Technology Transfer at Stanford University
Overview

• Technology transfer at Stanford University

• Silicon valley and the importance of the university

• How universities help

• How to get rich
University-Industry Technology Transfer

Mechanisms
- Graduated students
- Publications
- Seminars, conferences, etc.
- Faculty consulting
- Industry sponsored research
- Industrial affiliate programs
- Intellectual property licensing

Research results → Start-up companies and large corporations → New products in marketplace

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Office of Technology Licensing (OTL)

Mission
To promote the transfer of Stanford technology for society’s use and benefit while generating unrestricted income to support research and education.
Silicon Valley Today

Total revenues in the Valley $360 billion
  The 10 largest companies $200 billion
  The ~3000 small companies $30 billion

Stanford University spin-offs
  Of 3500 small companies 1000 are spin-offs
    Average # employees ~20
    Revenue per employee ~ $250k
    Total revenue for small spin-offs ~ $10 billion
  Of all large companies ~1/3 are spin-offs
    Total revenue for ~100 large companies $100 billion

$100 billion dollars in revenue or approximately half of the Silicon Valley revenue is spin-off from Stanford University.

The Question:

How many companies have used Stanford Technology either directly or indirectly in their business?

courtesy of Prof. Bob Byer, Stanford
The Answer

Of the >1000 Companies SPUN-OUT from Stanford University

ONLY 5%

Or

1 in 20

HAVE USED TECHNOLOGY DERIVED FROM Stanford University!!

courtesy of Prof. Bob Byer, Stanford
Universities Benefiting Technology Exploitation

- Universities can stimulate the economy because
  - (least important first, most important last)

  - people in universities come up with new ideas for products from their university research

  - universities contain a remarkable reservoir of knowledge, including the newest

  - universities attract smart, well-educated, motivated people, and some of them stay around
Necessary Culture in the University

• respect between basic research and applied engineering
  – a complete spectrum between the two

• the university and other entities (e.g., professional societies, government bodies) can help by exposing students to
  – industry, areas of application, problems worth solving
  – people to talk to
    • successful entrepreneurs
    • senior people who understand how innovation and commercialization really work
    • contacts for funding, expertise, etc.
What Not to Expect from Universities

• do not expect universities to do development

• do not expect products will flow out of the door of universities
Students – how to get rich!

• If you want to make a lot of money,
  – start by finding a large market that really needs a product
    • make it and sell it

• Warning - the ultimate goal of a company is to make money
  – not to turn your idea into a product
    • unless that is the best way to make money
  – most start-ups end up making a product quite different from the original idea
Students – how to get rich!

• Very often the best ideas are at the junctions of two relatively mature fields
  – e.g., world wide web exploited the intersection between two mature fields
    • communications, including the internet
    • computers sitting on desktops with nothing to do

• When you are young, you can take risk
  – failure is OK
    • you learn from it
      – pick yourself up
        » start again
How to do knowledge transfer

• Applications pull is much more important than technology push
  – most of the rest of the problems in knowledge transfer will solve themselves if the application and market are there

• Make it your business as a researcher to find the important problems that need to be solved
  – don’t rely on anyone else to feed them to you

• There are three kinds of researchers (and people in general) …
Licensing: Inventions to New Products

Federal & industry research money

Stanford researcher discovers new invention & submits disclosure

OTL decides IP protection for invention and markets invention broadly

OTL licenses invention to Company

Company makes new products

Company pays royalties to University

Additional research funding

©
OTL: Notable Stanford Inventions

1970 – OTL Established
1971 – FM Sound Synthesis ($22.9M)
1974 – Recombinant DNA ($255M)
1981 – Phycobiliproteins ($46.3M), Fiber Optic Amplifier ($32M), MINOS ($3.4M)
1982 – Amplification of Genes ($30M)
1984 – Functional Antibodies ($120.6M)
1986 – CHEF Electrophoresis ($2.1M)
1996 – Improved Hypertext Searching - Google™ ($336.5M)

2007 – the next big thing ???
Silicon Valley—Factors for Success

SILICON VALLEY – Factors for Success

Entrepreneurial Attitude

Land Resources

Educated People

$ Venture Capital $

Lawyers!

Risk taking encouraged—
FAILURE allowed!!

Government R&D Labs
(LBNL, LLNL, AMES, SLAC)

DIVERSE
and mobile work force

CELEBRATE SUCCESS!

courtesy of Prof. Bob Byer, Stanford
Stanford’s Royalty Distribution Policy

- Cash Royalties from Issue, Minimums, Earneds
- Net Royalties = Cash Royalties
  - minus 15% for administrative expenses
  - minus out-of-pocket expenses (e.g. patent costs)
Stanford Facts for 2006

- 7 Schools
  - Business, Earth Sciences, Education, Engineering, Humanities and Sciences, Law, and Medicine
- 1,771 Faculty members
- Students (6,705 undergraduate and 8,176 graduate)
- Finances (FY 2005-2006)
  - $2.9 billion budget
    - $975 million in sponsored research, including SLAC (87% by federal government sponsors)
    - additional $122 million in part through over 53 industrial affiliate programs
  - $12.2 billion endowment

(http://www.stanford.edu/home/stanford/facts/)