 2002, there were 208 biotechnology companies in the Greater San Francisco Bay Area**
  - **391, statewide**

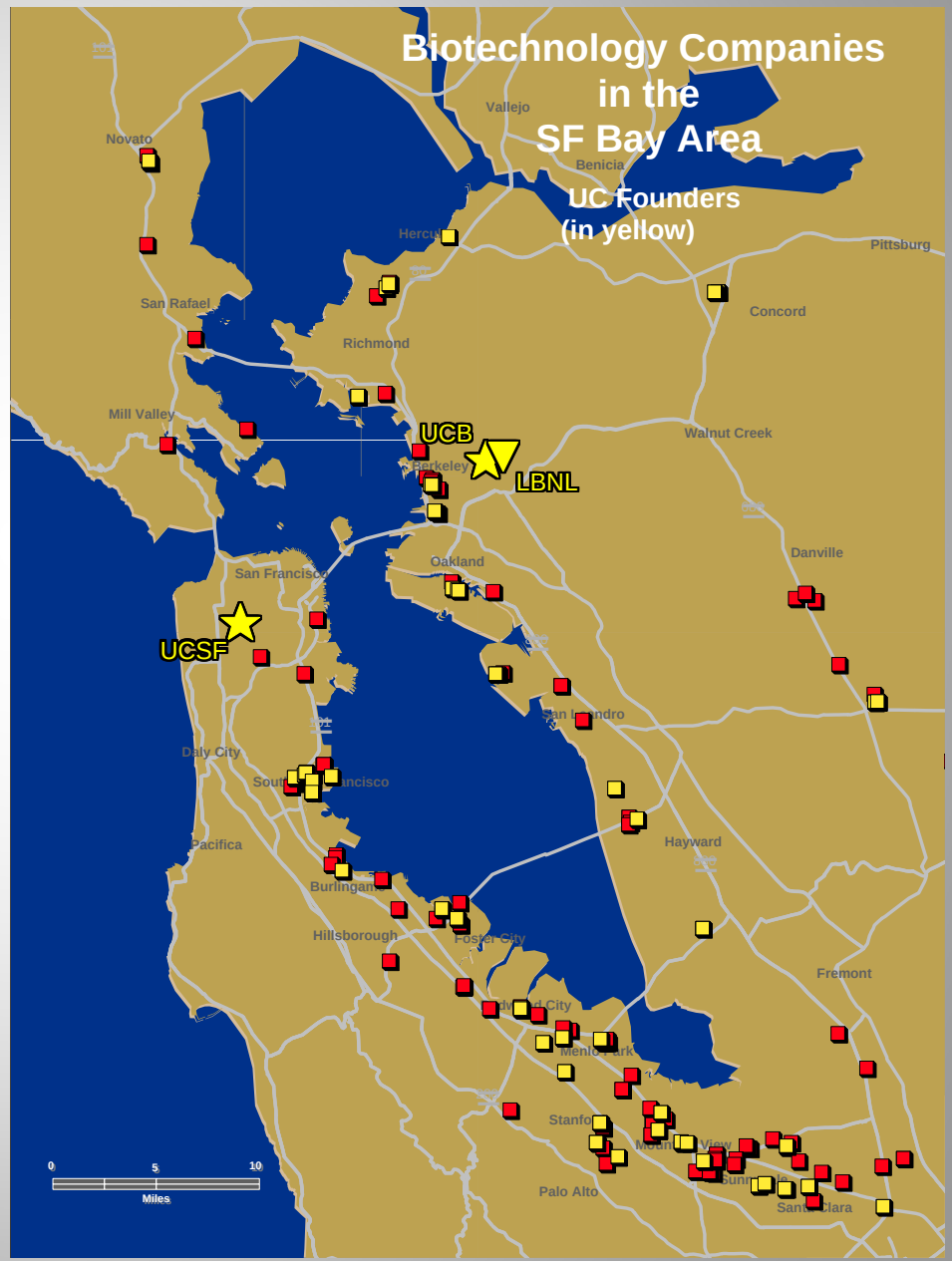


- **A "biotechnology company" is a for-profit business entity with an active R&D operation in California that uses the tools of modern molecular biology**

Source: University of California Industry-University Cooperative Research Program

Overview of Clusters of Innovation Theory
Location Example: Interaction Between Academia & Business

- **UC scientists were founders of 74 of the 208 (35%) biotechnology companies in the Greater SF Bay Area that were in business as of July, 2002.**

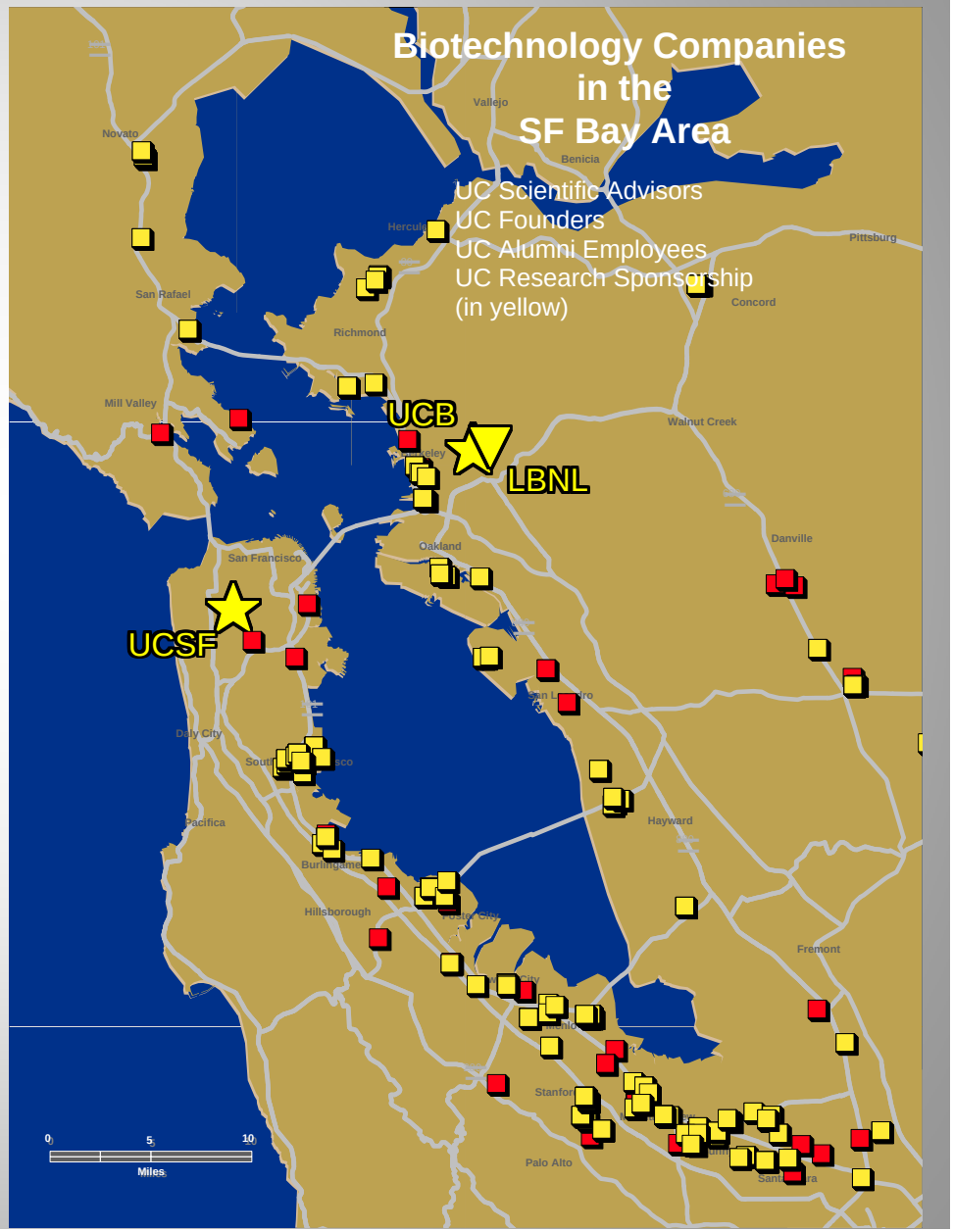


University of California Industry-University Cooperative Research Program

Source: University of California Industry-University Cooperative Research Program

Overview of Clusters of Innovation Theory
Location Example: Linkage Between Universities & Local Firms

- **More than 158 of the 208 companies (75%) in the Greater San Francisco Bay area are linked to UC scientists and research through :**
  - **Founders**
  - **Scientific Advisors**
  - **Alumni Employees**
  - **Research Sponsorship at UC, especially participation in the UC Discovery Grant Program**



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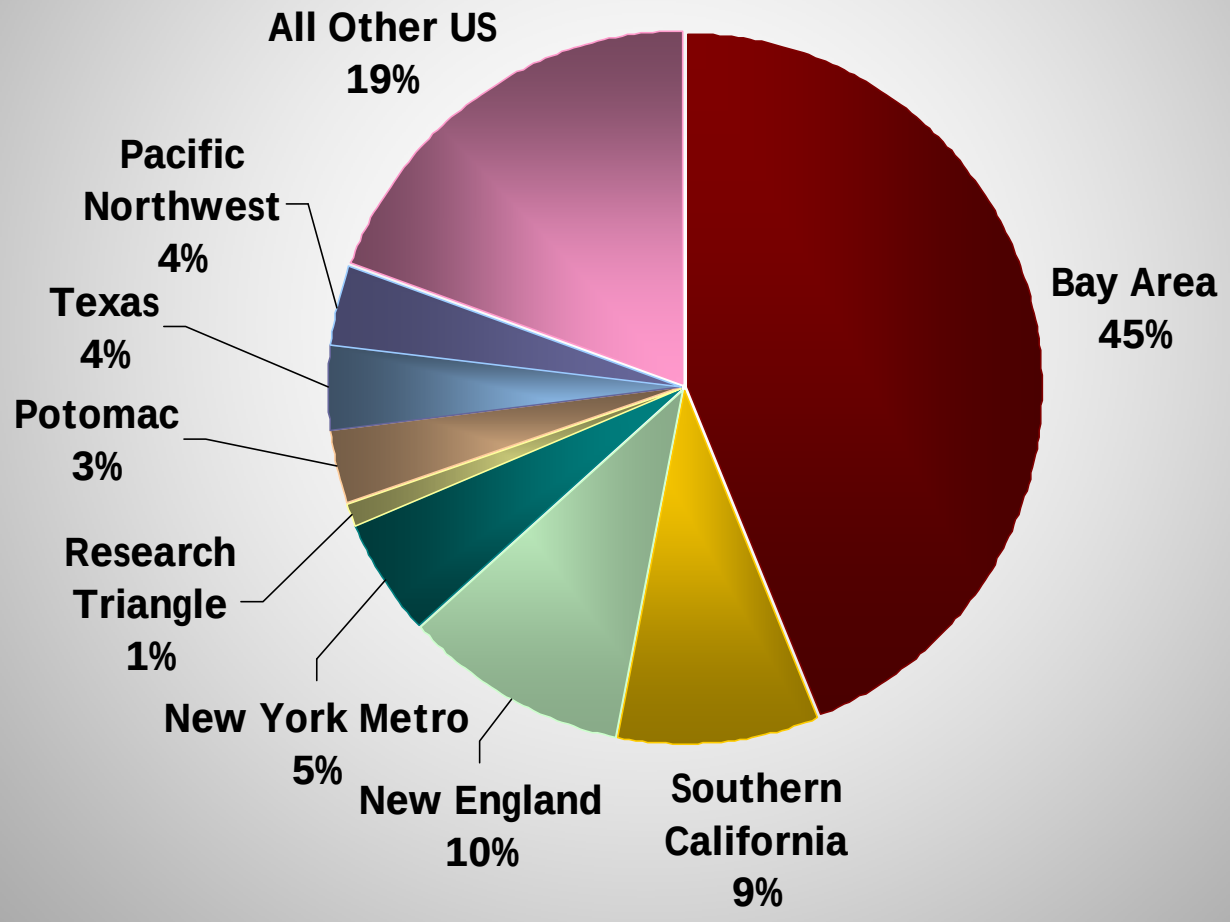
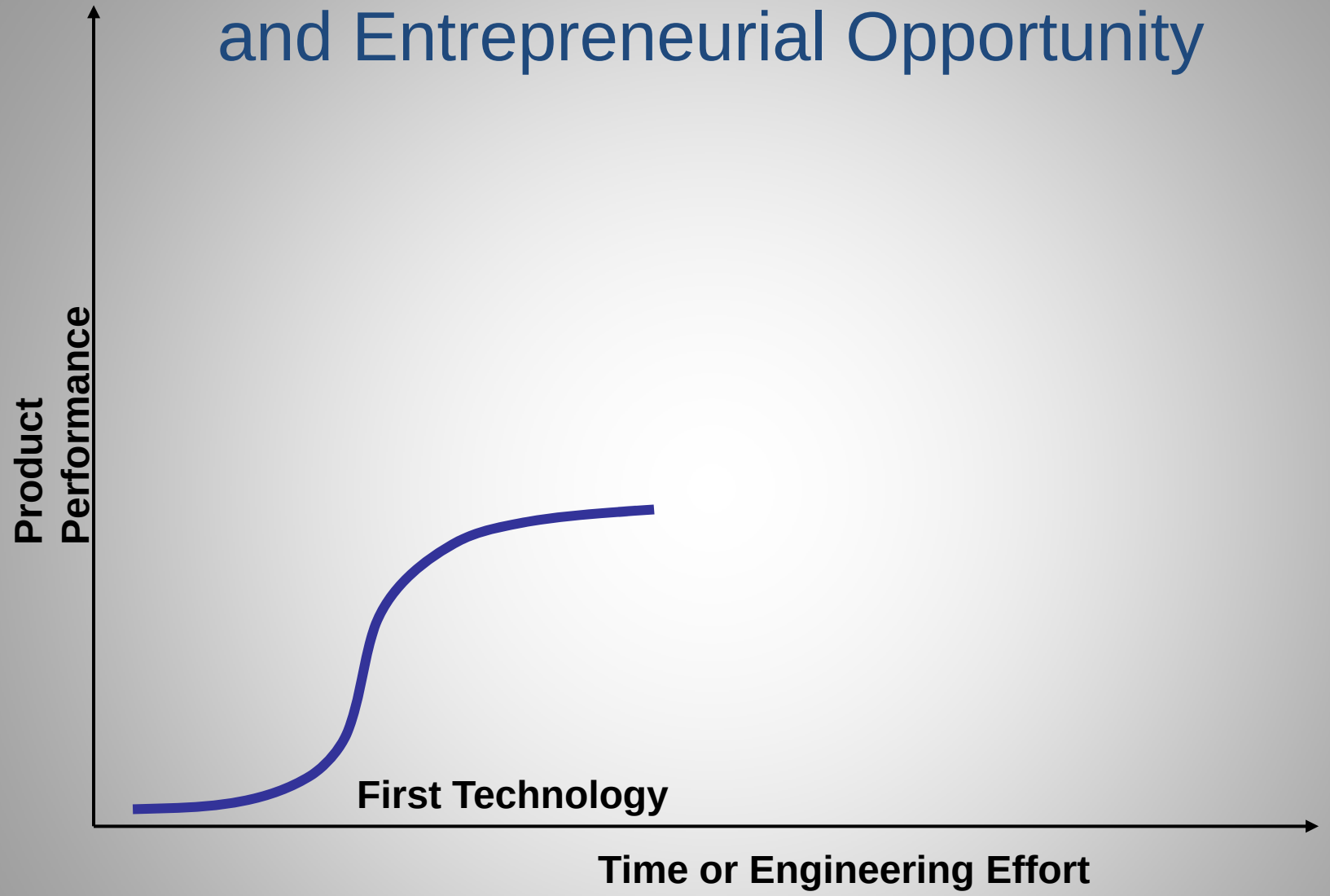
Bay Area Draws Most Investment Dollars

Regional Investment in the United States 3Q '09



Source: Dow Jones VentureSource

The Technology S Curve and Entrepreneurial Opportunity



Source: Clayton M. Christensen, "Exploring the Limits of the Technology S-Curve. Part I: Component Technologies," *Production and Operations Management* 1, no. 4 (Fall 1992): 340. Reprinted by permission.

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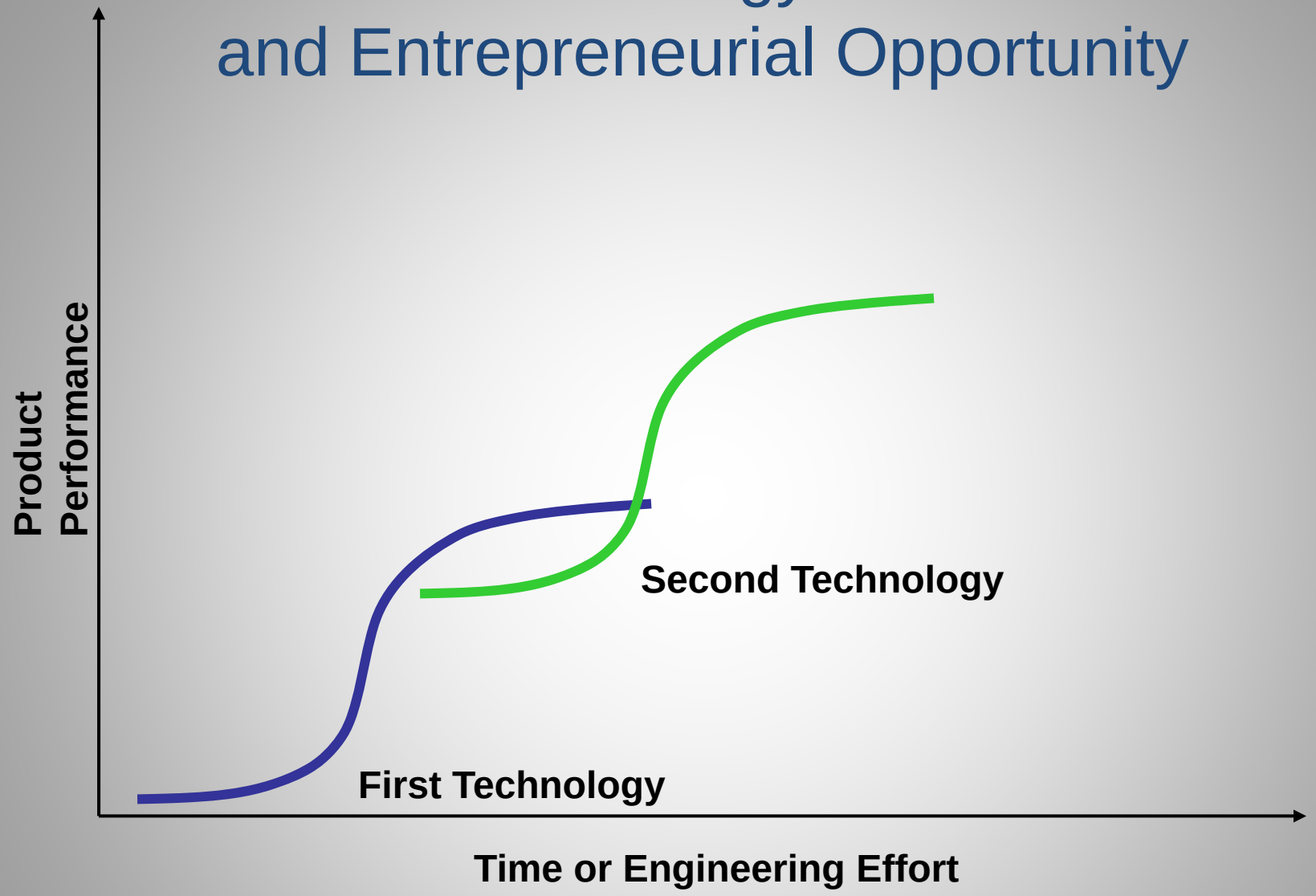

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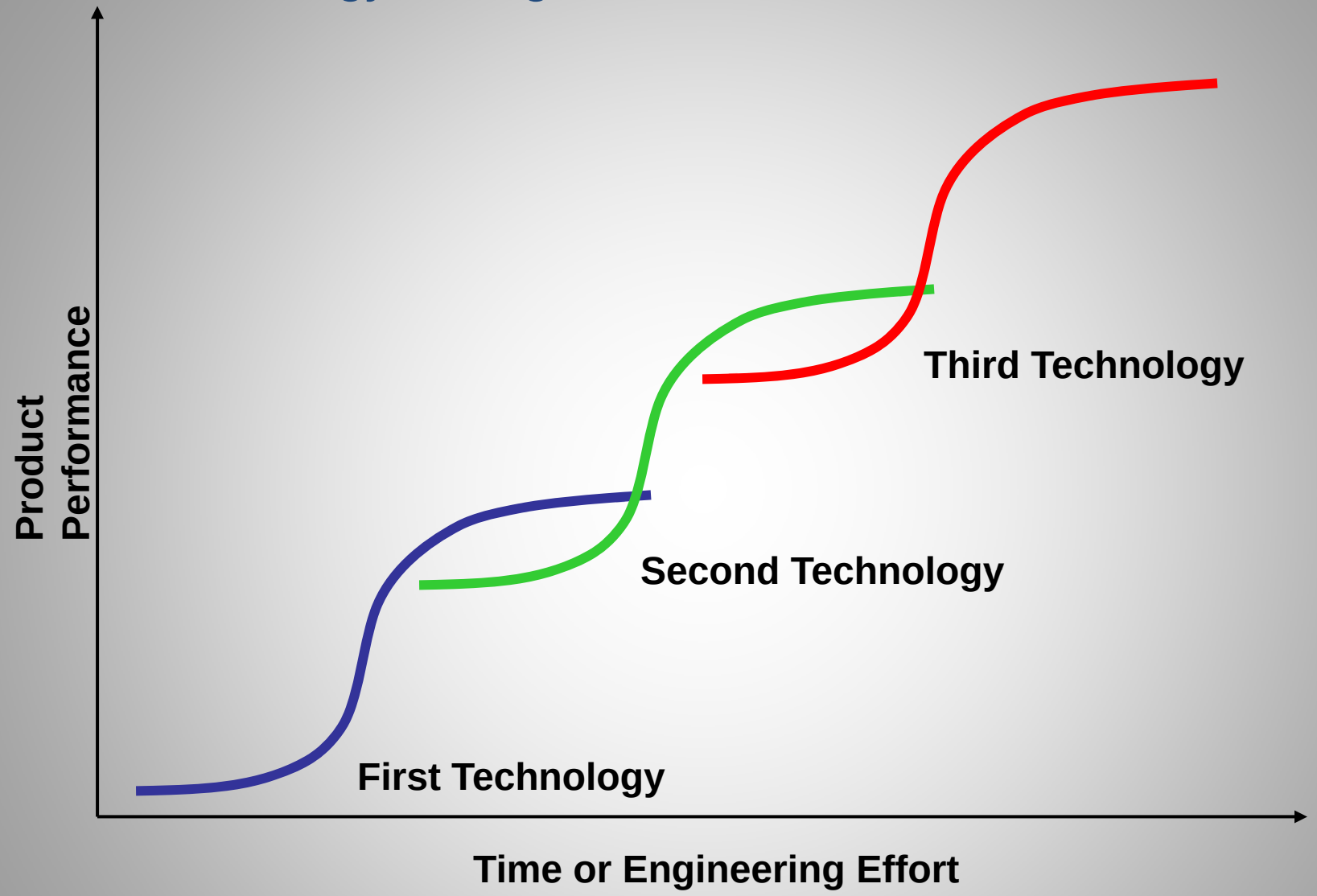
Strategy: Using Small Markets as “Beach Heads”



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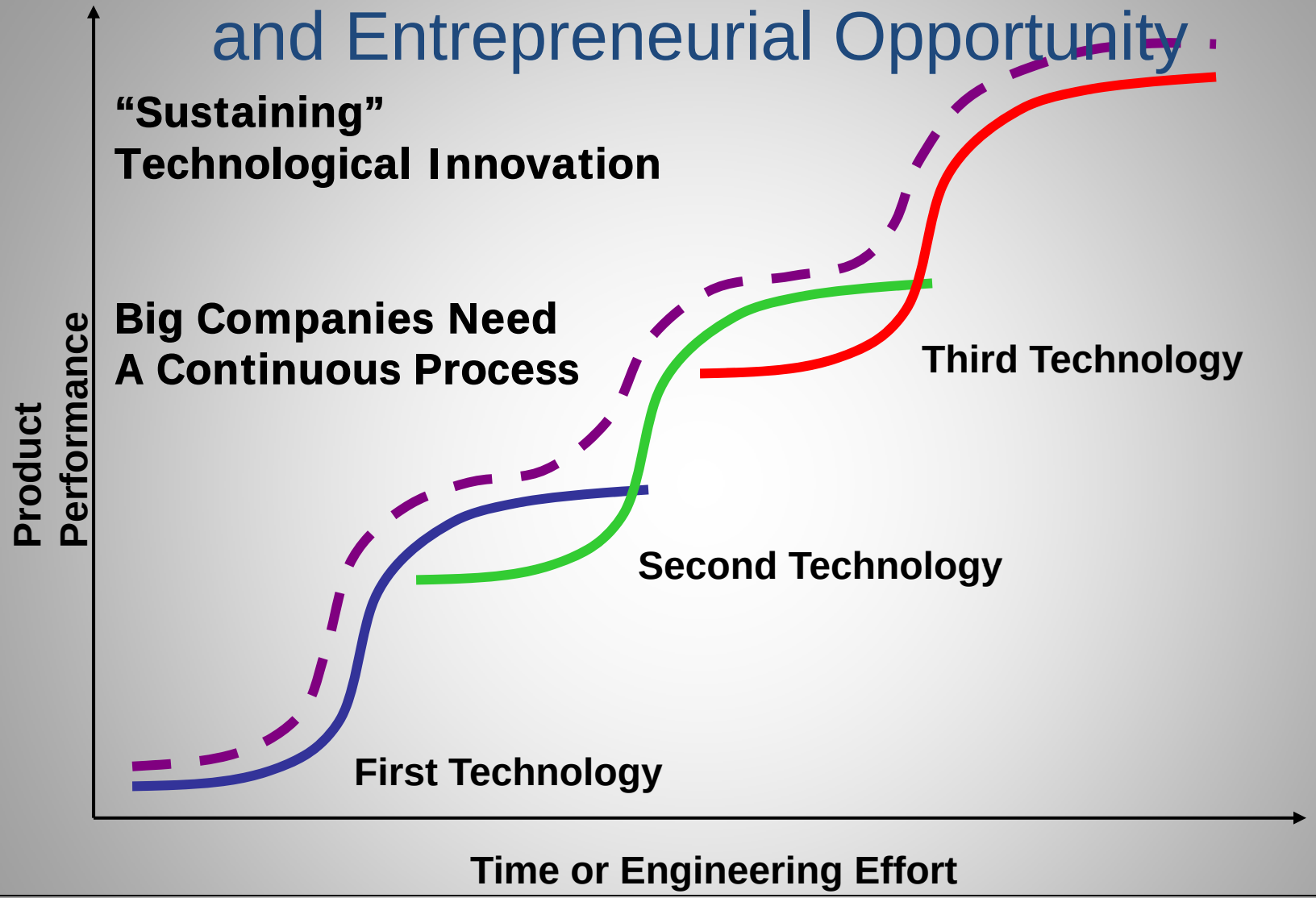

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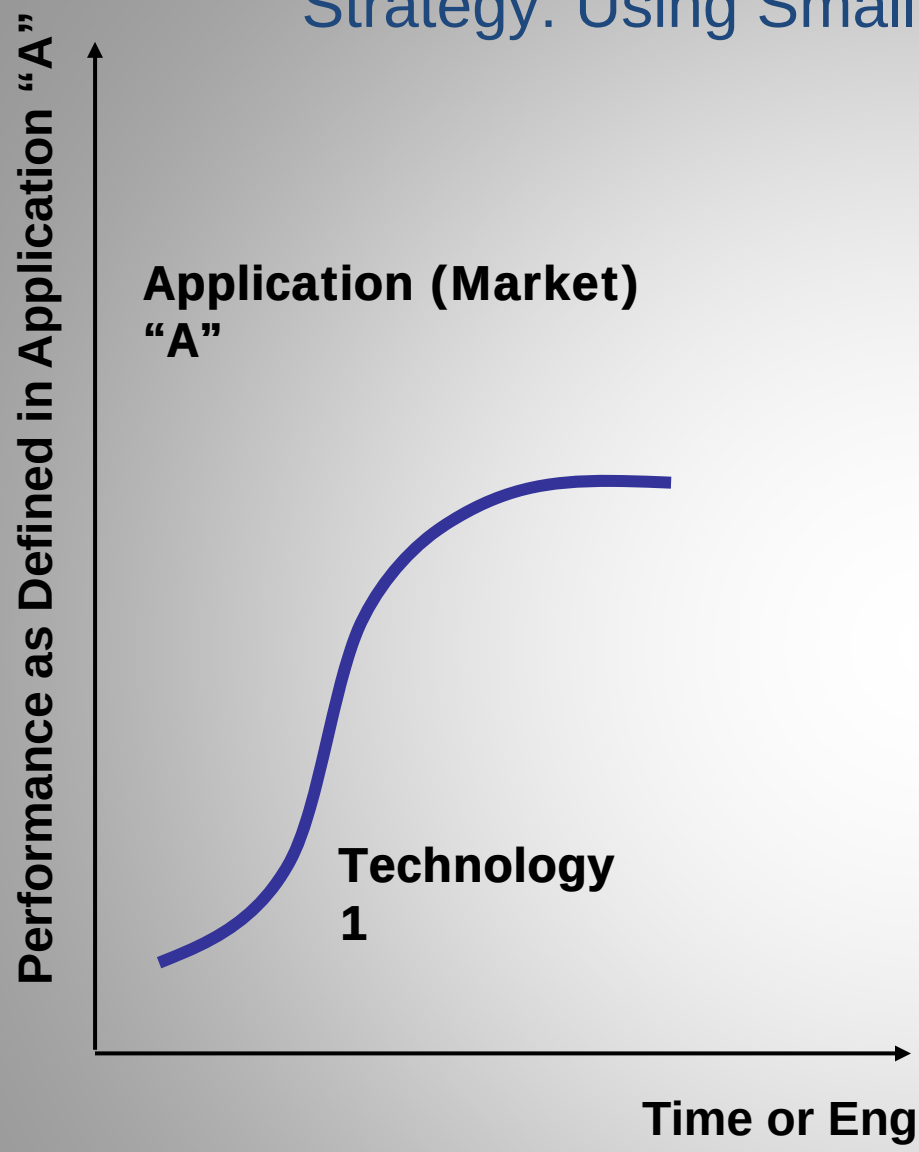

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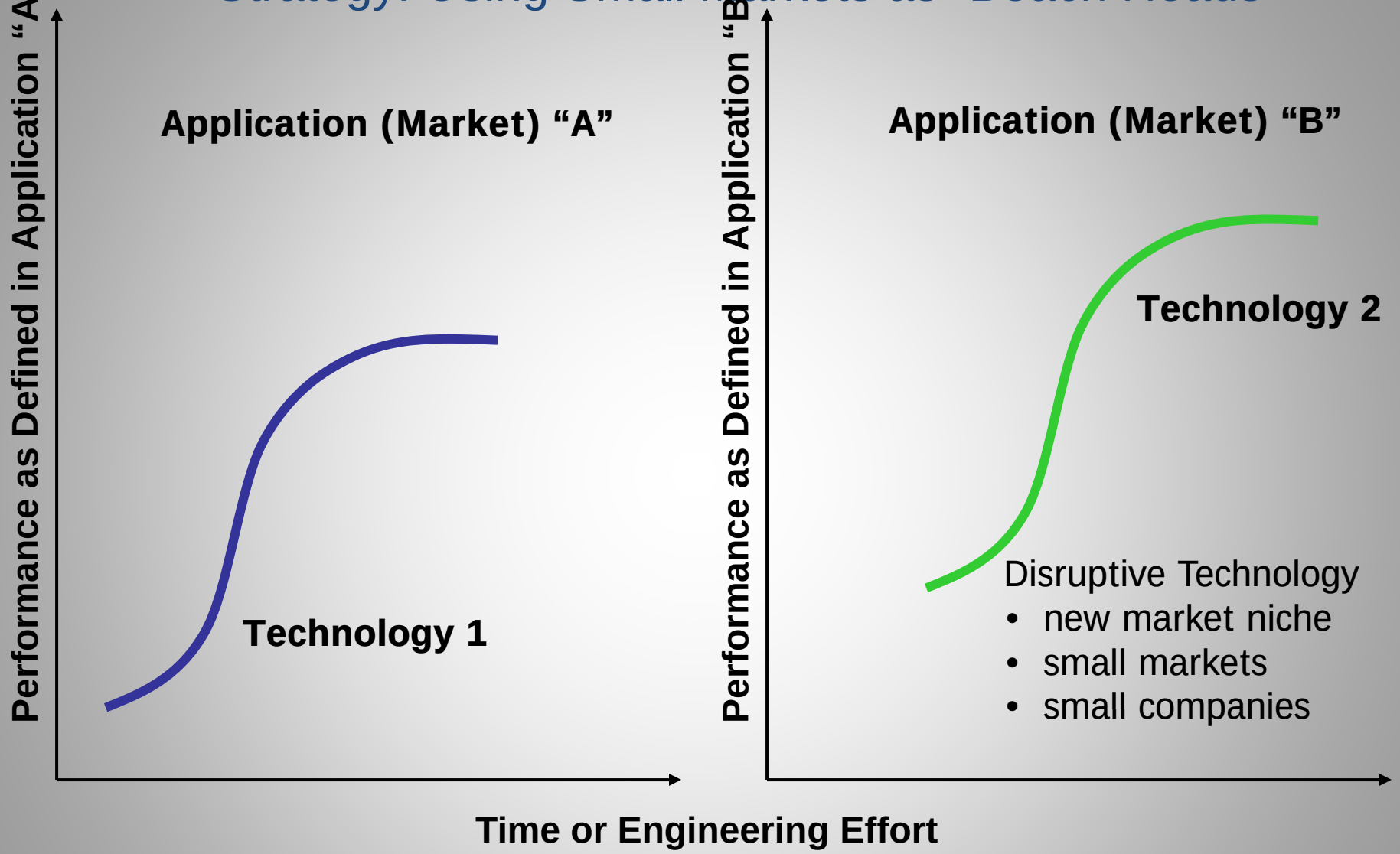

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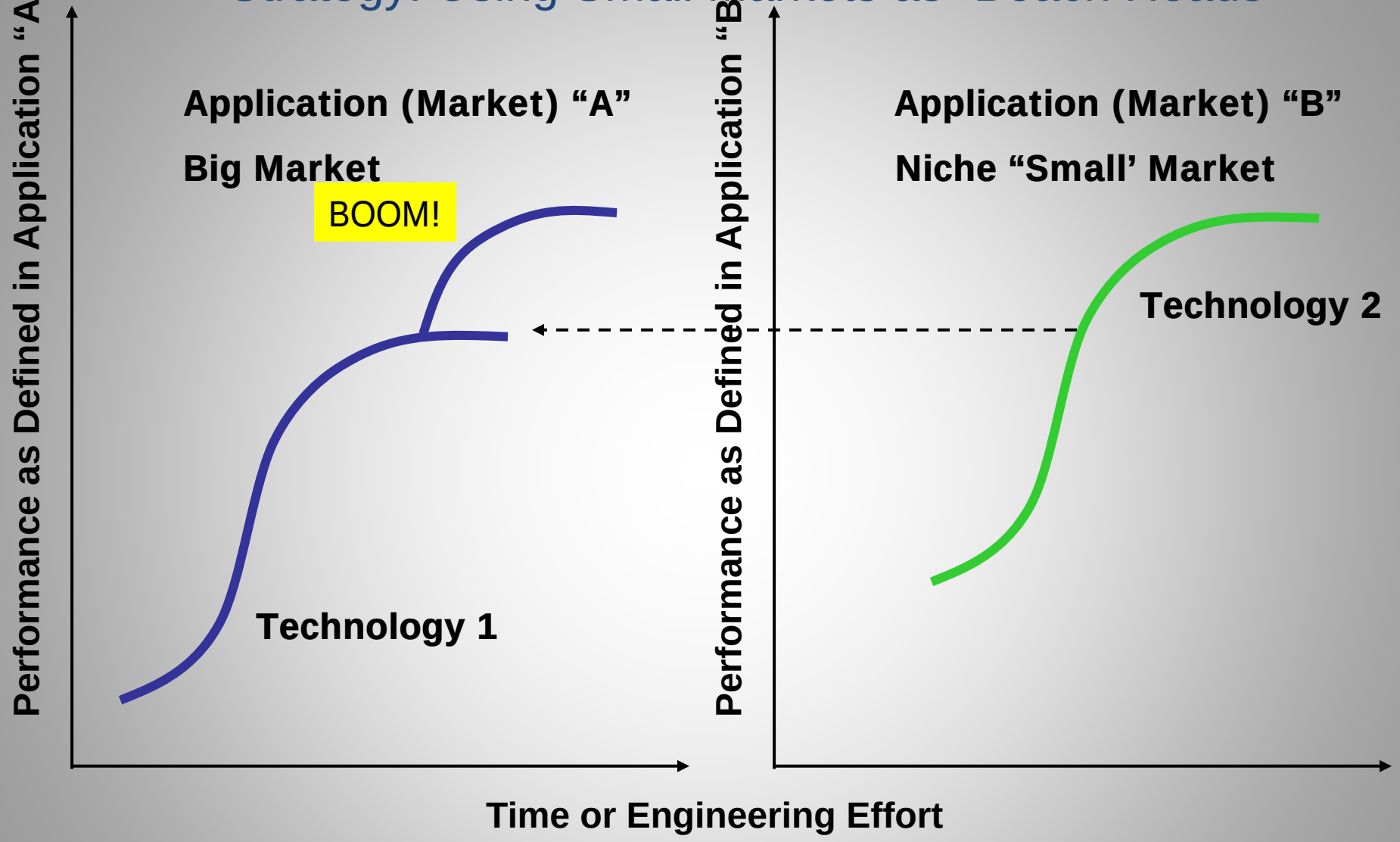

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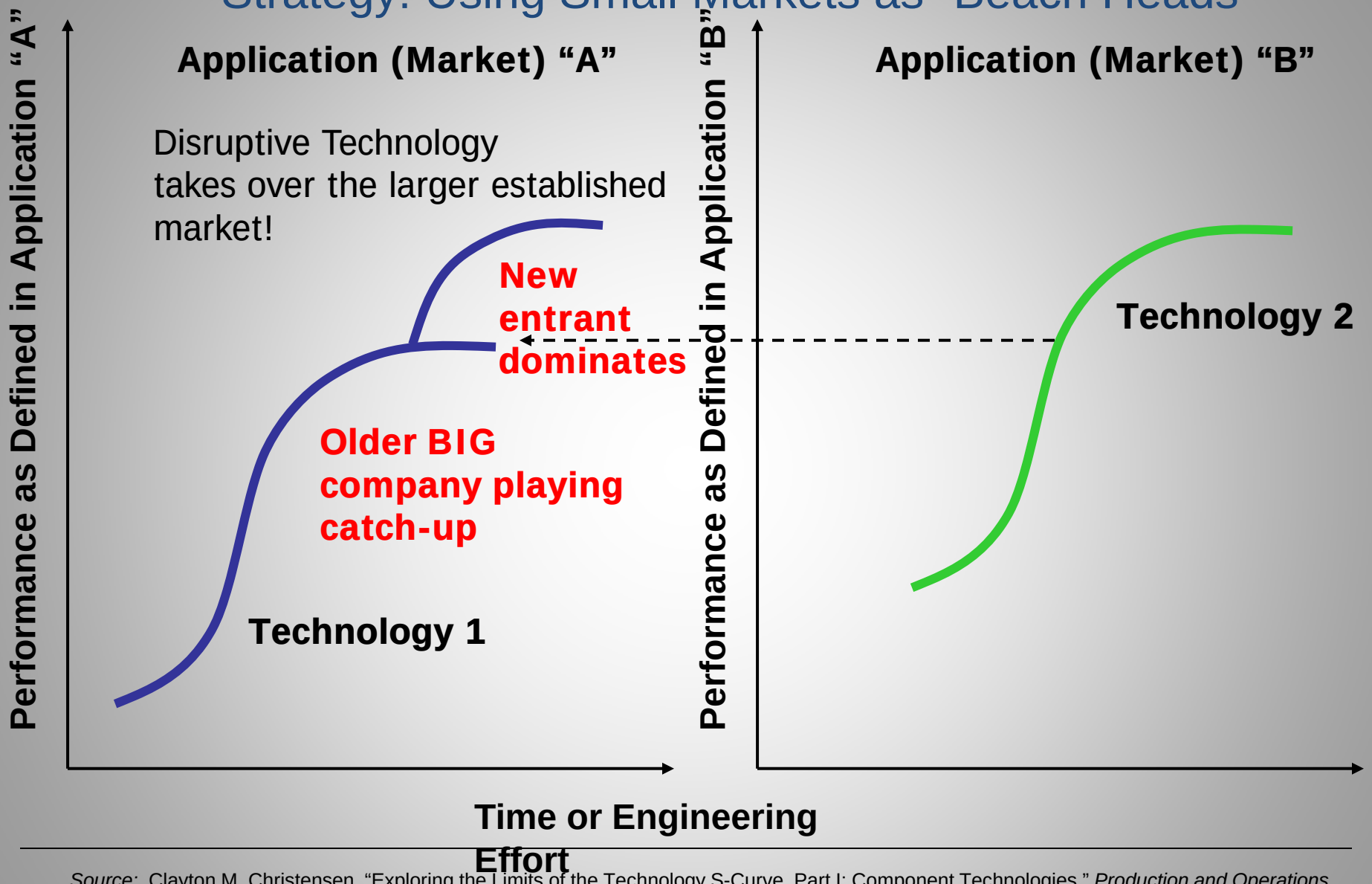

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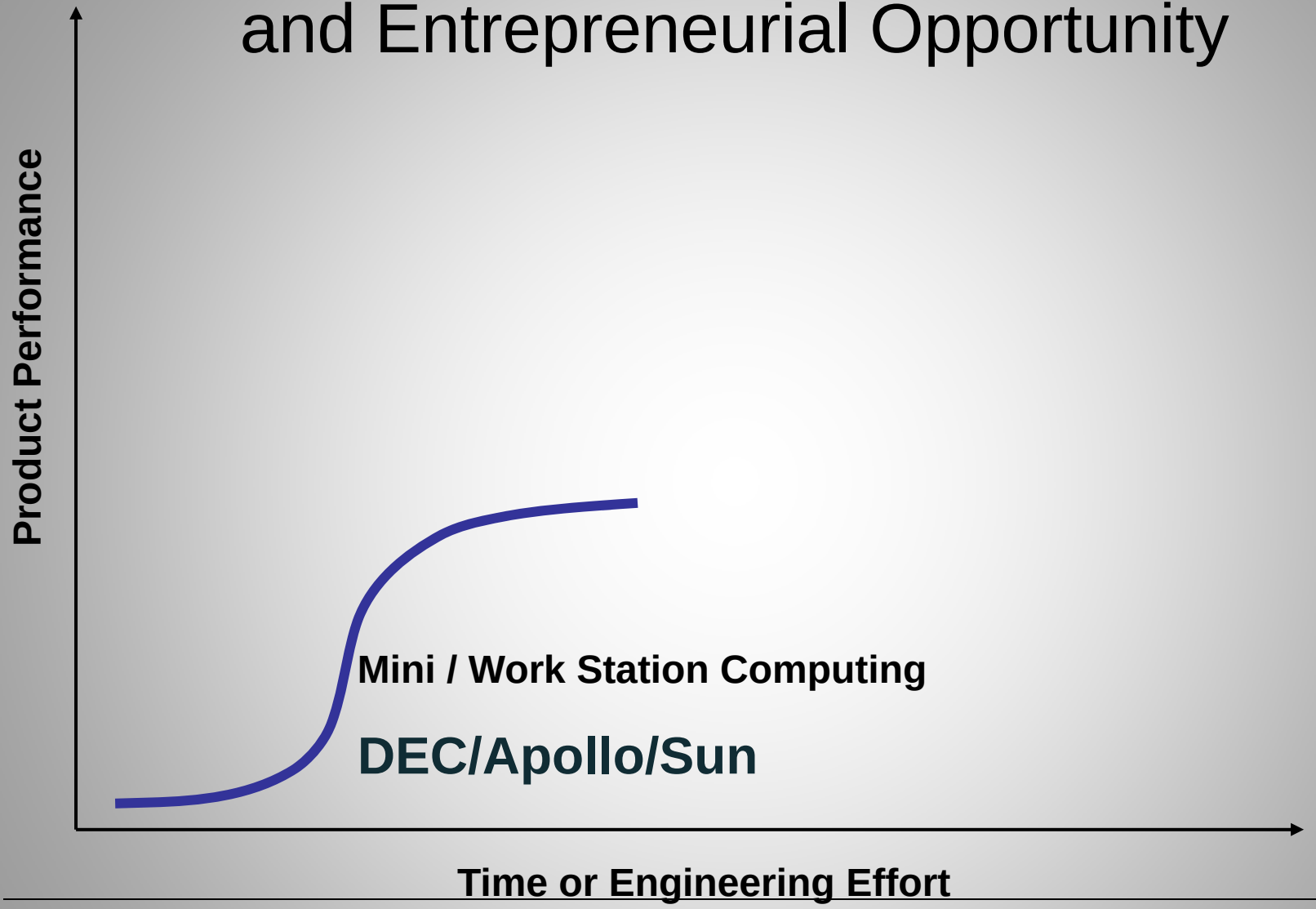
The Technology S Curve and Entrepreneurial Opportunity



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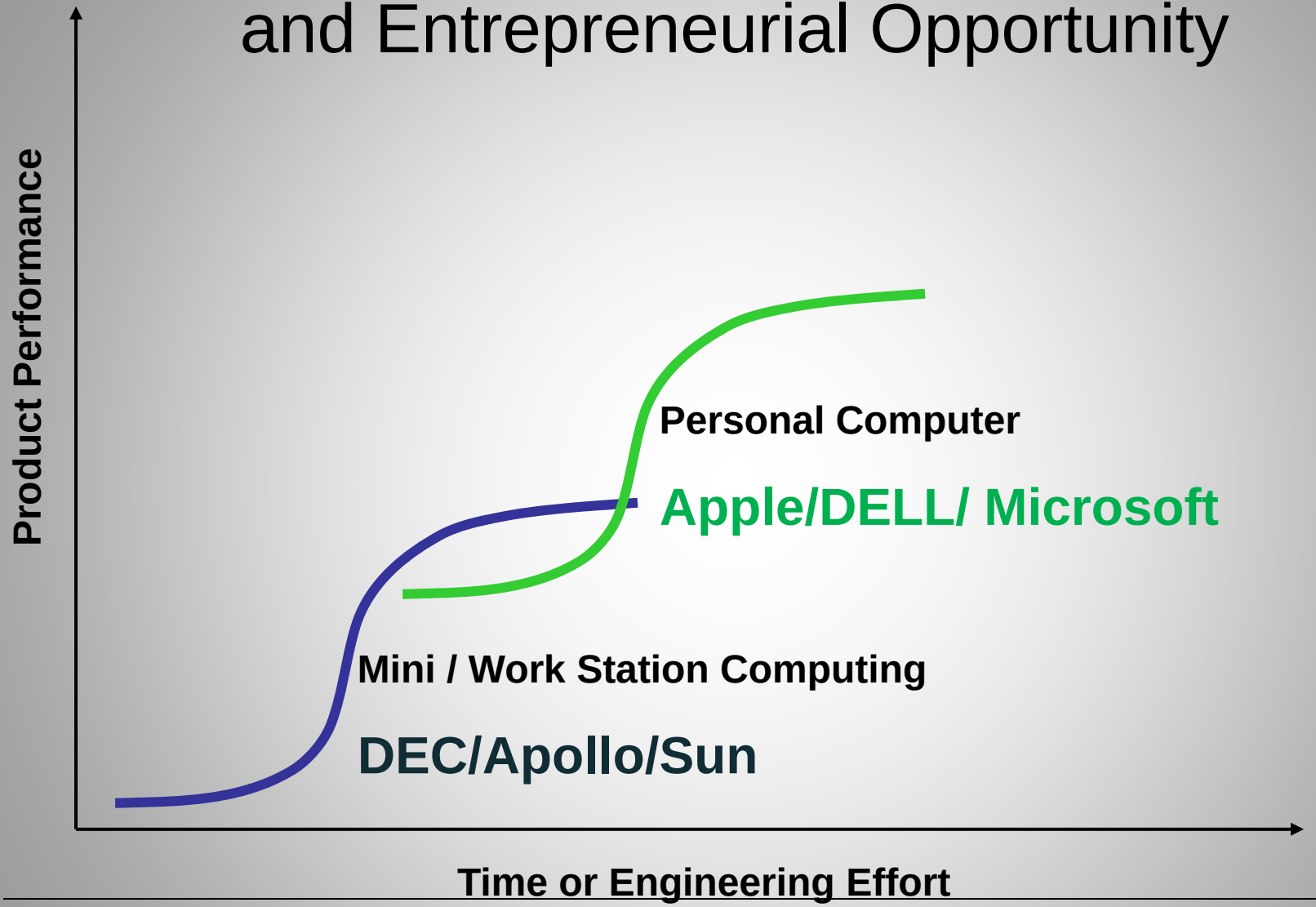

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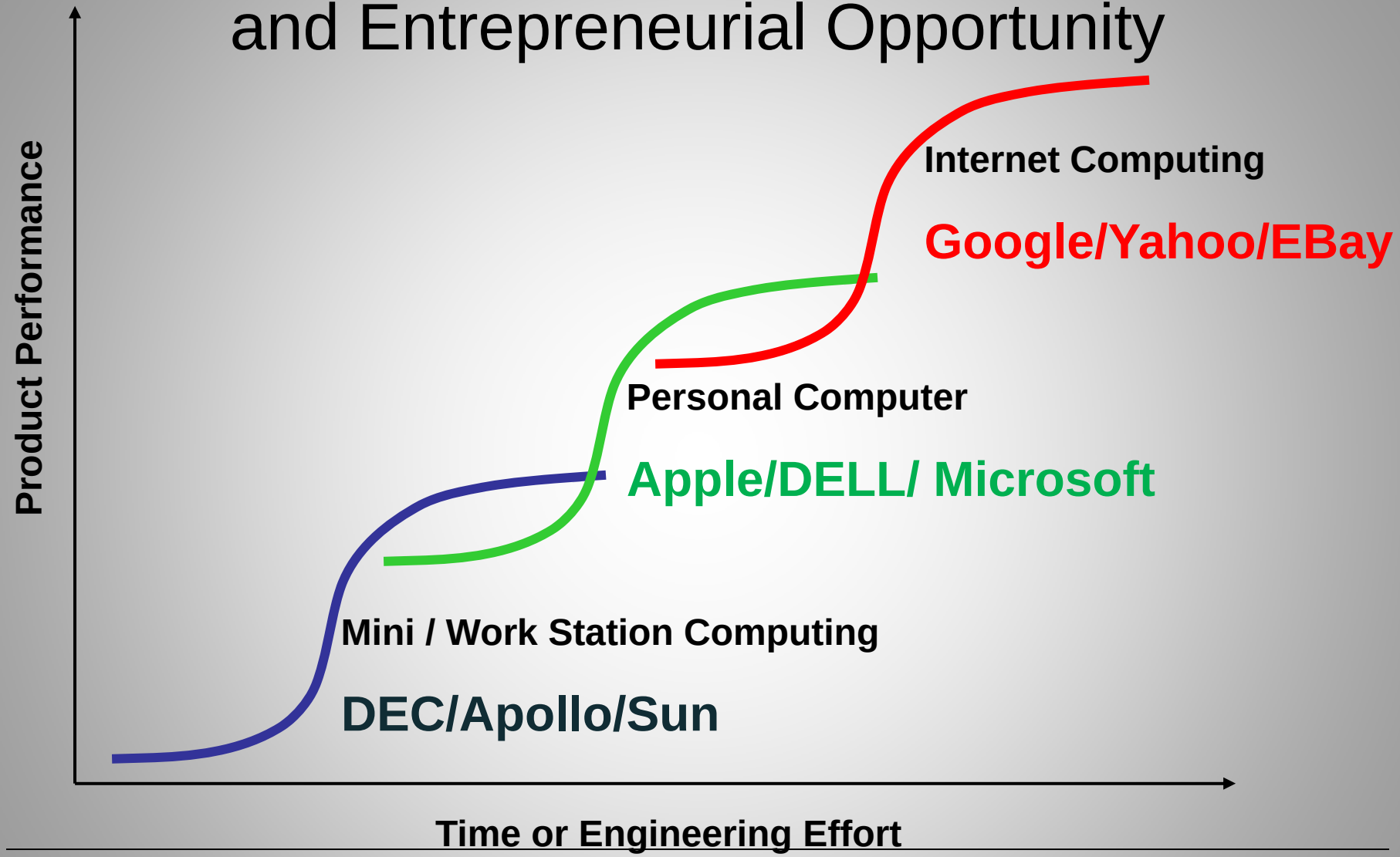

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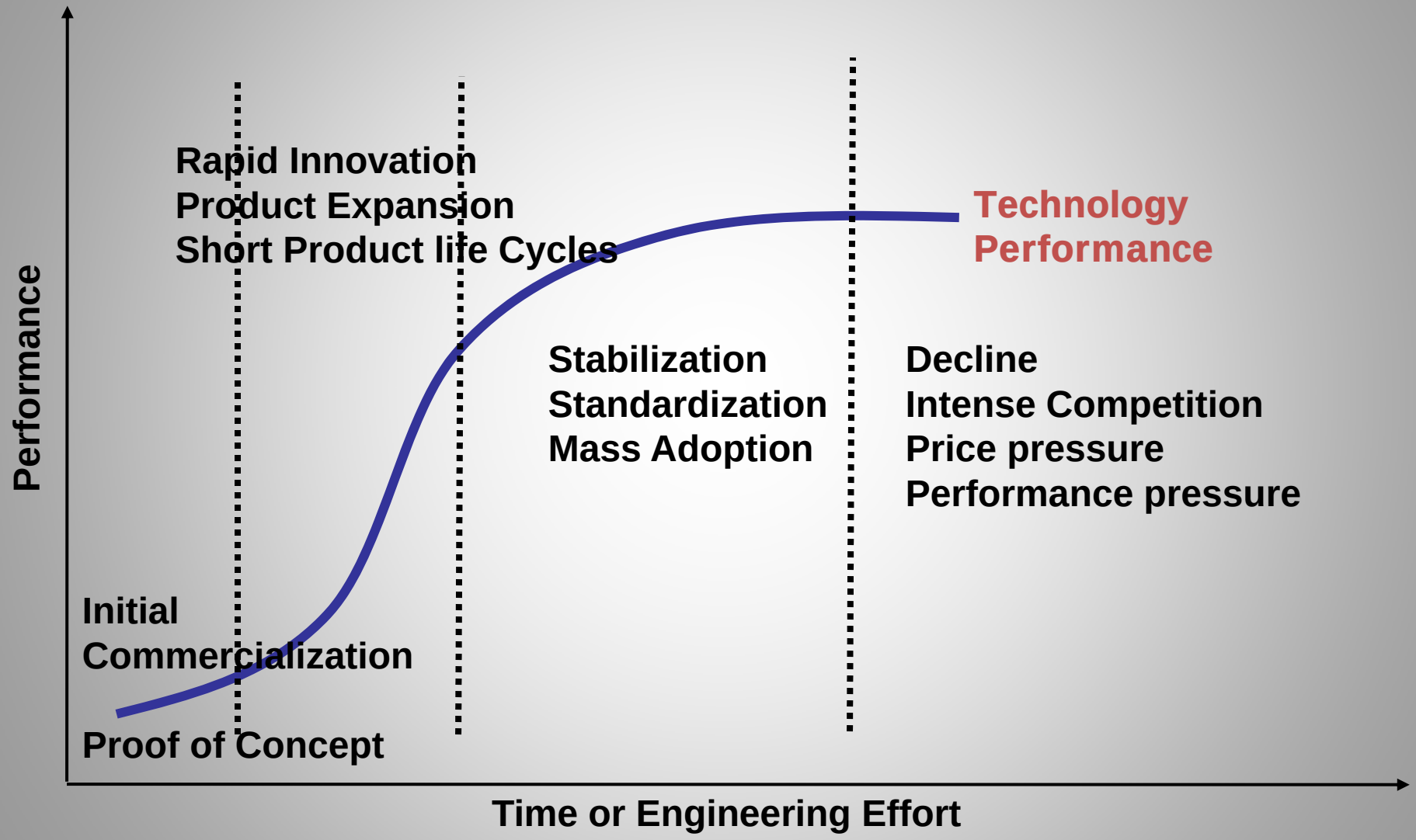
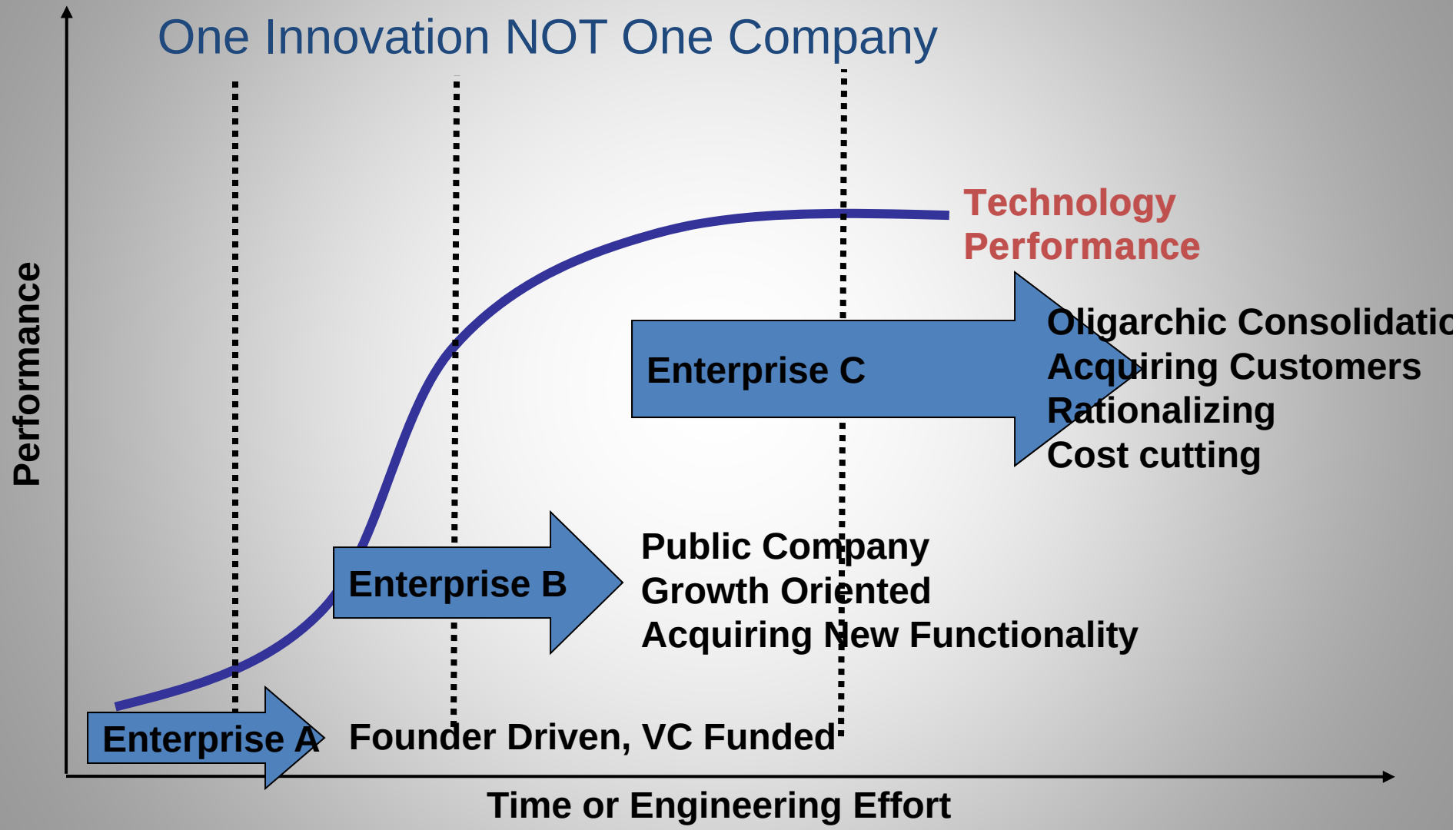
Innovation Progression

- Innovation progresses with multiple companies
- Past: Innovation concentrated within industry leaders
- Today: Innovation is driven by combinations of startups and mature corporations building on the work of each other
- Mergers and acquisitions facilitate the progression and provide investor returns

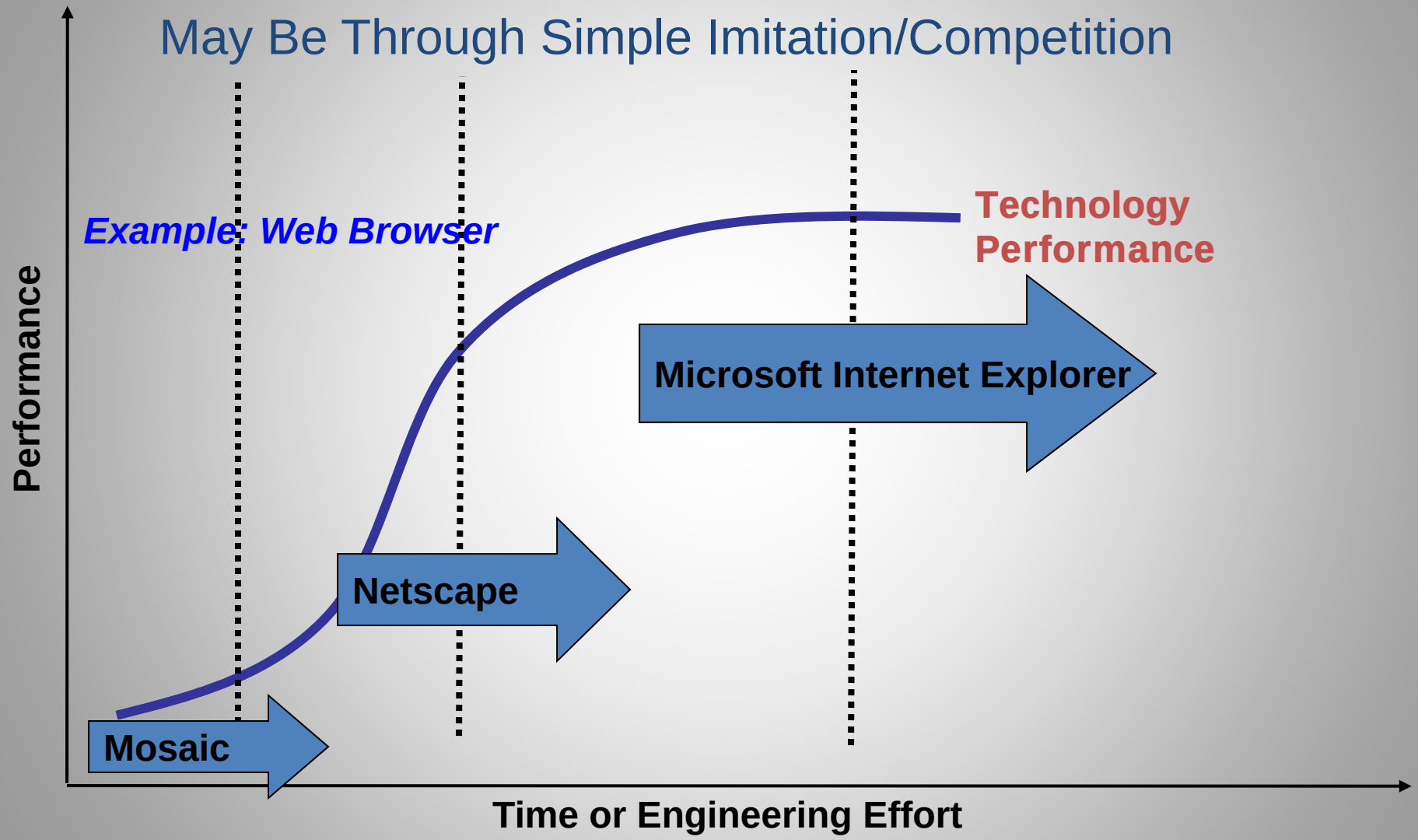
Technology or Innovation Development and Commercialization



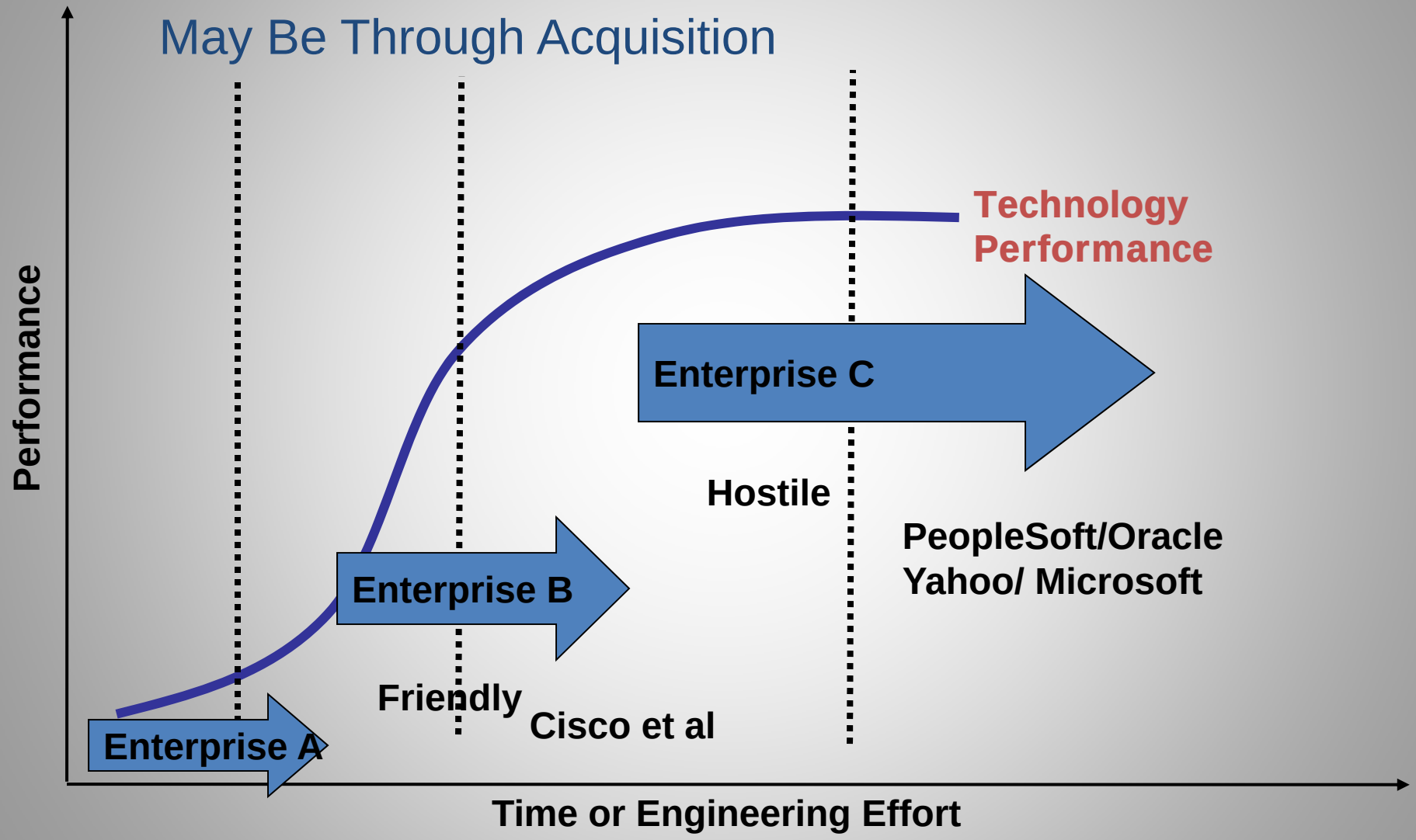
Technology or Innovation Development and Commercialization
One Innovation NOT One Company



Technology or Innovation Development and Commercialization
May Be Through Simple Imitation/Competition



Technology or Innovation Development and Commercialization May Be Through Acquisition



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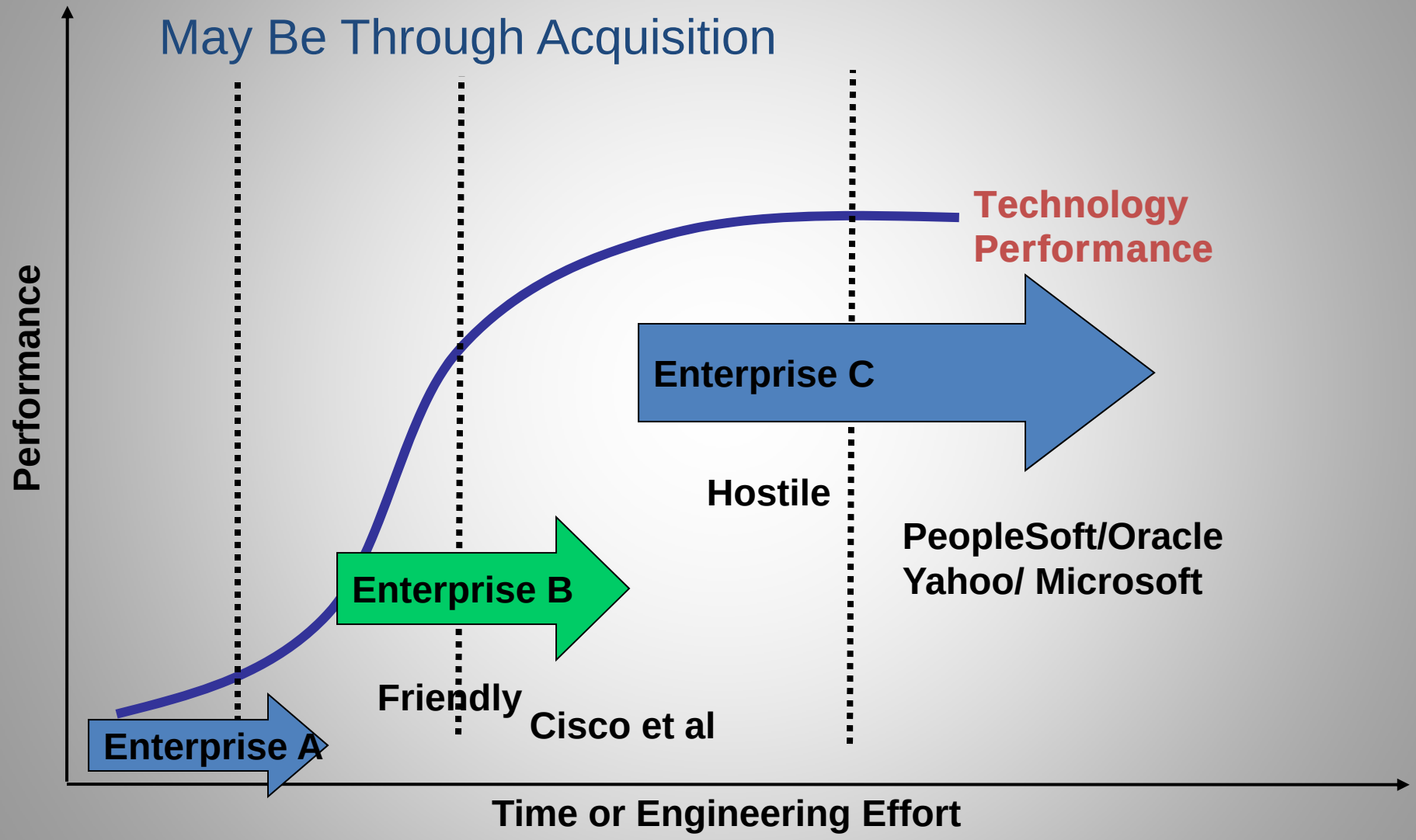
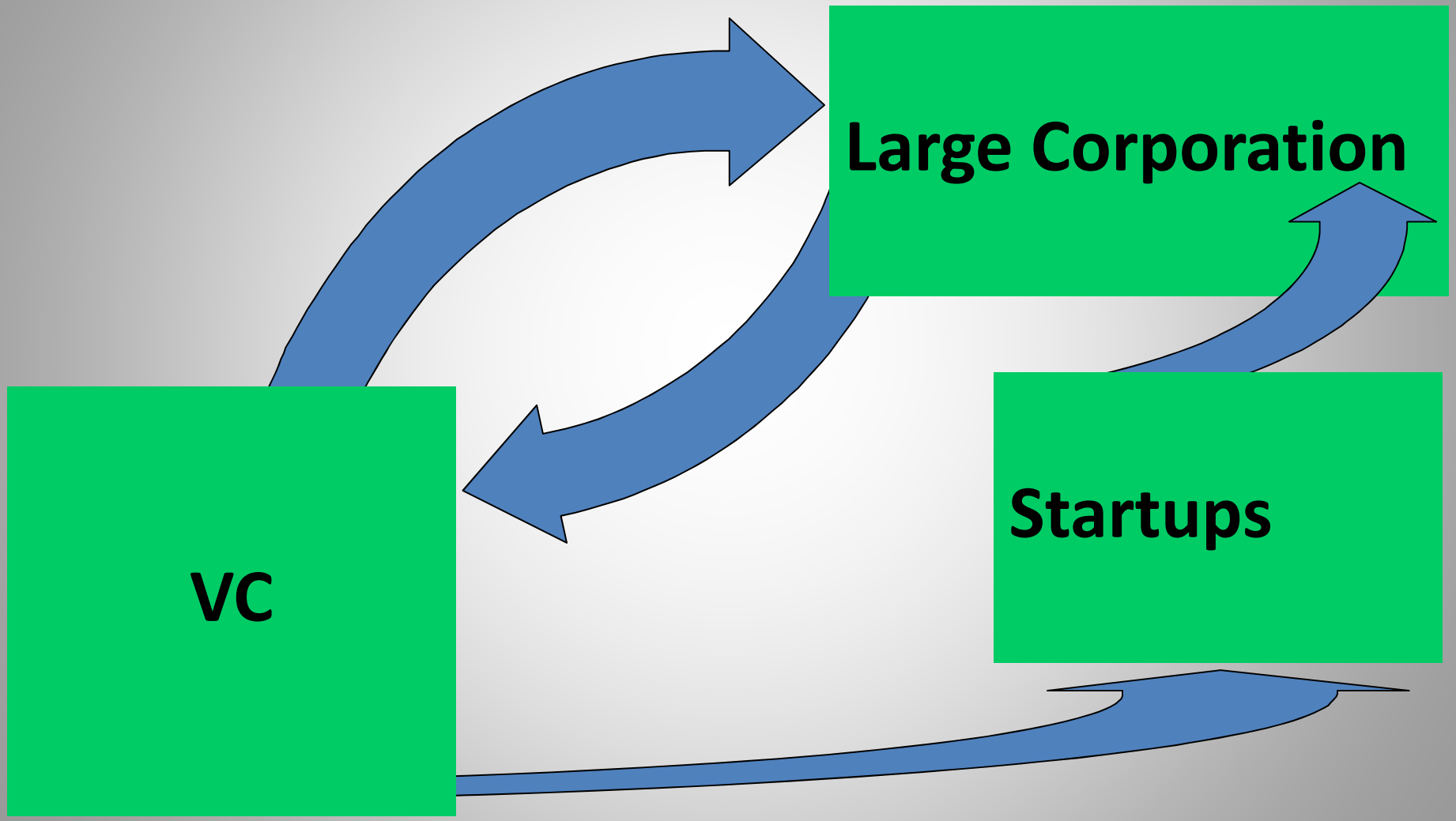


Cycle in Large Corporations



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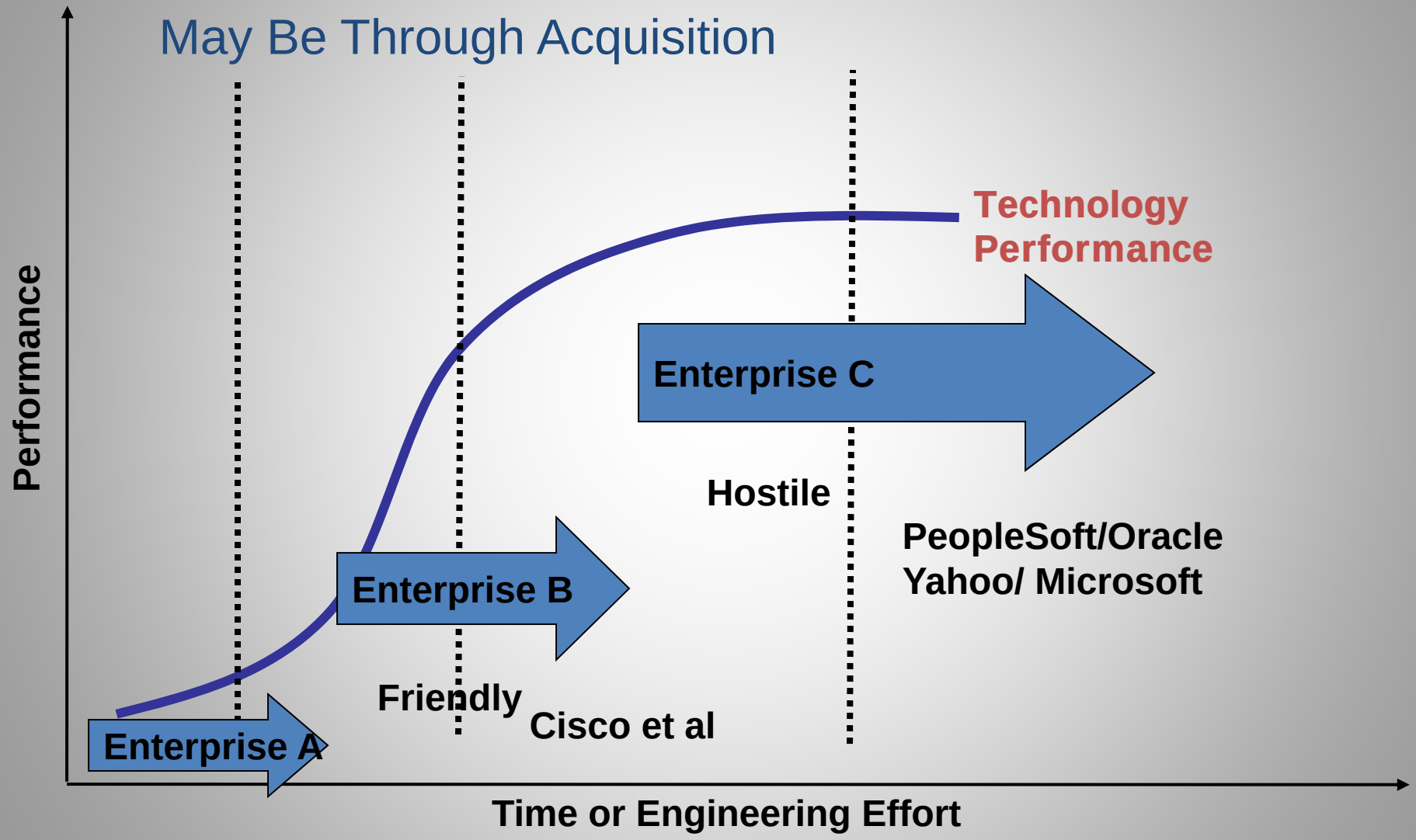

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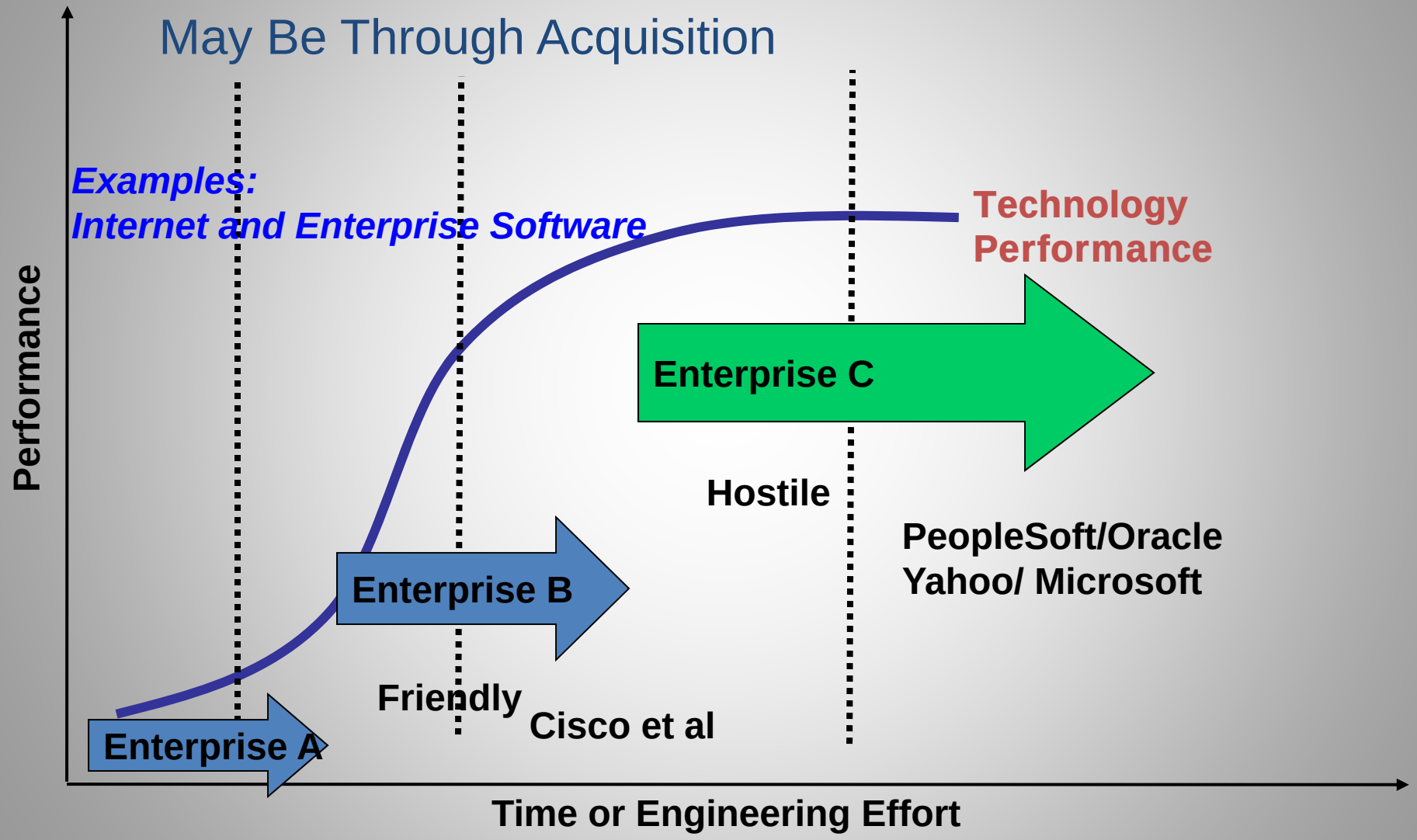
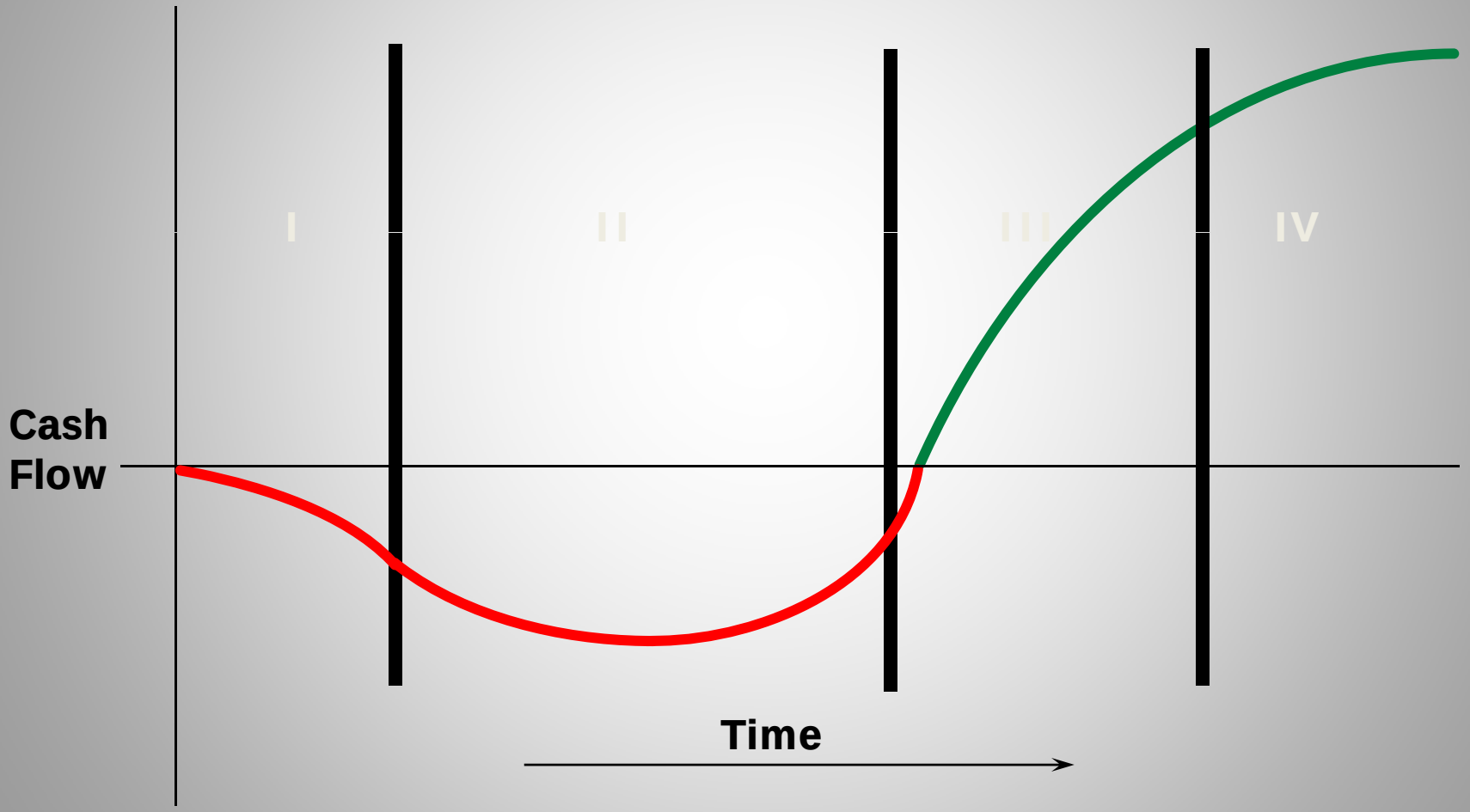
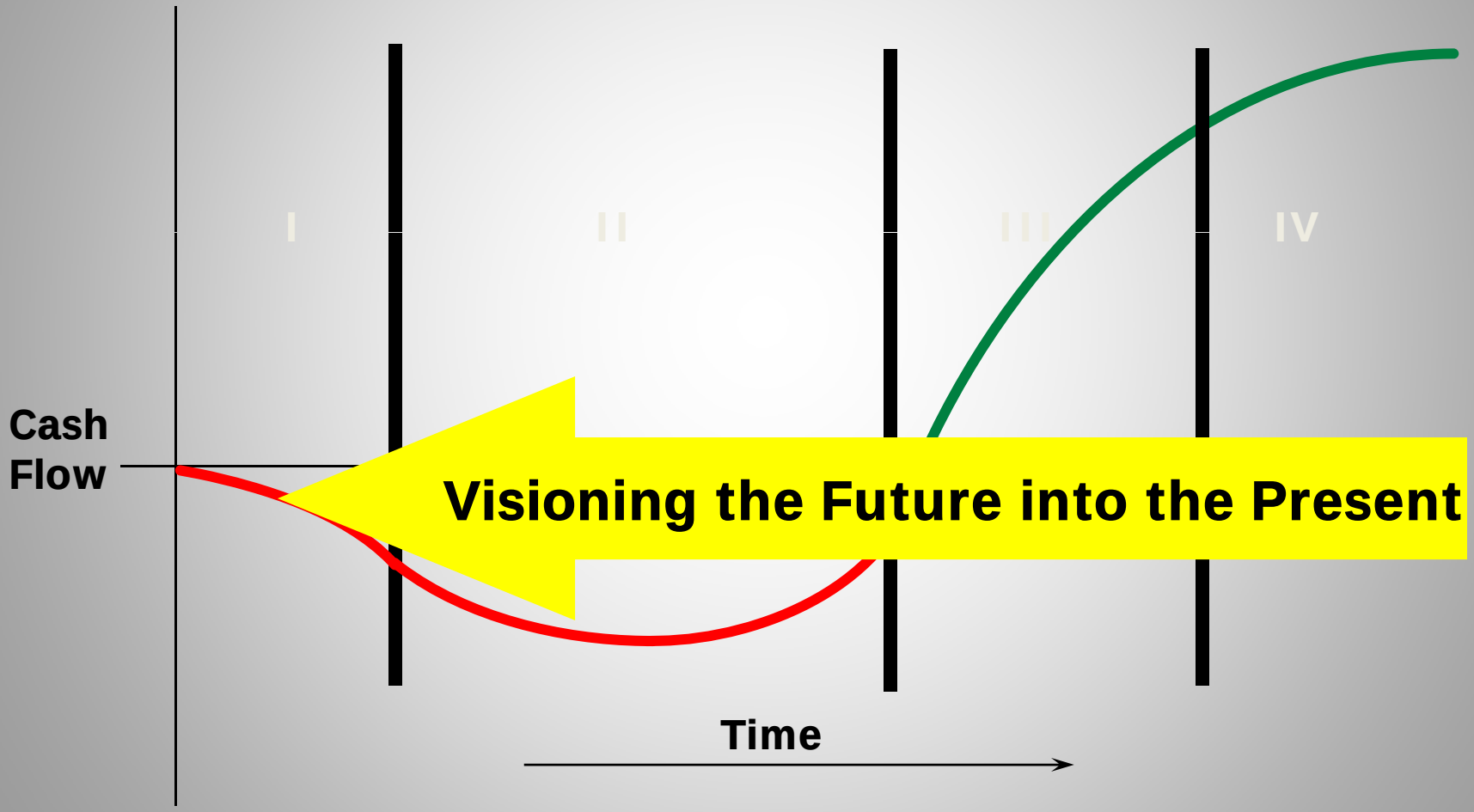


The Entrepreneurial Venture

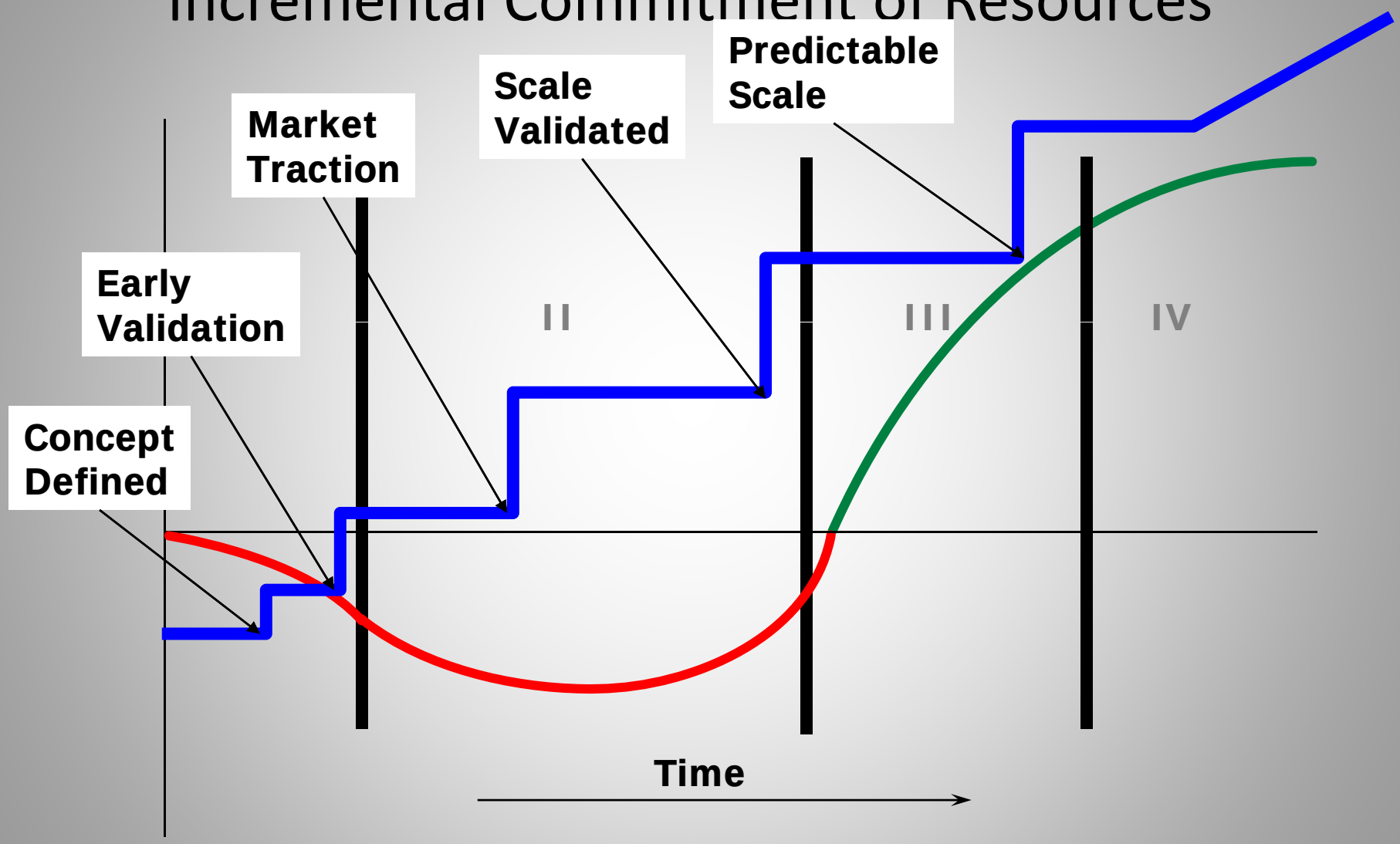
FOUR STAGES of DEVELOPMENT



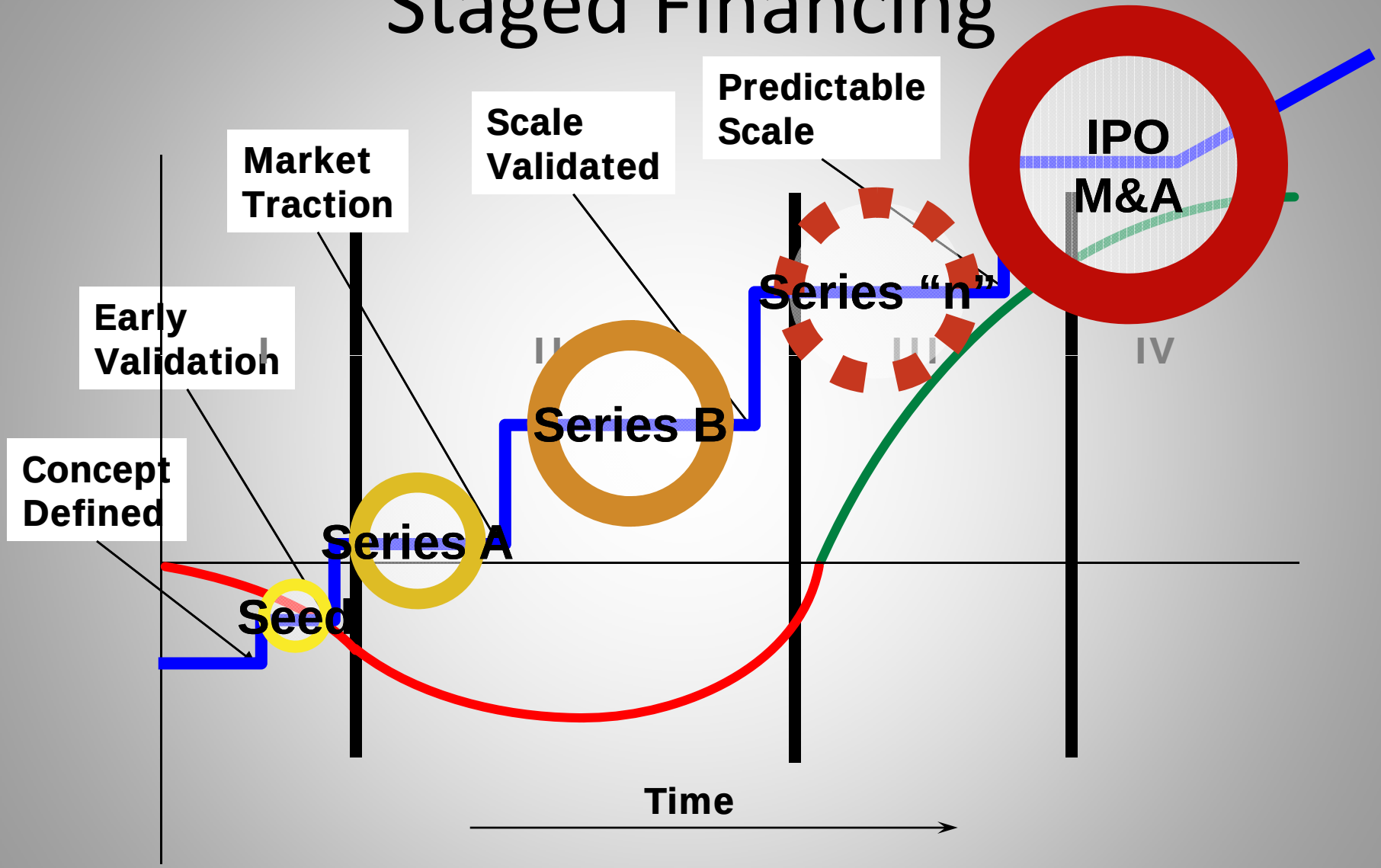
The Professional Entrepreneur



Valuation in Steps
Incremental Commitment of Resources



Staged Financing



Innovating the Green Economy in California

- Challenges
  - Clean Tech markets often require solutions at scale
  - How do we break risk into small chunks to allow entrepreneurial methods to work
    - Niche markets
    - Short time lines / feedback cycles
    - Risk sharing with Gov and major corporations
- It is important to capitalize on our Cluster of Innovation

State of the Industry

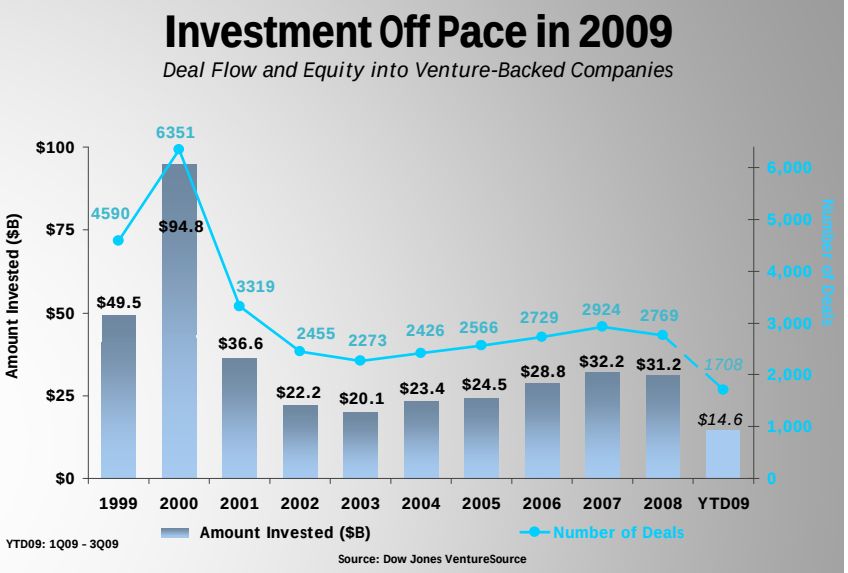
- Markets have returned but signals are mixed
  - Recession may be over, but jobs are a concern
  - Housing/new construction remains weak
  - Oil >$75
  - Project Finance/Tax Equity (Anything Solar, Wind)
- Venture investments recovering…slowly
  - 2009 will likely be about 60% of 2008; concentration of deals

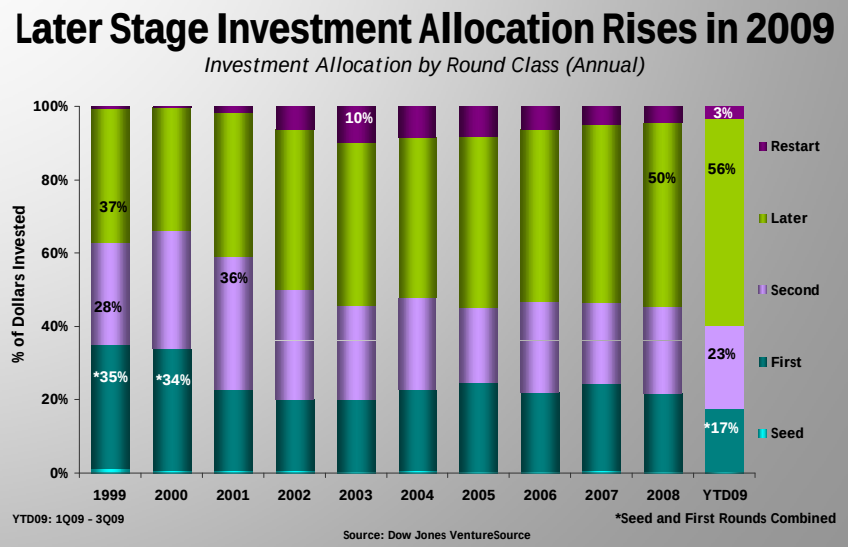
Deal Environment – 2009 Trends

- Deal flow highlights:
  - Smart Grid Everywhere
  - Lighting and Energy Efficiency
  - Solar
  - Batteries and Electric Vehicles
- Challenged Areas:
  - Biofuels
  - Waste to Energy

Deal Environment - Fundraising

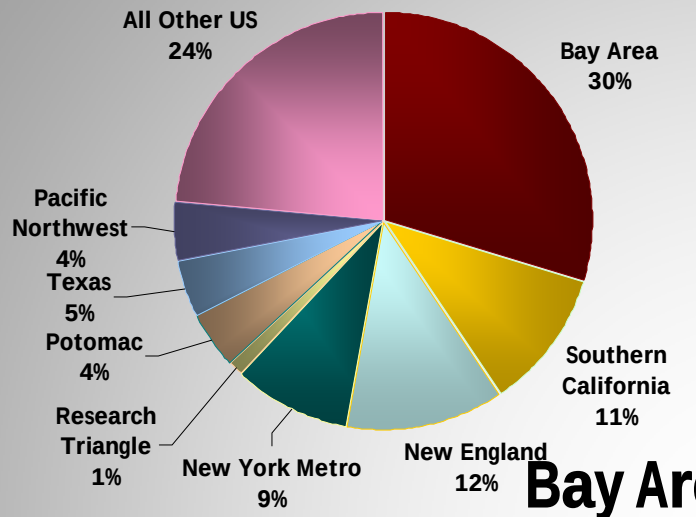
- Company Perspective
  - Series A Companies
    - Raising less than 2007/8 – valuation and availability issues
    - 18-24 month runway
  - Series B+ Companies
    - Extension of last round with existing investors
    - Raise 1 year ahead of schedule
    - Trying (or tried for) ARRA dollars
    - Avoid raising altogether
- VC Perspective
  - No urgency
  - Syndicates are more important
  - Testing other waters – is the grass greener in other areas?





California Companies Garner Most Deals

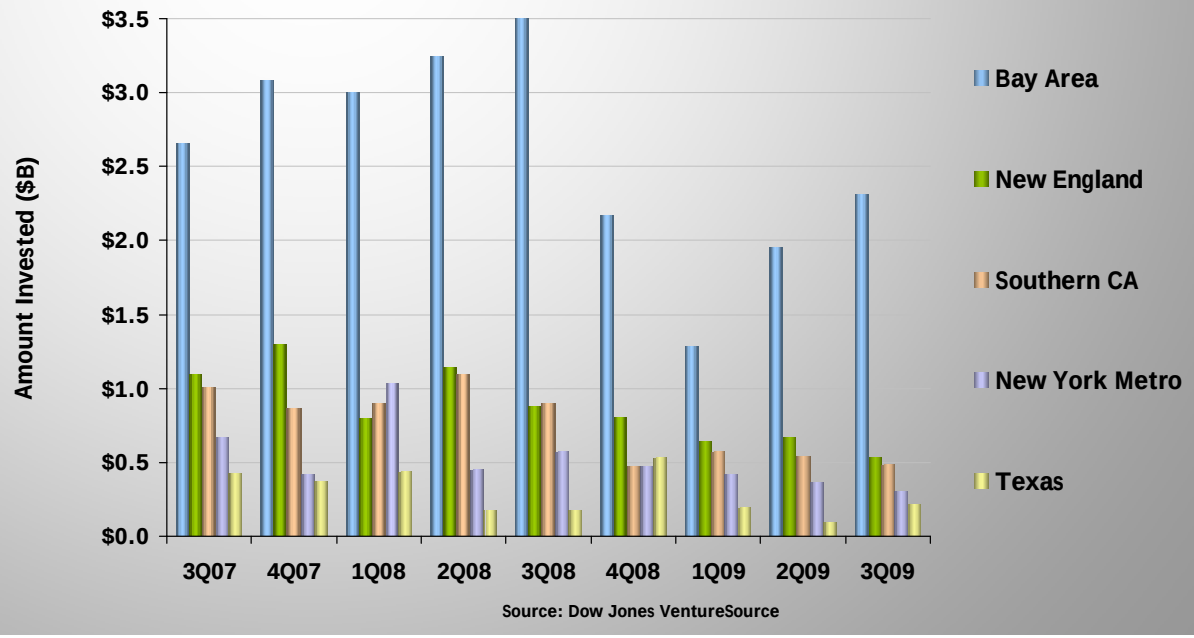
Regional Deal Flow in the United States 3Q '09



Source: Dow Jones VentureSource

Bay Area Continues to Attract Most Dollars

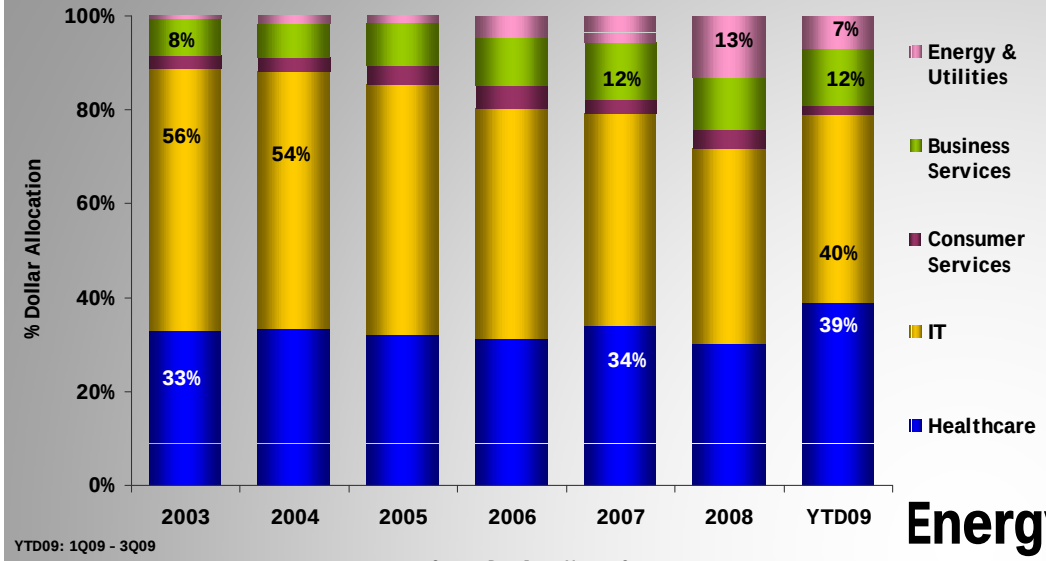
Equity into Most Active Regions



Source: Dow Jones VentureSource

HC & IT Investment Allocation Almost Equal in Through 3Q '09

Investment Allocation by Selected Groups (Annual)

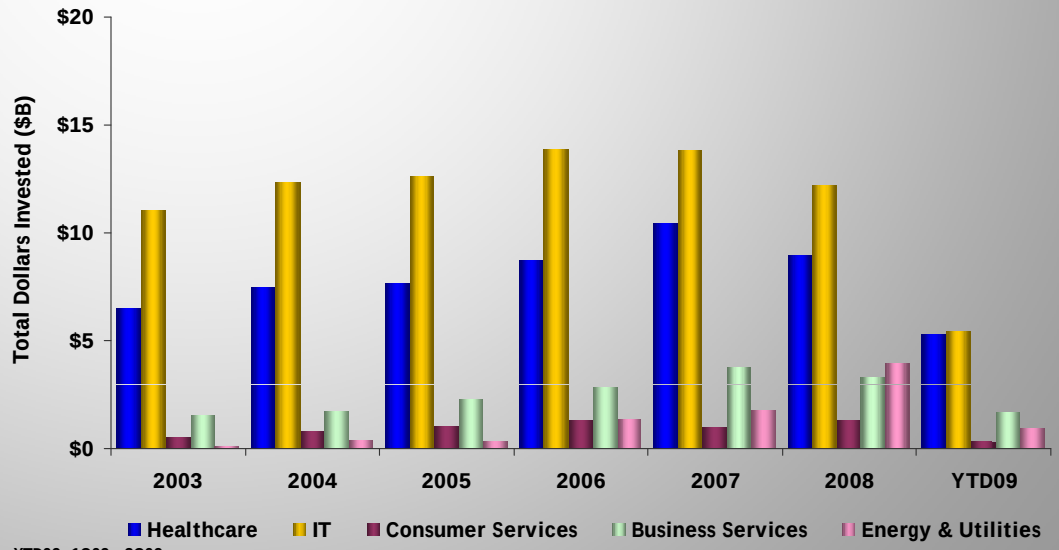


YTD09: 1Q09 - 3Q09

Source: Dow Jones VentureSource

Energy & Utilities Investment Slows Through 3Q '09

Investment Allocation by Industry Sector (Annual)

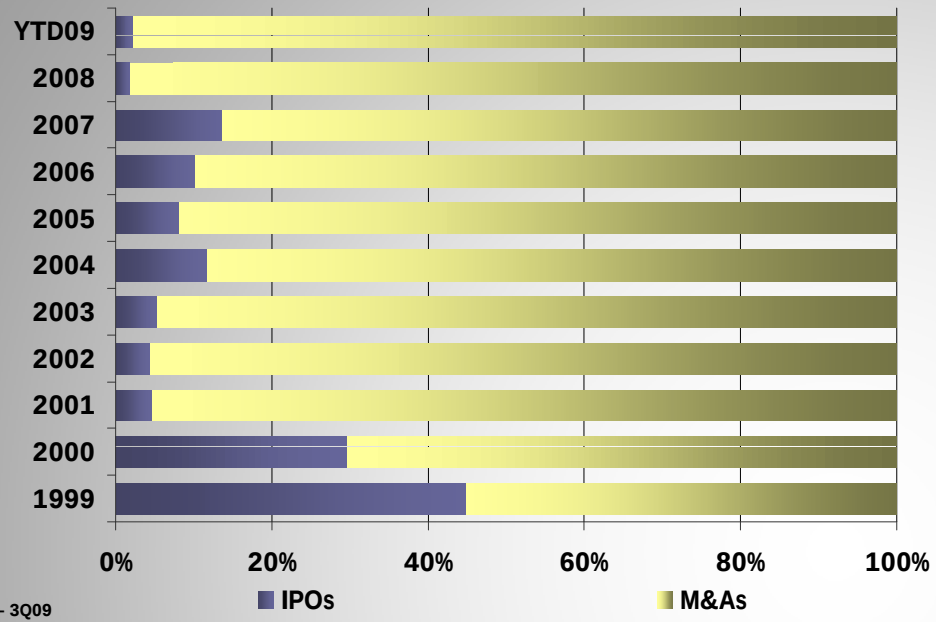


YTD09: 1Q09 - 3Q09

Source: Dow Jones VentureSource

M&As Remain Primary Source of Liquidity in 2009

Percentage Breakdown of Venture Backed Liquidity Events: IPO vs. M&A



YTD09: 1Q09 - 3Q09

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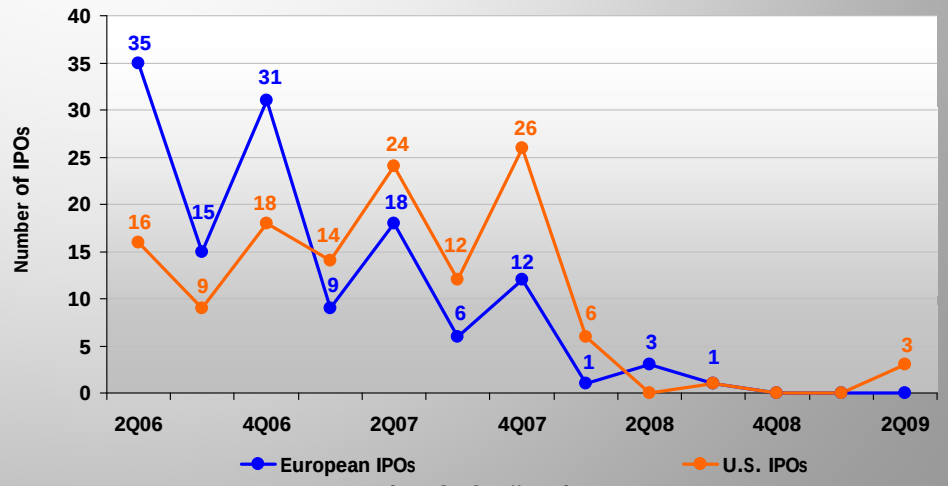
IPO Activity Resumes in US

IPOs Per Quarter, US & Europe



Source: Dow Jones VentureSource

Regulatory & Stimulus –Thoughts

- Effort on Climate / Energy legislation lagging
- First wave of stimulus dollars ending; what's next?
- From VC perspective, long-term, stable legislation remains important
- States are still playing an important role shaping national energy/climate policy; but budget burdens are slowing things

Where do VC see opportunities?

- Solar – Still a large and growing market
  - Utility-scale opportunities with single digit LCOE
  - Value chain focus
  - Low cost seems to be winning over high efficiency
- Energy Efficiency – Lighting & Controls
  - Value proposition must go beyond energy efficiency
  - Solution must target a “spread sheet” decision-maker
  - Well articulated approach to overcoming past failures
- Storage – Primarily around large scale
  - Proven technology with referenceable field trials

Investment Strategies That Still Make Sense

- Early stage investment valuations remain reasonable
- Capital efficient models are back!- <$50M required to build business to liquidity event
- Build strong syndicates to support company through follow-on rounds
- Focus on understanding where there are real customer needs – minimize demand creation

Thank You