

The Convergence of University Research, Technology Commercialization & Career Development: A New 21st Century Contact Sport

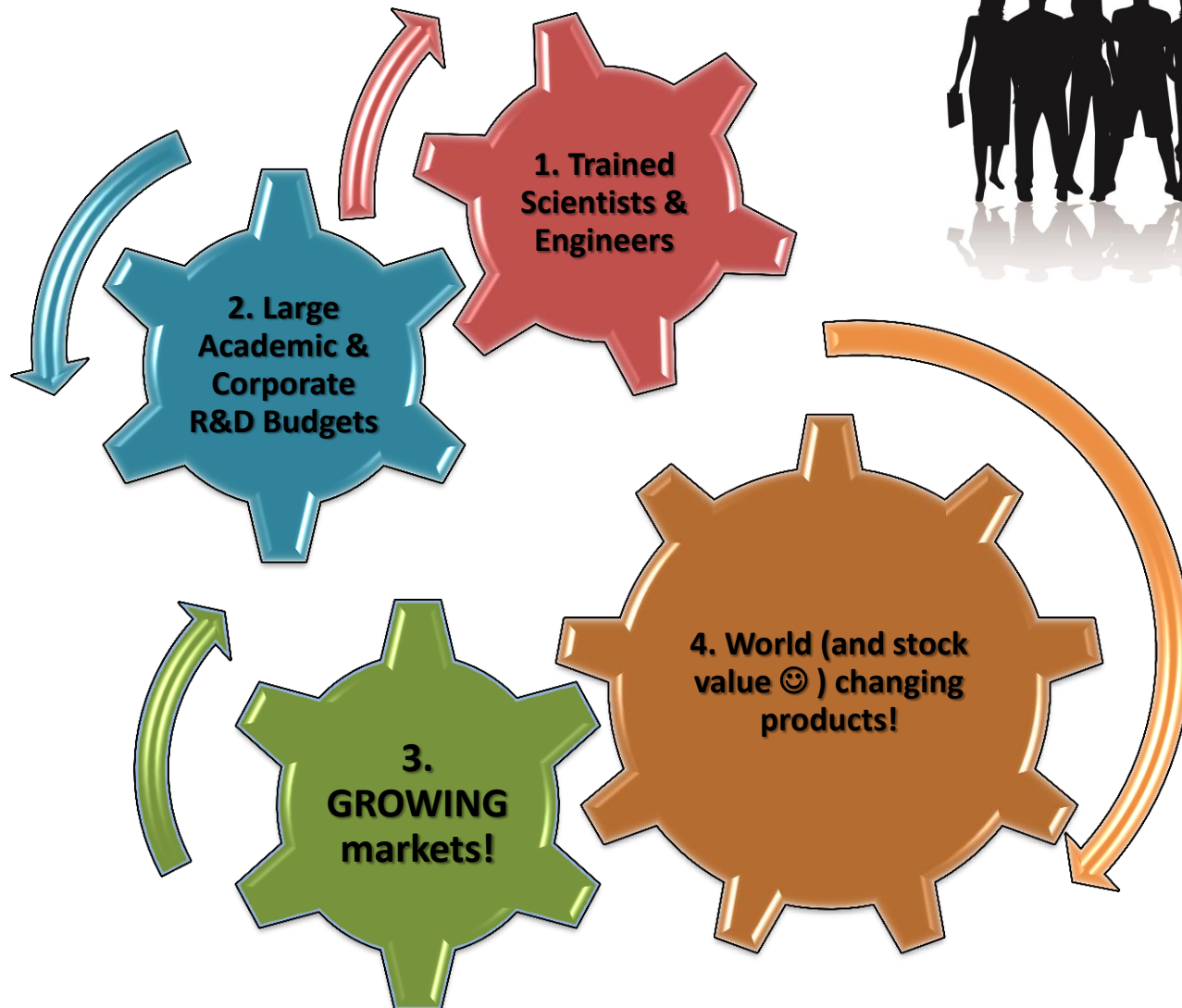
University of DE
January 2015

Judith Giordan – ecosVC, Inc.

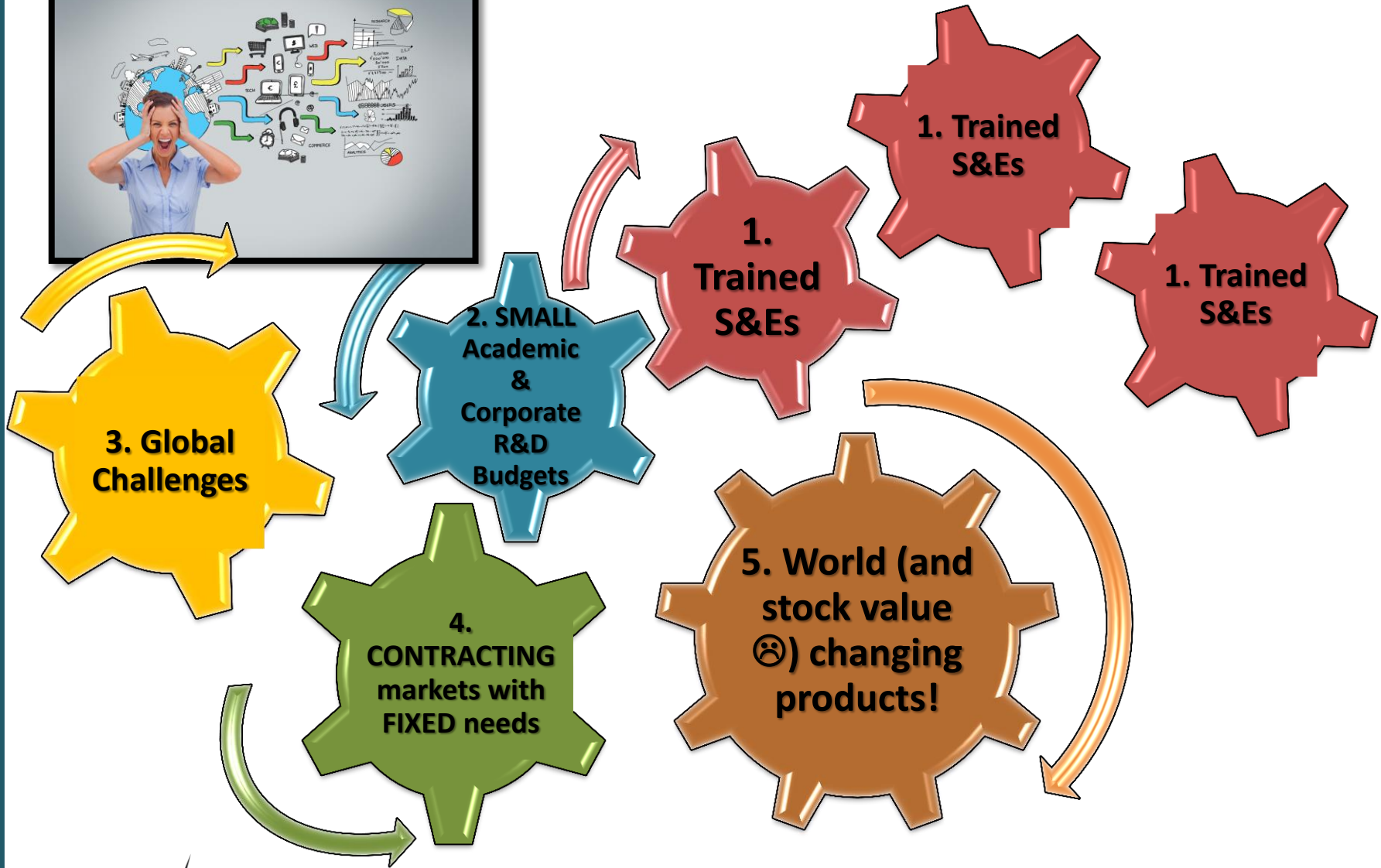
Getting to know YOU...

- Scientists and engineers
- Other? What?
- Grad students
- Post docs
- Faculty
- Industry
- Other?

It Used to be SOOOOO Simple...



Then it changed...





WHY?

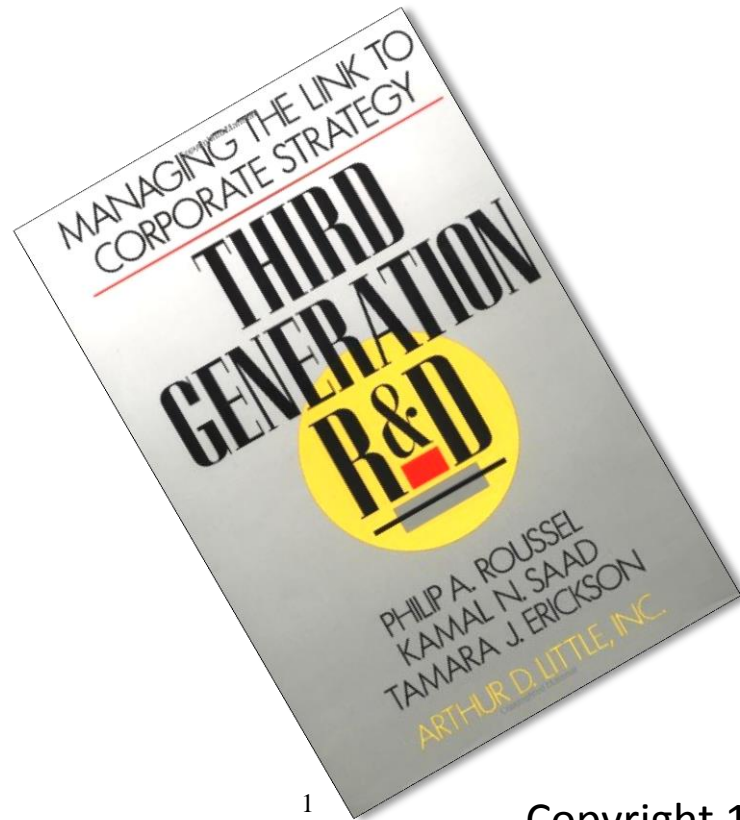


Technology Commercialization:

It is NOT that we didn't see it coming...



It's not like we NEVER HEARD of this...

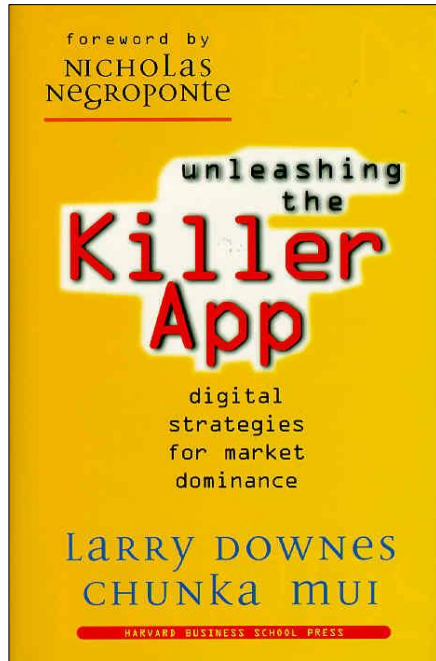


Copyright 1991!

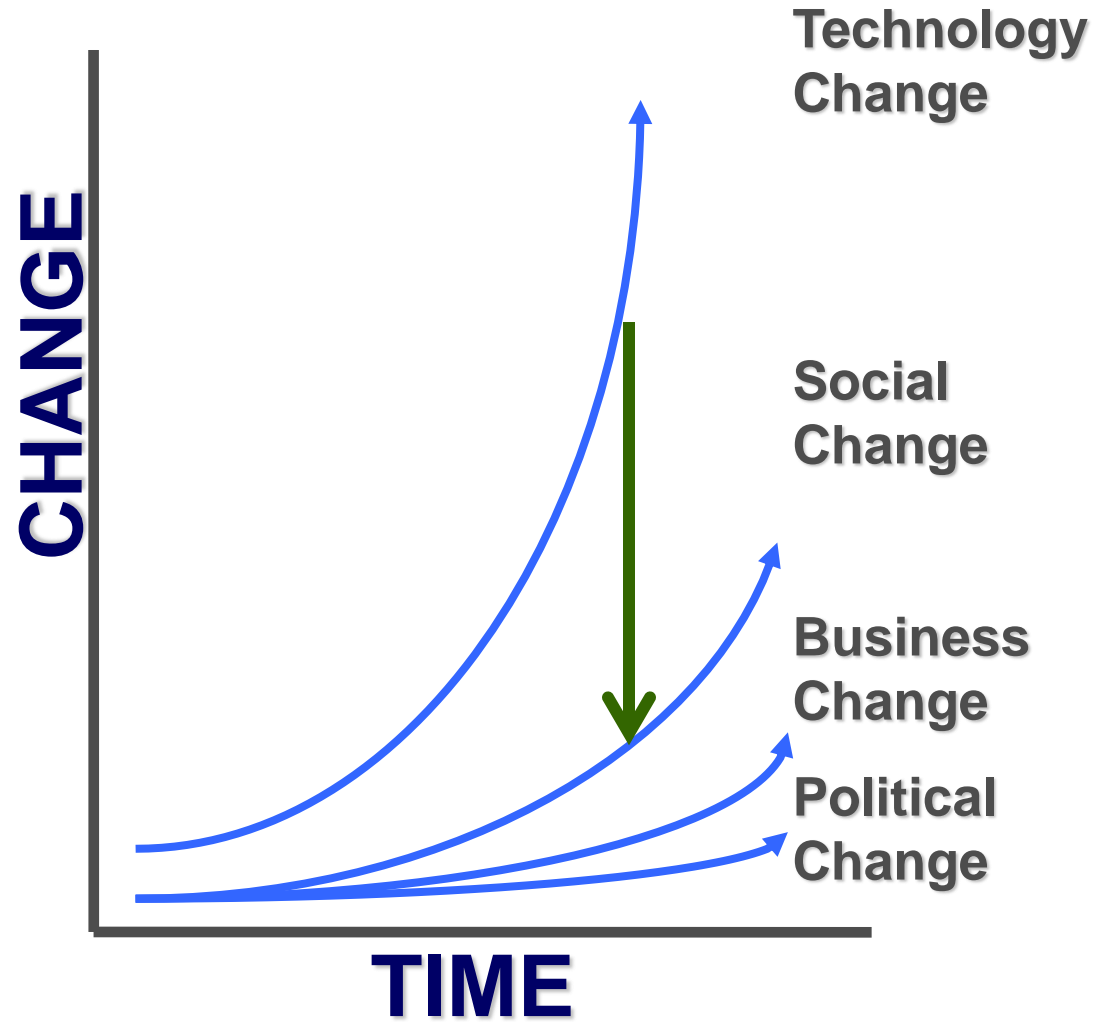
DOWN with *functional*
silos...

UP with *business* silos!

1998



2



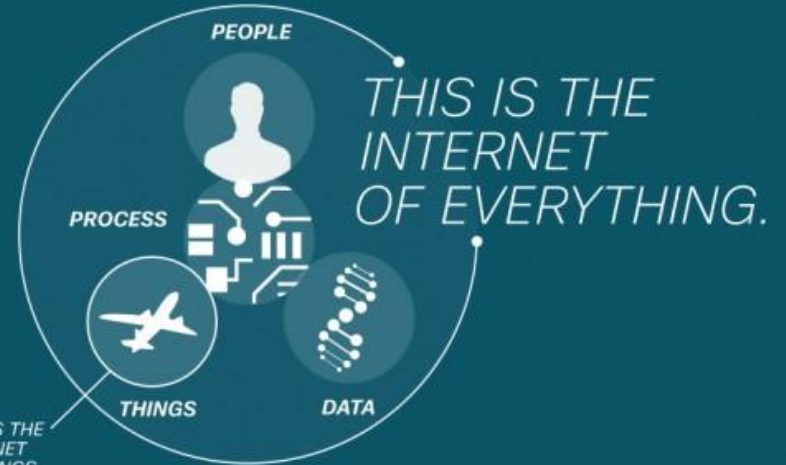
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Search ID: aba0029

**“Those are interesting questions Timmy.
I suggest you ask your search engine.”**

3



THIS IS THE
INTERNET
OF THINGS.

“It is up to all of us to get involved to ensure that the Internet, as IoE unfolds, continues to be a powerful force for improving people’s lives.”

-Dave Evans, Chief Futurist

#IoE
#InternetOfEverything



Internet Addiction, Internet Use Disorder & Internet Use Gaming Disorder are three synonymous terms describing the psychopathology involved with children and adults who become dependent upon Information and Communications Technology.

Michael Nuccitelli Psy.D., a New York State licensed psychologist and author of the Information Age Forensics construct, iPredator, presents his understanding of the Information Age addiction called Internet Use Disorder.



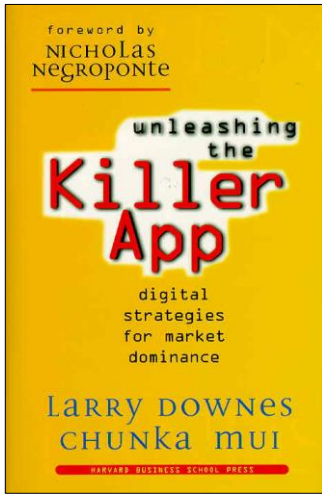
4

www.ipredator.co/internet-addiction/

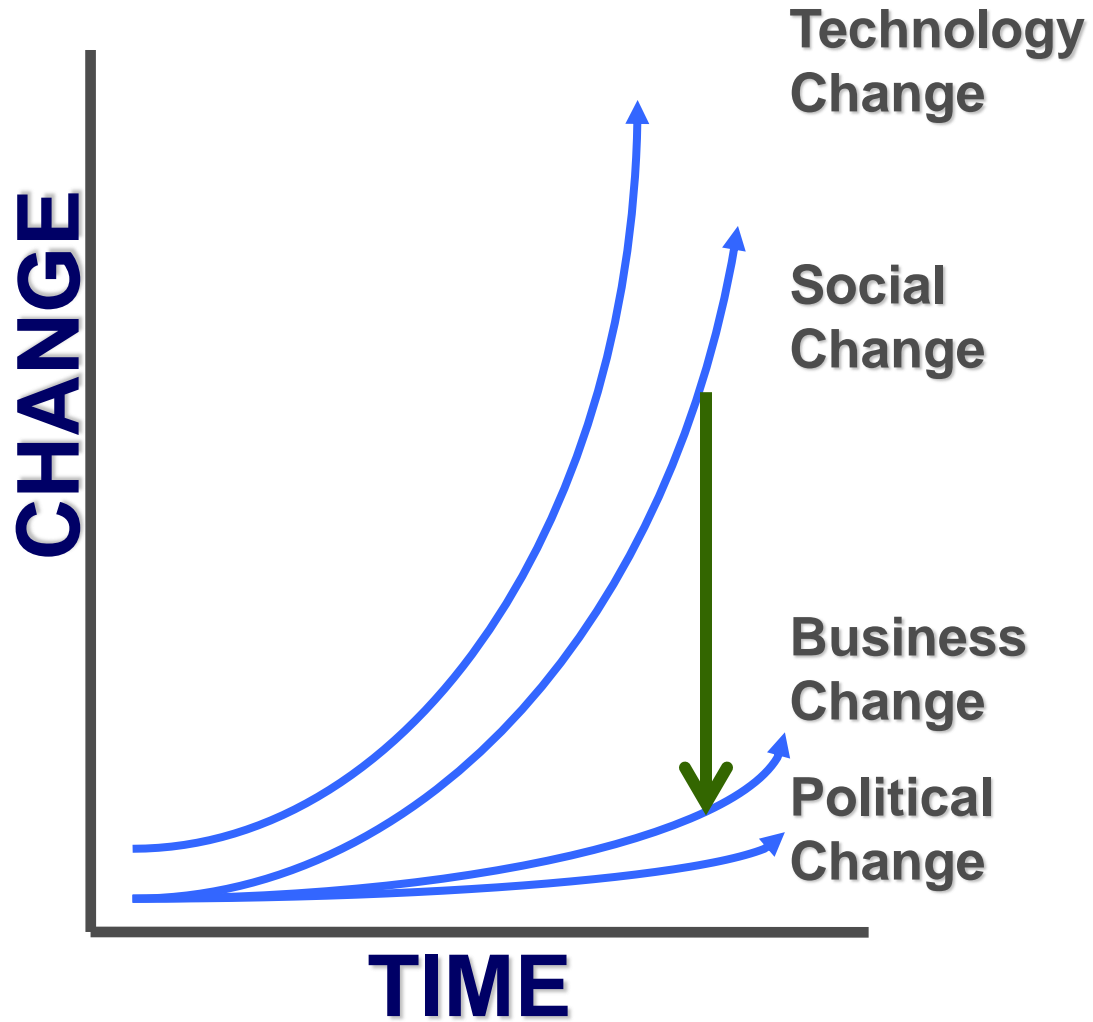
The GLOBAL Challenge

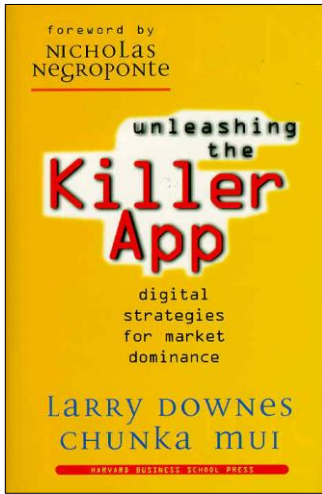
Providing environmentally *sustainable* solutions for...



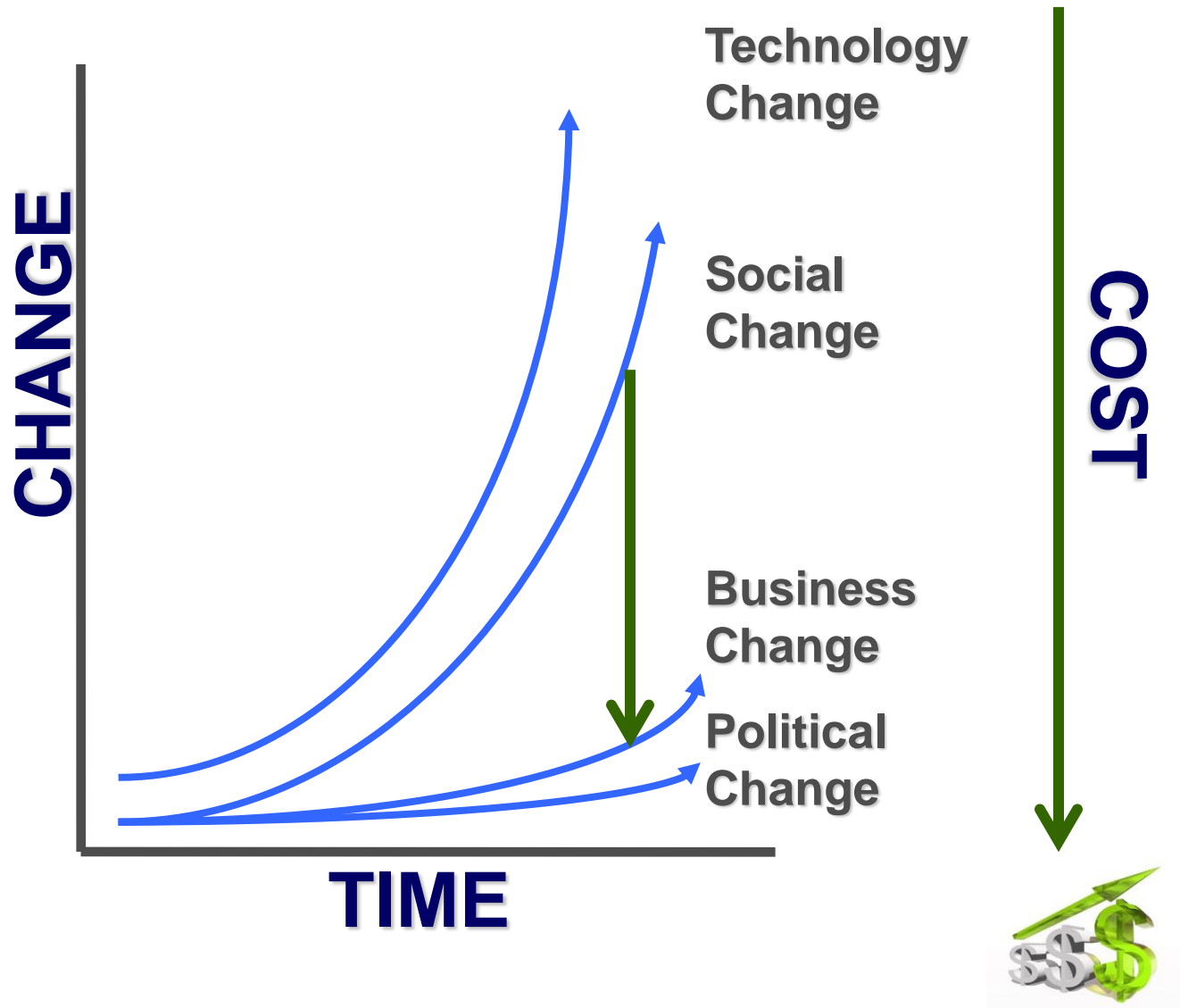


2014





2014



Financing – Follow The \$\$\$

Industry						
	2011 Total	2011%	2012 Total	2012%	2013 Total	2013%
Biotechnology	\$4,826,041,400	16.28	4,160,199,700	15.35	3,156,038,100	15.21
Computers and Peripherals	\$566,634,500	1.91	453,407,000	1.67	419,021,700	2.02
Consumer Products and Services	\$1,432,440,300	4.83	1,336,325,100	4.93	927,699,400	4.47
Electronics/Instrumentation	\$407,088,200	1.37	253,969,100	0.94	217,126,600	1.05
Industrial/Energy	\$3,637,272,800	12.27	2,861,101,100	10.55	940,576,800	4.53
IT Services	\$2,323,244,300	7.84	1,888,768,500	6.97	1,366,590,100	6.59
Media and Entertainment	\$2,278,607,600	7.69	2,039,814,800	7.53	1,655,030,500	7.98
Medical Devices and Equipment	\$2,882,478,600	9.72	2,474,218,600	9.13	1,609,314,500	7.76
Networking and Equipment	\$386,434,400	1.30	330,798,100	1.22	633,194,800	3.05
Semiconductors	\$1,309,863,900	4.42	923,655,000	3.41	375,893,200	1.81
Software	\$7,761,398,000	26.18	8,581,882,700	31.66	8,163,477,300	39.35
Telecommunications	\$612,326,800	2.07	706,310,300	2.61	435,957,900	2.10
Grand Total	\$29,645,324,000		27,106,747,200		20,745,836,500	

National Venture Capital Association, "VC Investments Q2 '14 – MoneyTree – National Data"
www.nvca.org/index.php?option=com_docman&task=doc_download&gid=1071&Itemid=317

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Figure 3.32
2013 Internet-Related vs. Non Internet-Related By Industry Sector (\$ Million)

Industry	Internet Related	Non-Internet Related	Total
Biotechnology	16.2	4,545.7	4,561.9
Business Products and Services	53.8	164.2	218.0
Computers and Peripherals	222.2	295.0	517.2
Consumer Products and Services	1,074.0	171.5	1,245.5
Electronics/Instrumentation	5.5	318.8	324.3
Financial Services	324.0	212.4	536.4
Healthcare Services	107.1	179.0	286.1
Industrial/Energy	22.5	1,484.0	1,506.5
IT Services	1,967.0	25.9	1,992.9
Media and Entertainment	2,771.4	164.1	2,935.5
Medical Devices and Equipment	15.6	2,114.5	2,130.2
Networking and Equipment	669.6	-	669.6
Other	5.6	93.0	98.6
Retailing/Distribution	228.4	12.0	240.4
Semiconductors	132.5	464.9	597.4
Software	10,821.3	198.7	11,020.0
Telecommunications	572.4	71.2	643.6
Total	19,009.3	10,514.8	29,524.1

2014...

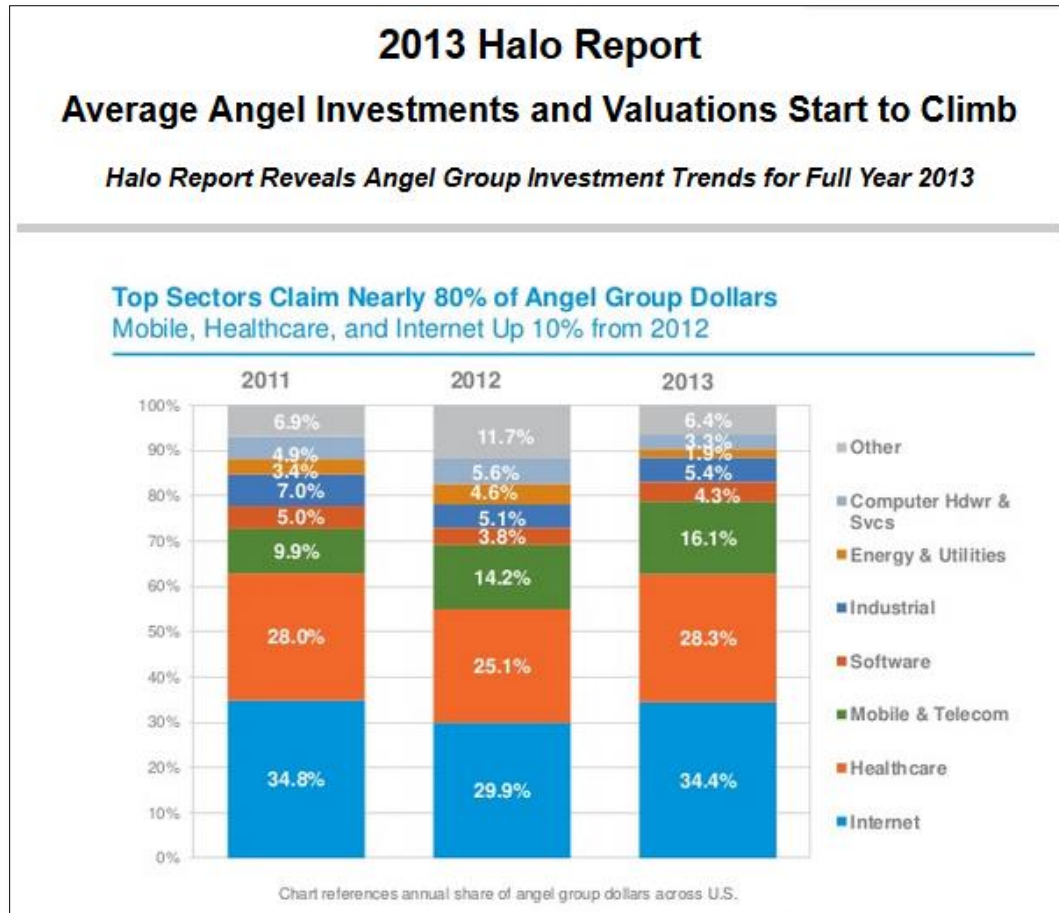
- Annual Venture Capital Investment Tops \$48 Billion in 2014, Reaching Highest Level in Over a Decade, According to the MoneyTree Report

The Software industry maintained its status as the single largest investment sector for the year, with dollars rising 77 percent over 2013 to \$19.8 billion, which was invested into 1,799 deals, a 10 percent rise in volume over the prior year.

Fourteen of the 17 industry categories experienced increases in dollars invested for the year. Industry sectors experiencing some of the biggest dollar increases for 2014 included:

**Retailing/Distribution (265 percent);
Computers and Peripherals (132 percent);
Electronics/Instrumentation (128 percent);
and Financial Services (109 percent).**

Financing – Follow The \$\$\$



www.angelresource.org/en/Research/Halo-Report/Halo-Report.aspx

What About Chemicals in 2015...

strategy&

Formerly Booz & Company

Who we are ▾

What we do ▾

What we believe ▾

Home > What we believe > 2015 Industry Perspectives > 2015 Chemicals Trends



Industry perspectives

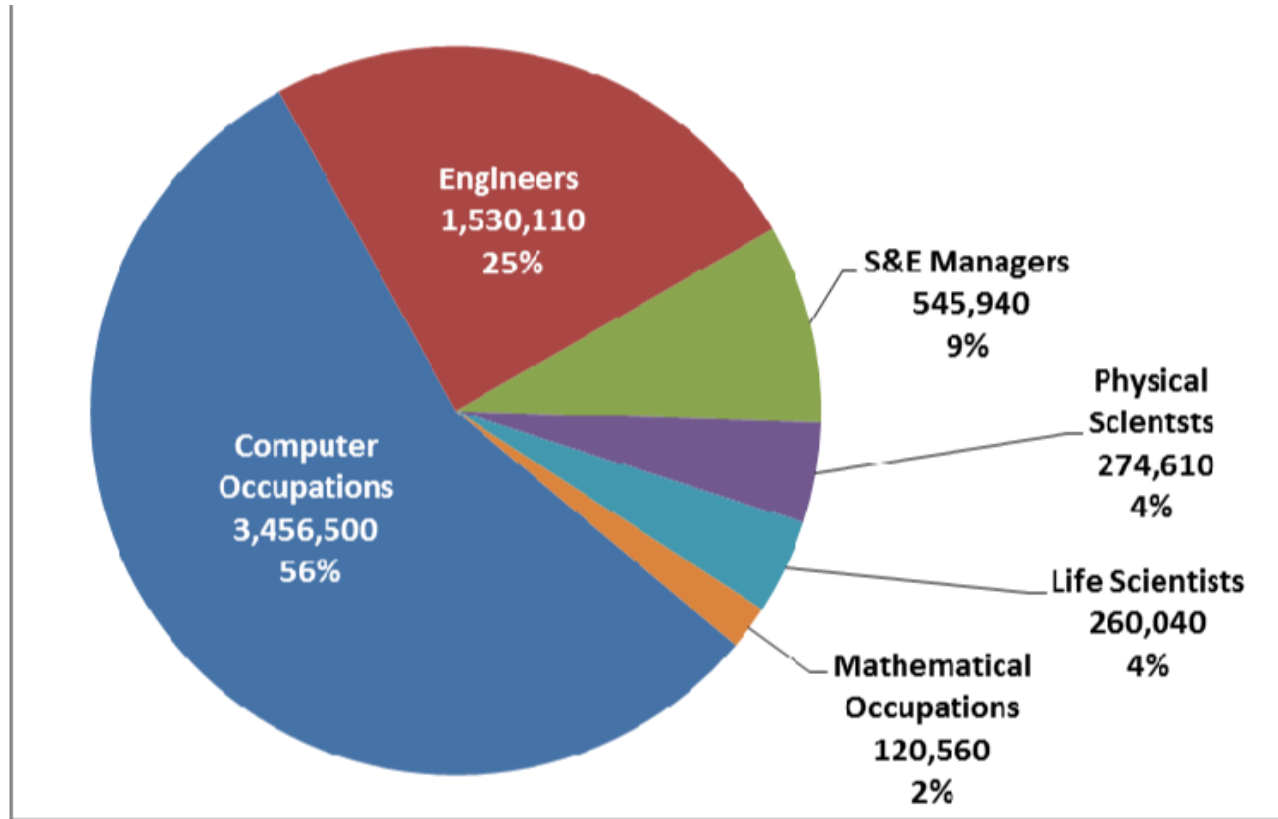
2015 Chemicals Trends

Chemicals companies can no longer afford to be passive about restructuring their business models or technological transformations.

<http://www.strategyand.pwc.com/perspectives/2015-chemicals-trends>


- **FOCUS** for **GROWTH** in *new business models..*
- **Embracing digital transformation**
- **Innovation.** Digital technologies are creating structural changes in the ecosystem of most of the sectors that the chemicals industry serves, such as automotive and electronics. The flexibility of 3D printing....

Career Development used to be easy – HIGH \$ JOBS!



Source: CRS analysis of Occupational Employment Statistics survey data, May 2012, Bureau of Labor Statistics, U.S. Department of Labor, <http://www.bls.gov/oes/tables.htm>.

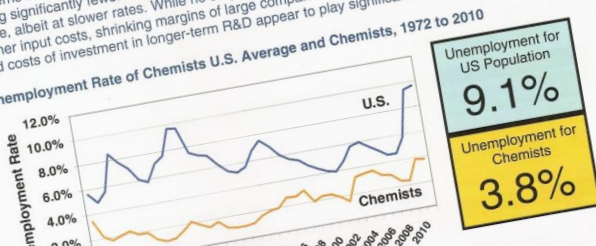
Career Development used to be easy – HIGH \$ JOBS!


ACS Careers
 Chemistry for Life™

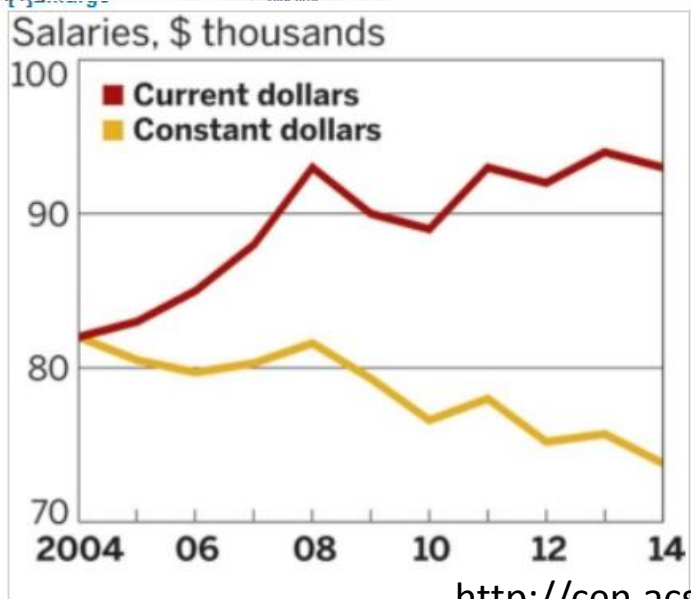
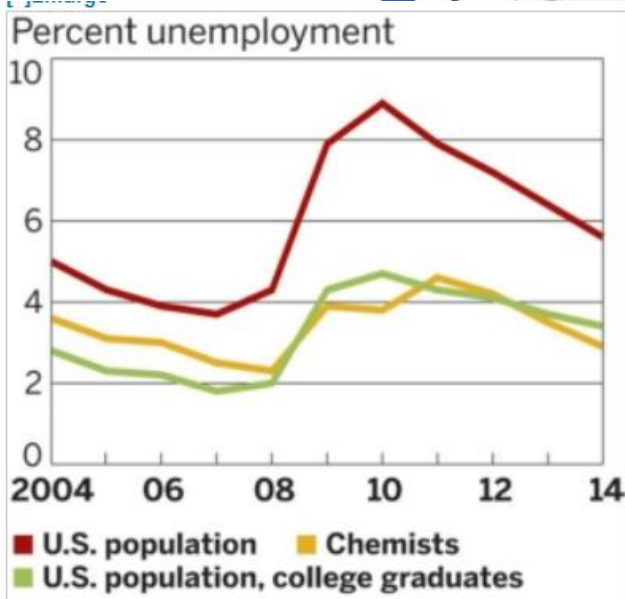
Employment in the Chemical Enterprise

Since 2008, nearly 25,000 jobs—including thousands in research and development (R&D)—have been lost in chemical manufacturing companies in the United States, and layoffs continue. For the past 20 years, a clear job loss trend is evident in Bureau of Labor Statistics data that suggests the loss of approximately 300,000 full-time chemist jobs in the U.S. Patterns of hiring are also changing. Chemical companies with more than 500 employees are hiring significantly fewer new graduates than in the past, while small businesses are hiring more, albeit at slower rates. While no single factor explains these recent job losses or trends, higher input costs, shrinking margins of large companies, and growing aversion to the risks and costs of investment in longer-term R&D appear to play significant roles.

Unemployment Rate of Chemists U.S. Average and Chemists, 1972 to 2010



Category	Unemployment Rate
Unemployment for US Population	9.1%
Unemployment for Chemists	3.8%

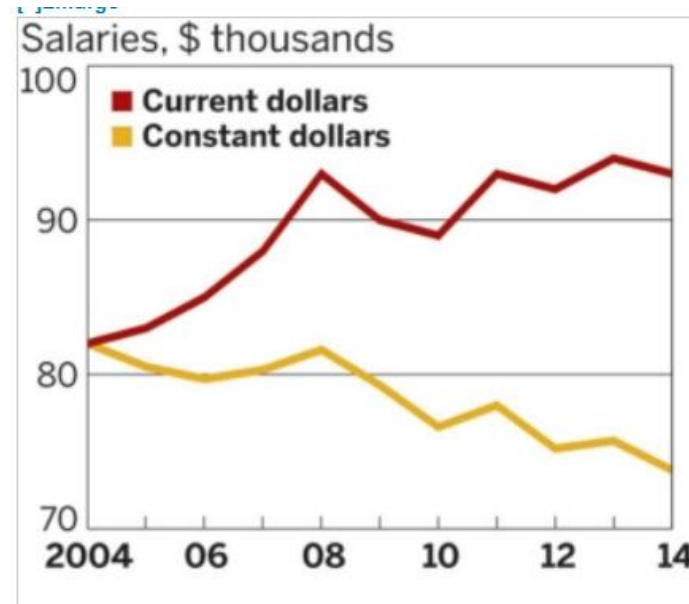
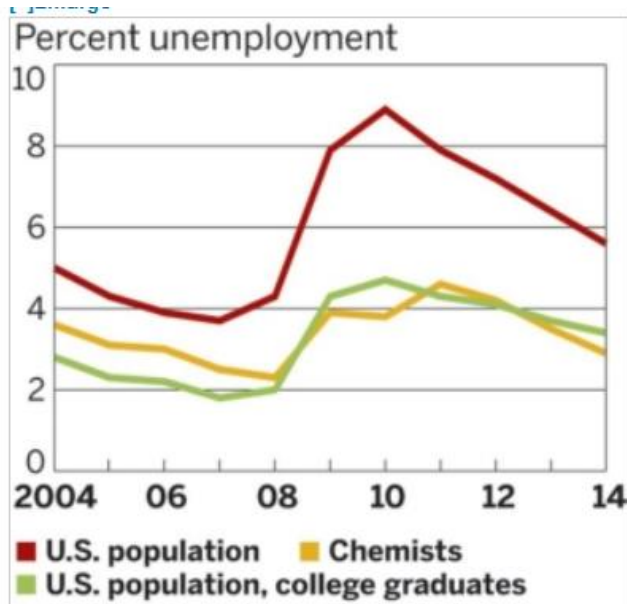


Career Development used to be easy – HIGH \$ JOBS!

Base Salary Rise of 3% Forecast for 2015

Flat post-inflation increases based on modest wage pressure

See more at: <http://www.shrm.org/hrdisciplines/compensation/articles/pages/2015-salary-budget-forecasts.aspx#sthash.N1jzmnh.dpuf>

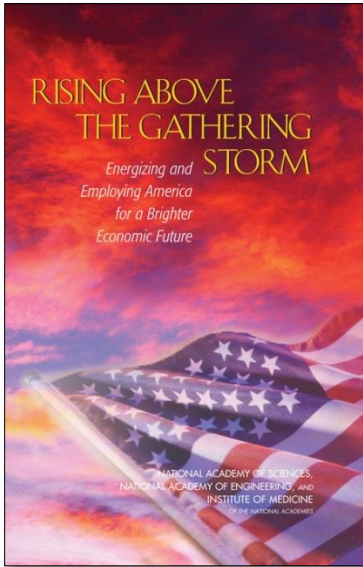


Action in the Anthropocene

The screenshot shows the homepage of the 'Welcome to the Anthropocene' website. The header includes the site logo, navigation links for 'ANTHROPOCENE', 'EARTH SYSTEM', 'THRESHOLDS & BOUNDARIES', and 'GALLERY', a search bar, and social media icons for YouTube, Facebook, and Twitter. Below the header is a main banner with the text 'A planet transformed by humanity'. A section titled 'WHAT IS THE ANTHROPOCENE?' explains that we are living in a new geological epoch. Below this are four video thumbnails, each with a title, a brief description, and a play button. The videos are: 'Welcome to the Anthropocene', 'Water in the Anthropocene', 'An Urbanizing Planet | Narrated by Edward Norton', and 'Climate Change — The state of the science'. Each video player shows a progress bar and a 'vimeo' logo.

www.anthropocene.info/en/home

- The rules *are* and *must change...and*
- *We must help change them.*
- Requires full commitment and skill



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

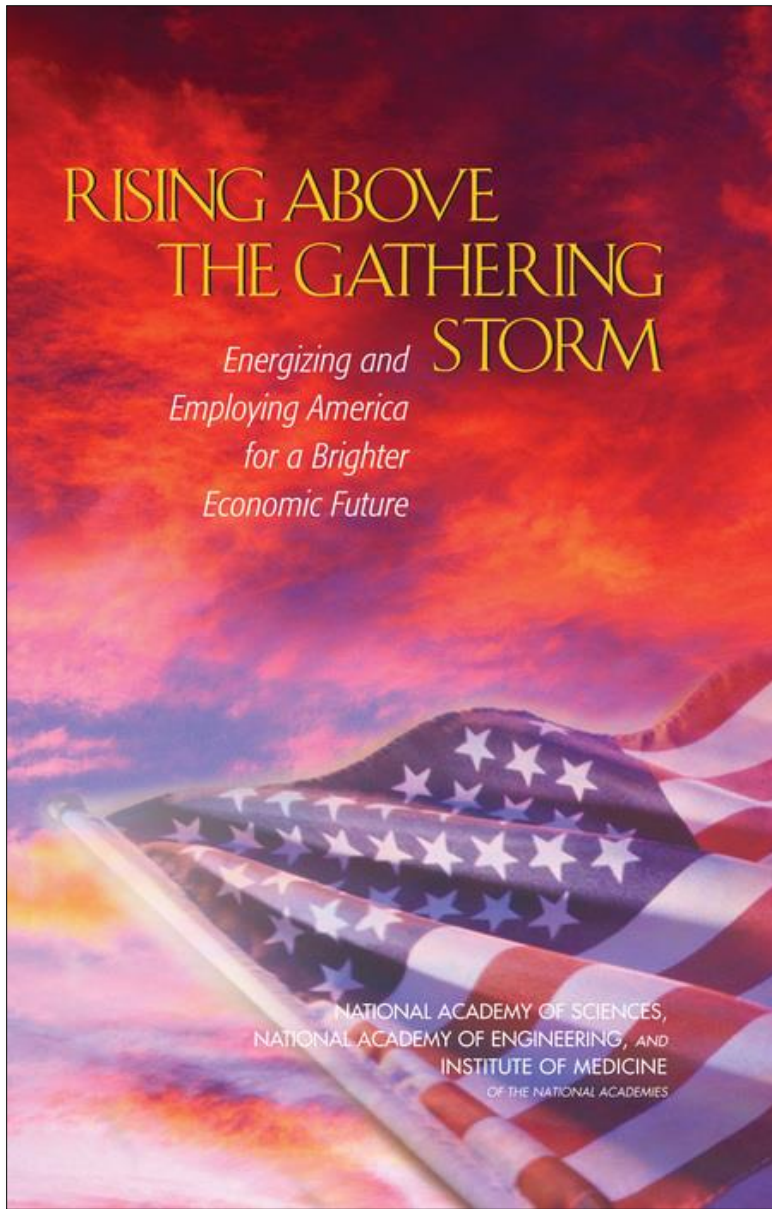
Insight Report

The Global Competitiveness Report 2012–2013

Klaus Schwab, World Economic Forum



www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf



University Research

In a world where advanced knowledge is widespread and low-cost labor is readily available, **U.S. advantages in the marketplace and in science and technology have begun to erode.** A comprehensive and **coordinated federal effort is urgently needed** to bolster U.S. competitiveness and pre-eminence in these areas. ...to **create high-quality jobs and focus new science and technology efforts on meeting the nation's needs, especially in the area of clean, affordable energy:**

- 3) **Develop, recruit, and retain top students, scientists, and engineers from both the U.S. and abroad; and,**
- 4) **Ensure that the United States is the premier place in the world for innovation.**

University Research

- Proof of value...

The screenshot shows the website for The Science Coalition. The logo is in the top left. Navigation links include ABOUT, BRIEFING ROOM, INITIATIVES, CHAMPIONS, and TOOLKIT. A search bar is on the right. The main content area features a large blue banner for the report "Science 2034: Where Will Science Take Us in 20 Years?". The text on the banner reads: "While we don't know what the next 'Big Thing' will be, we can make some educated predictions about how well-funded scientific research might change our lives and the world...". A yellow "Learn More" button is at the bottom right of the banner. To the right of the banner is an image of binoculars with a sky view through the lenses, flanked by green arrows. The top right of the page has a "For Members" button and a "Sign Up For Updates" link.

www.sciencecoalition.org/reports/Sparking%20Economic%20Growth%20Full%20Report%20FINAL%204-5-10.pdf



ECONOMIC DEVELOPMENT



**University
Research**



**Technology
Commercialization**



**People and
Careers**

Economic Development:



ECONOMIC
DEVELOPMENT



INDIANA
A State that Works

nia
COMMUNITY

Ohio

Development
Services Agency



THE 21st
LARGEST
ECONOMY
IN THE
WORLD



New Hampshire Department of
Economic Development

Successful Food Hubs
Engaging and Processing Local Food in Illinois

TEXAS
WIDE OPEN FOR BUSINESS

THE
STATE

President
10rg
10. Inc. #504
10202
10
10med.org

GOVERNOR RICH SNYDER

WORKS
for the Regional Economic
Development Councils

ECONOMIC
DEVELOPMENT

People
Next Generation
Researchers and
Careers

Technology
Commercialization
Economic development
from market aligned
Innovations



University
Research
Problem Aligned
Research

Adapted from: wilson.house.gov/energy-and-the-environment/

Harvard researcher, John Kotter in the early 1990s demonstrated that so called “adaptive cultures” dramatically outperformed “non-adaptive” cultures across a variety of indicators.

Success Indicators	Adaptive Culture	Non-Adaptive Culture
Increase in revenues	682%	166%
Expanded workforce (growth)	282%	36%
Increased stock price/market valuation	90%	74%
Improved Net Incomes	756%	1%

http://workforcediversitynetwork.com/docs/business_case_3.pdf

Business Case for Inclusion and Engagement. By Marcus Robinson, Charles Pfeffer, and Joan Bucchigrossi, (2003). wetWare, Inc. Rochester, NY.



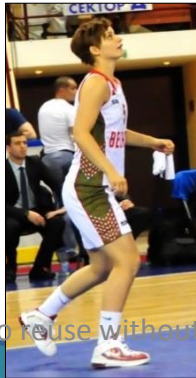
ECONOMIC DEVELOPMENT



Can WE adapt



ECONOMIC DEVELOPMENT



People and Careers

Key Decisions..

- People

1. **YOU are the CEO of Me.Life – and always have been**

- *YOU must take charge of your life and career... there is NO little yellow school bus!*



Life isn't an
"exercise" ...





**Already doing it...
and doing it WELL
are two different
things!**



Key Decisions..

- People

1. **YOU are the CEO of Me.Life – and always have been**

- *YOU must take charge of your life and career... there is NO little yellow school bus!*

2. **INDIVIDUAL actions COUNT**

- Millennials seem to “say” it, now will you DO IT?

WALK the WALK...

- RICN's "[Blueprint for a Millennial America](#)," a report prepared by thousands of Millennials who participated in their "Think 2040" project, placed the development and usage of renewable sources of energy at the top of all other environmental initiatives.
- ...proposed solutions to the challenge...through **individual initiative and grassroots action** rather than a heavy-handed top down bureaucratic approach.

www.newgeography.com/content/003455-how-green-are-millennials;
www.rooseveltcampusnetwork.org/chapter/1875/blueprint-millennial-america



ECONOMIC DEVELOPMENT



**Technology
Commercialization**



**People and
Careers**

Financing – Follow The \$\$\$

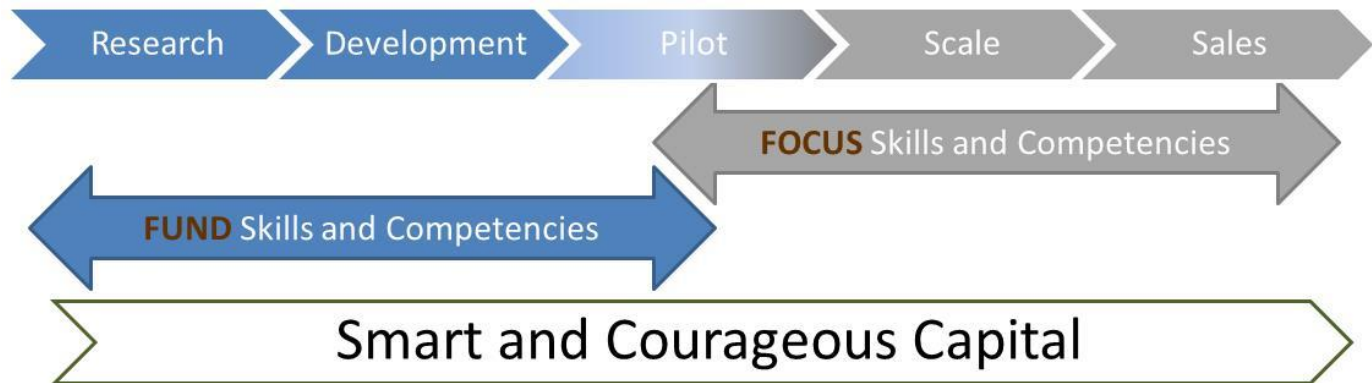
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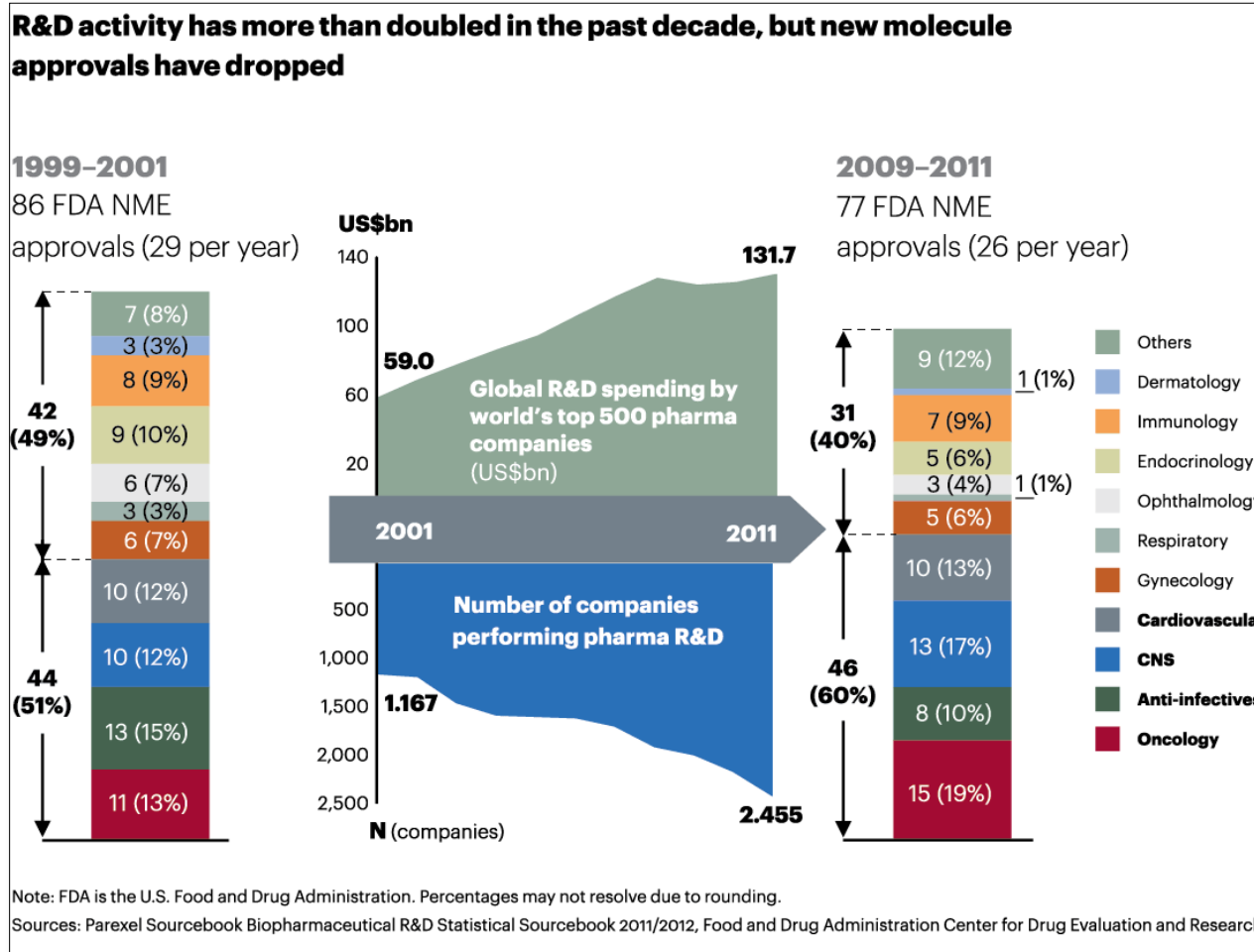
Key Decisions

- Corporations...

– Will you step up to the plate? And If so, then WHEN and HOW?



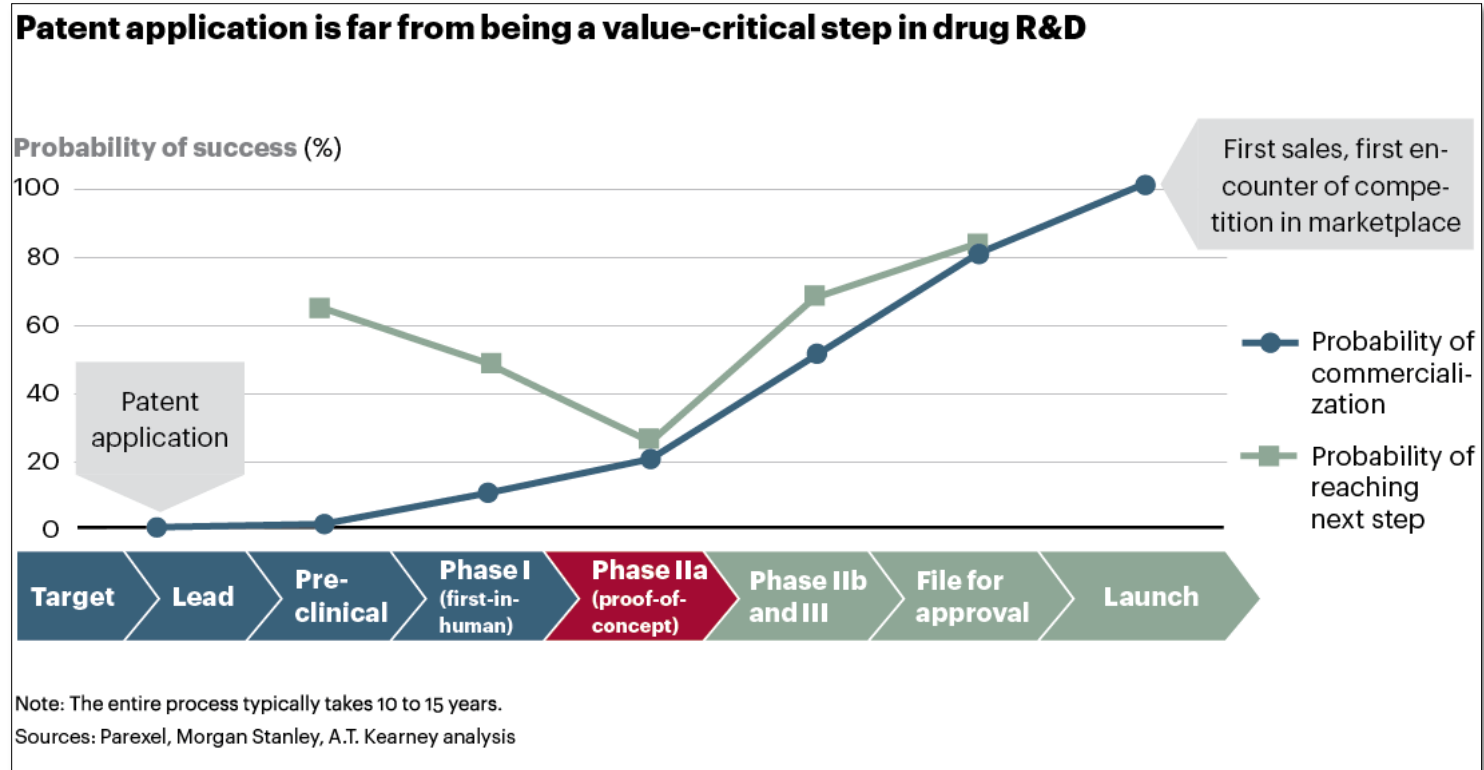
The *real* Drug Wars



www.atkearney.com/paper/-/asset_publisher/dVxv4Hz2h8bS/content/unleashing-pharma-from-the-r-d-value-chain/10192

The *real* Drug Wars

FOCUS on what matters...

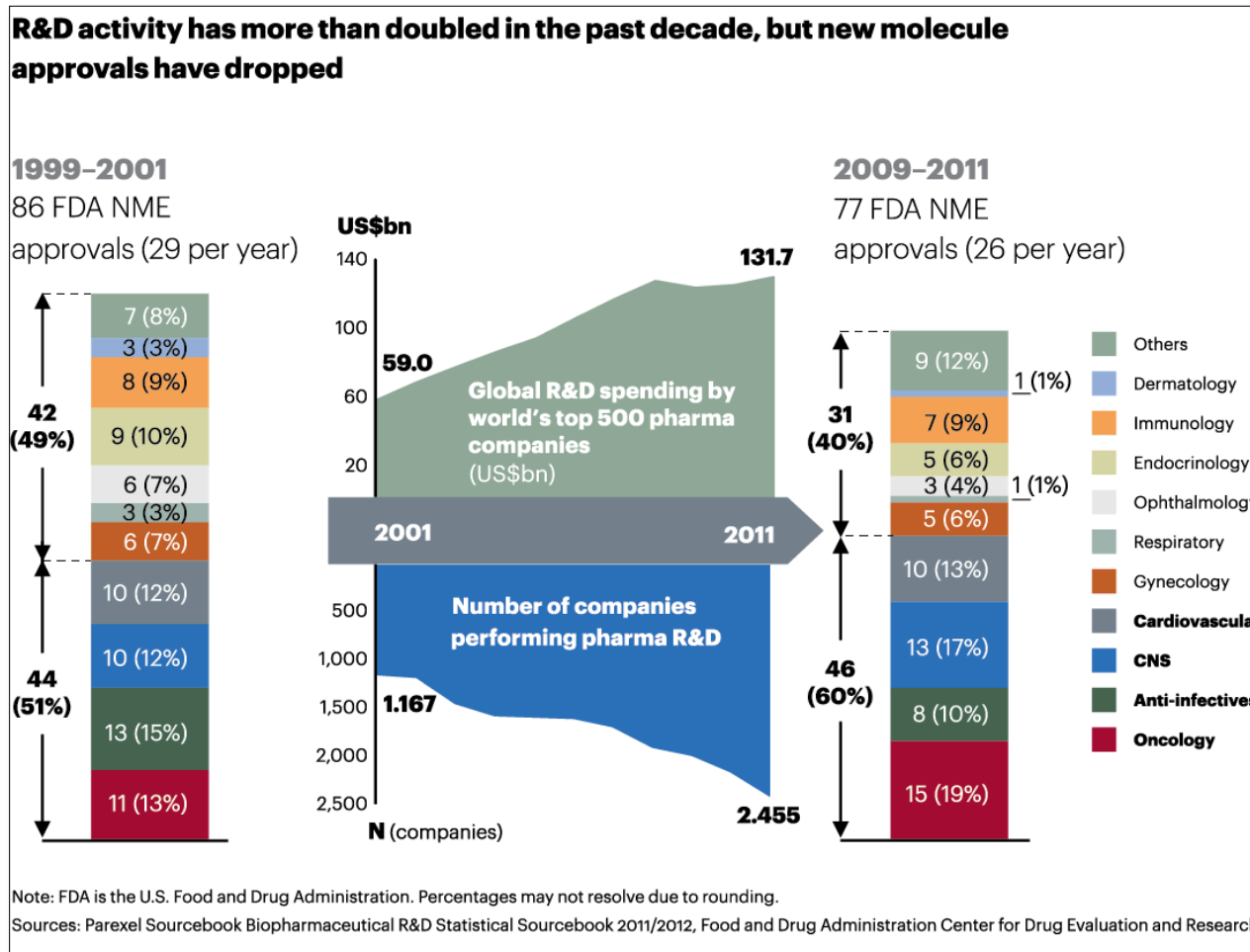


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www.atkearney.com/paper/-/asset_publisher/dVxv4Hz2h8bS/content/unleashing-pharma-from-the-r-d-value-chain/10192

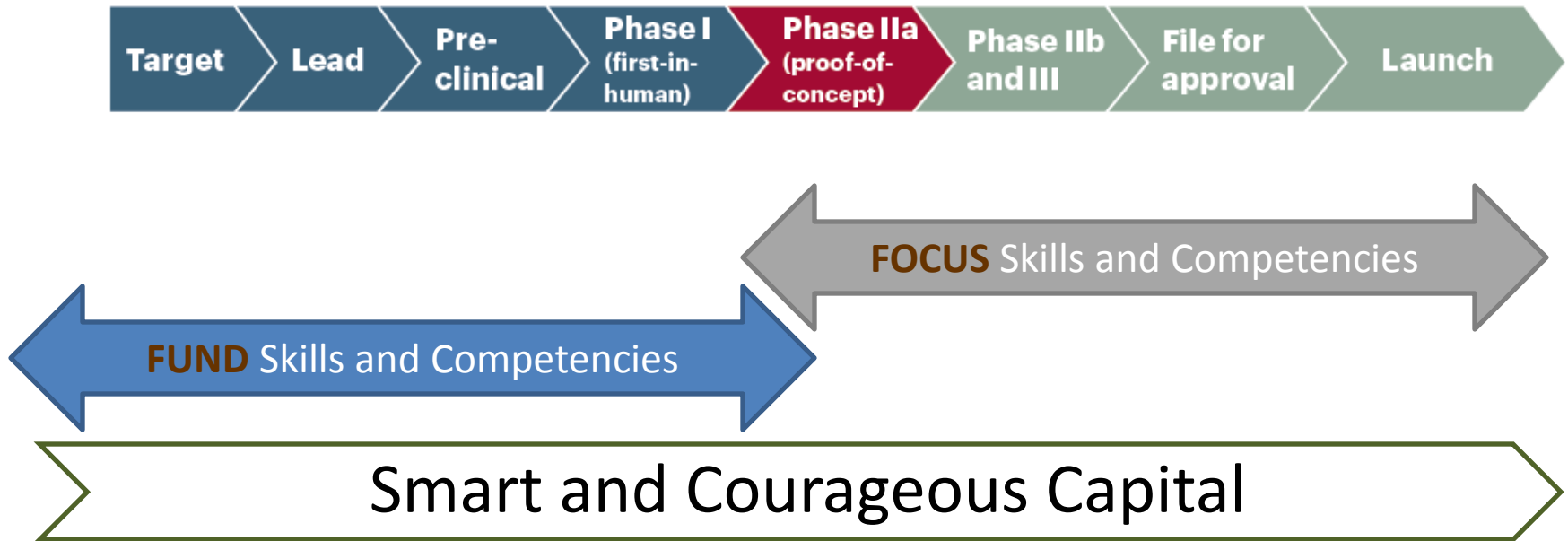
The *real* Drug Wars

OPEN INNOVATION



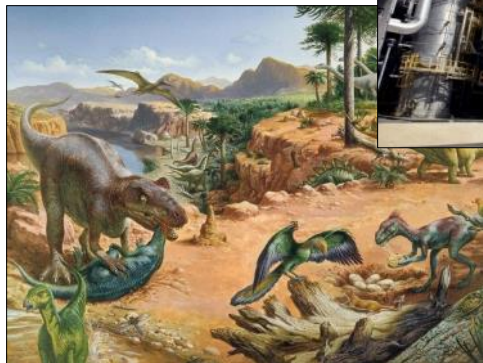
The *real* Drug Wars

FOCUS on what matters...



The *old* Solution

Staying with petrochemicals is *not sustainable*



9



10



...as a means to addressing major global issues

The *new* Solution

Going BIOMASS **GREEN**



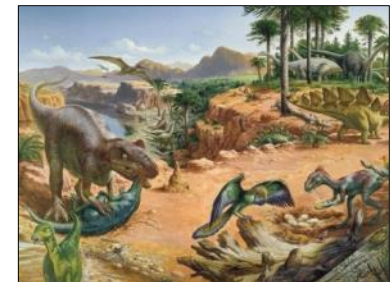
...as a means to addressing major global issues

Crossing the Great Divide



The Golden Rules of **CREATING VALUE** –

- *And woe to anyone who forgets...*



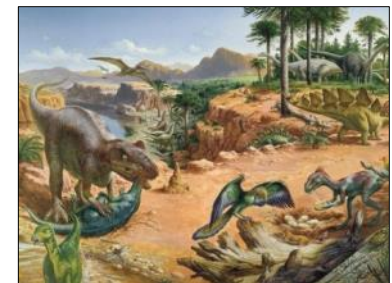
Crossing the Great Divide



The Golden Rules of **CREATING VALUE** –

- The **chemical and fuel** industries have *always* been driven by *feedstock costs*
- The **technology** was there to *profitably and safely convert* to the desired products
- The **courageous capitalization** support was available

- *And woe to anyone who forgets...*



Unilever Seeks More Renewables

Industrial Biotech: Consumer products firm, U.K. university join for biobased chemicals development

By **Alex Scott**

Department: **Business** | Collection: **Green Chemistry**
Keywords: **biomaterial, renewable, U.K., collaboration**

[+]Enlarge



Unilever has begun a research project with English **Liverpool** to develop renewable chemicals from biomass and personal care products. The effort is the latest move for the consumer products company to increase the renewable materials used in its products without adding costs for the buying public.

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Len Sauers, P&G's VP for Global Sustainability highlighted in the firm's most recent environmental report: Few consumers are willing to pay a premium for greener goods. Thus the processes they are developing will have to be cost-competitive from the outset...

And that's not all...



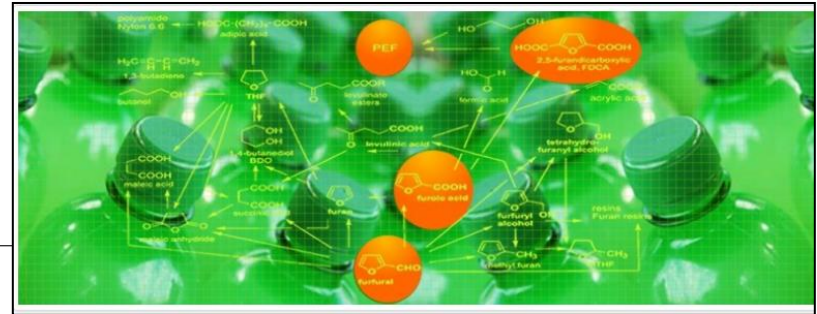
Coca-Cola Eyes Growth In The Sparkling Bottled Water Market

Trefis Team Contributor

Coca-Cola And Competitors Go Green

In 2009, the largest CSD manufacturer in the world, Coca-Cola, introduced PlantBottle for its water brand Dasani. PlantBottle uses about 30% PET resin from sugarcane and is thus more eco-friendly than traditional plastic bottles. Sales of Dasani have increased by 20% since the launch of PlantBottle. The company also plans to introduce bottles made completely out of plant-based resin in the coming few years. This move could further boost sales of Dasani, which currently has a market share of ~10% in the still water category with retail sales of over \$900 million in FY2013.

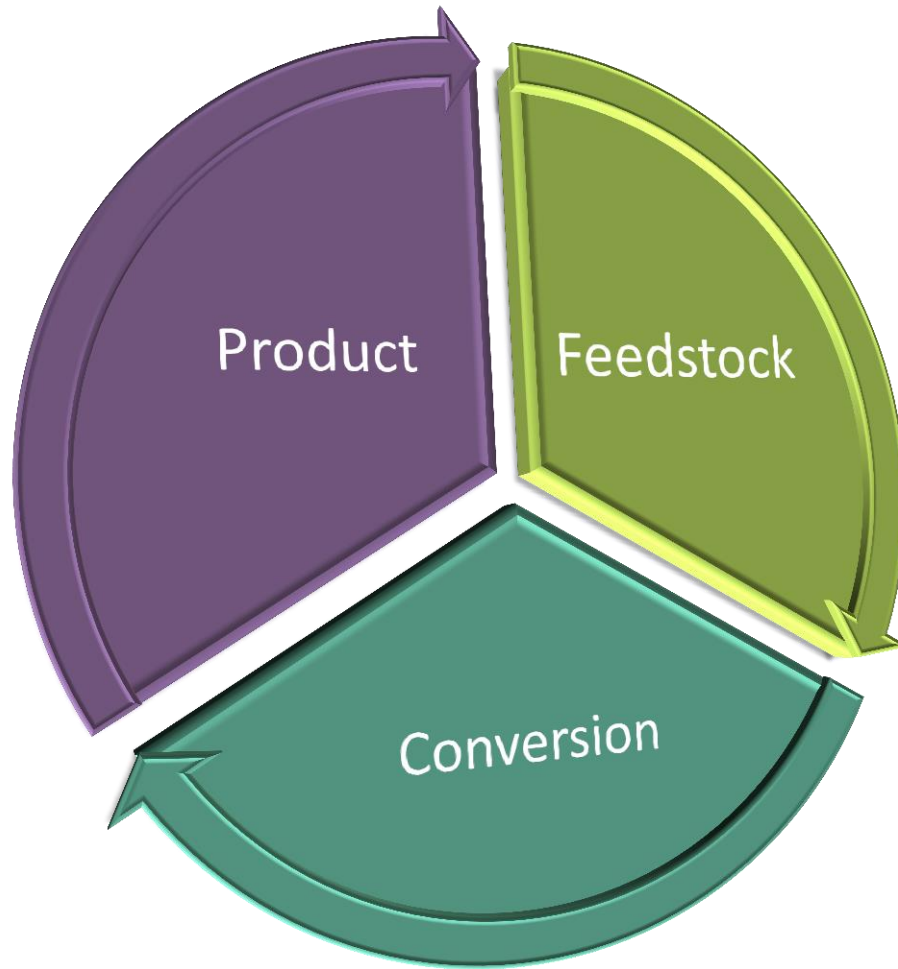
Coca-Cola might also look into the possibility of using PEF (polyethylene furanoate), a bio-based alternative to PET. However, the impact of PEF on the recycling stream is still to be known. As the company is a major user of recycled PET, it wouldn't want to harm its own recycled material. Coca-Cola is presently working on bottles from PEF with Avantium, a renewable chemicals firm based in Amsterdam. Coca-Cola also experimented with bottles made of ice that could melt away after consumption. The ice bottle is currently available only in Colombia and carries the company's flagship Coca-Cola CSD. However, these



ES AND MORE

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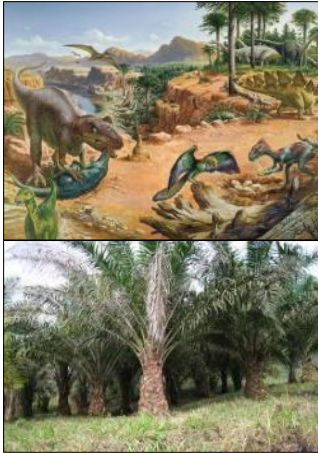
Crossing the Great Divide



The *Real* Solution

Align **feedstock** with **technology** for **product** in a *global market... where there is opportunity in delivering locally*

The *Real* Solution



Feedstock

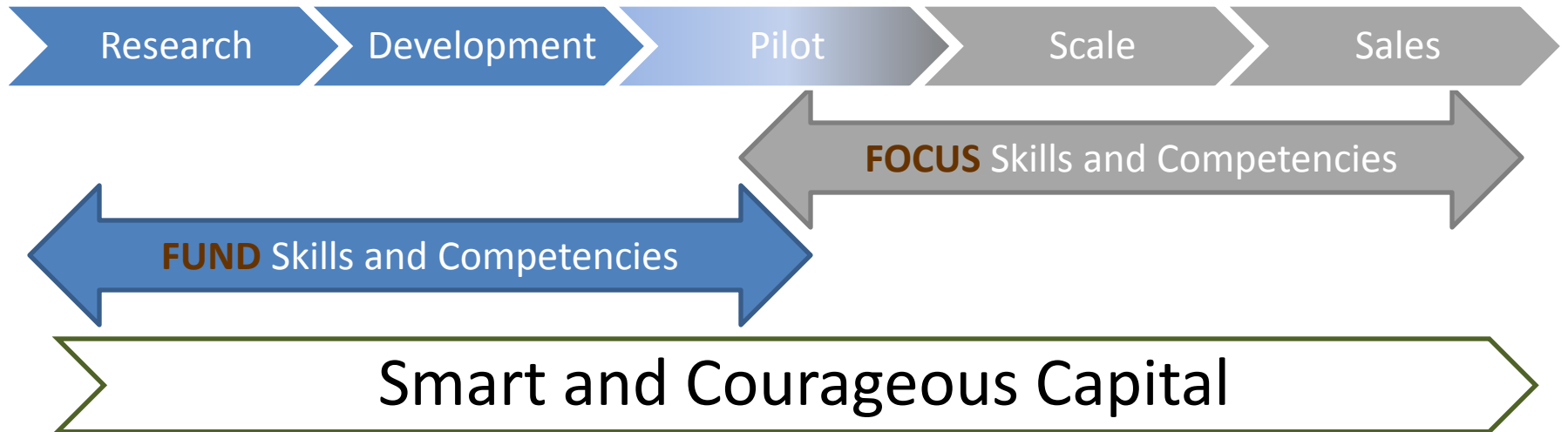
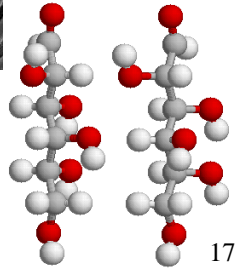
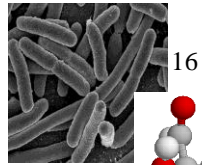
Conversion

Profitable
Product

Smart and Courageous Capital

...as a means to addressing *major* global issues

The *successful new* BIOMASS Solution



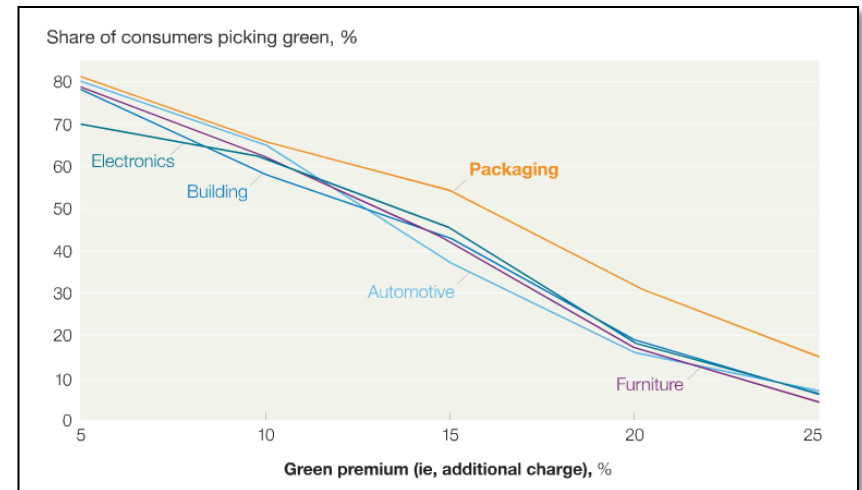
Key Decisions

- The Public
 - Change is NOT free. Are you willing to help pay for the cost of what you say you want...

Wednesday, June 05, 2013 SHARE

U.S. Consumers Increase 'Green' Purchases; But Are They Willing to Pay More?

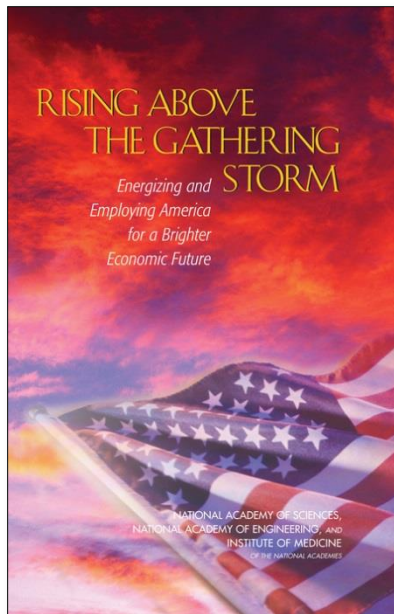
PHILADELPHIA – (June 5, 2013) – U.S. consumers continue to go green, as 78 percent say they buy green products and services, a steady increase over 69 percent last year, according to the 5th Annual Tork Sustainability Study. The study was conducted by Harris Interactive on behalf of SCA, makers of the Tork® brand of away-from-home paper products and one of the world's most sustainable and ethical companies.



www.mckinsey.com/insights/manufacturing/how_much_will_consumers_pay_to_go_green

Key Decisions

- Governments
 - Globally can you make decisions and provide long term incentives that corporations, investors, innovators and universities can trust and *stick with them?*



A screenshot of the Renewable Fuels Association (RFA) website. The top left features the RFA logo and the text "RENEWABLE FUELS ASSOCIATION". The top right has a "Member Login" button with the text "Forgot your password?". Below the logo is a navigation menu with four items: "About RFA", "Public Policy", "The Industry", and "Resource Center", each with a dropdown arrow. The main content area displays a news entry titled "Study: Statutory 2014 RFS Levels Can be Met Through Increased E85 & E15 Consumption, Carryover RINs" in green text. Below the title is the date "January 24, 2014" and a small "informa economics" logo. The text of the entry reads: "(January 24, 2014) WASHINGTON — A new study by Informa Economics entitled 'Analysis of the Potential Use of Biofuels toward the Renewable Fuel Standard in 2014' shows the originally intended Renewable Fuel Standard (RFS) 2014 blending requirements can be reached through expanded consumption of E85 and E15, as well as judicious use of carryover RIN credits. The study clearly demonstrates why the Environmental Protection Agency's proposal to reduce RFS blending requirements is unnecessary and imprudent."

www.ethanolrfa.org/news/entry/informa-statutory-2014-rfs-levels-can-be-met-through-e85-e15-rins/



ECONOMIC
DEVELOPMENT



**University
Research**



**Technology
Commercialization**



**People and
Careers**

Key Decisions

- Universities

- Do you REALLY know the rules of the road for successful commercialization...
- An can the Tech Transfer office REALLY do this alone?

“Everything BUT the Squeal”



- REAL SOLUTIONS require more than “invention”

Already doing it...
and doing it WELL
are two different
things!



#1: Making the most of the PROMISE

Innumerable undifferentiated “top of funnel” opportunities

INVUURE
**BUSINESS
PLAN
COMPETITION**



\$100K
MIT ENTREPRENEURSHIP COMPETITION

accelerate>>MICHIGAN™
INNOVATION COMPETITION

†USF
UNIVERSITY of
SAN FRANCISCO
International Business Plan Competition

mic mass
CHALLENGE

2011 RICE
UNIVERSITY
BUSINESS PLAN
COMPETITION
Sponsored by **Administaff**
World's Richest and Largest Business Plan Competition April 14-16, 2011

#2 Addressing PEOPLE and teams...

Or trying to?

An ecosystem that efficiently validates and structures seed stage deals exists only in Web 2.0, not for STEM ventures



Combinator

#3: PLANET is losing out...

Research – Lost in translation

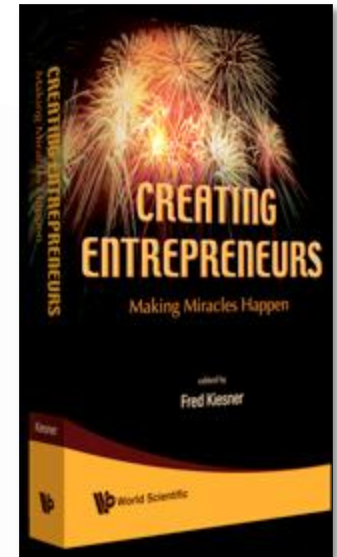
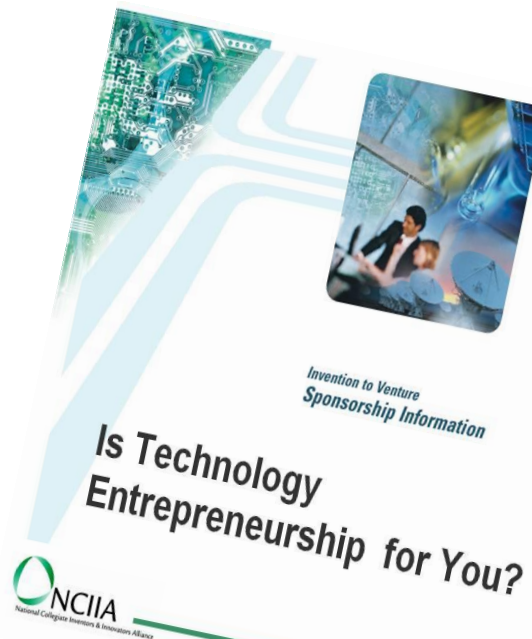
- Low success of STEM translation to commercialization
- Need to “fail fast and iterate”... not easy in STEM



Only 1% of more than 200 U.S. entrepreneurs surveyed cited higher education as a significant motivator toward starting their own venture, while 61 percent cited their “innate drive.”

- Northeastern University Survey

Entrepreneurs are born, but can they be taught? By Jim Hopkins, USA TODAY



Southern Miss
Ole Miss

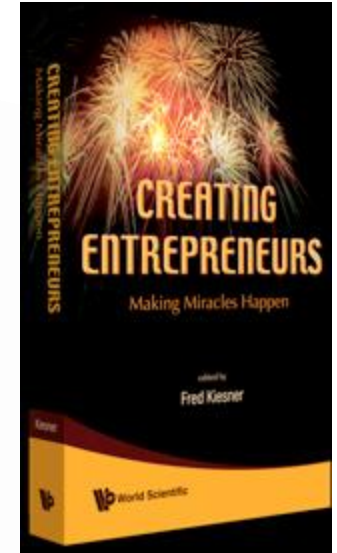
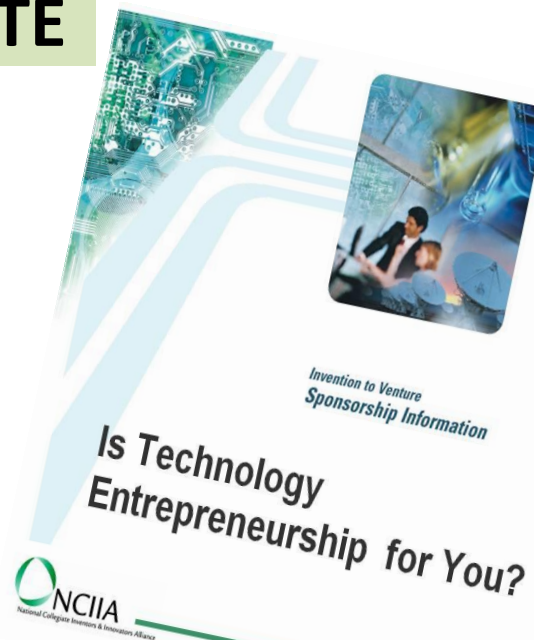
Are Entrepreneurs Born or Made?
Two-thirds of entrepreneurs claim they were inspired by innate desire, not education or training, according to a new survey.
By Leslie Taylor | Inc. | Oct 24, 2006

EDUCATE... TO INNOVATE

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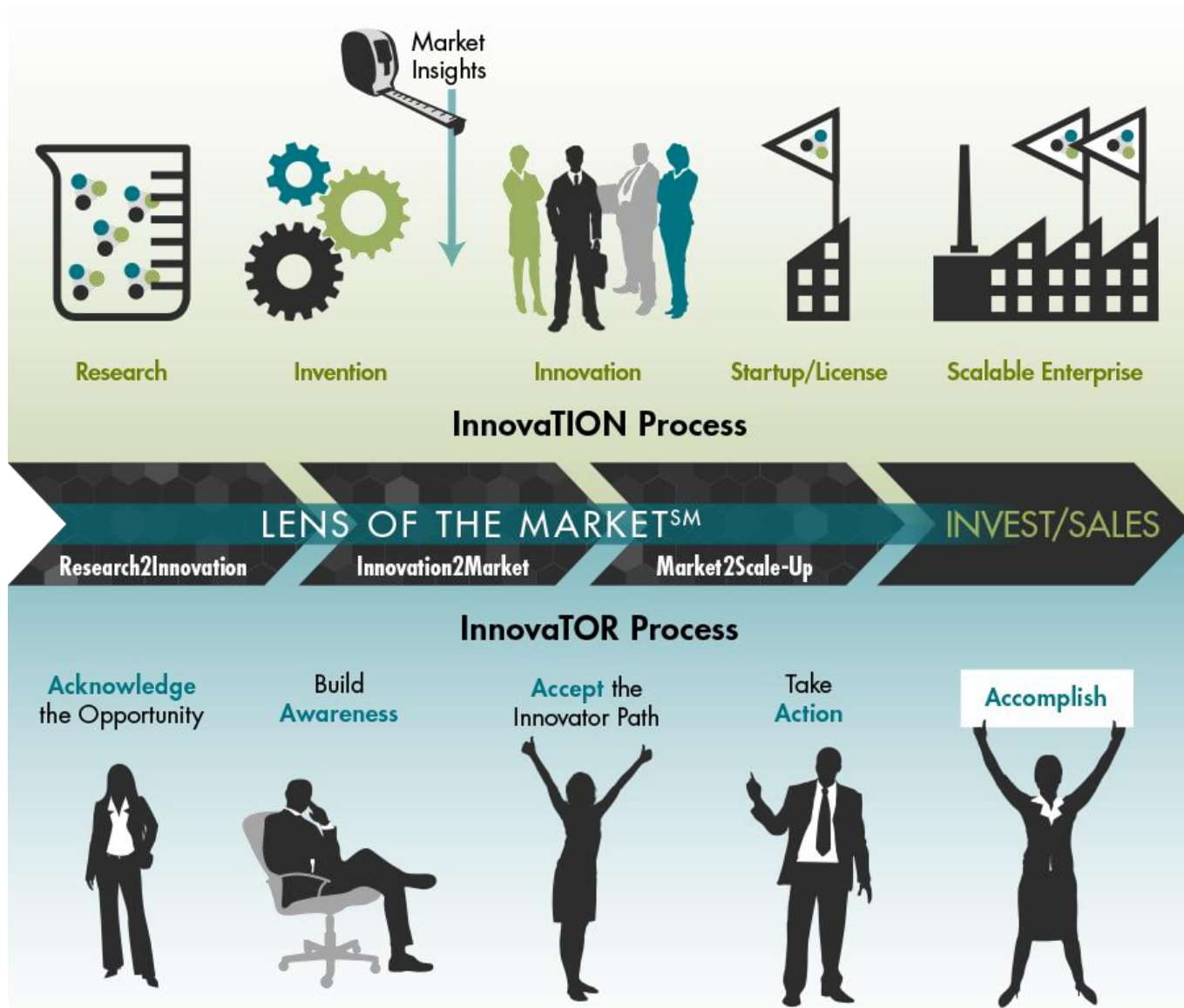
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By Leslie Taylor | Inc. | Oct 24, 2006

Hundreds of \$Millions in Grants
Thousands of Students & Professors



Entrepreneurship and
Business Courses
One Tech Transfer Office and
Accelerator (maybe)

InnovaTORS and InnovaTIONS



	Research2Innovation → 1 Day	Innovation2Market → 3-6 Months	Market2Scale-Up → 3-6 Months
Vocabulary building	✓	→ Ongoing development	
Identification of innovations & platform technologies	✓	→ Ongoing development	
Market/Gap analysis		✓	→ Ongoing development
Research Plan		✓	→ Ongoing development
Executive summary			✓
Business model/go-to-market plan			✓
Sales and marketing plan			✓
Operations plan			✓
Team (and team development)			✓
Financials			✓
Financing plan			✓





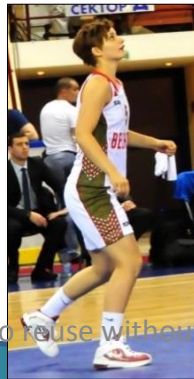
ECONOMIC
DEVELOPMENT



**University
Research**



**Technology
Commercialization**



**People and
Careers**



ECONOMIC DEVELOPMENT



**University
Research**



**Technology
Commercialization**



**People and
Careers**

Thank you



Judith Giordan

Managing Director - ecosVC, Inc

CTO – Qteros, LLC

Co-Founder – Chemical Angel Network

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