2017 Global Venture Lab:
Tech Transfer Perspective

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University Mission

Education Mission

Research Mission

Service Mission:
(including economic vitality & quality-of-life via commercializing university innovations)
University Mission: *Tech Transfer*

**Education Mission**

**Research Mission**

**Tech Transfer**

**Service Mission:**
(including economic vitality & quality-of-life via commercializing university innovations)
University Mission: 3 Tiers of Tech Transfer

Education Mission

Research Mission

(Hyper) Localize
commercialization of innovations from Berkeley research
(i.e. innovation centers for startups & nurturing ecosystem)

Acclimate
commercialization of innovations from Berkeley research
(i.e. startup competitions & lab-to-market courses)

(ACCELERATE)
catalyze commercialization of innovations from Berkeley research
(i.e. license IP)

Service Mission:
(including economic vitality & quality-of-life via commercializing university innovations)
Agenda: 10 Minute Talk + 5 Minute Q & A

1. *Research*: How University Innovations Get Commercialized
2. *Observation*: Vortex Versus Waypoint Universities
3. *Prediction*: Strategic Value of Local Innovation Ecosystems
Research: How Do Univ Innovations Get Commercialized?

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

- What is the starting point?

- How are universities involved?

- How can universities increase startups?

![Diagram showing the stages of technology development from research to marketing.](image)
Research: Studied >50 Cases of Tech Commercialization

- 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 starting point patterns
- Developed strategies for optimizing the 4 starting points
- Strategies led (in part) to:
  - BerkeleyStartupCluster.com in 2009
  - QB3 East Bay Innovation Center in 2010
  - The Skydeck in 2011
Framework: *4M Starting Points 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

Hyper-Local Innovation Ecosystem

Systematic Activities by University Employees
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
Recent 5th Starting Point: *Migrated*

- **Examples:** TBD
- **Drivers:**
  - Student admissions?
  - Faculty recruitment?
- **IP:**
  - Probably not owned by UC
  - Collaborate with previous institution
- **Comments:**
  - Growing pathway
  - Has lots of merit for UCB ecosystem (a form of importing innovation)
# Research: What Campus Activities Drive the 4Ms?

<table>
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<tr>
<th>Pathways (4Ms)</th>
<th>Activities, Catalysts, Programs, Initiatives</th>
<th>Recent Progressive Approaches</th>
<th>Offices</th>
<th>Ideas &amp; Comments</th>
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<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>• 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>• 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,</td>
<td>• VCRO</td>
<td>• Adjacent R&amp;D Office Parks(Buildings)</td>
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<td>• Opportunistic PIs</td>
<td>SRA IP grants, etc)</td>
<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>• CoE</td>
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<td>• Visiting Industrial Fellows</td>
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<td>• Faculty Consulting &amp; Student Hiring</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>• EBGC Cluster Clubs</td>
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<td>• Serial Entrepreneur &amp; VC Discussions</td>
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<td>• NewsCenter</td>
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<td>• Scholarly Publications &amp; Presentations</td>
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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
- Startups & established corps
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Market-Driven
The extent that the market drives the transition from research to product

Moderate
High

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

Moderate
High
Systematic v Organic: Impact - Asymptotic v Exponential

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

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

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**High**

| Organic via 
Hyper-Local Innovation Ecosystem (Hy-LIE) |
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<tr>
<td>Startups &amp; established corps</td>
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**Systematic via**
Programs & Practices

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

**Contrived**

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

---

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

- **High**
  - Stanford, UCSF, MIT-Harvard
  - UC Berkeley-LBNL
  - UT Austin
  - Georgia Tech
  - CMU
  - UCD
  - University of Iowa

- **Moderate**
  - Cornell

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

**Accessibility (not just Proximity) 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: **Strategic Value to University**

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

- **High Accessibility (not just Proximity) to Campus**
  - **Hyper Local:** Convenient: walk, bike, shuttle or short drive (with easy parking)
  - **Local:** Less than 30 minutes drive + easy parking
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**Innovation Ecosystem**
(introductions > relationships > collaborations)
Hy-LIE: Bolster Research, Education & Tech Xfer

1. Commercialization of campus innovations (& licensing of IP)
2. Sponsored research from established corporations
3. Sponsored research from young companies (via STTR & SBIR)
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. Serendipitous discussions: researchers, entrepreneurs, investors
10. *Advantages to attract & retain top faculty & students

* 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
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Innovation Ecosystem
(introductions > relationships > collaborations)

Relationship-Driven Opportunities for the University’s Mission

High

Grow

UC Berkeley Innovation Commercialization 8/23/18
Hy-LIE: A Key Attribute of Planet’s Top Hy-LIEs

Supercritical Mass of Human Talent:
scientists, engineers, management, manufacturing, marketing, finance, etc

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

Innovation Ecosystem
(introductions > relationships > collaborations)

Relationship-Driven Opportunities for the University’s Mission

Grow

High
Supercritical Mass: *Waypoint Versus Vortex Univ.*

**Supercritical Mass of Human Talent:**
- scientists
- engineers
- management
- manufacturing
- marketing
- finance
- etc
Waypoint University: *Subcritical Mass of I&E Talent*

Year after year of incoming I&E talent:
- Undergrads
- Grad students
- Post docs
- Visiting scholars
- Entrepreneurs in residence

Most disperse after completing their academic program, and consequently they don’t contribute to building the university’s critical mass of high quality, diversified I&E talent.
Year after year of incoming I&E talent:
- Undergrads
- Grad students
- Post docs
- Visiting scholars
- Entrepreneurs in residence

Most stay near the university to work and live, and thereby contribute to building the university’s critical mass of I&E talent

Most don’t disperse after completing their academic program
Vortex University: *World-Class I&E Ecosystem*

From Ivory Tower to IPO

- Undergrads
- Grad students
- Post docs
- Visiting scholars
- Entrepreneurs in residence

Most stay near the university to work and live, and thereby contribute to building the university’s critical mass of I&E talent.

Most don’t disperse after completing their academic program.
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

Super-Critical Mass

UC Berkeley Innovation Commercialization

8/23/18
Strategy: Grow, Branch or Envy (Die)

Rating of University STEM-B Programs

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<thead>
<tr>
<th>High</th>
<th>Sustainable Competitive Advantage (Cultivate)</th>
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<tr>
<td>Cornell branchING: NYC</td>
<td>MIT, Harvard, Stanford, UCSF</td>
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<td>UPenn Wharton branchED: SV</td>
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<td>UCLA growing: Silicon Beach</td>
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<tr>
<td>CMU branchED: SV</td>
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<tr>
<td>Weak</td>
<td>Long-Term Potential (Catapult)</td>
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<td></td>
<td>Santa Clara University</td>
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<td>San Jose State University</td>
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<td>Singularity “University”</td>
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Long-Term Competitive Disadvantage (Grow, Branch or Envy)

Long-Term Challenge (Branch)

Status of Hyper-Local Innovation Ecosystem

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

Rating of University STEM-B Programs

- Yale (New Haven CT)
- Hopkins (Baltimore MD)
- Princeton (Princeton NJ)
- Dartmouth (Hanover NH)
- Brown (Providence RI)

Long-Term Competitive Disadvantage *(Grow, Branch or Envy)*

Sustainable Competitive Advantage *(Cultivate)*

Status of Hyper-Local Innovation Ecosystem
Strategy: Dilemma for Some Public Univs

Rating of University STEM-B Programs

- MI > ?
- WI > ?
- UCD > ?
- UCSB > ?

Difficult to grow Hy-LIE in state & Can’t branch to Hy-LIE out of state

- IL > Chicago
- NY > NYC
- CO !! Boulder
- TX !! Austin

Status of Hyper-Local Innovation Ecosystem

Super-Critical Mass
Agenda: Q&A + Follow-up

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