What's New In Innovation
October 19, 2010

Presented by:
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President and CEO
Innovation America

The World Has Changed

- Convergence of Complex Challenges
- Loss of Jobs
- Growing US Trade Deficit
- Greater International Competition in manufacturing and service industries
- Competitive advantages are increasingly tied to human capital and innovation
- Economic growth is closely related to education/workforce, energy, climate change, environmental, natural resource and geopolitical issues
- **"Innovation & Creativity Matter"**

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Bill Gates - Microsoft

"Never before in history has innovation offered promise of so much to so many in so short a time."

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West Virginia's Future is Determined By the Present

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What is Innovation?




- **Radical Innovation:** a new product, process, or system that replaces its accepted predecessor and renders it obsolete.
- **Ideation** is applied knowledge; **Creativity** is applied ideation; Invention is applied creativity; and **Innovation** is the successful commercialization or adoption of radical invention
- **Innovation** results when a new approach is applied to an old problem that makes lasting and far-reaching changes in behavior
- "A new match between a **Need** and a **Solution**"

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Why Is Innovation Essential?

"INNOVATION DISTINGUISHES BETWEEN A LEADER AND A FOLLOWER."

-STEVE JOBS

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Can You Tell Which is the Real IPad?

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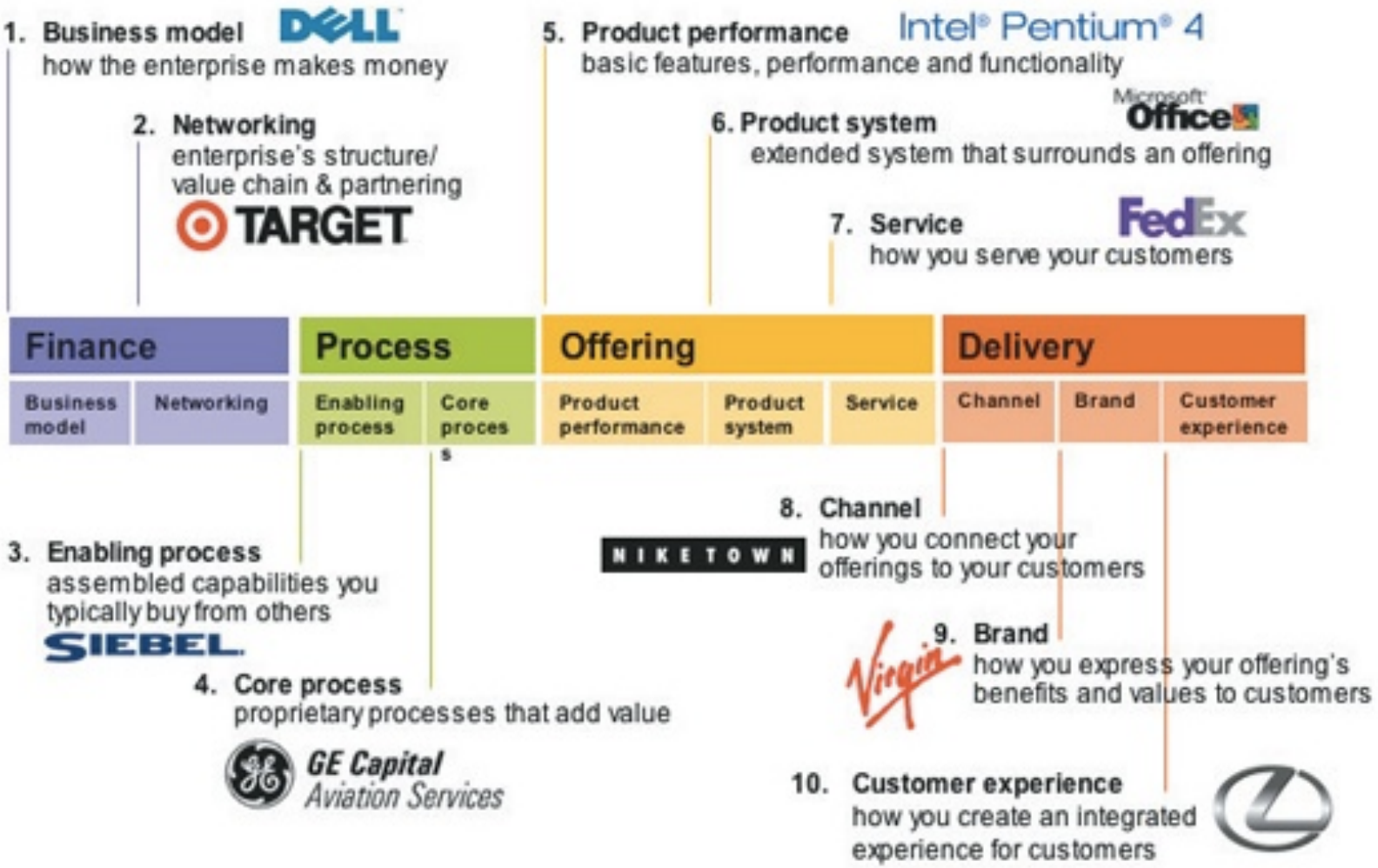
10 Types of Innovation



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Global Innovation Network

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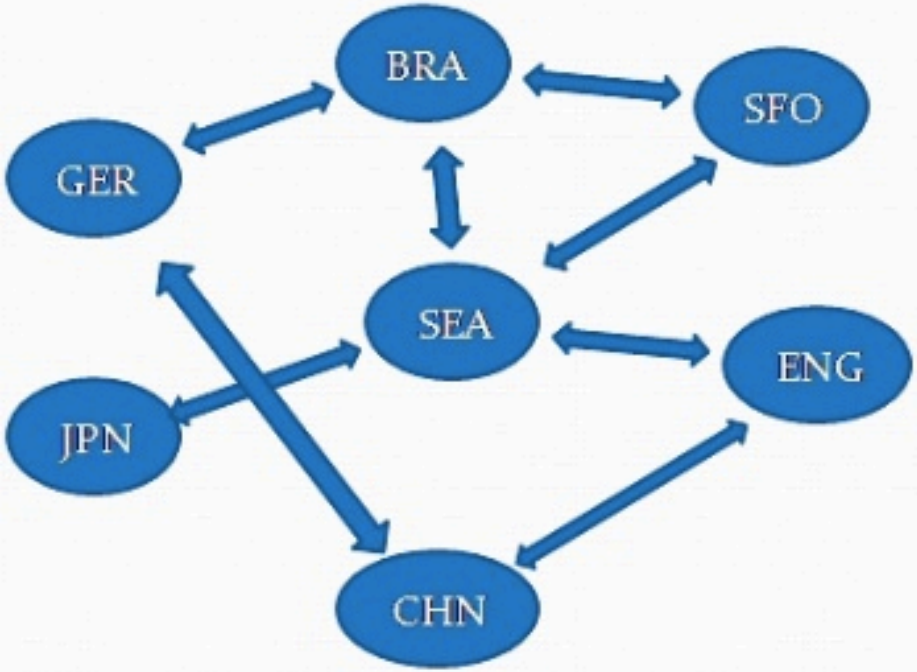
Global Innovation Networks

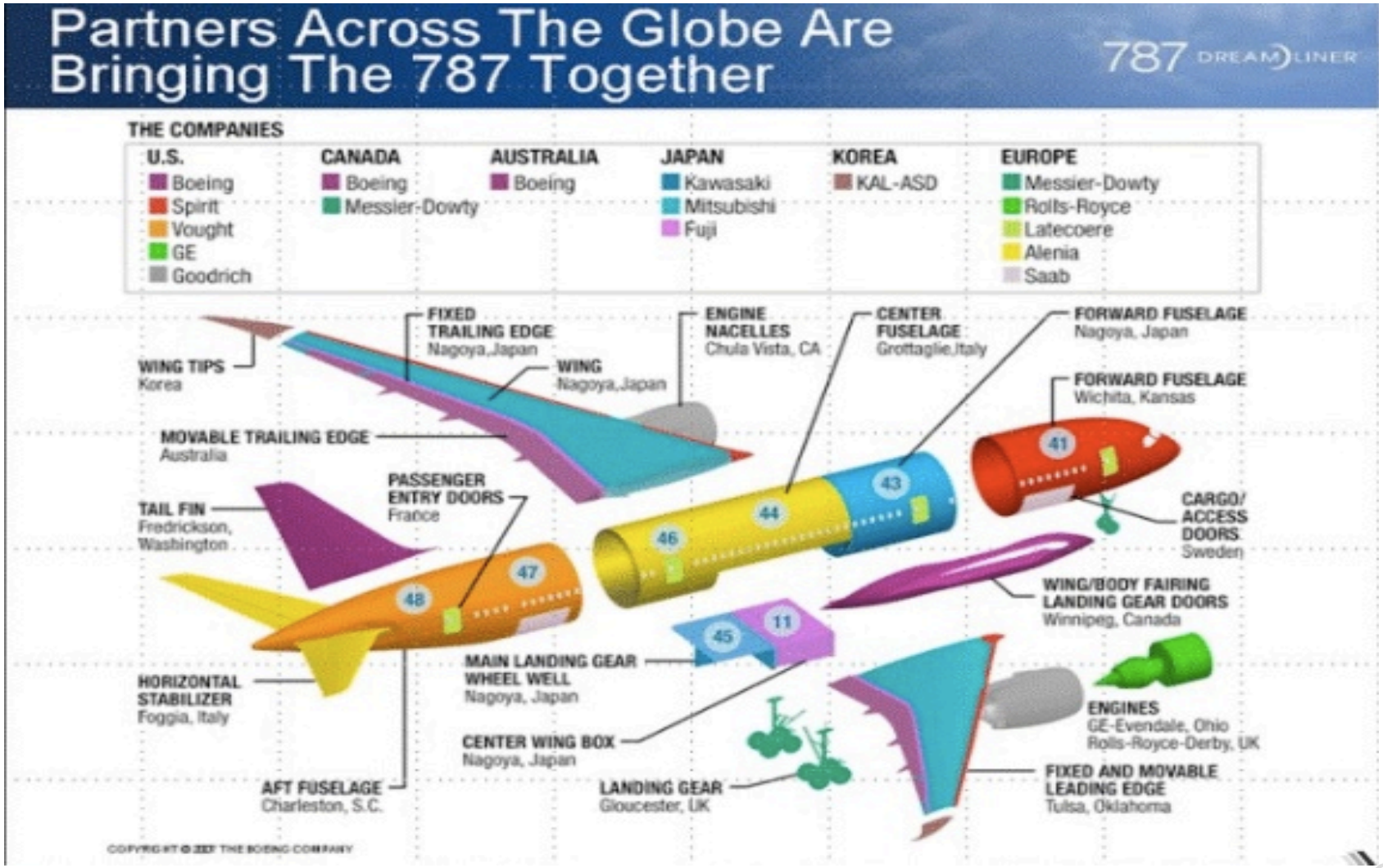
New Model: Regional Clusters making up Global Innovation Networks



Exchange of

- Ideas
- Talent
- Investment
- Supply Chain Linkages
- Design
- Manufacturing
- Sales
- Marketing

Global Innovation Networks



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★AMERICA'S TOP STATES FOR BUSINESS 2010★ | A CNBC SPECIAL REPORT

Overall	State	Cost of Business	Workforce	Quality of Life	Economy	Transportation	Technology & Innovation	Education	Business Friendliness	Access to Capital	Cost of Living
32 (tie)	California	48	31	15	18	16	1	31	49	1	49
24	New York	50	49	18	2	22	2	2	45	3	43
5	Massachusetts	39	23	6	17	39	3	1	14	2	41
1	Texas	30	16	29	1	1	4	30	19	7	8
15	Washington	33	30	8	18	35	5	22	34	5	35
20	Pennsylvania	40	42	25	15	16	6	4	32	11	30
41	Michigan	32	41	36	47	24	7	35	35	18	24
27	Maryland	43	36	28	18	43	8	10	16	12	45
22	New Jersey	44	32	14	28	32	9	2	35	4	47
2	Virginia	26	9	18	11	12	10	13	2	9	27
4	North Carolina	15	3	32	37	10	11	26	13	10	23
3	Colorado	25	10	2	8	36	12	29	4	15	35
28	Florida	41	1	31	48	21	13	35	23	17	30
30	Illinois	35	39	24	29	12	14	26	39	6	17
34	Ohio	29	48	38	34	2	15	18	38	24	15
46	West Virginia	15	44	40	24	38	48	34	50	40	17

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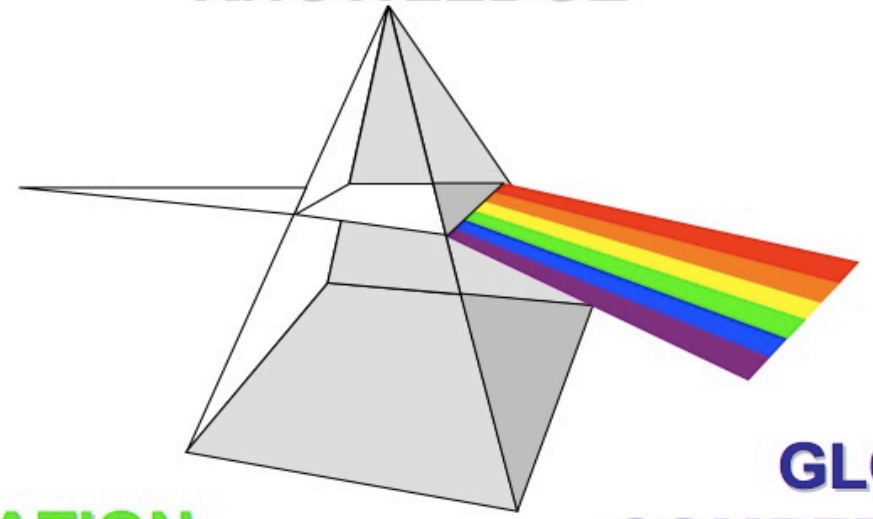
Innovation Economy

KNOWLEDGE



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GLOBAL COMPETITIVENESS

"If a man empties his purse into his head, no man can take it away from him. An investment in knowledge always pays the best interest."

--Ben Franklin

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Realities, Opportunities & Innovations for the Next Decade

- Continued fiscal difficulties
- Sorting out of the capital markets
- More opportunities for entrepreneurship
- China as a potential market if consumers spend
- Reshaping of manufacturing
- New tech frontiers (e.g., alt energy, climate change)
- Continued growth of open innovation
- Workforce issues among the U.S. and global populations
- **INNOVATION** is essential to remain competitive

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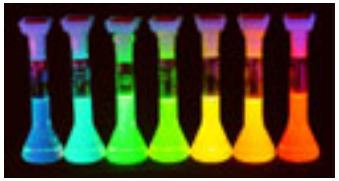
Implementing a New Innovation Paradigm

- Willingness to deviate from traditional and parochial perspectives
- Encourage public investment and risk taking
- Developing trust through collaboration
- Ensuring the paradigm is responsive to partners' missions
- Building consensus of all constituents through education, participation, and positive outcomes
- Move from technology-based economic development to **Innovation-Based Economic Development**



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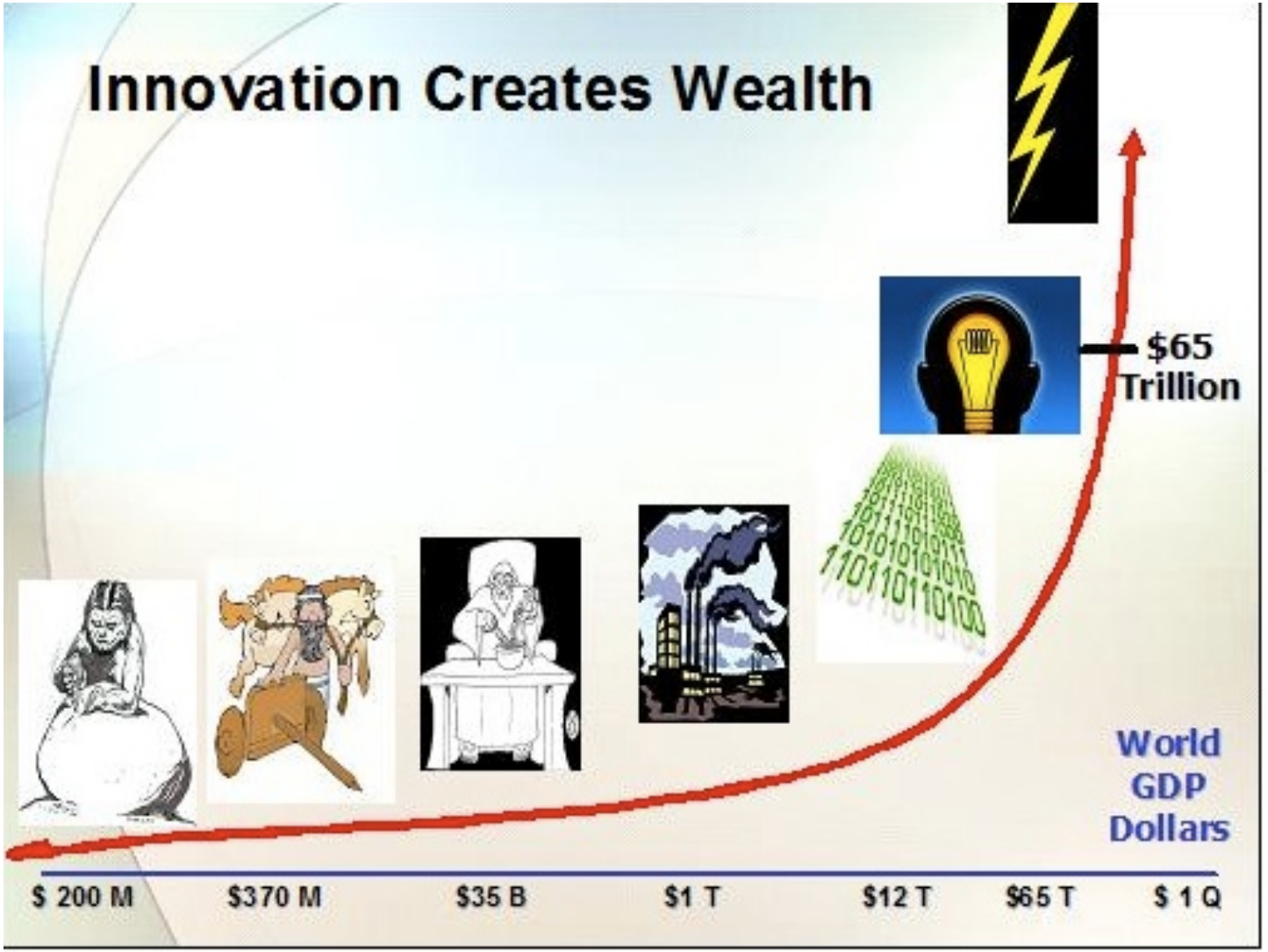

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Social Innovation

- Social innovation refers to new strategies, concepts, ideas, and organizations that meet social needs of all kinds
- From working conditions and education to community development that will extend and strengthen civil society

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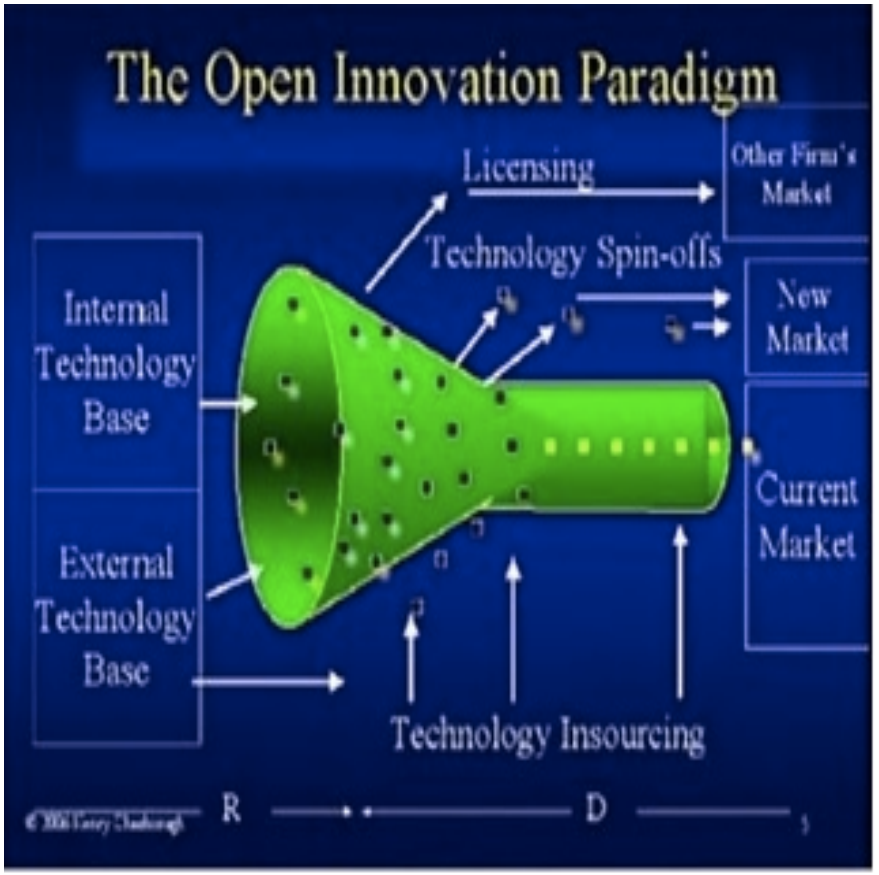
Open Innovation

Open innovation is what happens when big companies collaborate on a large scale with outsiders – university researchers, suppliers, small tech start-ups – to get new products or services to market.



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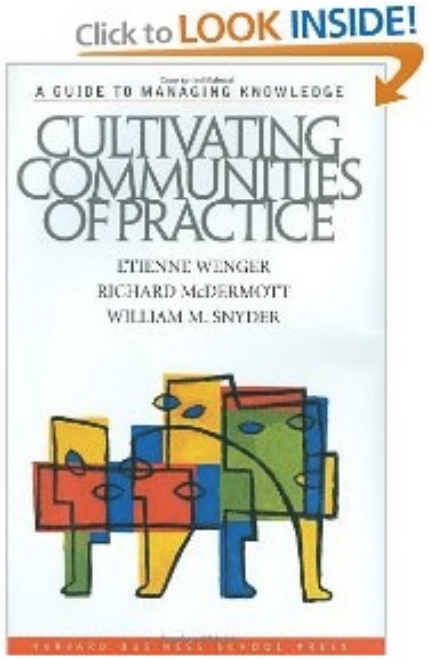
Communities of Practice

- Group of people who share a common concern, a set of problems or a passion about a topic.
- Deepen their knowledge and expertise by interacting on an ongoing basis.
- Follow a particular methodology which is based on theories of learning in action – learning while doing



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Crowdsourcing

- ***Crowdsourcing*** is the act of outsourcing tasks, traditionally performed by an employee or contractor, to a large group of people or community (a crowd), through an open call.

- ***Crowdfunding*** is the raising of a small amount of risk capital from a large number of people.

The Millennials

•Millennials, an abbreviation for *millennial generation, is a term used by demographers to describe a segment of the population born between 1980 and 2000 (approximately).*

•**76** million Millennials in the United States

•**186** million Millennials in Europe?

•As a result of growing up with the Internet and associated devices, Millennials are often said to be the most technologically savvy generation to date.

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Definition: Collaboration

A recursive process where 2 or more people or organizations work together in an intersection of common goals.

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Public/Private Partnership

- Progress is promoted by strong industry, government and university leadership
- Sustained by dynamic public/private partnerships
- These leaders create new, responsive models of governance

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Government's Role in S&T

- Long term vision and planning
- Identify gaps and trends in science, technology and innovation
- Be a catalyst through strategic investments and partnering
- Develop a balanced and flexible innovation capital investment portfolio
- Encourage private sector innovation
- Establish performance-oriented innovation-based economic development strategy and implementation plan

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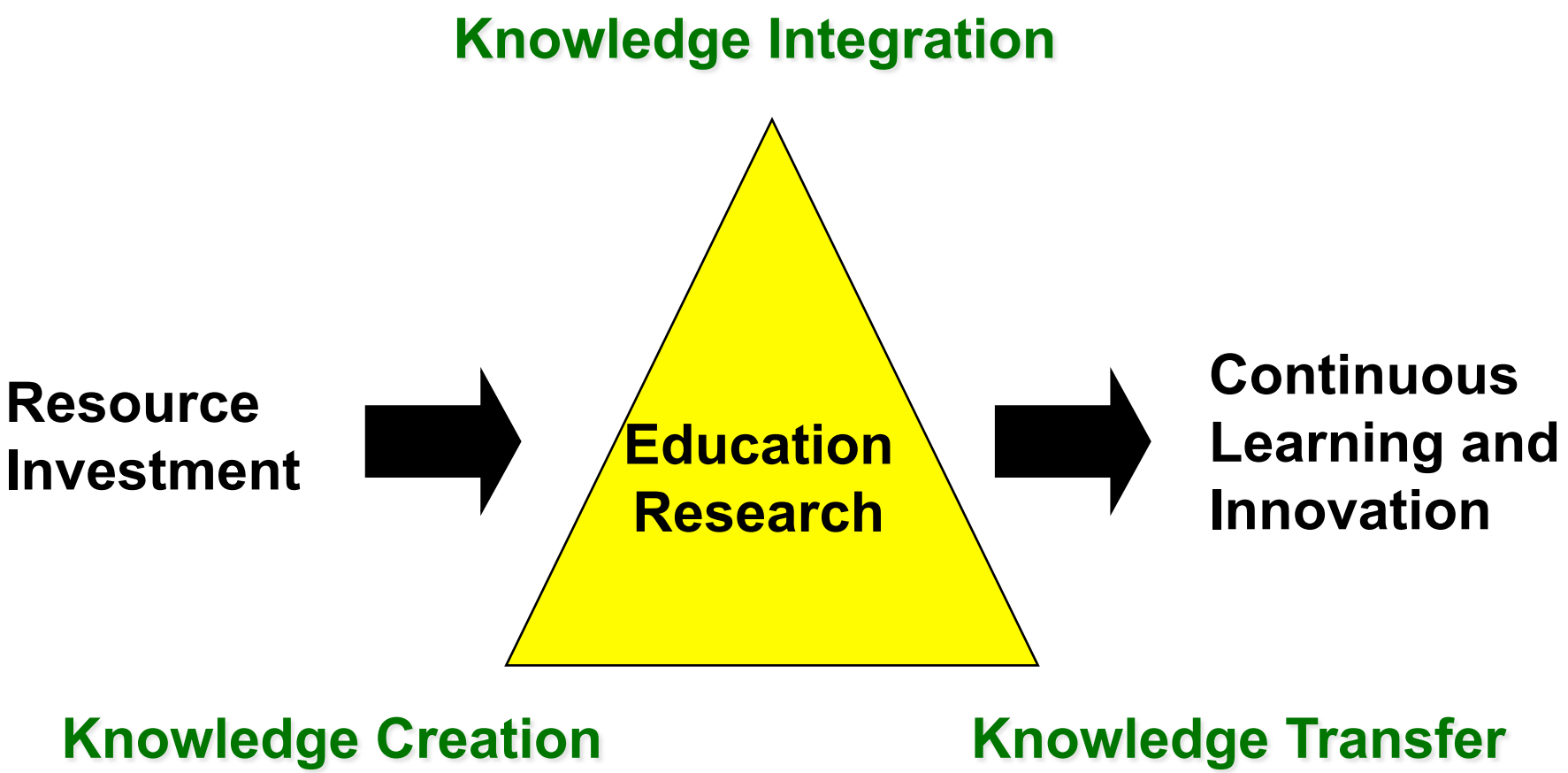
The Role of Academia



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The Role of Industry: Wealth Creation

Capitalism is a Process of Creative Transformation

"The interaction of technological innovation with the competitive marketplace is the fundamental driving force in capitalist industrial progress."

Joseph A. Schumpeter, 1942

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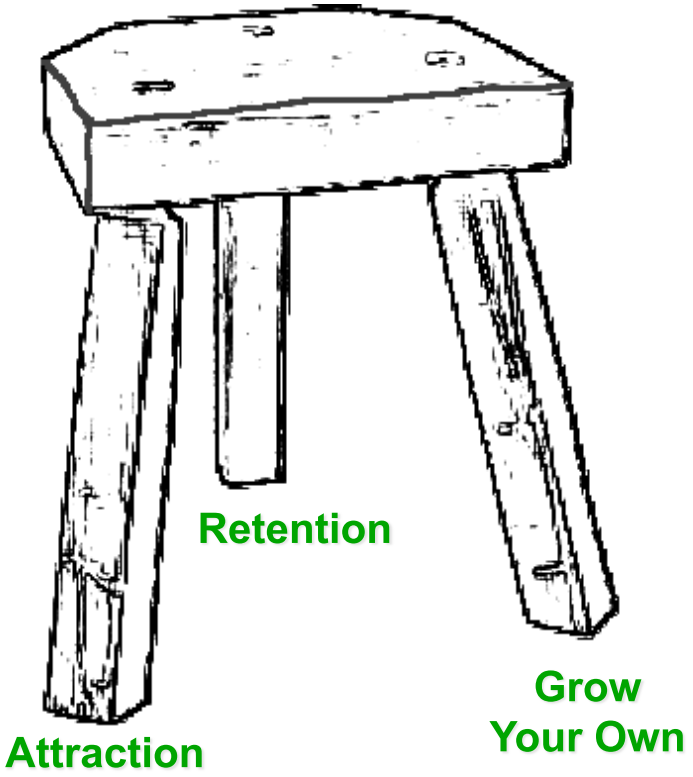
Economic Development

- Economic Development is like a three-legged stool:
  - **Attraction**
  - **Retention**
  - **Grow Your Own**
- IBED requires patience and persistence, continuity and consistency.
- Working with early-stage companies takes time.
- Balanced portfolio economic development strategy is best!



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Traditional & Innovation-Based Development

	Traditional	Innovation
• Competitive Basis	Natural resources Highways / Rail Proximity Costs	Specialized talent Networks, information University research / professors Market understanding Global Reach
	i.e. PHYSICAL	i.e. KNOWLEDGE
• Key values / offerings	Business parks Incentives	Access to research Workforce competencies Lifestyle
• Lead Organization	Chambers / EDCs	**Innovation intermediaries,** Economic developers

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What is an Innovation Intermediary?

An Organization at the Center of the region's, state's or country's efforts to align local technologies, assets and resources to work together on advancing Innovation.

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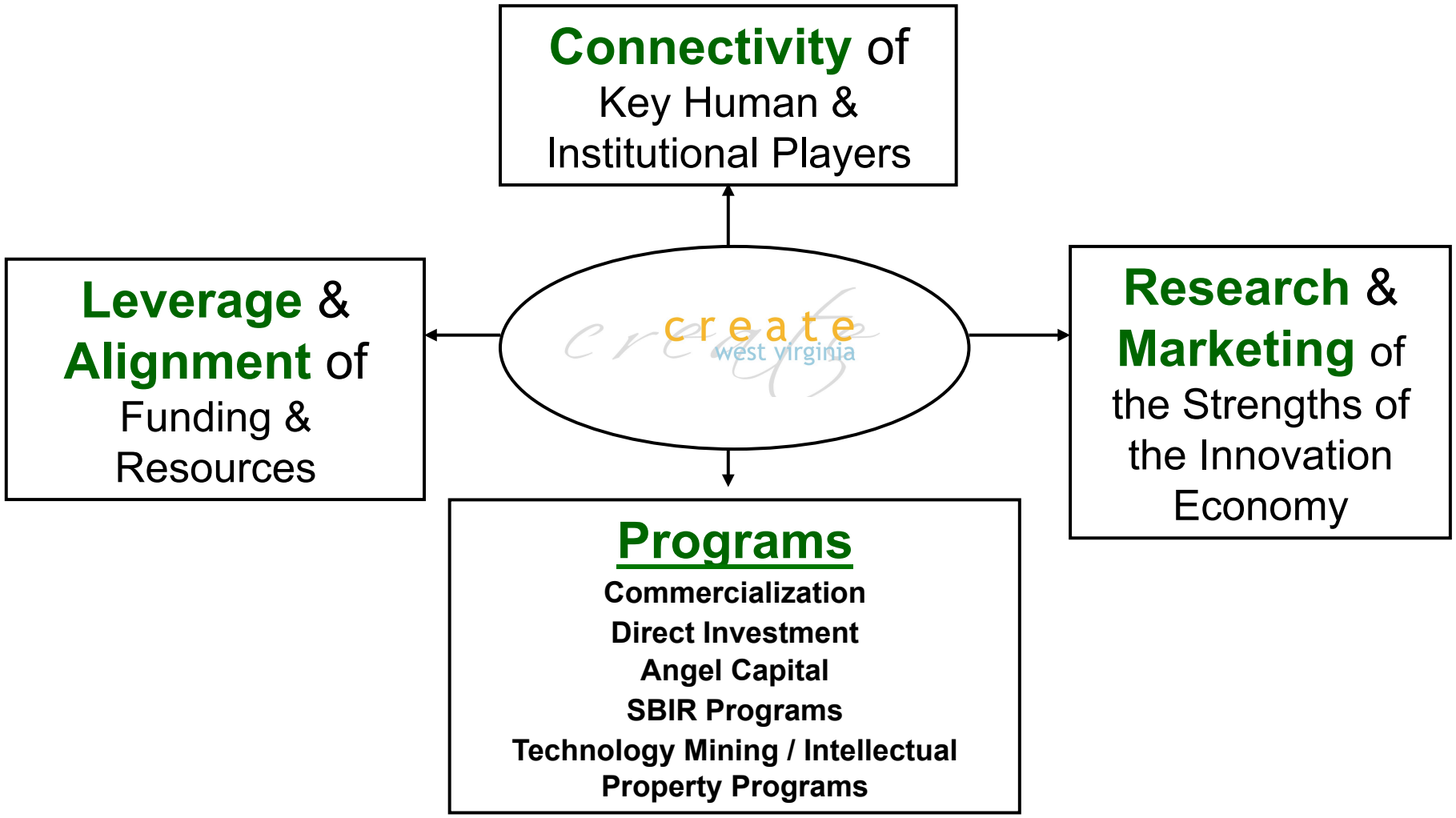
21st Century Innovation Intermediary



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Innovation Intermediary Commercialization Structure

Investigation	Technical	Market	Business
Proof of Concept	Technology Concept Analysis	Market Needs Assessment	Venture Assessment
Development Phase			
Feasibility	Technology Feasibility	Market Study	Economic Feasibility
Planning	Engineering Prototype	Strategic Marketing	Strategic Business Plan
Introduction	Pre-Production Prototype	Market Validation	Business Start-Up
Commercial Phase			
Full Scale Production	Production	Sales and Distribution	Business Growth
Maturity	Production Support	Market Diversification	Business Maturity

Intermediary Best Practices

- Longevity
- Bipartisan Support & Champions
- Independent Organizations
- Continuous Reinvention
- Private Sector LEADERSHIP
- Understand Return On Investment
- Sustainability In Funding
- Accountable
- Innovative
- Effective Leadership

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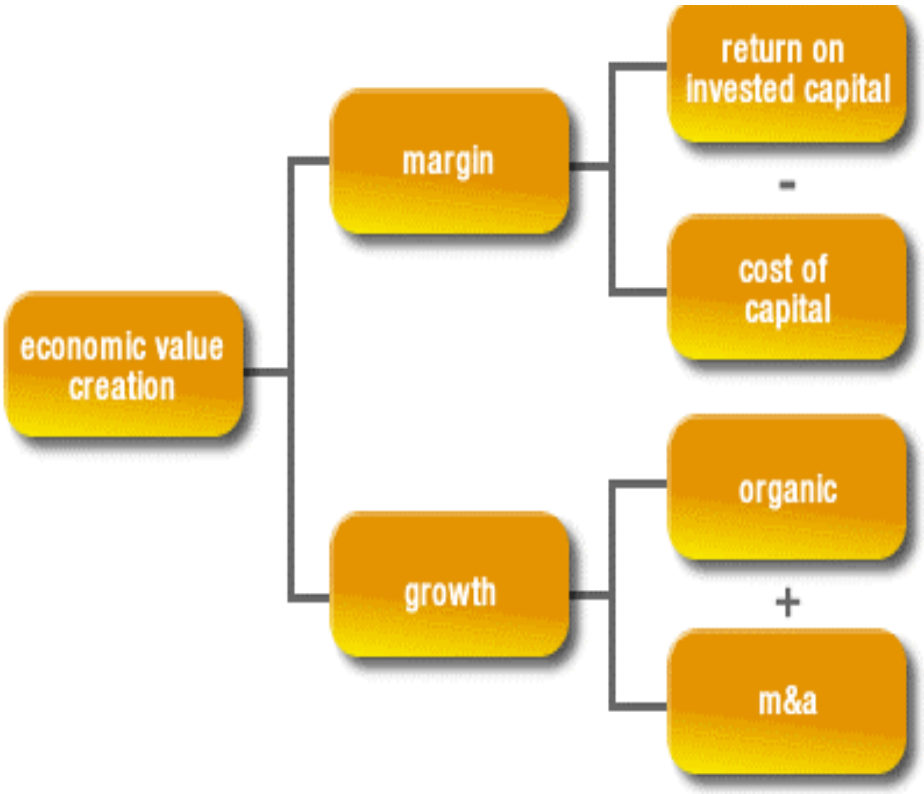
Innovation Paradigm Shift

PROOF OF CONCEPT

(Technological Feasibility)

PROOF OF RELEVANCE

(Market Pull)



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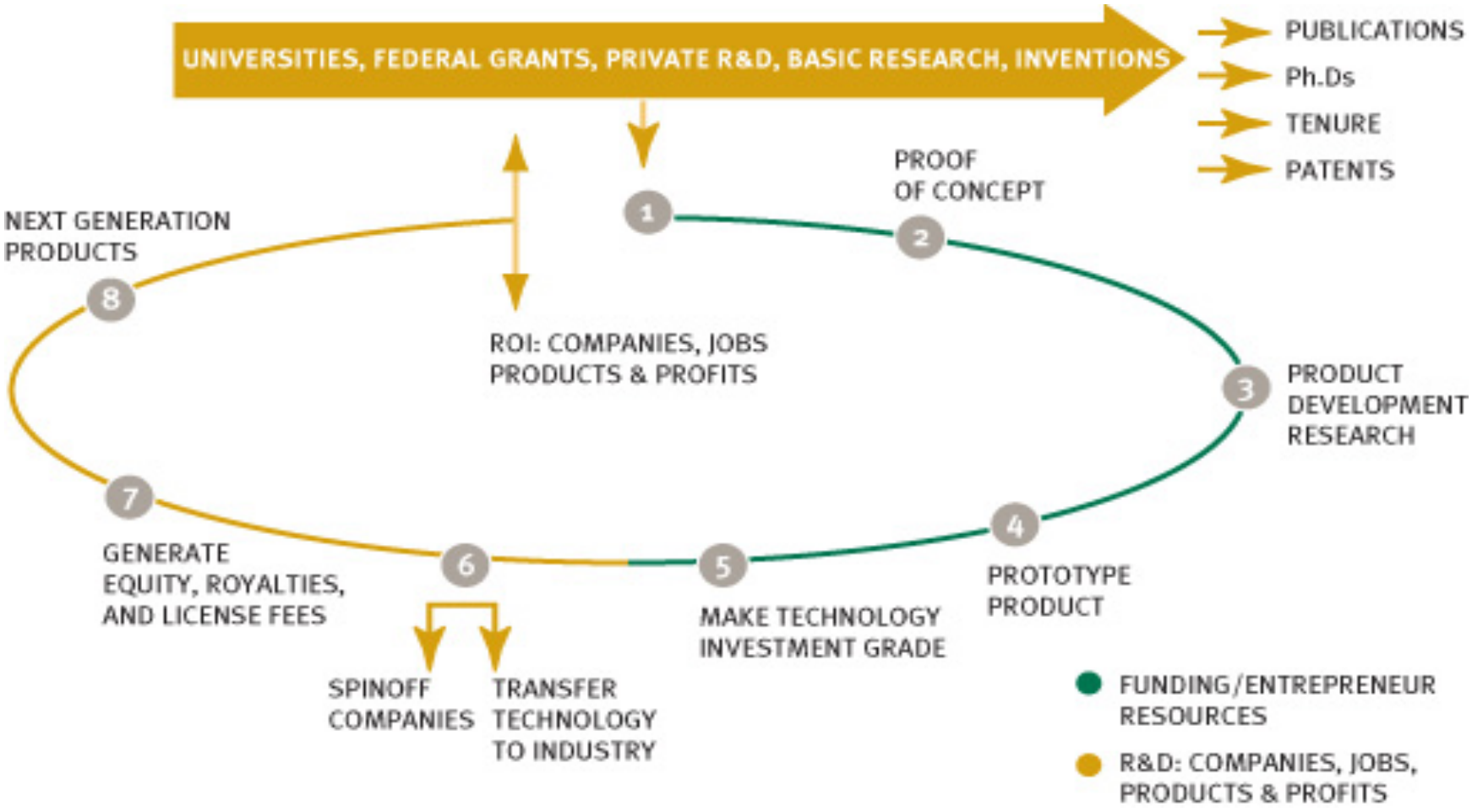
Innovation Commercialization Model



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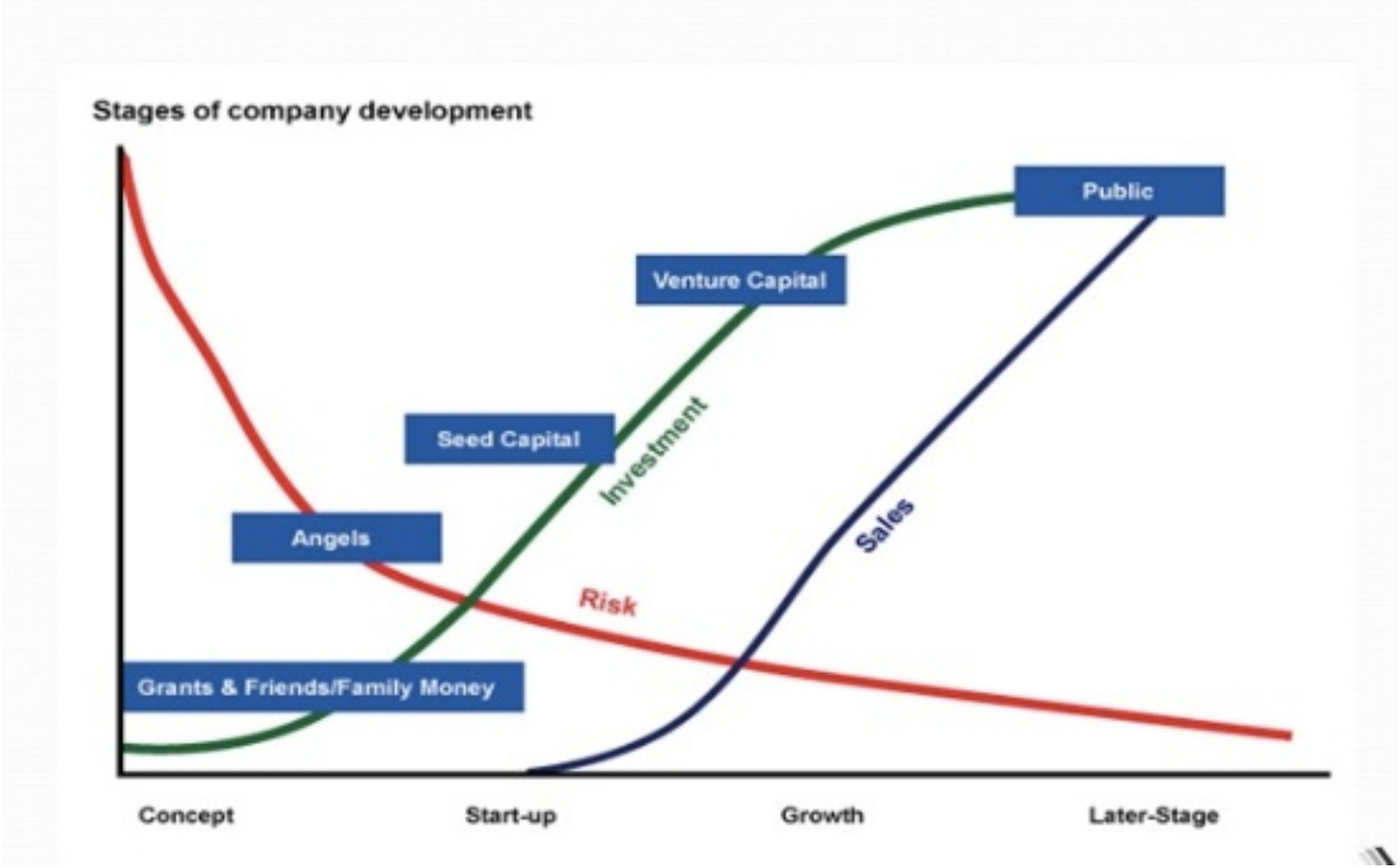
Stages of Investment



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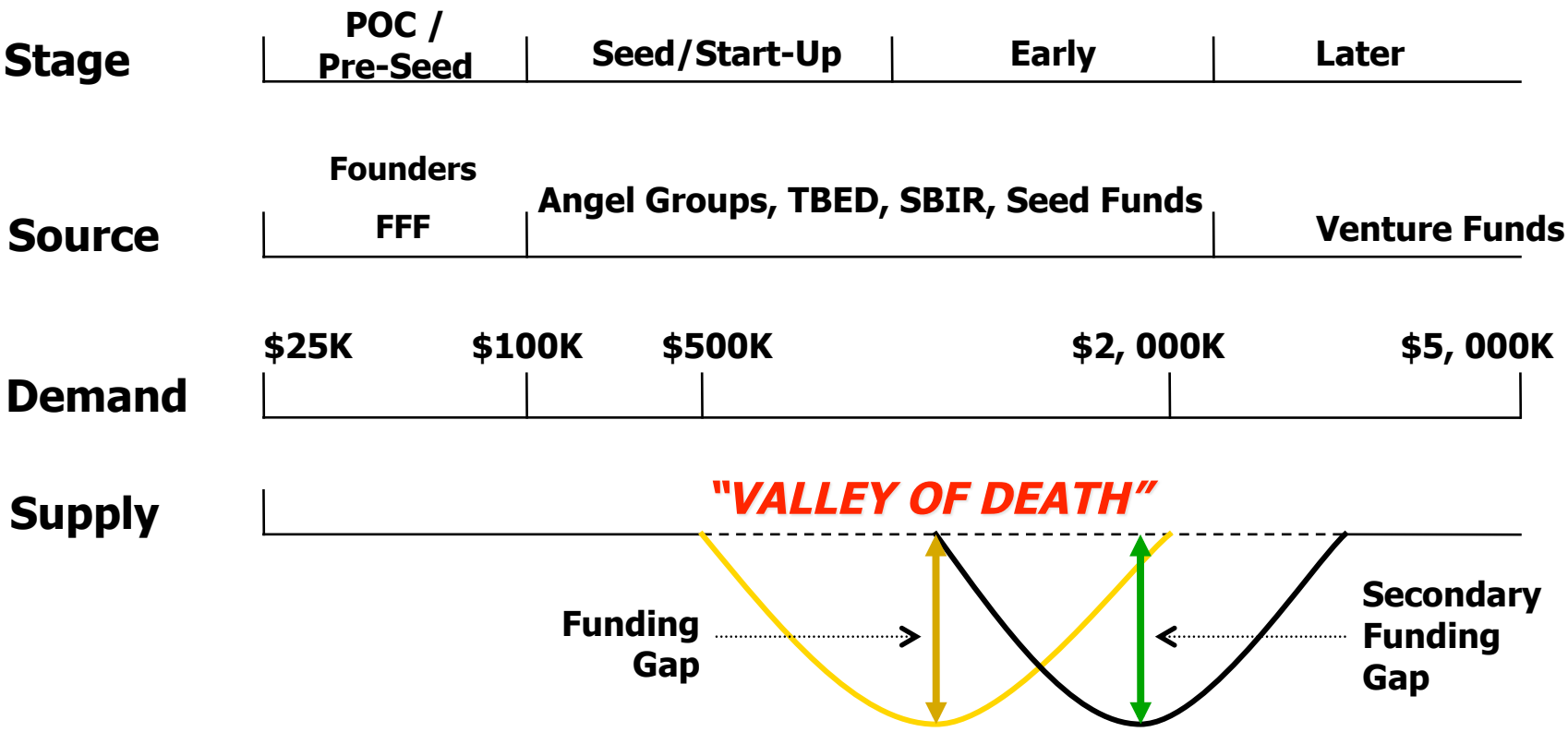
Innovation Capital Valley of Death

"VALLEY OF DEATH"



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Bootstrapping

The term comes from the German legend of Baron Münchhausen pulling himself out of the sea by pulling on his own bootstraps.

Definition: *"The act of starting a business with little or no external funding"*

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New Popular Venture Financing Programs

Mentorship programs:

- Help startups ideate
- Form founding teams
- Build initial products.

seedcamp

Super Angels:

Provide capital and guidance to:
hire non-founder employees
further product development
market the initial product (usually to early adopters) and
raise follow on VC funding.

Y Combinator

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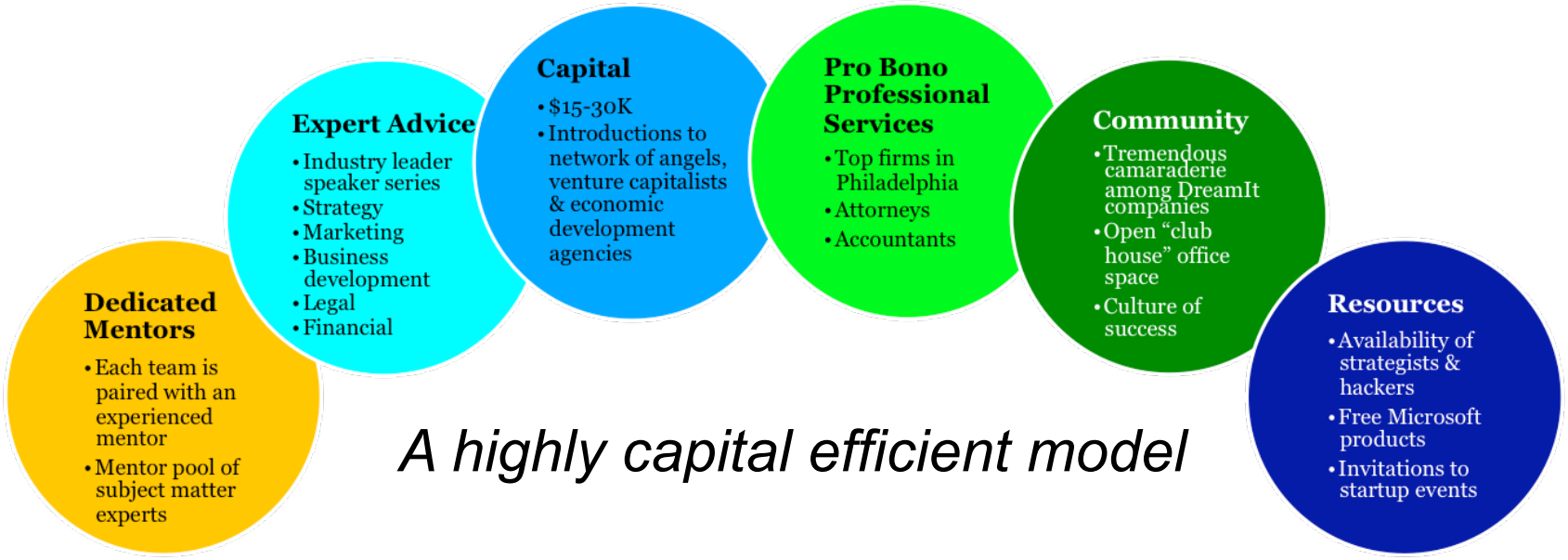
What These Programs Offer Entrepreneurs



A highly capital efficient model

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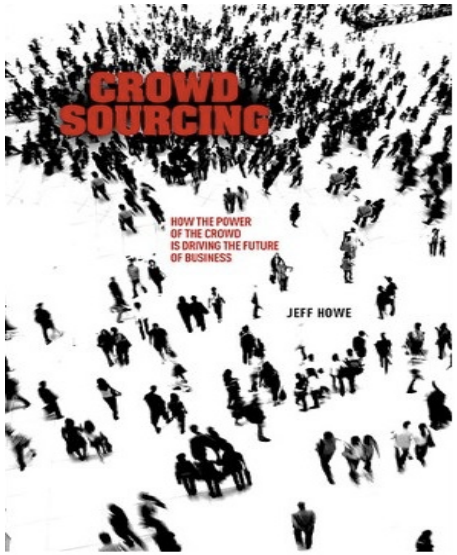
New Popular Venture Financing Programs

Tradition VC's *- (Sequoia, Kleiner, etc)*

SEQUOIA CAPITAL
THE ENTREPRENEURS BEHIND THE ENTREPRENEURS

- Help companies scale and get to profitability.
- Access to broad networks to help with hiring, sales, bizdev and other scaling functions.
- They are also experts at selling companies and raising follow-on financing.



Accelerator funds - Focus on providing partial liquidity and preparing the company for an IPO or big M&A exit.

- VC's played all of of these roles (lifecycle" investors).
- They incubated companies, provided seed financings & and later stage liquidity.
- Mostly the mentorship and angel investing roles were played by entrepreneurs who had expertise but shallow pockets and limited time and infrastructure.

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Jobs! Jobs! Jobs!

Does Seed Investing

REALLY

Create Jobs?

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Public Investment In Job Creation

Category	CDVCA*	State of PA	State of MI	State of UTAH	Stimulus Bill
Funds Invested	$26M	$90M	$291M	$60M	$800B
Jobs Created	3.700	8,150	28,854	2,047	1,000,000 To 4,000,000
$ Per Job Invested	$7,100	$11,000	$11,728	$29,300	$800,000 To $200,000

*Community Development Venture Capital Association

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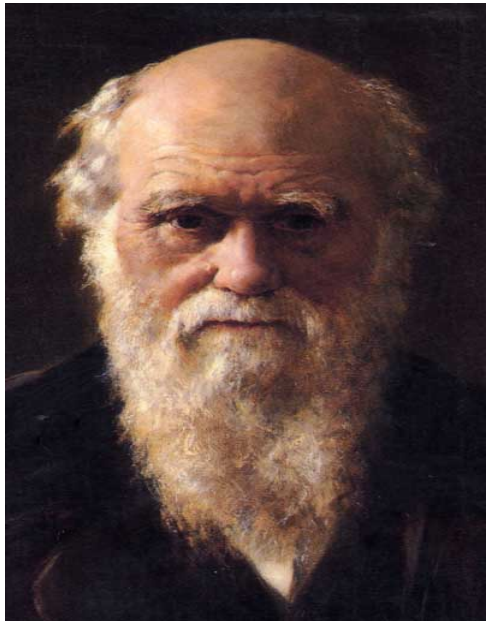
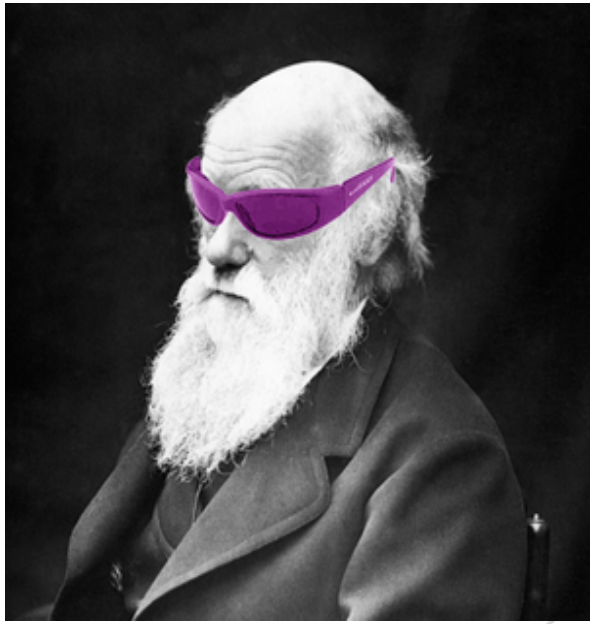
Change Is Inevitable

" It is not the strongest of species that survive, nor the most intelligent, but the ones most responsive to change."

-Charles Darwin





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What Is A Road Map…..Why Is It Needed?

- A roadmap answers the ***question "Where do we want to be and how to we get there?"***
- A cluster roadmap ***provides strategies and action*** plans to best ***achieve a vision of the future shared by a critical mass*** of industry-related organizations.
- The strategies and action plans are developed according to the unique strengths of the cluster and region as compared to a global market opportunity.

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Why Regional Innovation Capacity Matters

- In a knowledge-driven economy, new job and wealth creation derive from the accelerated commercialization of innovative, world-class technological breakthroughs
- A region's accumulated research and innovation assets is *the* "seed corn" that enables the growth of entrepreneurial science-based enterprises in that region
- Every region's research assets ("seed corn") differs ***(Are you growing "soybeans" or "wheat"?)***
- "Seed Corn" that is tossed on infertile growing conditions will not generate a rich harvest of jobs or wealth.

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Mapping The Characteristics of Innovative Regions

- **Each region's innovation capacity ("regional DNA") differs**
  - Every region has its unique path to building its cluster
  - Scientific expertise concentrated in a region is distinct from other regions
  - Regions need to understand what they *truly* have as assets
- **Must couple world-class scientific with business smarts for successful tech. commercialization**
  - Synergy in a cluster depends on functional social structures between technologists and business community

Mapping The Characteristics of Innovative Regions

- **World class research institutions** as sources of intellectual capital
- **Appropriate business assistance programs** to accelerate technology commercialization
- **Seasoned senior managers with entrepreneurial "know-how"** that can work in tandem with scientists and engineers on teams to jump-start enterprise creation
- **Sources of "intelligent" startup capital** beyond what "sweat equity/boot-strapping" and "family and friends" capital can provide
- **Active entrepreneurial networks** that can support all the players involved in enterprise creation activities
- **Institutions of higher learning** that can train and quickly upgrade the skills of a world-class workforce for the region's growing high tech companies

All of these regional assets must be integrated for the entire eco -system to work!

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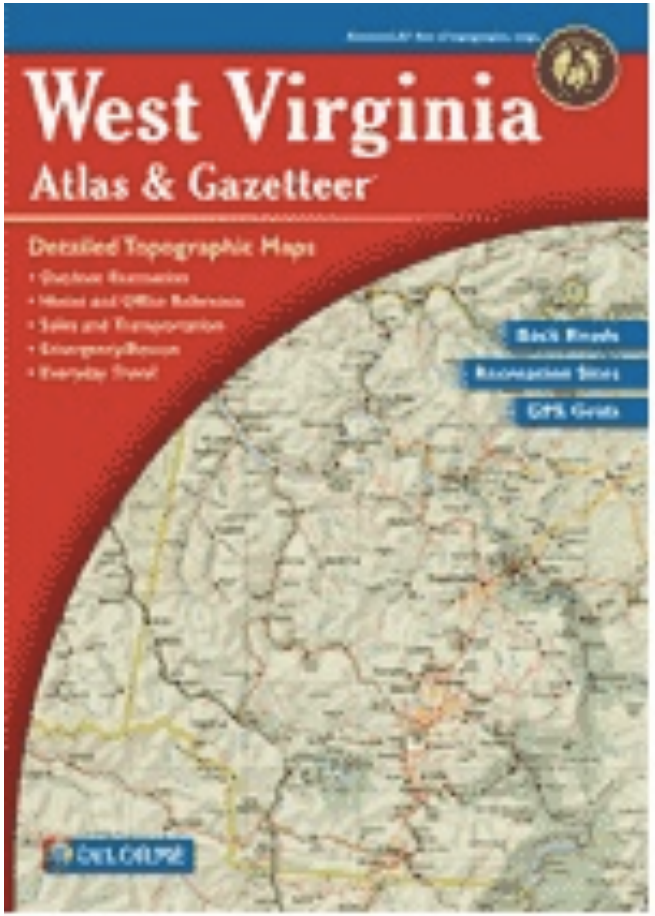
Key Innovation Road Map Elements

1. Asset Mapping
2. Cluster analysis
3. Innovation Benchmarking (Peer 2 Peer)
4. Innovation and Entrepreneurship resource identification
5. Innovation Economic Development organizational analysis and matrix
6. Gap Analysis (programs & services)
7. Public policy recommendations
8. Strategic Plan with Recommended organizational structure, governance, budget and funding sources (Private Public Partnership)
9. Organizational leadership and staffing
10. Program portfolio/implementation
11. Economic Impact Analysis
12. Branding and Market Research



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Collaboration

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U.S. State IBED Programs

Ben Franklin
Technology PArtners

Ohio | Third Frontier
Innovation Creating Opportunity

KTEC
KANSAS TECHNOLOGY
ENTERPRISE CORPORATION

OCAST

GEORGIA
RESEARCH
ALLIANCE

Maryland TEDCO
Technology·Development·Corporation
Maryland...Technology Starts Here.

TTDC
TENNESSEE TECHNOLOGY
DEVELOPMENT CORPORATION

Best Practices in IBED

Ohio | Third Frontier
Innovation Creating Opportunity

The Ohio Third Frontier represents an unprecedented and bipartisan commitment to expand Ohio's technological strengths and promote commercialization that leads to economic prosperity throughout Ohio. Designed to build world-class research programs, nurture early-stage companies, and foster technology development that makes existing industries more productive, Ohio Third Frontier creates opportunity through innovation.

"***Ohio's $700M Third Frontier initiative is a comprehensive, professionally run effort to build world-class research capacity, promote interaction between research and industry, and commercialize R&D." –***

National Governor's Association and Pew Center for the States

hi velocity

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Pennsylvania's Sustainable Government Innovation

- Pennsylvania Governors Thornburgh and Ridge, as well as current Governor Ed Rendell, discuss the importance of committing to economic development through science, innovation & technology
- The governors focused on the effects that short-term decisions would have on long-term goals
- Three important ideas:
  - Think outside of the box
  - Measure your results and
  - Tell your story well.

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Pennsylvania's Industry Clusters

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KTEC

Kansas Technology Enterprise Corporation

www.ktec.com

KTEC Mission:

"To create, grow and expand Kansas enterprises through technological innovation."

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Kansas Strategic Technology Cluster Assessment and a Plan for the 21st Century

Purpose of the Study:

- Technology revolution affecting the economy.
- We must map our course in this new innovation economy.
- Focus our resources on strategic technology clusters in order to compete.

Published by The Kansas Technology Enterprise Corporation

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KTEC Program Structure

Board of Directors

KTEC Staff

Federal Initiatives and Partnerships

Research

For Inventors, Entrepreneurs and University & Industry Scientists

- Advanced Manufacturing Institute (AMI)
- Kansas Polymer Research Center (KPRC)
- Information Technology & Telecommunications Center (ITTC)
- Higuchi Biosciences Center (HBC)
- National Institute for Aviation Research (NIAR)
- EPSCoR

Investments

For Inventors, Entrepreneurs and New & Existing Companies

- Small Business Innovation Research (SBIR) Awards
- SBIR Bridge Funding
- State-Sponsored SBIR
- Applied Research Matching Fund (ARMF)
- ACE-Net
- Ad Astra Funds I & II
- Kaw Holdings (KIC)
- Wichita Ventures (WTC)
- Manhattan Holdings (MACC)
- Prairie Investments
- Quest Ventures
- KU Medical Center Research Institute Pre-Seed Fund
- Alliance for Technology Commercialization

Business Assistance

For Inventors, Entrepreneurs, Scientists and New & Existing Companies

- Kansas Innovation Corporation (KIC)
- Mid-America Commercialization Corporation (MACC)
- Wichita Technology Corporation (WTC)
- Mid-America Manufacturing Technology Center (MAMTC)
- Capital for Manufacturers (CFM)
- Information Research Corp. (IRC)
- Kansas Integrated Commercialization Information Network (KICIN)
- Intern Program
- Business Residency Program
- Inventor Development Assistance Program (IDAP)

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The Kansas Experience - 2009

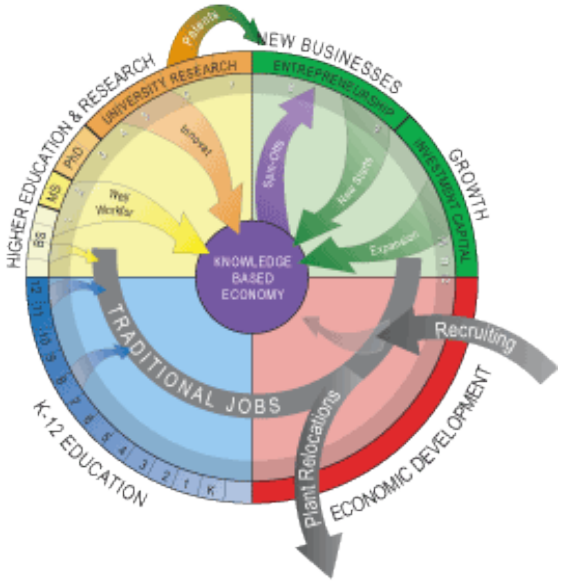
CLUSTER	ORGANIZATION	OUTCOMES
Human BioSciences	**Kansas BioScience Authority (KBA)** www.kansasbioauthority.org	•$581m Fund •Build world-class research capacity, growth of bioscience startups, expansion of the state's bioscience clusters and facilitate industrial expansion and attraction.
Value-added Agriculture and Ag Bio	**National Agricultural Biosecurity Center (NABC)** http://nabc.ksu.edu/content	•$500m Research Center •Focused on protecting America's agricultural infrastructure and economy from endemic and emerging biological threats.
Aviation	**National Institute for Aviation Research (NIAR)** www.niar.wichita.edu	24 year-old research and tech-transfer center established to advance the nation's aviation industries that may benefit from aviation-related technologies.
Information and Telecommunications & Computing	**Software and Technology Association of Kansas (SITAKS)** www.sitaks.com	Advocate for Kansas' software and information technology sector to help Kansas' software and IT companies grow and succeed.

Kansas Bioscience Authority

- $581 million state-funded independent bioscience TBED organization
  - $75.5 million program budget; $3.5 million operating budget
  - 18 employees (8 “deal” people)

- Investment priorities
  - Expand the quantity and quality of bioscience research
  - Focus on the commercialization of bioscience discoveries
  - Foster formation and growth of bioscience companies
  - Position Kansas for international leadership in key clusters

KANSAS BIOSCIENCE AUTHORITY



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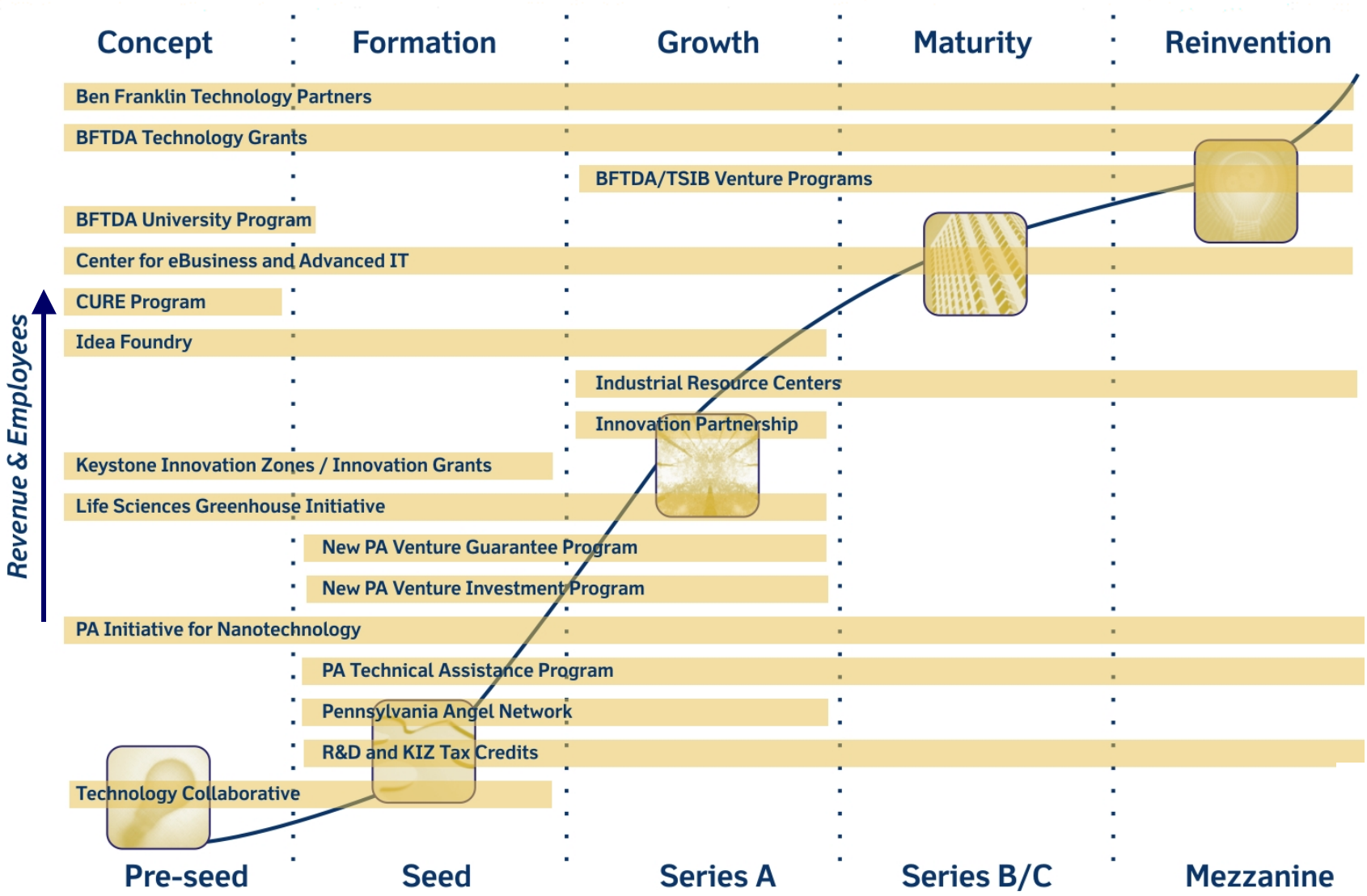
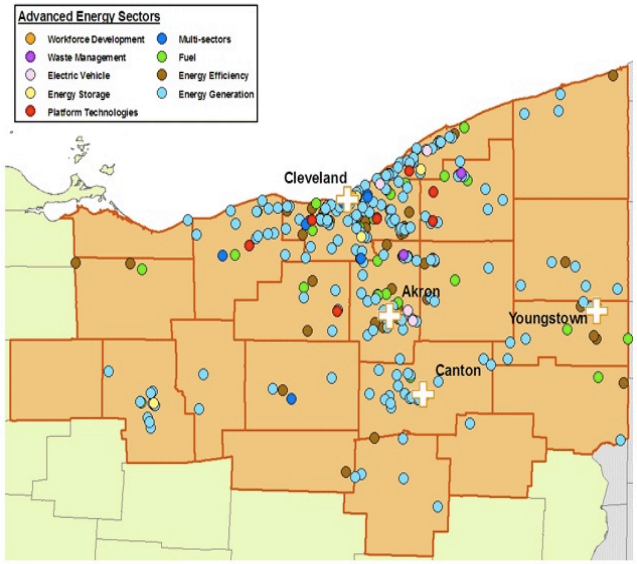
Technology Investment

Technology-based Economic Development Tools Along the Continuum

> ready > set > succeed



U.S. Regional IBED Intermediaries



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NorTech
Shaping Northeast Ohio's Technology Future

BioEnterprise
A Leader in Growing BioScience Companies

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Regional Innovation...Global Realization

CONNECT

ANN ARBOR SPARK
IGNITING INNOVATION

i2E

Innovation Works

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Churning the Greater Philadelphia Innovation Economy

A Roadmap for Regional Growth

> "You can always amend a big plan, but you can never expand a little one. I don't believe in little plans. I believe in plans big enough to meet a situation which we can't possibly forsee now."
>
> – Harry S. Truman

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GREATER PHILADELPHIA CHAMBER OF COMMERCE
Get involved. Get results.

IP Core Products / Services

Investment

ESF Economic Stimulus Fund
An IP Investment Fund

ResearchDollar$ Fund

Innovation Partnership

Commercialization

MAC Mid-Atlantic Commercialization Corporation

Phoenix IP Ventures

World's Best Technology Network

Bio Advance
Biotechnology Greenhouse of Southeastern Pennsylvania

Ben Franklin Technology PArtners

IP innovation PHILADELPHIA

Sc 21 Science Center

Global & Regional Workforce / Economic Development

KIP Knowledge Industry Partnership

career PHILLY

GP2 Greater Philadelphia Global Partners

Creative Economy

DVIN Delaware Valley Innovation Network

Branding, Research & Marketing

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Knowledge Industry Partnership & CareerPhilly

Knowledge Industry Partnership

ATTRACT
GPTMC, Campus Visit/ Philadelphia

ENGAGE
Campus Philly, City of Philadelphia

RETAIN
Innovation Philadelphia, CareerPhilly

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career PHILLY
www.careerphilly.com

smart Network
The *smart* way to connect...

- The first Web site dedicated to the career development of students in the Greater Philadelphia Region.
- Provides Regional students with a ***search engine*** designed to help them
- find Regional job and internship
- opportunities.
- A ***calendar of events*** provides students
- with a listing of career development and
- networking activities.
- An ***advice*** section contains helpful
- information for students on the many
- aspects of their career development.

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The Creative Economy of Philadelphia

CREATIVE FOOTPRINT

THE ECONOMIC IMPACT OF THE PHILADELPHIA REGION'S FOR-PROFIT CREATIVE ECONOMY

Key Finding ⇨

The Philadelphia Region's for-profit, creative industry generates high-paying, high-value jobs.

Jobs within for-profit, creative industry sectors, as well as creative occupations, pay quite well as a whole. There are particularly high average annual wages within industry sectors such as:

Creative Industry	Creative Occupation	Creative Industry Sector
$77,500	$74,600	Software Development
$59,300	$66,700	Architecture, Engineering and Planning
$58,200	$70,600	Information Technology

Average annual salaries of those working in creative occupations ($61,600) are 45% higher than those in non-creative occupations ($43,000).

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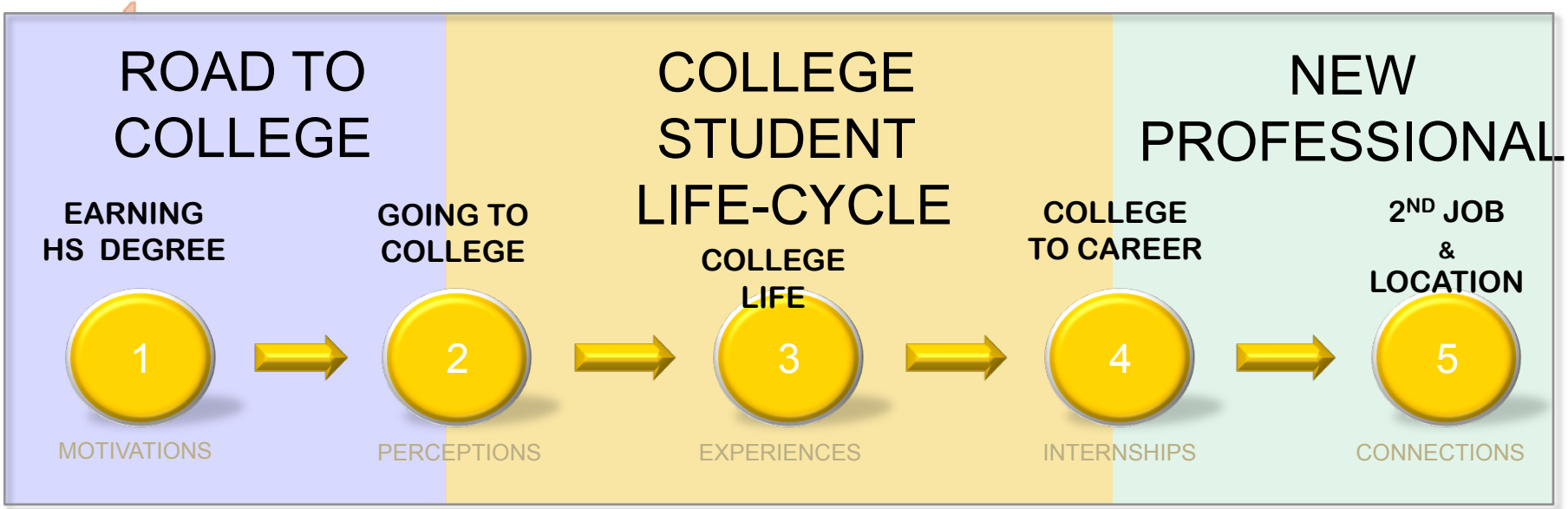
Leveraging the Talent Pipeline



Enroll ▶ Engage ▶ Employ

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What Are Clusters & Do They Matter?

Clusters represent a new way of thinking about national, state, and local economies, and they necessitate new roles for companies, government, and other institutions in enhancing competitiveness.

-Michael Porter

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Why Clusters?

Clusters and cluster approaches holdout substantial attractions as the nation seeks to rebuild a damaged economy.

- *Pointing to impact, new research confirms that strong clusters tend to deliver positive benefits to workers, firms, and regions.*
- *As a matter of paradigm, clusters reflect the nature of the real economy.*

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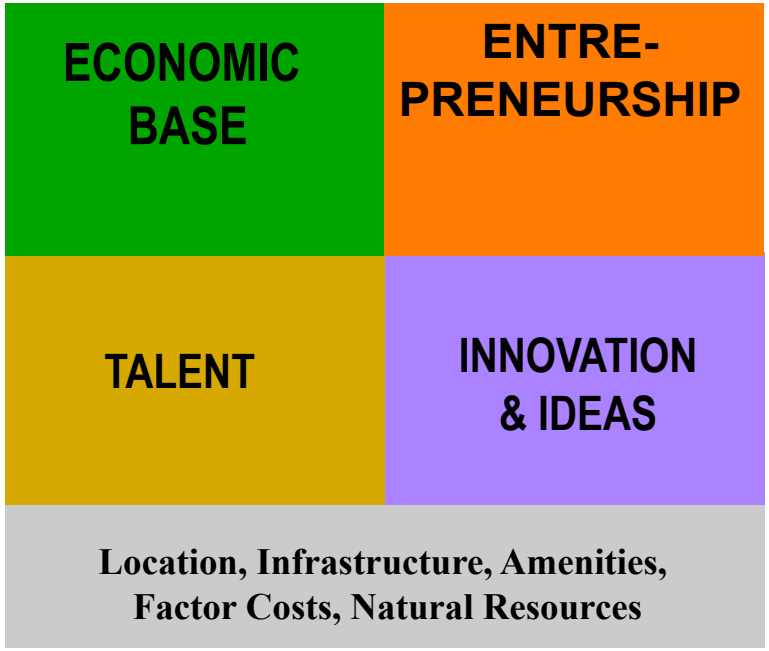
Regional Innovation Clusters

Five Key Components to Consider When Defining Unique Regional Assets

What you make, including your existing & prospective industry clusters

What you do: your workforce skills & human capital base



Your capacity to create companies wholly new or from existing firms

Your capacity to innovate and generate new ideas

The basic conditions defining the economic milieu of the region

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West Virginia Blueprint For TBED

WEST VIRGINIA BLUEPRINT FOR

TECHNOLOGY-BASED ECONOMIC DEVELOPMENT

HIGHLIGHTS

March 2009

TechConnect
WEST VIRGINIA

A report from: **TechConnectWV**
West Virginia Coalition for Technology Based Economic Development

With consultation and assistance from:
Battelle Technology Partnership Practice

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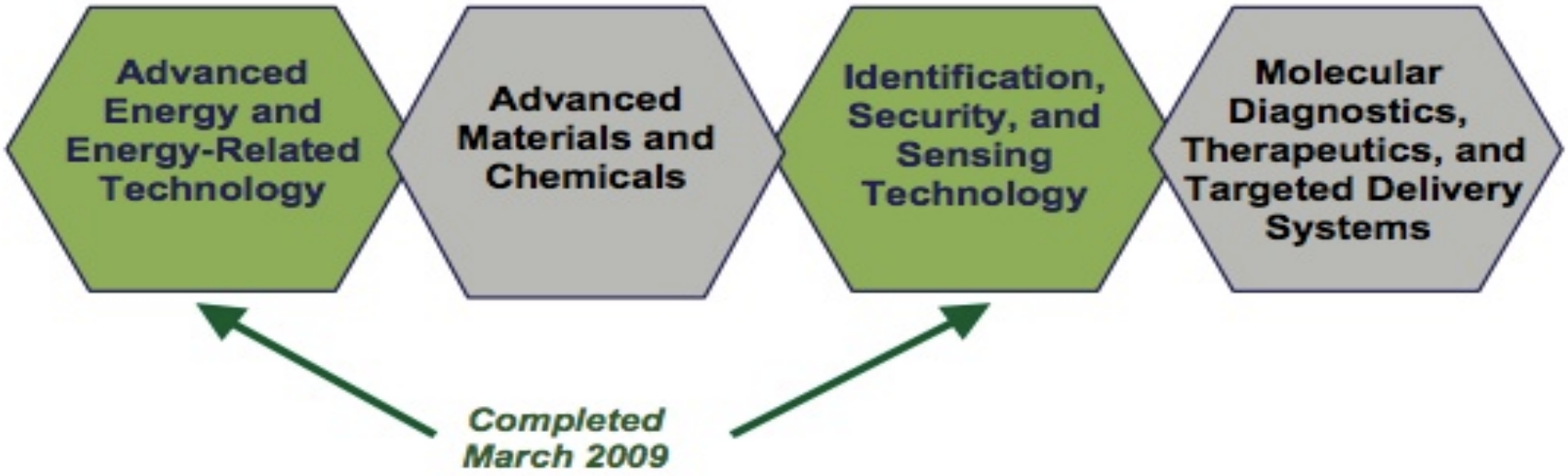
West Virginia's Technology Platforms



SOURCE: WEST VIRGINIA BLUEPRINT FOR TECHNOLOGY-BASED ECONOMIC DEVELOPMENT 2009

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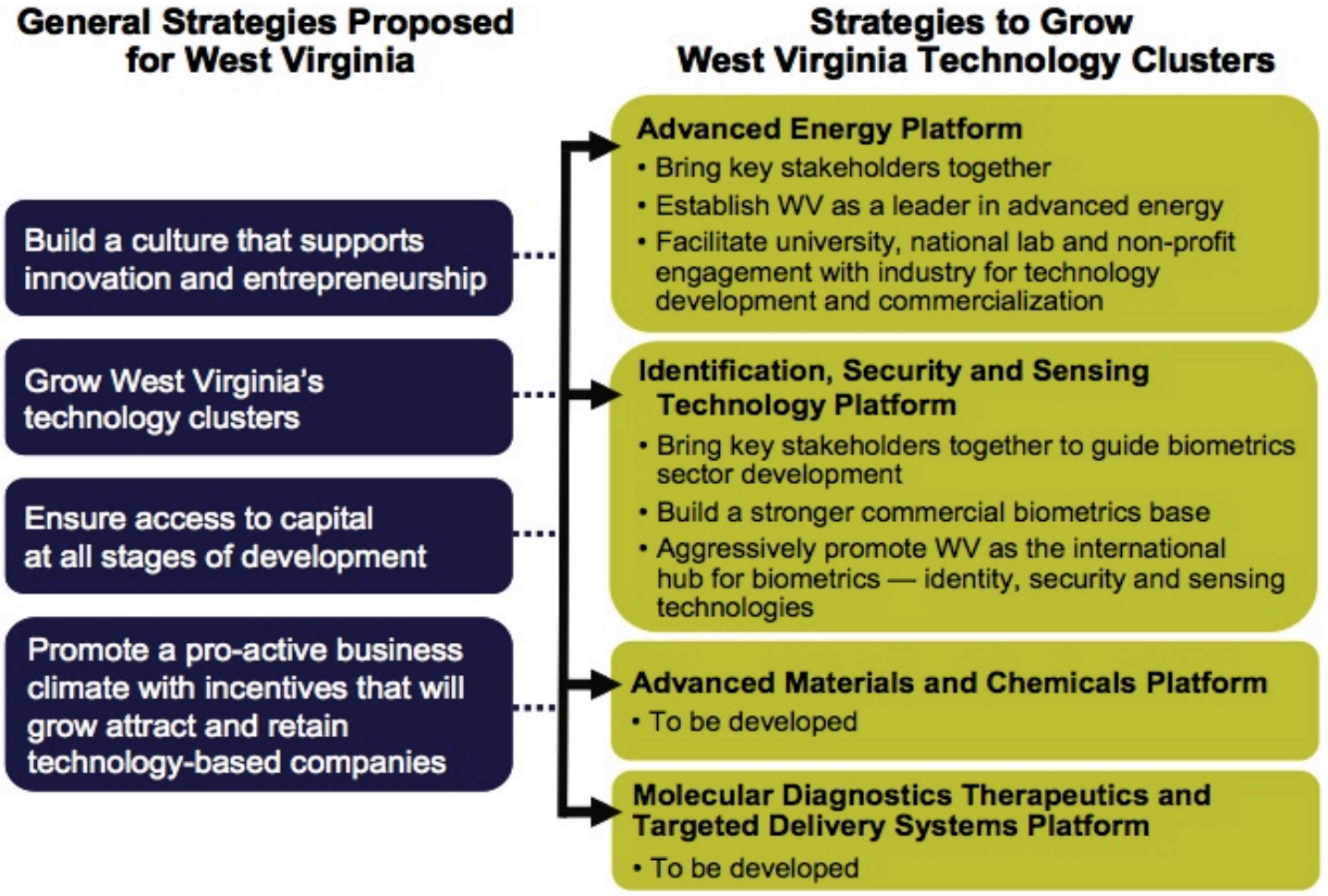
Overview of Cluster Strategies and Relationship to Overall Strategies



SOURCE: WEST VIRGINIA BLUEPRINT FOR TECHNOLOGY-BASED ECONOMIC DEVELOPMENT 2009

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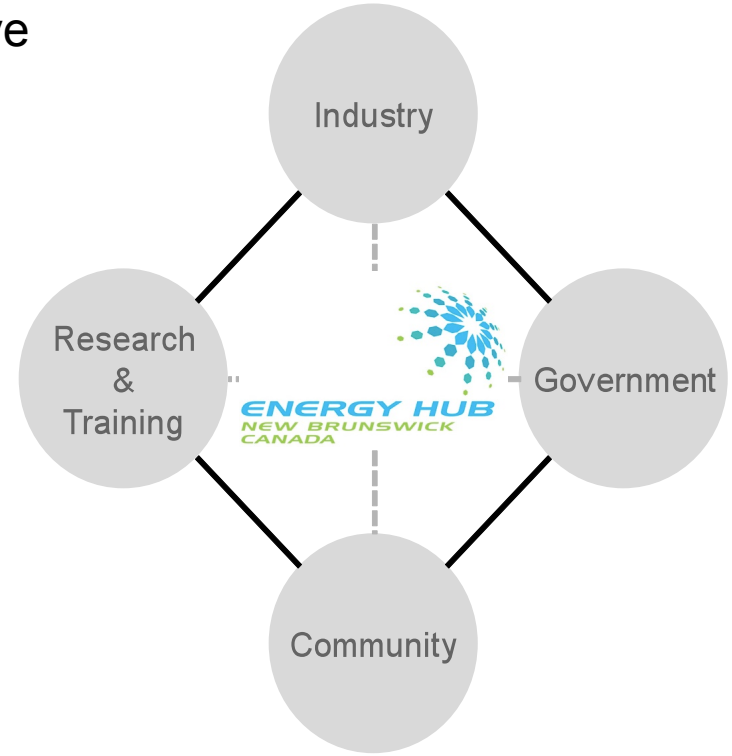
Overview of General Strategies and Actions

Build a culture that supports innovation and entrepreneurship	Grow WV's technology clusters around the targeted technology platforms	Ensure access to capital at all stages of firm development	Promote a proactive business climate
▪ Support and expand TechConnect WV ▪ Support and expand a statewide network providing comprehensive commercialization services and support to technology entrepreneurs and early-stage start-up companies ▪ Encourage the state's universities to continue to increase support for technology transfer and commercialization ▪ Create a university-industry matching grant program ▪ Publicize and celebrate TBED success	▪ Continue to provide support for the WV Research Trust Fund ▪ Establish an Innovation Institute Program focused on the technology platforms ▪ Form technical networks around each of the platform areas	▪ Provide funds to match SBIR and STTR Phase I awards received by WV companies ▪ Increase funding for INNOVA's seed and early-stage investment fund ▪ Use tax credits to make capital available to early-stage technology companies ▪ Attract venture fund investments in WV technology companies	▪ Invest in technology infrastructure, including research parks, incubators, and laboratories ▪ Maintain the state's refundable R&D tax credit and Economic Opportunity Tax Credit ▪ Develop a branding and marketing strategy that builds on the technology and location strengths of WV ▪ Identify and build awareness of 21st Century Skills ▪ Facilitate and expand talent recruitment efforts ▪ Undertake a communications campaign

New Brunswick Energy Hub Partners

- **INDUSTRY**
  - Requires energy to produce goods & Services in NB & competitive energy enables competitive businesses.
- **GOVERNMENT**
  - Government sets policy to enable the overall success of the Energy Hub.
- **RESEARCH & TRAINING**
  - These organizations generate the world-class ideas that lead to world-class solutions & they ensure an effective & productive workforce.
- **COMMUNITY ORGANIZATIONS**
  - Ensure that the Energy Hub is consistent with "public good" & the values of the communities within the hub.



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New Brunswick Cluster Desired Results

- **SUSTAINABLE WEALTH CREATION**
- **THE WHOLE IS GREATER THAN THE SUM OF THE PARTS**
- **COORDINATED TACTICAL IMPLEMENTATION OF SHARED MISSION AND PROJECTS**

ENERGY HUB
NEW BRUNSWICK
CANADA

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How Do You Measure Success?

- Stimulate creation and commercialization of strategic energy projects
- Foster productive interrelationships and linkages among New Brunswick institutions.
- Establish institutional arrangements to improve effectiveness of R&D.
- Expand and disseminate information and knowledge about energy innovation
- Promote consciousness about the importance of Energy Hub.
- Create new, high wage, high skilled job opportunities to avoid “brain-drain.”
- Make small and medium sized enterprises become more competitive.
- Build a financial-technical network willing to invest in and support energy-based enterprises.
- Provide incentives for foreign and domestic investment.

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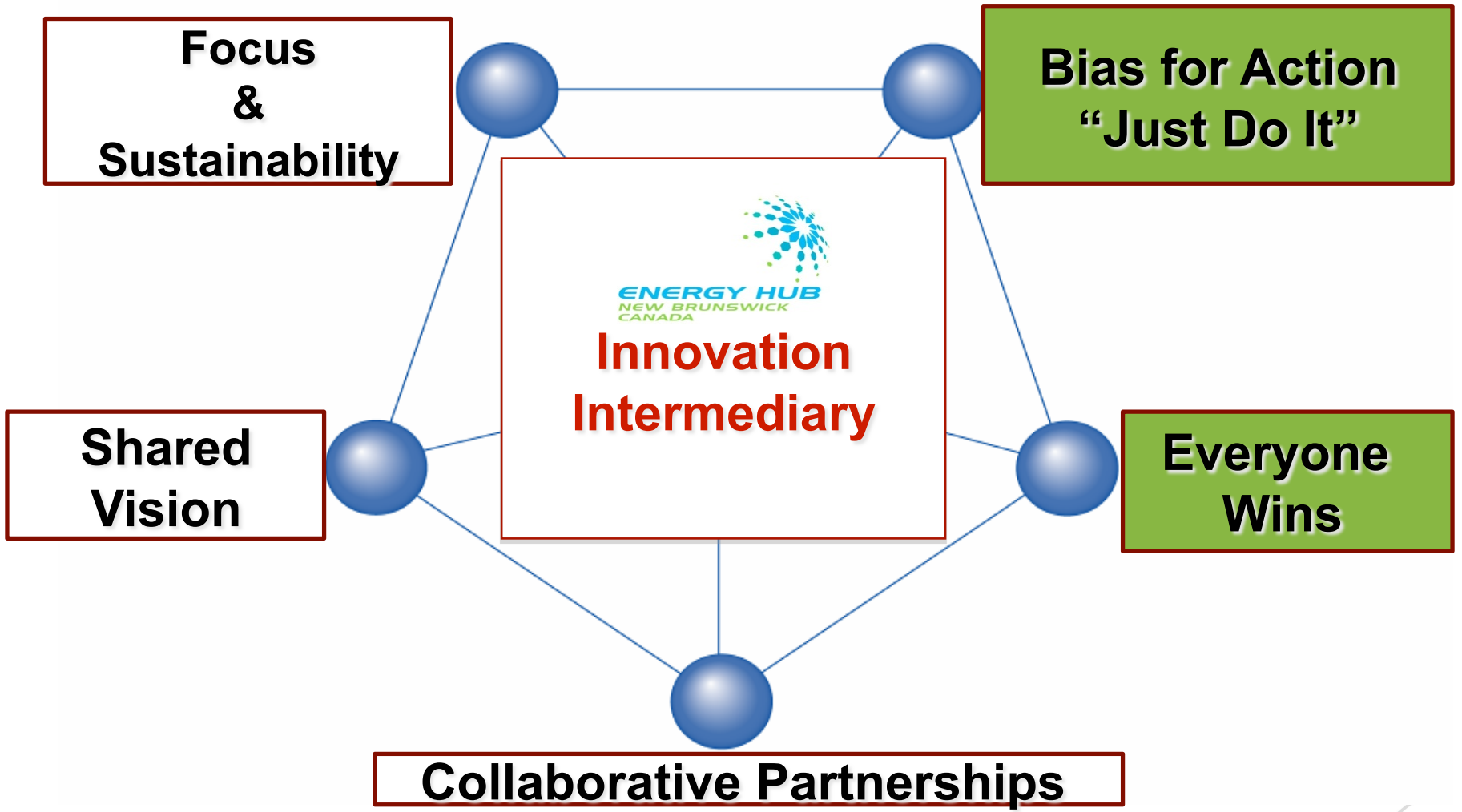
New Brunswick Key Components for Success



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The New Tasks of National Leaders

1. Be Proactive
2. Begin with the End in Mind
3. Seek First to Understand, then to Be Understood
4. Put First Things First
5. Think Win-Win, Be Inclusive
6. Synergize
7. FOCUS

"You don't concentrate on risks. You concentrate on results. No risk is too great to prevent the necessary job from getting done."

Chuck Yeager

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Read My Mind

10 Profound Innovations Ahead

The new mind-reading device shows letters on a screen that flash one at a time. When the user thinks of a letter, and then that letter finally flashes, brain waves send a signal to the computer that it recognizes as, "Hey, choose that letter." It is slow, but it works for crafting short messages such as tweets for Twitter. Credit: UW-Madison

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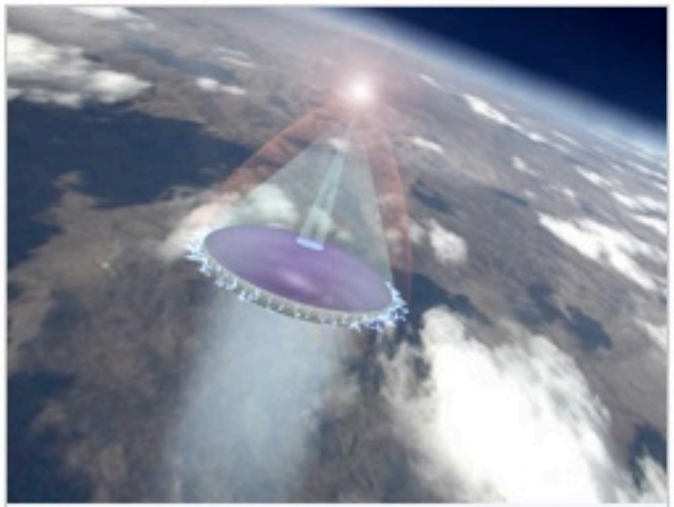
Read My Mind

True mind-reading devices remain in the realm of science fiction, and lie detectors rely on indirect cues to catch fibbers. Still, brain scans have allowed neuroscientists to predict what people will do during specific task experiments, and even to observe when a person will make a mistake up to half a minute beforehand. Another technique has used near-infrared light to figure out simple preferences based on brain activity. These feats rely on analyzing brain patterns that occur during specific actions, rather than truly cracking the brain's neural code, but they still have scientists and legal experts debating mind-privacy issues. Perhaps in the near future, they'll just use Twitter for a meeting of minds.

Around The World In 90 Minutes

10 Profound Innovations Ahead



Artist's concept of Lightcraft in hypersonic mode.
Credit: Media Fusion; Courtesy of NASA

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10 9 8 7 6 5 4 3 2 1

Around the World in 90 Minutes

Phileas Fogg took 80 days to go around the world, but travelers may eventually hop halfway around the globe in less than an hour. The U.S. Air Force and Brazil are developing a Lightcraft concept that could someday ride laser-produced explosions into the sky, and deliver passengers or cargo around the world. Barring that wild ride, space planes that could take off and land like regular aircraft have begun undergoing serious development in the U.K. and United States, and some could fly within the next few years.

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A Perfect Artificial Limb

10 Profound Innovations Ahead

U.S. Army Sgt. Juan Arredondo, outfitted with an i-LIMB after losing his hand in Iraq, says it does things naturally. The i-LIMB has flexible hydraulic drives located directly in the movable finger joints. Credit: Touch Bionics

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A Perfect Artificial Limb

U.S. veterans and other prosthetic users may soon wield artificial hands, arms and legs as easily as they control their natural limbs. The most advanced prostheses tend to use "smart" microprocessors that act as tiny brains to anticipate how a user will walk or move an arm. But both monkeys and humans have already used brain signals alone to control robotic arms and digital applications, which paves the way for new brain interfaces with artificial limbs. Such technology could then retrofit the latest prostheses to give users ultimate control over that "Luke" Skywalker arm.

Know It All

10 Profound Innovations Ahead

SixthSense is a wearable gestural interface that augments the physical world with digital information and lets people use natural hand gestures to interact with that information. Here Sixth Sense projects web video onto a prototype newspaper. Credit: MIT Media Lab

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Know It All

People could eventually hold a hitchhiker's guide to everything that they see. Pick up a carton of OJ in the supermarket, and nutritional comparisons about that brand would appear. Flip through a new bestseller in the bookstore, and reader reviews might flash on the pages. MIT has already unveiled a prototype of such a technology in 2009, which combines a webcam, a projector and a smart phone to link the Internet's vast array of information with the real world. Such wearable devices would work together with embedded "smart" systems and tags to create an augmented reality, where staring at a street might bring up GPS coordinates and a local map. In the 21st century, information reigns supreme.

Regenerate The Body

10 Profound Innovations Ahead

The carbon-14 imprint left on cells from nuclear testing in the 1950s revealed the regenerative capacity of heart cells. Credit: Matthias Karlen

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Regenerate the Body

No one has regenerative powers just yet, but patients can expect a growing array of therapies to repair or entirely replace organs in the human body. A British team grew the world's first artificial liver from umbilical cord stem cells in 2006, and other researchers have since found that even the heart may harbor stem cells capable of regenerating the organ. Adult stem cells have also helped restore eyesight using a patient's own healthy eye stem cells in an Australian study, and Chinese scientists demonstrated the potential of adult stem cells by creating live mice from reprogrammed skin cells. The future of individually-tailored organs and therapies may soon arrive.

Feed The World

10 Profound Innovations Ahead

Researchers tend to a test batch of heat-tolerant corn developed by University of Florida plant molecular biology researcher L. Curtis Hannah. Credit: University of Florida Institute of Food and Agricultural Sciences

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10 9 8 7 6 **5** 4 3 2 1

Feed the World

Solving world hunger represents an incredibly difficult task, given that the political situations and economics of each region bring their own complications. Nonetheless, scientists have moved to protect the important crops that feed most of the world. Researchers continue to develop different varieties of wheat, corn and rice that have greater yields and are more resistant to temperature changes, drought conditions and even insects. New information technologies can keep farmers updated on the condition of their crops and agricultural practices which preserve nutrient-rich soil in the long run. Even lab grown meat could help satiate the growing worldwide demand, if people can get over the ick factor. And if all else fails, scientists have stored thousands of seeds in a doomsday vault to safeguard the future of food.

Eliminate Waste

10 Profound Innovations Ahead

New biodegradable plastics could be tossed into the ocean without harming the environment.

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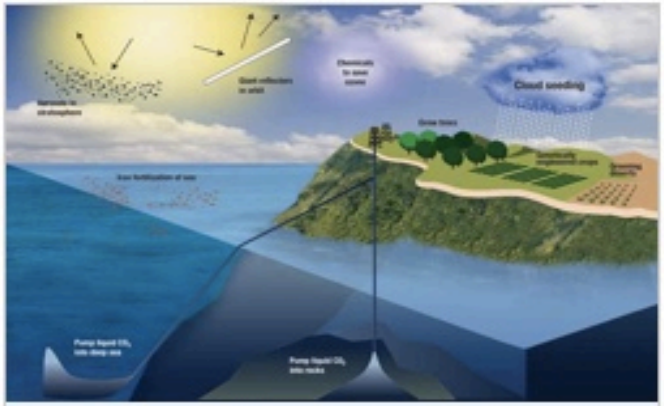
10 9 8 7 6 5 **4** 3 2 1

Eliminate Waste

New technologies look to turn all our trash into reusable materials. Chicken feathers and other agricultural castoffs could become the future of plastics. Biodegradable plastics that dissolve harmlessly in seawater might actually encourage people to throw their garbage into the ocean. Food scraps, sewage and other waste has already begun to fuel some power plants and generators for the U.S. Army and civilians alike. Achieving 100 percent sustainability may still sound daunting, but the efforts do add up. MIT researchers have even begun a Trash Track project to gauge the costs and patterns of waste disposal in New York, Seattle and London, in hopes of helping more people think green.

Global Climate Control

10 Profound Innovations Ahead



Researchers at Lawrence Livermore National Laboratory have drawn up a schematic representation of various geoengineering and carbon storage proposals.Credit: Kathleen Smith/LLNL

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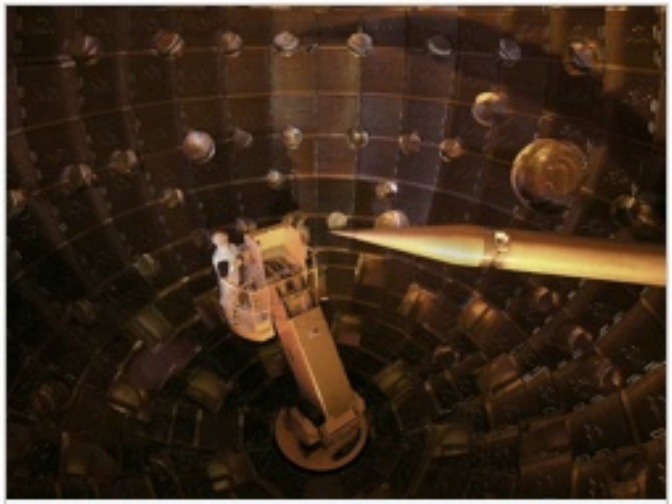
Global Climate Control

Forget modest goals like trying to halt Mother Nature from raining on the Olympics. Geoengineering plans befitting Bond villains have become hot topics for the National Academy of Sciences, the American Meteorological Society and the White House science advisor. Ideas include lofting reflective particles up into the atmosphere to divert sunlight and cool the planet, or seeding the oceans with iron to encourage carbon-gobbling algae blooms. Even billionaire Bill Gates joined a patent filing on an idea to slow or stop hurricanes, by deploying a fleet of ships to churn the ocean and cool the warm surface water that fuels such storms. Climate control technologies have almost become reality, which raises the question of whether scientists and policymakers want to risk the side effects of such schemes.

Harness The Sun's Fiery Furnace

10 Profound Innovations Ahead



The interior of the National Ignition Facility's target chamber, where researchers plan to use 192 giant lasers to ignite a pinpoint fusion reaction. Credit: LLNL/DOE

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Harness the Sun's Fiery Furnace

Nuclear fusion has kept the sun shining for billions of years. Now scientists want to recreate that power on Earth and finally tap into fusion's unbeatable energy efficiency. Giant lasers at the National Ignition Facility could help along that breakthrough by focusing their power on a tiny hydrogen fuel pellet, and ideally release more energy than what the lasers require. Still more alternatives involve the magnetic confinement of high-temperature plasma involved in fusion, or even a rebranded form of cold fusion. For now, LiveScience readers have already voted on their best bets for alternative energies.

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Hack The Brain

10 Profound Innovations Ahead

Scientists hope it is only a matter of time before the first artificial brain arrives. Credit: dreamstime.

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Back to Introduction

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Hack the Brain

Much of the human brain remains a mystery embedded in billions of neurons. Now researchers behind the Blue Brain Project have announced plans to create a functioning, artificial human brain within the next decade. They have already modeled part of an artificial rat brain using the IBM supercomputer Blue Gene, and said that the simulated brain cells have even begun self-organizing without human intervention. Success in reverse-engineering the brain could lead to a model for biomedical testing, as well as a better understanding of human consciousness. The researchers only caution that it's no artificial intelligence ... at least, not yet.

Global Industry Key Locations Redrawn By 2040

Key industry cluster findings:

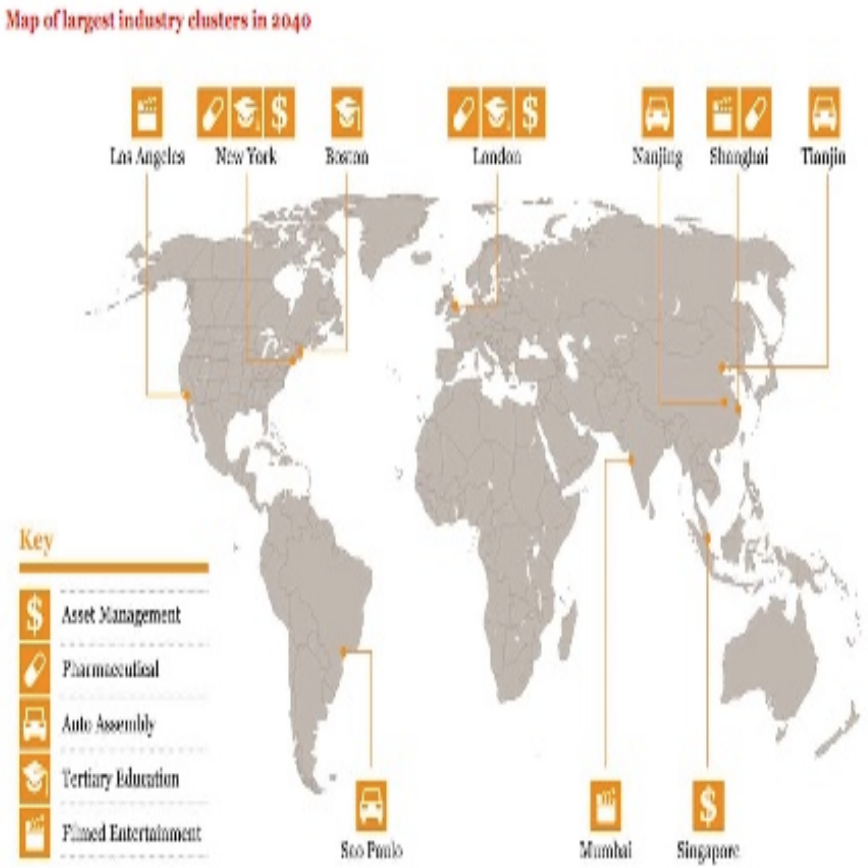
•***Asset Management*** **–** Singapore New York, London and Boston. The availability of public & private capital & increased regulation in US and Europe is driving Asian growth.

•***Automotive Assembly*** –Tianjin, Nanjing and Sao Paulo

•***Filmed Entertainment*** – Mumbai and Shanghai vie for dominance in Asia and Los Angeles remains dominant. Both Asian cities will have large entertainment centers as they move increasingly into mainstream productions.

•***Pharmaceuticals*** – New York and London---- Shanghai is expected to grow in importance helped by affluence and an ageing population

•***Tertiary Education*** – New York, London and Boston.



Source: PWCP 'Future Industry Clusters' September, 2010

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Human Connectivity

Communications networks have the ability to transform economic, political, and social relationships on a global scale.

- In the past, organizations strategized to gain **COMPETITIVE** advantage.
- The emphasis in the future will be to gain **COOPERATIVE** advantage.
- A core competency needed in individuals, organizations, and regions alike is **CONNECTIVITY**.

Implementing Innovation Connectivity

Effective Intermediaries strive for the **5C's** of **INNOVATION CONNECTIVITY**:

- Cultivation
- Collaboration
- Capital
- Careers
- Commercialization

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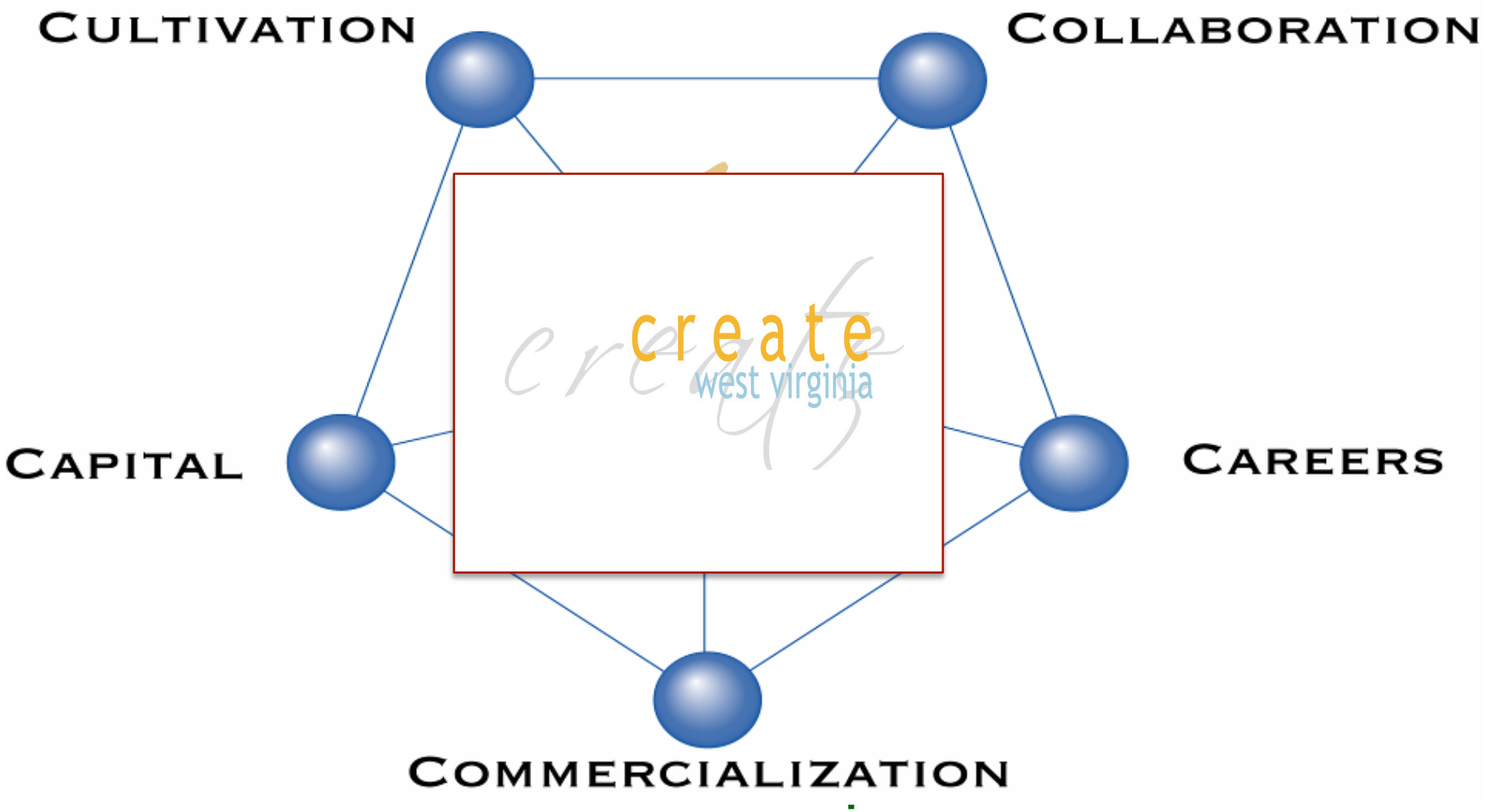
West Virginia Innovation Eco-System

Innovation Paradigm



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THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT

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A Call to Action

"Somebody has to do something, and it's just incredibly pathetic that it has to be US."

--Jerry Garcia of the Grateful Dead

The US is YOU!

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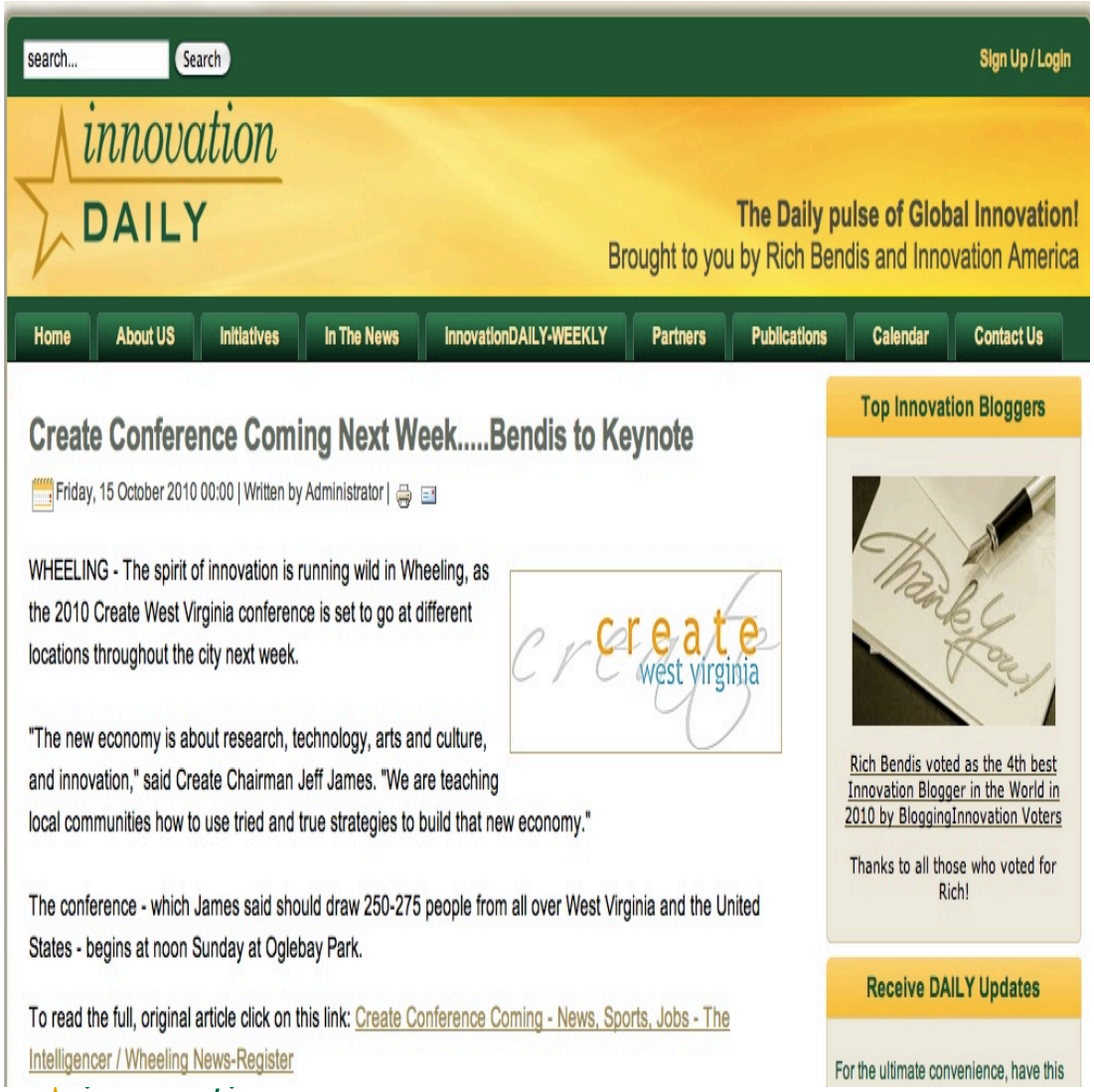
innovationDAILY



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