Intellectual Property Strategies for New Berkeley Ventures: A Framework

Engineering Leadership Technical Brief – Summary
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This is a companion document summarizing the findings of “Intellectual Property Strategies for New Berkeley Ventures: A Framework.”
To view the full study, visit: cet.berkeley.edu/translational-research

Our Findings

Here, we have identified the most salient viewpoints obtained by collecting anecdotes and advice from successful technology entrepreneurs at UC Berkeley:

1. **IP + Idea ≠ Startup:** Misconceptions of this theme are common. Having a breakthrough invention from Berkeley does not necessarily result in successful startup. Our entrepreneurial experts emphasized that building a startup is much more than developing the core technology or process.

   “Creating a product requires a huge amount of investment. Creating an invention just requires a paper and pen.”

   Pravin Varaiya, UC Berkeley Professor Emeritus of Electrical Engineering and Computer Science, Co-Founder and board member of Sensys Networks, Inc.

As a company forms, its trajectory moving forward will derive from four dynamic components: the venture’s team and stakeholders, resources, technology, and customers. A new venture’s intellectual property strategy will arise from the company’s activities on all four fronts, and as the nature of these components continually change, the startup’s IP strategy will necessarily adapt over time.

![Fig. 1. Venture Creation and IP Strategy](source)

Source: Center for Entrepreneurship and Technology
2. Regarding IP strategies for Berkeley startups, one size definitely does not fit all. *Research centers, in particular, have different and very specific IP policies that reflect the culture and history of each microenvironment.*

3. We identified two primary IP strategies and one emerging trend used by Berkeley entrepreneurs to launch ventures. The pathways are characterized by the startup's initial competitive advantage. As was encouraged by our interviewees, one of the best methods of understanding various IP strategies is to learn from analogies. Here we summarize the three IP strategies and their case studies used to illustrate how some Berkeley ventures have started ventures:

- **Know-how Model (No Initial IP):** Initial competitive advantage is primarily derived from the entrepreneur(s) know-how and expertise developed while at the University of California, Berkeley. Entrepreneurs using this model typically do not find a need to generate or secure IP prior to developing the company.
  
  - *Case Study: SiBEAM Inc.* Berkeley EECS Professor Emeritus Bob Brodersen and two of his graduate students decided to start SiBEAM, a fabless semiconductor company, after publishing over five years of technical breakthroughs and collecting unique know-how in CMOS processing for wireless communication at new frequency ranges. While at the university, all their research findings had been publicly disclosed in accordance with their research center's policy and consequently, no IP had been generated. The team went on to start the company confident that their know-how and hands-on expertise along with Professor Brodersen’s previous experience with startups would allow them to attract institutional funding and outrun the competition.

- **IP Protection Model (IP from UC Berkeley):** Initial competitive advantage is primarily derived from intellectual property developed, owned, and licensed from the University of California, Berkeley. Inventors using this model typically develop and secure IP prior to a company's formation, and entrepreneurs using this model typically license that IP from the University at the onset of their company's formation.
  
  - *Case Study: Mercator MedSystems, Inc.* Then Ph.D. student in Mechanical Engineering, Dr. Kirk Seward, and his research advisor, Professor Al Pisano, embarked on a project developing medical MEMS (microelectrical mechanical systems) to actuate micro needles on catheters. Together, Dr. Seward and Professor Pisano negotiated an exclusive license from the University for the core IP they had created. With an initial competitive edge derived primarily from their core IP as well as years of expertise and know-how, Dr. Seward and Professor Pisano were able to launch Mercator MedSystems, which utilizes the technology to address medical drug delivery applications.

- **Open Innovation Model (IP from Another Institution):** Initial competitive advantage is primarily derived from intellectual property licensed
from an outside institution along with the team’s ability to start and grow a company. This model has so far been less common, but may emerge as a strong trend in future.

- **Case Study: TerViva BioEnergy, Inc.** Naveen Sikka fortified his knowledge and passion for the clean energy sector through the Haas MBA program. While a student at Haas, he learned of research occurring outside of the Berkeley campus on a strain of trees that could be leveraged as environmentally responsible feedstock for biofuel. After researching and then recognizing the opportunity, he, along with his partners, started TerViva BioEnergy. Sikka steered TerViva’s initial IP strategy, which included the acquisition of licensing rights of key IP from research institutions outside of Berkeley.

![Company Timelines of Three Berkeley Ventures and their Initial Competitive Advantages](image)
4. **Intellectual property strategy is always evolving.** Initial IP strategies (for example, the know-how, IP protection, or open innovation models) designed to secure an initial investment can morph when startups subsequently need to build their competitive edge. Secondary IP strategies can include building a picket fence of IP to protect an original competitive advantage.

![Fig. 3. Comparison of IP Picket Fence Strategies](source: Center for Entrepreneurship and Technology)

5. **Our experts recommend academic researchers and inventors ask themselves these questions to better understand their own IP strategy.**

   - **What is my startup’s competitive advantage?**
     
     A company’s initial competitive advantage may derive primarily from a company’s know-how or IP.

   - **What are the IP strategy trends in my industry?**
     
     Our experts observed that a company’s IP strategy tends to follow trends established by its industry. There are many varying time-dependent cycles in technology commercialization: a drug can take 10-15 years to get to market, while a website can be built in 1 week. In between is the slow cycle of patenting, which can take from 2 to 5 years from “idea” to an issued patent. Reconciling these time frames feeds heavily into the type of IP strategy an entrepreneur might choose to practice.

   - **Is my startup first in class or entering a crowded space?**
     
     “One of the first things you want to address is what role does your fundamental innovation play in your IP strategy and what is its value? This is done by understanding whether your invention will be the ‘first in class’ or entering a busy space. If it is the former, then most VC’s will encourage a company to be aggressive in generating as much IP as
possible to ‘fill the whitespace’; however, if your technology is within the latter, you may find less incentive to depend on your fundamental IP and instead rely on licensing or execution.”

Jim Matheson, Lawrence Berkeley Lab’s Entrepreneur in Residence and General Partner at Flagship Ventures

• **How will my IP strategy affect my academic career?**

Most entrepreneurially minded faculty members have developed their own strategies for reconciling both their academic and entrepreneurial goals. By doing so, these academics have gained greater insight into executing high quality research, developing strong industrial collaborations, and successfully commercializing their work. Many of these entrepreneurially savvy and prolific academics were interviewed for this study.

• **How is my IP strategy affected by my obligations to the university?**

Some at Berkeley debate the efficacy of the IP licensing procedures on campus to promote innovation and high caliber research. At the heart of his debate is a fundamental question: at a research university, are employees obligated to generate IP?

• **How will my IP strategy affect my company?**

A company’s initial IP strategy may be a catalyst towards securing funding and building market value, but may also lead to unintended consequences.

“There is difficulty with expressing and determining value for an early stage company because nothing yet is meaningful. The potential product and business model is merely a hypothesis, and development is needed to understand this more clearly. This can lead to IP decisions and license agreements that can come back to haunt you later.”

Ilan Gur, UC Berkeley Ph.D. in Materials Science and Engineering ’06, Co-Founder of Seeo, Inc.

• **How does my IP strategy impact the world?**

“Berkeley has such a wonderful public interest focus. Sometimes we assume that means the right course of action is to place all innovations in the public domain. However, in areas like cleantech, we may be providing the greatest public interest by patenting things like new solar cells, or other low-carbon, high efficiency inventions that will help combat climate change. Otherwise, we may fail to attract the large investments over long periods of time required to develop products that will ultimately serve the public interest.”

Beverly Alexander, Director of Cleantech to Market (C2M), Energy Institute at Haas.
• **What is the right IP strategy for me?**

“There are many paths to salvation and each person has to pick their own path. Researchers should understand what the ground rules are; they should understand where you could begin to get into trouble. Know that you can succeed in an open path or an IP centric one; if you have the right sort of idea and pursue it correctly, you can be successful.”

John Huggins, Executive Director of the Berkeley Sensor and Actuator Center (BSAC)

6. **We collected the following best practices for entrepreneurs engaged in Berkeley’s invention disclosure, patent, and licensing processes.**

• **Know your obligations to the University:** Understand your obligations to the University. These obligations are described in the Patent Acknowledgement Form, signed by all University employees.

• **Timing is important:** Publishing a paper, giving a conference talk, or even participating in an enabling discussion are all considered public disclosures of an invention. A public disclosure of an invention triggers a clock in which provisional and full patent applications must be filed otherwise the rights to the IP are lost and the invention can be freely used by anyone in the public domain. Understand the nuances of timing, its implications in securing U.S. and foreign rights to IP that is generated, and your own academic obligations.

• **Be the champion of your invention:** Engaging with the Office of Technology Transfer and championing your invention will increase the likelihood of success in convincing the Office of Technology & Licensing (OTL) of its merits and potential impact. This may increase the chances of the OTL patenting your invention.

• **Read existing patents:** Before going through the patent process, read 10 patents. Understand its structure, language, and how to communicate the “non-obvious” aspects of your invention.

• **Work with experienced individuals:** A patent license negotiation is a long process and the many terms that are negotiated are complex. Experienced entrepreneurs, lawyers, investors, and faculty members with inside knowledge on the patent license negotiation can help guide new entrepreneurs through the arduous process.

• **Understand that Berkeley OTL is flexible:** The terms and types of agreements the OTL can provide a venture will reflect the startup’s situation and its intended progress. As a startup grows, its business will likely change, and the OTL is flexible in renegotiating terms to help the company succeed.
“I read the whole report. I think it is excellent. It documents the great flexibility of policies and practices at Berkeley. Faculty entrepreneurs have a real choice about how they proceed…I'd like to send this to a friend in Japan and one in France. They have been very interested in our practices.”

- David Hodges, Professor Emeritus of Electrical Engineering and Computer Science

“GREAT WORK…the strength is not only the insights you synthesized, but in one document you’ve combined perspectives of inventors, entrepreneurs, licensing specialists, academics, venture sources, students, and industry!”

- John Huggins, Executive Director of the Berkeley Sensor & Actuator Center (BSAC)

“A doctoral student in Materials Science, Christine Ho, has shown a lot of initiative and taken on a constructive solution-oriented study of these issues.”

- Kurt Keutzer, Professor of Electrical Engineering and Computer Science, Co-Founder of CommandCAD, Inc. and early contributor to more than 10 startups.

“This project was a fantastic idea and will itself be a valuable resource to would-be entrepreneurs on campus.”

- Michael Katz, Director of UC Berkeley’s Office of Intellectual Property & Industry Research Alliances (IPIRA)

“This is great. I'd like to have my students read it.”

- Kris Pister, Professor of Electrical Engineering and Computer Science, Co-Founder and Chief Technologist of Dust Networks, Inc.