Commercializing University Innovations:
Pathways & Practices

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Agenda: 30 minute talk + 30 minute Q & A

1. Framework for How Univ Innovations Get Commercialized
   - The 4Ms: Morphed, Mined, Milked & Marketed
   - University startup spin-outs versus blast-outs

2. Bifurcation of Activities that Drive & Support Commercialization
   - Systematic activities that have an asymptotic impact
   - Organic activities that have an exponential impact (and are cost-effective)

3. Value of Univ Local Innovation Ecosystems
   - Definition & segmentation
   - Strategic value to university

4. Framework & Strategy for Growing Univ Innovation Ecosystems

5. How Univ Ecosystems Scale Talent & Reach Supercritical Mass

6. Hy-LIE 10 Best Practices & 5 Predictions
Question: *How Do Univ Innovations Get Commercialized?*

- Conventional answer (in 2006) was linear
  (research=>invention=>license =>commercialize)

- What and/or who catalyzed the commercialization?

- How are universities involved in the process?

- How can universities increase startups?
Research: **Studied Over 50 Technologies**

- **Institutions:** UC Berkeley & Berkeley Lab
- **Sectors:** Information technology, life sciences, clean tech
- **Scenarios:** Success & failures
- **Cases Studies:**
Results: *The 4Ms of Univ Innovation Commercialization*

- Identified 4 common patterns/pathways
- Developed strategies for optimizing the 4 pathways
- Strategies led (in part) to:
  - BerkeleyStartupCluster.com in 2009
  - QB3 East Bay Innovation Center in 2010
  - The Skydeck in 2011
4Ms Framework: 4 Pathways for Commercialization

- **Mined**: Methodically out of research by corporate collaborators
- **Morphed**: Gradually out of research by team member(s)
- **Milked**: Opportunistically by entrepreneurs (e.g. MBA students) that scour campus
- **Marketed**: Periodically to industry by campus (e.g. PI, PR, IPMO, etc)

**Organic Activities** by University & External People

**Systematic Activities** by University Employees

Hyper-Local Innovation Ecosystem
4Ms Framework: *Morphed, Mined, Milked, Marketed*


- **Drivers:**
  - Quantity & Quality of Research
  - Ecosystem: Spin-out vs Blast-out

- **IP:**
  - Some obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP
4Ms Framework: Morphed, Mined, Milked, Marketed

- **Examples:** Adura Tech (Acuity), Aurora Biofuels, CommandCAD, Euclid Media, MediFuel, NanoRay, nanoPrint
- **Drivers:**
  - Quantity & Quality of Research
  - MBAs, Biz plan comp, OTL mrktg
- **IP:**
  - Many obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP
- **Comments:**
  - Pathway with highest growth rate
  - Many campus EIRs are MBA students
4Ms Framework: *Morphed, Mined, Milked, Marketed*

- **Examples (that licensed IP):**
  - Analog Devices, Nueprene (XL Tech), Google (streetscape), Honeywell, Intel, Berkeley Bionics (first morphed then milked)

- **Drivers:**
  - Great sponsored research with optimized terms (i.e. 1st access, NERF, open source, etc)
  - Off-campus corporate labs (i.e. BWRC, Intel, Cadence, Yahoo, Starkey, etc)

- **IP:**
  - Some jointly own IP
  - Some obtain a license to legally use IP or thwart competitors
  - Some ignore or abscond with IP (why license when get know-how)
4Ms Framework: *Morphed, Mined, Milked, Marketed*

- **Examples:** Arkal Medical, Cisco, ClimateCooler, FuelFX, Luminus Devices (laser lift-off), Honeywell, Microchip Biotech, Renovis, Sand9, Silicon Basis, Solexel, Vitesse, 3M

- **Drivers:**
  - Quantity & Quality of Research
  - Marketing (i.e. IP Licensing offices, University PR programs, Faculty pubs & ppts, Patent pubs, etc)

- **IP:**
  - Most obtain exclusive license to stay legal, improve BP, attract investment, or thwart competitors
  - Some ignore IP or abscond with IP

- **Comments:** Didn’t get morphed, milked or mined because tech or market too nascent when invented

Periodically to industry by campus faculty & staff (e.g. PI, PR, OTL)
**4Ms Framework: Partial List* of >100 Start-ups**

*This is a list of the over 100 start-ups that have leveraged UC Berkeley intellectual property rights (i.e. patentable inventions or copyrightable software) since about the mid 1990s. These start-ups have used UC Berkeley's intellectual property (IP) rights to strengthen their business plans and thereby improve their prospects for obtaining the venture capital or other funding needed to pursue the commercialization of Berkeley innovations.

Note that this list does not include the numerous start-ups that have commercialized UC Berkeley innovations but did not leverage any UC Berkeley IP rights (because the innovations don't have associated IP rights – such as UNIX, SPICE, RAID, etc).

<table>
<thead>
<tr>
<th>Acacia Biosciences</th>
<th>DNA Sciences</th>
<th>Libraria</th>
<th>Protiveris</th>
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<tbody>
<tr>
<td>Adura Technologies</td>
<td>Ecoprene</td>
<td>Light Stage</td>
<td>Q-Chem</td>
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<td>Alien Technologies</td>
<td>Euclid Media</td>
<td>Lumiphore</td>
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<td>Ambrx</td>
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<td>Amyris Biotechnologies</td>
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<td>Bandwidth9</td>
<td>FLX Micro</td>
<td>Microchip Biotechnology</td>
<td>Rubicon Digital Mapping</td>
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<td>Berkeley Bionics</td>
<td>Fluxion Biosciences</td>
<td>Micro Climates / Aptility</td>
<td>Secured Streams</td>
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<td>Fuel FX</td>
<td>MicroFab Biosystems</td>
<td>SenSys Networks</td>
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<td>Genocea Biosciences</td>
<td>MicroReactor Systems</td>
<td>Silicon Basis</td>
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<td>Gold Mountain Research</td>
<td>Molecular Dynamics</td>
<td>Silicon BioDevice</td>
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<td>BeThere</td>
<td>Goodguide</td>
<td>MOR Innovations</td>
<td>Silicon Clocks</td>
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<td>Biomanagement Group</td>
<td>Harmonic Devices</td>
<td>NanoGripTech</td>
<td>Silicon Genesis</td>
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<td>Bioscale</td>
<td>Covararium/Heath Interactive</td>
<td>NanoNerve</td>
<td>Similix</td>
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<td>BPS</td>
<td>HFTA</td>
<td>NanoRay</td>
<td>Solexel</td>
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<td>Integrated Diagnostics</td>
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<td>OmniOx</td>
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<td>InVino Sense</td>
<td>Oncobionic</td>
<td>Target Analytics</td>
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<td>Cognitive Wearable Technologies</td>
<td>Iris Micromedical</td>
<td>ON Diagnostics</td>
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<td>Cooler</td>
<td>Isatis</td>
<td>Onix Microsystems</td>
<td>TruVideo</td>
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<td>Joule Biotechnologies</td>
<td>OnWafer Technologies</td>
<td>Tularik</td>
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<td>Colusa Software</td>
<td>Juvenon</td>
<td>Oswald Green</td>
<td>Two Blades (Foundation)</td>
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<td>Cyberpac</td>
<td>Kaiwood Technologies</td>
<td>Photoswitch Biosciences</td>
<td>Urban Scan</td>
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<td>Davis Allergy Research</td>
<td>Kalinex</td>
<td>Preference Metrics</td>
<td>Ventria Biosciences</td>
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<td>KineMed</td>
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<td>Videnda</td>
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<td>Leucadia Technologies</td>
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<td>Vitapath Genetics</td>
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<td>Wireless Industrial Tech</td>
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<td>Xenometrix</td>
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4Ms Framework: University Startups

Systematic

Organic

Morphed

Mined
University Startups: *Spin-outs vs Blast-outs*

**SPIN-OUT Examples:** Amyris, CaliSolar, Chiron, Ensignta Security, GoodGuide, Inktomi, IntelliOne, Mercator Med, OnWafer, ON Diagnostics, Safely, TriFacta, Dust Networks

**Blast-OUT Examples:**

- ~20% of Startups
- ~80% of Licensing Revenue

**Benefit from University Resources**
- (e.g., Biz Plan Competitions, Incubators/Accelerators, Mentor Networks, etc)

**Organic vs Systematic**

- Morphed
- Mined
### Research: What Campus Activities Drive the 4Ms?

<table>
<thead>
<tr>
<th>Pathways (4Ms)</th>
<th>Activities, Catalysts, Programs, Initiatives</th>
<th>Recent Progressive Approaches</th>
<th>Offices</th>
<th>Ideas &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphed</td>
<td>• Entrepreneurship classes</td>
<td>• On-campus incubators co-located with special lab facilities</td>
<td>• CET (CoE)</td>
<td>• SBIR/STTR help center</td>
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<td></td>
<td>• On-campus Incubators</td>
<td></td>
<td>• Haas (MOT, Lester)</td>
<td>• Berkeley Startup Cluster</td>
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<td>• Entrepreneurial Admissions</td>
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<td>• OTL</td>
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<td>• Entrepreneurial Culture</td>
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<td>Mined</td>
<td>• Entrepreneurial MBA Program (EIRs)</td>
<td>• Cleantech-2-Market Course</td>
<td>• Haas (Lester)</td>
<td>• Berkeley Startup Cluster</td>
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<td></td>
<td>• Biz Plan &amp; Tech Competitions</td>
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<td>• OTL</td>
<td>• Berkeley Center for Growth Companies</td>
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<td></td>
<td>• Research-to-Market Courses (C2M)</td>
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<td>• CoE</td>
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<td>• Seminars &amp; Poster Sessions (YAPS)</td>
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<td>• CITRIS</td>
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<td>• Haas Speaker Series &amp; VC Office Hours</td>
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<td>• QB3</td>
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<td></td>
<td>• Haas Bancroft Incubator</td>
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<td>• Student Clubs (BERC)</td>
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<td>Milked</td>
<td>• Institutional response to RFPs</td>
<td>• Research-Oriented Approach to Managing IP rights (e.g. NERFs, BIP, SRA IP grants, etc)</td>
<td>• VCRO</td>
<td>• Adjacent R&amp;D Office Parks/Buildings</td>
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<td></td>
<td>• Opportunistic PIs</td>
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<td>• IPIRA (IAO &amp; OTL)</td>
<td>• Research Enterprise Marketing</td>
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<td>• Sponsored Research Agreements</td>
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<td>• Visiting Industrial Fellows</td>
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<td>• CITRIS</td>
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<td>• Faculty Consulting &amp; Student Hiring</td>
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<td>• QB3</td>
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<td>Marketed</td>
<td>• Newsletters &amp; Press Releases</td>
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<td>• CoE</td>
<td>• EBGC Customer Cred Program</td>
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<td>• Searchable Web Listings</td>
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<td>• OTL</td>
<td>• EBGC Cluster Clubs</td>
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<td></td>
<td>• Serial Entrepreneur &amp; VC Discussions</td>
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<td>• NewsCenter</td>
<td>• Email Mktg</td>
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<td></td>
<td>• Scholarly Publications &amp; Presentations</td>
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**Note:** The table above outlines various pathways and activities that drive different stages of commercialization (Morphed, Mined, Milked, Marketed) along with recent progressive approaches and offices responsible for each stage. Ideas & Comments section highlights additional activities and support systems in place to aid in the commercialization process.
Bifurcate Campus Activities: Systematic & Organic

Systematic via Programs & Practices
- Searchable web listings
- Proactive marketing
- Biz plan competitions
- Lab-to-market courses
- Events & poster sessions
- IP rights agreements, etc

Organic via Hyper-Local Innovation Ecosystem
- Startups & established corps
- Private startup incubators
- Tech vets & entrepreneurs
- Early stage investors
- Vet, mentor, staff, fund, partner, etc
Bifurcate Campus Activities: Systematic & Organic

**Systematic via Programs & Practices**
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**Organic via Hyper-Local Innovation Ecosystem**
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**Market-Driven**
The extent that the market drives the transition from research to product

**University-Driven**
The extent that the university drives the transition from research to product
Systematic v Organic: Impact - Asymptotic v Exponential

Systematic via Programs & Practices
- Searchable web listings
- Proactive marketing
- Biz plan competitions
- Lab-to-market courses
- Events & poster sessions
- IP rights agreements, etc

Organic via Hyper-Local Innovation Ecosystem (Hy-LIE)
- Startups & established corps
- Private startup incubators
- Tech vets & entrepreneurs
- Early stage investors
- Vet, mentor, staff, fund, partner, etc

University-Driven
The extent that the university drives the transition from research to product

Contrived*
- Incorporating
- Branding (logos)
- Housing
- Capitalizing
- Quasi-Staffing

* Suboptimal use of funding & resources
* Can’t force winners
* Baby vs facilitate entrepreneurs

Market-Driven
The extent that the market drives the transition from research to product

High
Moderate
Moderate
High
Too High
Systematic v Organic: Comparing Position & Potential

Market-Driven
The extent that the market drives the transition from research to product

University-Driven
The extent that the university drives the transition from research to product

- Suboptimal use of funding & resources
- Can’t force winners
- Baby vs facilitate entrepreneurs

Organic via Hy-LIE
- Stanford, UCSF
- MIT-Harvard

Systematic via Practices
- UC Berkeley-LBNL
- UT Austin
- Georgia Tech
- CMU
- UCD
- Cornell
- University of Iowa

High

Moderate

Too High

High

Moderate

Moderate
Hyber-Local Innovation Ecosystem (Hy-LIE): Definition

University Hyper-Local
Innovation Ecosystem:
Cluster of R&D-oriented entities readily accessible to the campus – including small & large corps, tech vets, entrepreneurs & early stage investors as well as related supply chains & service providers.

Hyper Local: Convenient: walk, bike, shuttle or short drive (with easy parking)
Local: Less than 30 minutes drive + easy parking
Metro: About 30-60 minutes + commuter traffic
Regional
National
Global

Accessibility (not just Proximity) to Campus
Hy-LIE: **Strategic Value to University**

**Relationship-Driven Opportunities for the University’s Mission**

- **High**
- **Accessibility (not just Proximity) to Campus**

**Innovation Ecosystem**

(introductions > relationships > collaborations)

- **Hyper Local:**
  - Convenient: walk, bike, shuttle or short drive (with easy parking)

- **Local:**
  - Less than 30 minutes drive + easy parking

- **Metro:**
  - About 30-60 minutes + commuter traffic

- **Regional**
- **National**
- **Global**
Hy-LIE: Bolster Research, Education & Tech Xfer

1. Sponsored research from established corporations
2. Sponsored research from young companies (via STTR & SBIR)
3. Commercialization of campus innovations (& licensing of IP)
4. Experiential learning, careers & internships for students
5. Advisory board & consulting roles for faculty
6. Visiting Industry Fellows
7. Entrepreneurs in Residence (on-campus)
8. Customers for campus-based service facilities
9. *Advantages to attract & retain top faculty & students
10. Serendipitous discussions: researchers, entrepreneurs, investors

* See white paper: University Hy-LIEs: Grow, Move or Decline

Accessibility to Campus

Hyper Local: Convenient: walk, bike, shuttle or short drive (with easy parking)
Local: Less than 30 minutes drive + easy parking
Metro: About 30-60 minutes + - commuter traffic
Regional
National
Global
Hy-LIE: Third Level of Ecosystem Development

**Education Mission**

(HYPER) LOCALIZE  
commercialization of innovations from Berkeley research  
(*i.e. innovation centers for startups & nurturing ecosystem*)

**Research Mission**

ACCELERATE  
commercialization of innovations from Berkeley research  
(*i.e. biz plan competitions & lab-to-market courses*)

CATALYZE  
commercialization of innovations from Berkeley research  
(*i.e. license IP*)

**Service Mission:**  
(including economic vitality & quality-of-life via commercializing university innovations)
In 2015, UCB VCRO convened monthly meetings of campus innovation ecosystem

- What are UCB ecosystem’s strengths & weaknesses?
- What are other university ecosystems doing well?
- How can UCB improve?
- Is UCB ecosystem too disorganized?
- Is UCB TTO (IPIRA) doing enough?

Carol & I made some strategic observations

- Some are slightly controversial or somewhat non-intuitive
- So, did research to assess observations & articulated observations in a paper

Is this Good?
Can it be Better?
Research: Approach

- Forbes ranked “America’s Most Entrepreneurial Universities”
- Researched correlation between Forbes ranking &:
  - Human talent
  - Ecosystem structure
    (- Leadership by TTO vs Academic Units)
- People talent (2)
  based on:
  - ARWU (Shanghai) ranking of engineering programs
  - US News ranking of MBA programs
- Ecosystem structure (3)
  based on web searches using key words such as “entrepreneurship” and “startups”
Research: Data in Paper

- Stanford
  - Engineering #2
  - MBA #2
  - Entrepreneurship #1

- MIT
  - Engineering #1
  - MBA #5
  - Entrepreneurship #2

- UC Berkeley
  - Engineering #3
  - MBA #7
  - Entrepreneurship #3

- UT Austin
  - Engineering #5
  - MBA #17
  - Entrepreneurship #22

- UMich AA
  - Engineering #8
  - MBA #11
  - Entrepreneurship #43

- UC Irvine
  - Engineering #51
  - MBA #53
  - Entrepreneurship #not in ranking
Research: *Data Additions*

- **Cal Tech**
  - Engineering #20
  - MBA #NA
  - Entrepreneurship #6
  - Org

- **Columbia**
  - Engineering #76-100
  - MBA #10
  - Entrepreneurship #NR
  - Org

- **Duke**
  - Engineering #51-75
  - MBA #12
  - Entrepreneurship #NR
  - Org

- **Harvard**
  - Engineering #25
  - MBA #1
  - Entrepreneurship #25
  - Org

- **Hopkins**
  - Engineering #76-100
  - MBA #NA
  - Entrepreneurship #NR
  - Org

- **Penn**
  - Engineering #76-100
  - MBA #4
  - Entrepreneurship #39
  - Org

- **UCSB**
  - Engineering #17
  - MBA #NR
  - Entrepreneurship #21
  - Org

- **UCSD**
  - Engineering #14
  - MBA #77
  - Entrepreneurship #48
  - Org

- **UFL**
  - Engineering #101-150
  - MBA #37
  - Entrepreneurship #NR
  - Org

- **UI**
  - Engineering #4
  - MBA #39
  - Entrepreneurship #NR
  - Org

- **UW**
  - Engineering #32
  - MBA #27
  - Entrepreneurship #45
  - Org

- **Yale**
  - Engineering #NR
  - MBA #8
  - Entrepreneurship #11
  - Org
Research: Framework

- Simplified model
- 2 axis & 4 quadrant
- No university had weak talent
- Decentralized doesn’t mean no coordination

Ecosystem Programs & Resources

Ecosystem Human Talent

Quadrant A: #1 Stanford, #2 MIT, #3 UC Berkeley
Quadrant B: #22 UT Austin, #43 UMich AA
Quadrant C: #NA UC Irvine
Quadrant D: 

Centralized

Moderate

Decentralized

High
Finding 1 of 4: *Ecosystem Structure*

- **Correlation:**
  - Top UIEs have strong talent & decentralized structure

- **Value of decentralization** not intuitive because it has trade-offs
  - Cost inefficiencies
  - Confusion (mitigated by web & concierge)

- **Why decentralized is optimal?**
  - Autonomy
  - Dynamism
  - Expertise
  - Private Sector

Diagram:
- Ecosystem Human Talent
  - Moderate
  - High

- Ecosystem Programs & Resources
  - Decentralized

Quadrant A:
- #1 Stanford
- #2 MIT
- #3 UC Berkeley
- #22 UT Austin
- #43 UMich AA
- #NA UC Irvine
Finding 2 of 4: *Ecosystem Leadership*

- Correlation: Top UIEs led by academic units, not VCRO / TTO (competitions, accelerators mentor/investor networks, etc)
- In comparison to TTO, academic units better at
  - Integrating UIE with student curriculum that maximizes experiential learning
  - Integrating UIE with alumni network
- If academic units don’t step-up, then TTO should
- Explains difference between VCRO / TTO at:
  - UC Berkeley, MIT, Stanford
  - UC Davis (#51, #48, NR) & UC Irvine
Finding 2: Academic Units vs Tech Xfer Office

<table>
<thead>
<tr>
<th>Ecosystem Leadership from Tech Transfer Office</th>
<th>Ecosystem Leadership from Engineering and/or Business Program</th>
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<tbody>
<tr>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Necessary to fill ecosystem leadership void</td>
<td>Conducive to overlapping programs that result in cost-inefficiencies &amp; confusion</td>
</tr>
<tr>
<td>- UC Irvine</td>
<td>- UC Berkeley</td>
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<tr>
<td>- UC Davis</td>
<td>- UC Berkeley</td>
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Ideal because of curriculum integration & student experiential learning opportunities

Cost-Saving Opportunities?
Finding 3 of 4: **Ecosystem Supply-Demand**

- Dispel myth that most universities have RCT that’s sitting-on-shelf (due to onerous TTOs & risk-averse VCs)
  - Tech not proven
  - Market too nascent
- In robust UIEs demand for RCT exceeds supply of RCT
  - Tech not proven
  - Market too nascent
- Strategy
  - More applied research & proof-of-concept funding
  - More lab-to-market courses (Cleantech to Market)
Finding 4 of 4: *Ecosystem Innovation-Drain*

- **Correlation:** Growth of UCB local tech cluster & growth of UCB ecosystem
- **UIEs not near tech clusters** incur innovation-drain that impedes achieving critical-mass of talent for robust UIE
  - Graduates & spinouts exit UIE
  - Brown (#7), Princeton (#8), Dartmouth (#9), Yale (#11), Penn (#39)
- **Strategies**
  - Grow a local tech cluster (UCB, UCLA, Harvard Allston)
  - Establish a branch campus in an existing tech cluster (Cornell, Wharton, CMU, UCD Business School)
Research: *Ecosystem Development Strategies*

- **Quadrant A:**
  - Minimize confusion via website & concierge
  - Minimize TTO overlap with academic units
  - Stay dynamic

- **Quadrant B:**
  - Facilitate multiple initiatives

- **Quadrant C:**
  - Local tech cluster?
  - Attract & retain talent via flagship programs & admissions

- **Quadrant D:**
  - Local tech cluster?
  - Consolidate activities
  - Create flagship program
  - Attract & retain talent

---

Ecosystem Human Talent

- Moderate
- High

Ecosystem Programs & Resources

- Centralized
- Decentralized

Quadrants labeled with corresponding strategies and human talent rankings.

1. Stanford
2. MIT
3. UC Berkeley
4. UT Austin
5. UMich AA
6. NA UC Irvine
University Innovation Ecosystem: Human Talent

- Quality, quantity & variety of human talent is key
- How do top univ ecosystems reach supercritical mass?
- Two paradigms for how students interact with campus:
  - **Waypoint campus**: matriculate, contribute, graduate & disperse
  - **Vortex campus**: matriculate, contribute, graduate & stay
    - Contribute to campus ecosystem throughout career
    - Discussing, hiring, mentoring, investing, licensing, researching, teaching, donating
    - Annual incoming students + grads remaining = supercritical mass
    - Eventually ecosystem attracts talent that is not affiliated with univ
    - Super University Metro Area I&E Ecosytem (SUMIEE):
      - MIT, Harvard, Cambridge & Boston
      - Stanford & Silicon Valley
      - UC San Francisco & upper San Francisco peninsula
      - UC Berkeley, Lawrence Berkeley National Lab & East Bay
Strategy: *Hy-LIE Effect on STEM-B Programs*

Rating of University STEM-B Programs

- High
- Not High

Status of Hyper-Local Innovation Ecosystem

- Weak
- Super-Critical Mass
Strategy: *Hy-LIE vs STEM-B Segmentation*

**Rating of University STEM-B Programs**

- **High**
  - Long-Term Competitive Disadvantage
    (Call-to-Action: Grow, Branch or Envy)
  - Sustainable Competitive Advantage
    (*Cultivate*)
- **Not High**
  - Long-Term Challenge
    (*Can’t Compete?*)
  - Long-Term Potential
    (*Catapult*)

**Status of Hyper-Local Innovation Ecosystem**

- **Weak**
- **Super-Critical Mass**
Strategy: Grow, Branch or Envy (Die)

Rating of University STEM-B Programs

High

Long-Term Competitive Disadvantage (Grow, Branch or Envy)
- Cornell branchING: NYC
- UPenn Wharton branchED: SV
- CMU branchED: SV

Sustainable Competitive Advantage (Cultivate)
- UC Berkeley growing
- MIT, Harvard, Stanford, UCSF

Not High

Long-Term Challenge (Branch)
- UCLA growing: Silicon Beach

Long-Term Potential (Catapult)
- Santa Clara University
- San Jose State University
- Singularity “University”

Status of Hyper-Local Innovation Ecosystem

Weak

Super-Critical Mass
Strategy: Univ Ratings Based on Many Factors

<table>
<thead>
<tr>
<th>Rating of University STEM-B Programs</th>
<th>Long-Term Competitive Disadvantage (Grow, Branch or Envy)</th>
<th>Sustainable Competitive Advantage (Cultivate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>- Yale (New Haven CT)</td>
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<td></td>
<td>- Hopkins (Baltimore MD)</td>
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<td>- Princeton (Princeton NJ)</td>
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<td>- Dartmouth (Hanover NH)</td>
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<td></td>
<td>- Brown (Providence RI)</td>
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</tr>
</tbody>
</table>
Strategy: *Dilemma for Some Public Univs*

Rating of University STEM-B Programs

- **High**
  - Difficult to grow Hy-LIE in state & Can’t branch to Hy-LIE out of state
  - MI > ?
  - WI > ?
  - UCD > ?
  - UCSB > ?

- **Not High**
  - IL > Chicago
  - NY > NYC
  - CO !! Boulder
  - TX !! Austin

Status of Hyper-Local Innovation Ecosystem

- Super-Critical Mass
- Weak
Hy-LIE: 10 Best Practices to Foster University Hy-LIEs

1. **Students & Faculty**: Entrepreneur-oriented MBA & tech management programs – from admissions, to curriculum, to culture

2. **Mixers**: MBA, engineering & applied sciences events: yet-another-poster session (YAPS), seminar series, etc – even across nearby institutions (i.e. UCB & LBNL)

3. **Competitions**: startups, tech innovations, big ideas (no more business plan competitions)

4. **Research-to-Market Courses**: Project-based classes with interdisciplinary teams that research market opportunities for selected tech (i.e. UCB’s Cleantech-to-Market course)

5. **University startup accelerators** (i.e. Skydeck & Foundry) & idea incubators

6. **Office park(s)** for mature corps to leverage university & act as an anchor for startups

7. **IP Management** with an “impact-oriented approach to IP” (not just $)

8. **University resources** (not just IP rights): students as workforce; faculty as advisors; alumni as mentors; the university as an early (beta) customer to help establish a startup’s credibility in its market

9. **Startup service packages** (with local biz): legal, finance, SBIR, etc

10. **Partnering**: university, local biz & gov (i.e. BerkeleyStartupCluster.net)

- **Not**: University funding of startups (that circumvents organic vetting process, & is different from proof-of-concept (POC) funding)
Hy-LIE: 5 Predictions on Hy-LIE Impact

1. Research universities will have a campus startup accelerator (just as they have libraries, sports stadiums, fitness centers & student centers)

   1b. Many universities with accelerators will establish “University Startup Accelerator Stock Equity (U-SASE) programs to monetize the support provided to startups

2. Many research universities will have campuses located in 1 or more leading Hy-LIEs (analogous to how many US corporations became multinational entities)

3. Many research universities will have economic development collaborations with their local governments (many already do)

4. Many research universities will have an employee responsible for local innovation ecosystem development

5. Hy-LIE attributes will become a new metric by which to evaluate & rank research university excellence (this will be problematic for some public universities that can’t grow or branch)
Agenda: Q & A
Research, Education & Support Programs

Periodic Boot Camps, Competitions, Events & Seminars

Investor, Mentor & Alumni Networks

Student & Postdoc Groups

Incubators, Accelerators & Co-Work Spaces
Bio: Commercializing Leading-Edge Technology

1. Engineering undergraduate degree
2. Systems Engineer @ HP (back when most admired company)
3. MBA degree
4. Sun Microsystems Inc (product manager)
5. Mips Computer Systems Inc (product line manager)
6. Silicon Graphics Inc (product family of servers, $100M revenue)
7. Netpulse Networks Inc (co-founder, $10M+ in venture funding)
8. Peak Democracy Inc (co-founder, bootstrapped lean startup)
9. UC Berkeley
Bio: UC Berkeley Research, Concepts & Initiatives

RESEARCH (1)
How Do University Innovations get Commercialized?

RESEARCH (2)
4Ms Framework (morphed, mined, milked, marketed)

RESEARCH (3)
How to Maximize Commercializable University Innovations?

RESEARCH (4)
How to Maximize the Commercializing of University Innovations?

RESEARCH (5)
UC Berkeley esp STEM-B
- Total Mission Integration
- Grow, Move, or Die

UC Berkeley Research & Ecosystem Segmentation / Strategy

EXPERIENCE (6)
City of Berkeley Especially Downtown & West Berkeley

EXPERIENCE (7)
Exponential Impact of the Hyper-Local Innovation Ecosystem (vs Asymptotic Impact of Systematic Programs)

EXPERIENCE (8)
Research-Oriented Approach to Managing University IP

EXPERIENCE (9)
University Research & Ecosystem Segment Strategy

EXPERIENCE (10)
Berkeley Angel/Mentor Network
- Berkeley Skydeck IT Accelerator
- QB3 East Bay Wetlab Incubator
- Berkeley Startup Cluster . com
- Building Owner Edu Campaign
- East Bay Green Corridor

EXPERIENCE (11)
How Do University People Start Companies?

EXPERIENCE (12)
- Uber-Founder or Co-Founder

11/5/16 UC Berkeley Innovation Commercialization Page 45