Balancing Knowledge Creation and Technology Transfer

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Prof. Charles L. Cooney
Faculty Director

web.mit.edu/deshpandecenter
Fundamental Beliefs

• Technological innovation is a major driver of economic growth
• Crossing disciplinary boundaries is essential to solve important problems
• National boundaries are increasingly porous with respect to technological innovation thru the internet and human mobility
• Research universities are a hub of technological innovation sustained by government funding
• Pursuit of fundamental science may be done in intellectual silos but the translation requires a broader ecosystem
MISSION

The mission of MIT is to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century.
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Tension: Knowledge Creation vs. Problem Solving

The University is about Knowledge Creation and Education

The Market is about Products and Services

Academic Research

Federal grants
Corporate Sponsored Research

Marketplace

SBIR
Angel Investing
VC Funding
Corporate Licensing
Mission of University Technology Transfer

Enhance the impact of university research by transferring intellectual property to address commercially important problems
The Deshpande Center for Technological Innovation

- Launched September 2002
- Founded by gift of $20M from Desh and Jaishree Deshpande

MISSION:
- Create impact through technological innovation
Evolution of an Idea

University Research

Ideas Emerge from Basic Research

Selection thru peer review – academic and business

Direction towards Market

Connection to Markets and Financing

NewCo Creation

Company Growth
Supporting the Idea-Innovation Value Chain

SELECT ➔ DIRECT ➔ CONNECT

Idea ➔ Invent ➔ Innovate ➔ Impact

IGNITION GRANTS ➔ INNOVATION PROGRAM GRANTS ➔ OUTSIDE FUNDING

2-3 cycle time
In the university

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SELECTION OF IDEAS

- Request for Pre-Proposals from anyone at MIT (3 page concept paper)
- Peer Review by panel of both technical and business experts
- Request for full proposal (10 pages) from subset of investigators
- Peer review of technology plus a team presentation
- Selection and award of grant plus catalyst
A journey into new territory involves risk

Risk = Probability X Impact
Innovation: A solution in search of a problem

3-D IMAGING TECHNOLOGY

- A tool for lab analysis
- Very fast, high resolution 3D imaging with off-the-shelf parts
- What should be the commercial focus?
Entrepreneurship: A problem in search of a solution

- Commercial photography
- Rapid prototyping
- New video games
- Medical imaging
- Security cameras and facial recognition
- Aerial imaging of bombing targets
- Digital imaging for complicated parts manufacturing

Let’s find a way to do high resolution 3-D images
The Dental Impression

Approximately 200 million dental impressions are done worldwide each year... dentistry is a $250 billion dollar cottage industry.

Brontes Technologies
Digitizing Dentistry
A.K.A. ‘No More Goop!’
How do we accelerate translation of ideas to commercial impact?

Lasers
rDNA
Stem cells
sRNAi
Search engine

The Right Solution to the Right Problem at the Right Time and the Right Price
Managing Risk While Closing the GAP

Academic Research

- Federal grants
- Corporate Sponsored Research

Catalyst Program

Grant Program

Innovation-Teams

Marketplace

- SBIR
- Angel Investing
- VC Funding
- Corporate Licensing
The i-Teams “Reactor”
An Educational Experience

- Develop go-to-market strategy for emerging science and technology
  - Look at technology by its application (rather than how it works)
  - Identify users, customers, markets: a path to realize potential
  - Identify a business model
  - Make a recommendation to develop the technology

- We do not address business plans. This is a next step
  - Without a market focus, one cannot begin to write a plan

- An acceptable option is “there is no good market”
  - Student evaluation is based on the process to assess potential and NOT on the market outcome
MIT INNOVATION ECOSYSTEM
Supporting new companies with complimentary assets

- DESHPANDE CENTER
- MIT ENTERPRISE FORUM
- MIT TLO
- VCPE
- $100K BP COMPETITION
- INNOVATION CLUB
- TECHLINK
- INNOVATION CLUB
- MIT SLOAN SCHOOL
- MIT ENTERPRISE FORUM
- MIT VMS
- X-Prize Lab
- I-Teams
- Legatum Center
- D-Lab

How can we stimulate more ideas?

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Prize Taxonomy

Inducement

Post/Award

X PRIZE
DARPA Grand Challenge
NASA Centennial Challenges
Nobel Prize
Millennium Technology Prize
Lasker Award

Pre/Grant

Research grants:
NIH, NSF, NASA

MacArthur Grant
Guggenheim Award
Fellowships

Recognition

Erika Wagner
ANSARI X PRIZE – The Teams

26 teams from 7 nations spending over $100 million to win $10 million purse

ARCA
Space Transport Corp.
DaVinci Project
Canadian Arrow
Rocketplane
Armadillo Aerospace
StarChaser
Pablo DeLeon
Scaled Composites - SpaceShipOne
• Prize definition, development, and testing
• Nexus for interdisciplinary innovation and problem definition
• Research effort into when prizes are
Grand Challenges Class Concept

- Action-oriented course
- Engaging multiple Schools: Science, Engineering, Sloan, Health Science and Technology
- Targeted at the process of prize definition
- Students define prize scope and rules,
- Interdisciplinary teams deliver a prize concept, including: incentive design, public relations strategies, and anticipated global impact

- **Spring ’08:** Developing World Healthcare
- **Fall ’08:** Energy Sustainability
- **Spring ’09:** Bionics
Translating Academic Research Into Commercial Impact

• Ideas emerge from a platform of basic science – “Prior Scientific Knowledge”
• Ideas need to be recognized as solutions to problems – “Prior Market Knowledge”
• BOTH funding and mentoring are needed to bridge the Knowledge GAP
• The “internal Ecosystem” stimulates and rewards innovative risk
• The “External Ecosystem” supports, nurtures and absorbs innovative ideas
“Progress is about taking and managing risk”

C. L. Cooney, Faculty Director Deshpande Center. Approaching summit of Ama Dablam, 22,600 ft
Moving Forward

• In difficult economic times – cash may be constrained but ideas continue to flow
• Reward Risk Takers – “Failure is not fatal and success is not final”
• Imagine “if this technology works ... then I could ...!”
• Students respond well to challenge