
Fostering Innovation with an Impact: The MIT Experience in Creating Entrepreneurial Success

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February 7, 2013



The 2013 Hyperion Lecture
University of Cyprus




Outline

- The MIT impact
- What it takes to create a company
- The AspenTech story
- MIT's ecosystem to foster innovation
- Lessons for Cyprus

The MIT Impact

The MIT Impact

**26,000
Companies
Created**



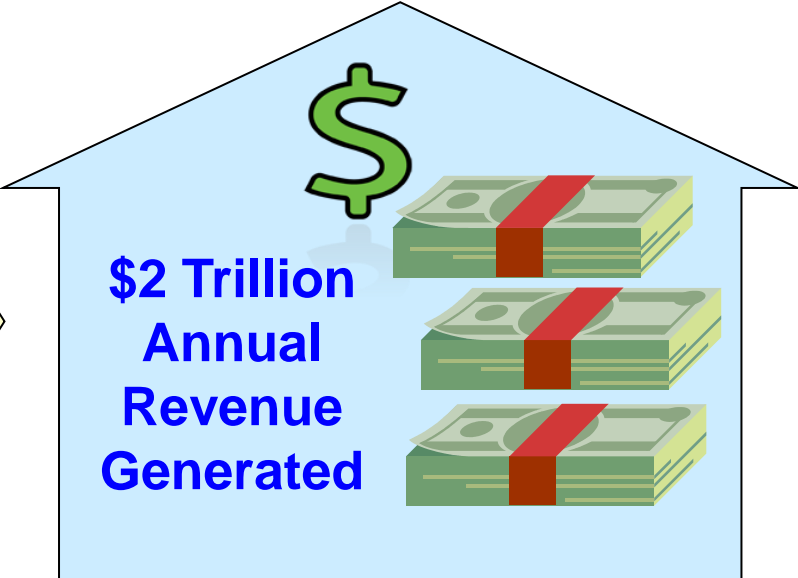
MIT

Equivalent to the 11th largest economy in the world !

**3.3 Million
People
Employed**



**\$2 Trillion
Annual
Revenue
Generated**



Estimates are Conservative

- Excluded companies:
 - If the founder was no longer alive
 - Founded by faculty and staff with no MIT degree
 - No longer independent
 - Based on MIT research but founded by others

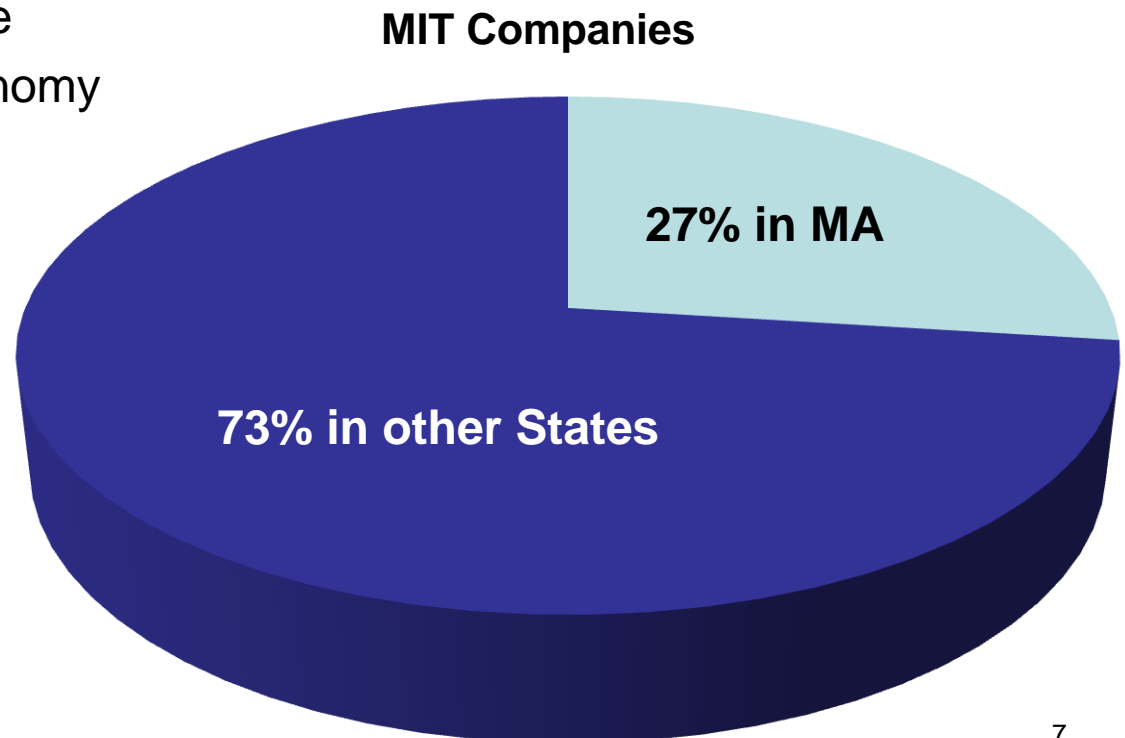
A Few Large Companies had the Largest Impact on Jobs

- 540 companies (2% of total) had 1,000 employees or more
- These large companies represent
 - 80% of revenues
 - 70% of jobs
- **Size matters!**



Extraordinary Impact on Local Economy

- **27% of all companies based in Massachusetts**
 - 6,900 companies
 - 1,000,000 jobs
 - \$164 billion in revenue
 - 25 % of the state economy



Factors Influencing Where to Locate a Company

Survey of company founder ranked factors in order of importance

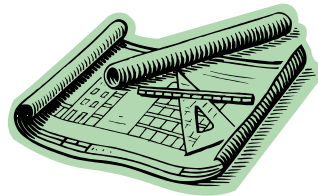
1. **Where the founders lived**
2. Availability of a network of contacts
3. Good quality of life
4. Proximity to major markets
5. Access to skilled professional workers

What it Takes to Create a Company

What Does it Take to Create a Company



Idea



Plan

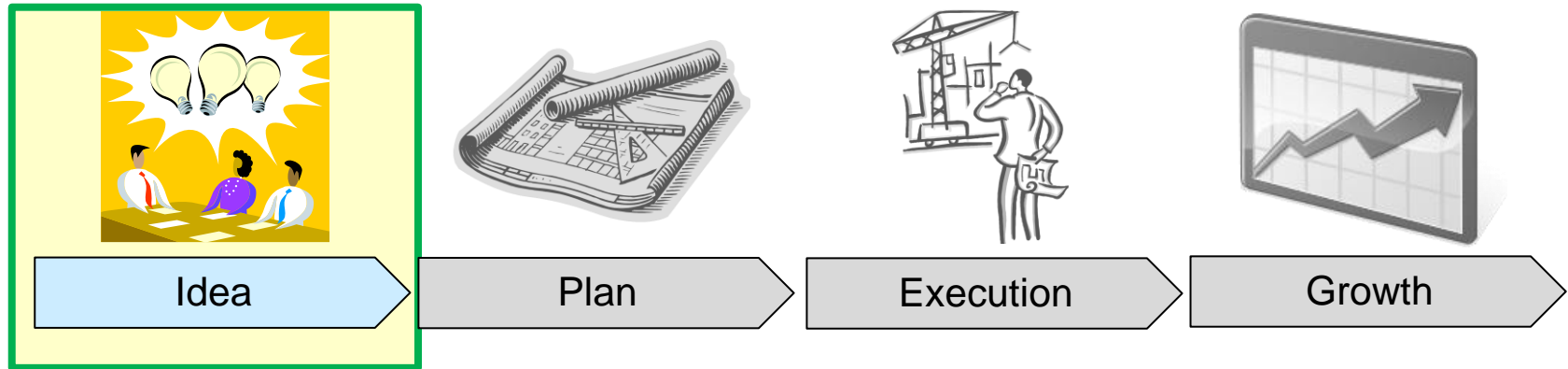


Execution



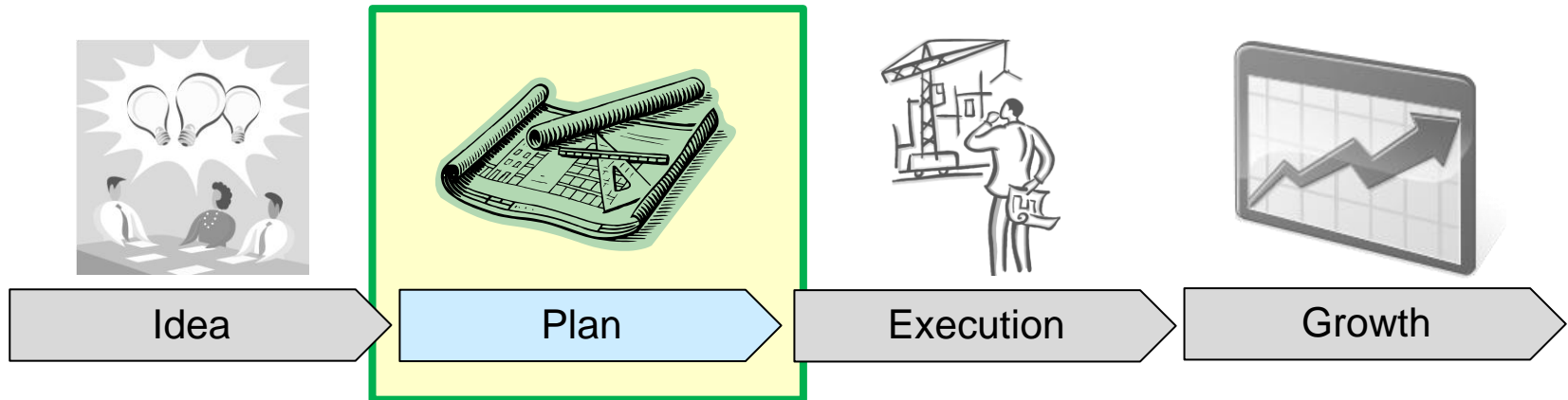
Growth

Generating the Idea



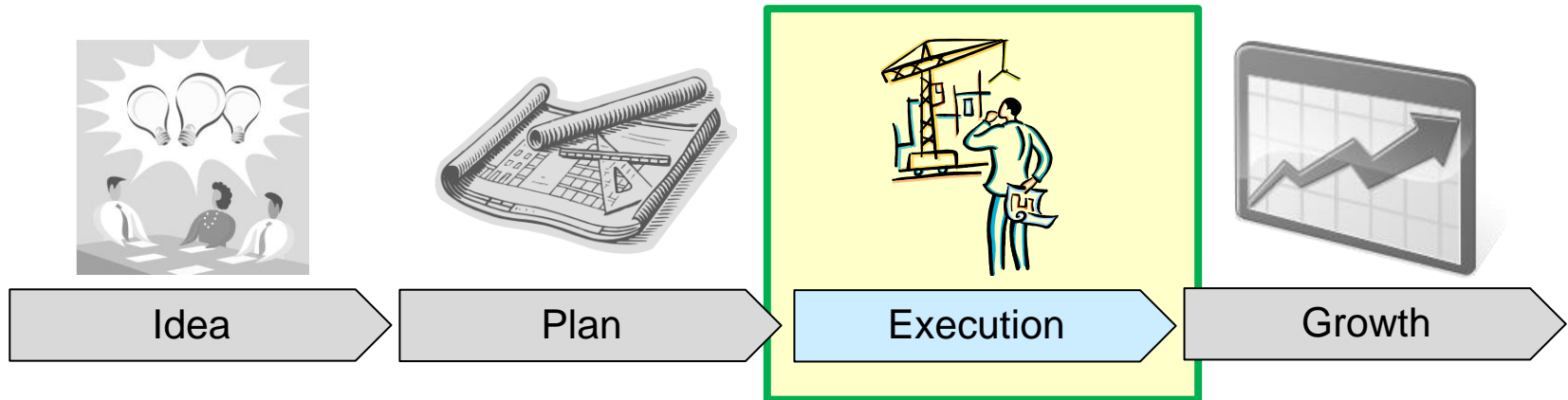
- May be driven by
 - Market need
 - New technology
- Ideas are not created in a vacuum
- Needs exposure to a network of people
 - New ideas
 - New technologies
- Needs exposure to customers with problems
- Reference: “*Where Good Ideas Come From: The Natural History of Innovation*” by Steven Johnson

Creating the Business Plan



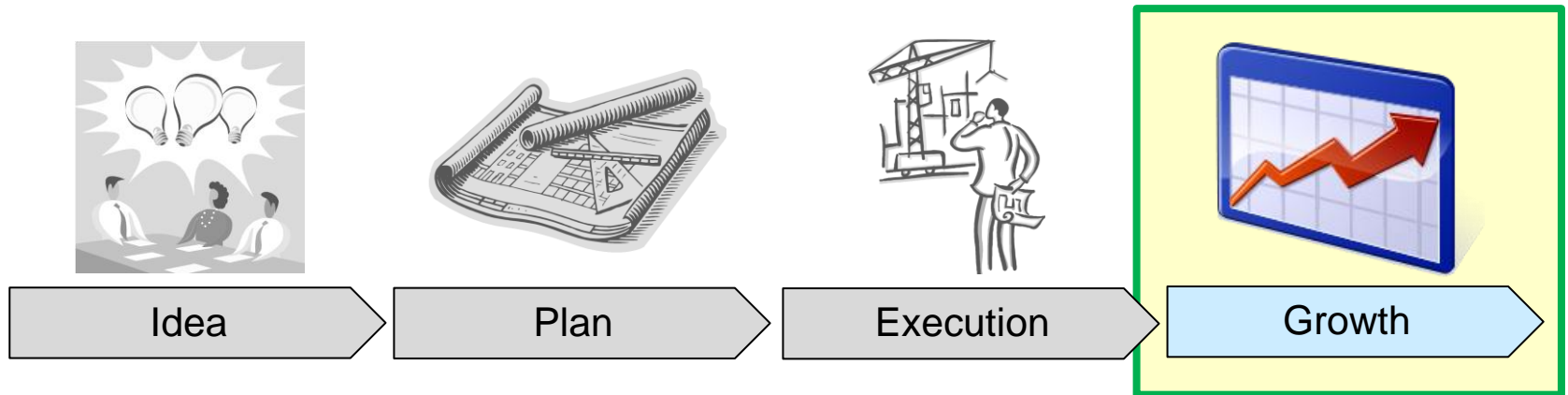
- Identify what is needed to translate the idea into a business
- Determine what resources will be required
 - Financial
 - People
- Design the business model
- Identify technical problems still need to be solved
 - To take the idea from laboratory to commercial use
 - To demonstrate proof of concept

Executing the Plan



- Form the company legally
- Secure funding
- Recruit key people
- Complete proof of concept of technology
- Attract first customers
- Prove the business model

Growing the Business



- Scale up every aspect of operations
 - Sales, Development, Human Resources, Services
- Capture an increasing share of the market
- Implement systems to support growth
 - Accounting
 - Management
- Defend the business against competitors

The AspenTech Story

When I Arrived at MIT in 1962

- Boston was the US center for high-tech entrepreneurs
- Route 128 around Boston had dozens of new companies
 - Lots of electronic firms
 - Supported by cold-war defense funding
 - Digital Equipment, Raytheon, Arthur D Little, BBN
- Three companies had been founded by chemical engineering faculty
 - Ionics was achieving success with desalination
 - Abcor and Amicon were developing membrane separations
- Venture capital was available
- MIT Alumni Association presented workshops
 - First was held October 1969
 - “Starting and Building Your Own Company”
 - Expected audience of 30 – oversubscribed with 300+

Aspen Prehistory – the 1960s

- Mainframe computing environment
- Chemical & petroleum companies had proprietary systems
 - FLOWTRAN (Monsanto)
 - SPECS (Shell)
 - COPE (Exxon)
- MIT was a hotbed of research in computer-aided design
 - Mechanical engineering
 - Civil engineering
 - Electrical engineering
- Chemical engineering was missing
- The US faced the first “energy crisis” in 1973
 - Needed to build hundreds of “synthetic fuel” plants
 - Goal to be energy independent

ASPEN Project at MIT 1976-1981

- **Idea**

- Create ASPEN (Advanced System for Process Engineering)
- Software system to be shared by many companies
- Flexible architecture: able to handle solids
- Use new computing technology– much easier to use

- **Plan**

- Obtain \$5 million from Department. of Energy over five years
- Recruit staff on loan from industry at MIT Energy Lab
- Purchase FLOWTRAN system from Monsanto to build credibility
- Form Advisory Committee with reps from 50 companies

- **Execution**

- Delivered source code to Department of Energy in 1981
- Made available free to the public

Founding Aspen Technology in 1981

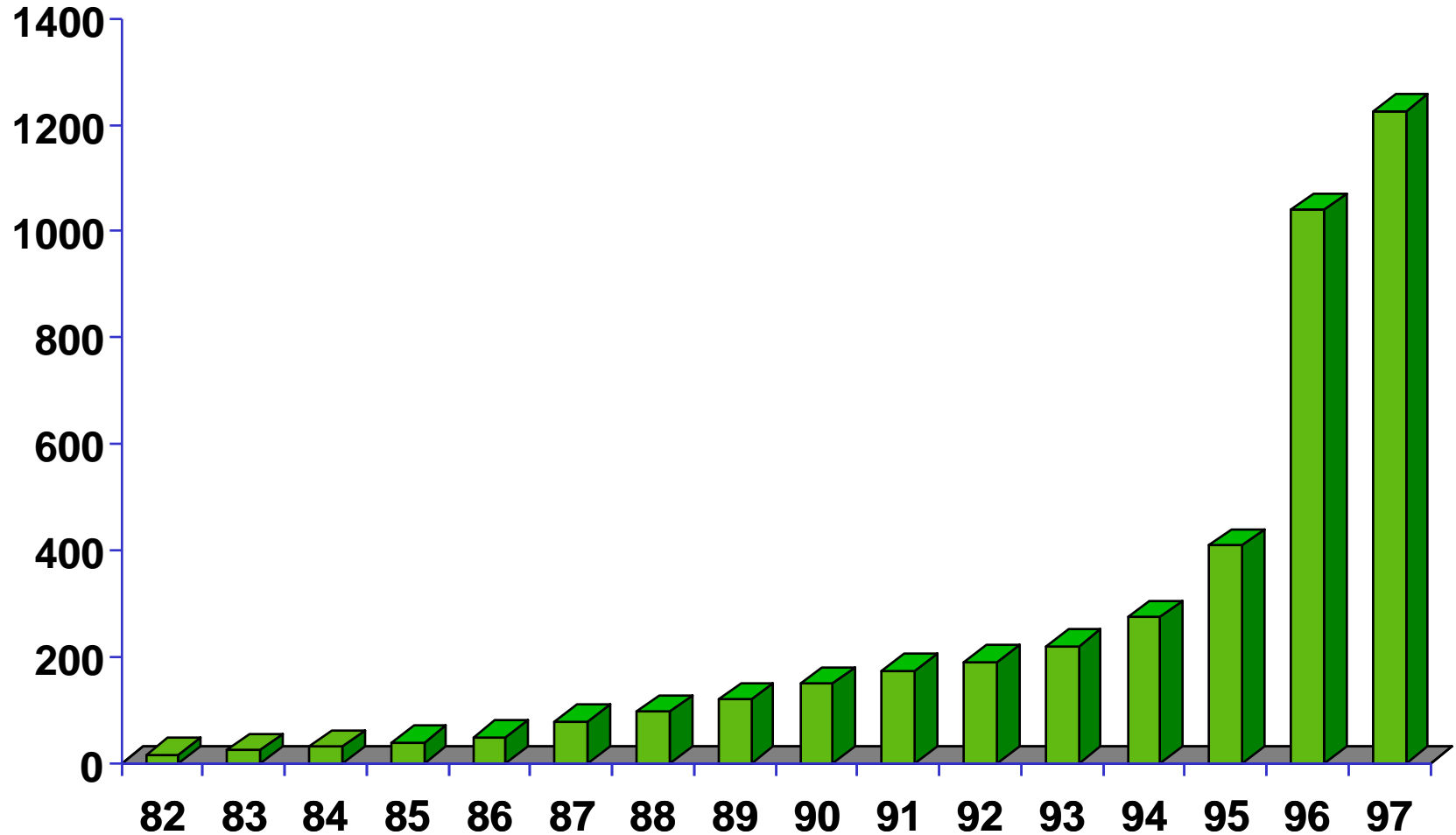
- **Idea**
 - Form a private company to develop and support ASPEN
- **Plan**
 - Obtain nonexclusive license to ASPEN software from MIT
 - Raise Financing from venture capital firms
 - Rent space and computer time from MIT
 - Founding staff were people from the ASPEN Project
- **Execution**
 - AspenTech founded as a private company in 1981
 - Couldn't raise venture capital – bootstrapped the company
 - Raised \$2 million mostly from founders, friends and family
 - Offered commercial version, ASPEN PLUS on a subscription basis
 - Continued to develop, enhance and support the software

Growing the Business

Year	Milestone
1981	AspenTech founded as a private company
1983	First commercial release of ASPEN PLUS
1986	\$3 million investment by Advent International
1990	Aborted IPO attempt – Saddam Hussein invades Kuwait
1991	Acquired Prosys in UK to obtain dynamic simulation
1994	Successful Public Offering
1994-2002	Acquired more than 20 best-in-class companies as part of a strategy to use models on-line to optimize plant operations and the manage the supply chain
2002	Evans retires as CEO

Today AspenTech is the largest supplier of technical software to the chemical and petroleum industries

Aspen Technology Annual Employee Growth



The MIT Ecosystem to Foster Innovation

The Entrepreneurial Environment at MIT 1945 -1975

- MIT Founded in 1861
 - Motto: “*Mens et Manus*” or “Mind and Hand”
 - Learn practical as well as intellectual knowledge
- Faculty encouraged to:
 - Consult for industry
 - Create companies
- First Venture Capital Firm formed in Boston in 1946
 - American Research and Development
 - Founded by Georges Doriot and Karl Compton
 - Early Successes
 - Ionics (1948) for electrochemical desalination of water
 - Digital Equipment Company (1957) mini-computers
 - Spawned formation of other venture capital firms in Boston

MIT Initiatives to Support Entrepreneurship

- First course in “New Enterprises” offered in 1960
- MIT Alumni Association presents workshops in 1969
- MIT Enterprise Forum formed by alumni in 1978
 - Now has chapters in 24 cities worldwide
 - Provides local support system for entrepreneurship
- MIT Technology Licensing Office established in 1986
 - Obtains patents and copyrights to MIT-developed technology
 - Licenses companies to use the technology
- MIT 10K Business Plan Competition first held in 1990
 - Grew to become 50K then 100K
 - Now more than a half dozen competitions

MIT Initiatives to Support Entrepreneurship (Continued)

- MIT Entrepreneurship Center Hires Full-time Director 1996
 - Kenneth Morse, recruited from AspenTech
 - Goal: to educate and develop those who will create, build and lead tomorrow's successful high tech ventures
- MIT Venture Mentoring Service created in 2000
 - Helps MIT related individuals contemplating a startup
 - 88 companies have already been formed by clients
- Deshpande Center for Technology Innovation established in 2002
 - Research grants to faculty to make leap from research to innovation
 - Enables them to prove concept and seek financing
- Entrepreneurship and Innovation Track in MBA Program
 - Established in 2006
 - Provides education for students interested in entrepreneurial life

Elements of the MIT Entrepreneurial Ecosystem



Idea Flow

- MIT Research
- Tech Licensing Office
- Deshpande Innovation Center

Training

- MBA Innovation Track
- Entrepreneur Center

Mentoring

- Venture Mentoring Service
- Business Plan Competition

Capital

- Angels
- VCs
- Government
- Banks
- Stock Market

Lessons for Cyprus

Strengths for Cyprus in Innovation and Entrepreneurship

- Cyprus has many advantages to take advantage of
 - Strong Greek culture
 - Emphasis on education, hard work, new ideas
 - Heritage of trading and commerce
 - Educated workforce
- Need to create jobs provides a strong incentive
 - High unemployment particularly among young people
- Encouraging innovation and creation of new businesses could contribute to the Economy of Cyprus
- Realistically, it will take time to produce meaningful results
 - Some results within a decade
 - Substantial results will take longer
 - It's not a quick fix, but important for the long run
- Need to address the challenges of a small country
 - Need to look outside Cyprus for customers and growth
 - Need to tap network of international collaborators

Recommendations

- Build an entrepreneurship ecosystem in Cyprus by building on elements already present
 - Business plan competitions
 - Government funding of applied research
 - Educational courses at universities
- Establish a venture mentoring capability
 - Consider forming a branch of MIT Enterprise Forum
 - Get established entrepreneurs in Cyprus to provide mentoring
- Substantially increase venture capital resources available
 - Provide incentives for EU firms to open a Cyprus office
 - Encourage local angel investments from wealthy individuals
 - Establish government VC firm to co-investment with private investors
 - Beware of letting politicians make venture investment decisions

Recommendations (Continued)

- Take advantage of the discovery of oil and gas in the Levant to create new ventures
 - Provide services in support of exploration and production
 - Partner with international firms
 - Invest in focused university research to develop new technology
- Look for opportunities in providing Professional Services
 - This was a recommendation of the recent PWC Study
“Driving Jobs and growth in Cyprus through professional services”
 - Professional services firms
 - Require less start-up capital than manufacturing
 - Create the most jobs per unit of revenue
 - Can potentially grow fast

Thank You