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Economic Growth Strategy: Capacity Building for Innovation and Entrepreneurship in Trinidad/Tobago

… the talent base and national priorities

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Founded in 1870, " By America's First Family of Inventors"
2,200 Undergrads – Residential, 3,400 Graduate Students - Worldwide

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Outline

- Shared Definitions
- The Case for Innovation
- Recommended Strategy: Build an Innovation System
- A New Model for University Based Innovation
- Lessons Learned
- Conclusion

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Shared Definitions

Innovation: The design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the university, the region and the nation.

- Modified from ***"The Executive Summary of Measuring Innovation And Its Impact on the Economy."*** US Department of Commerce. January 2008

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Shared Definitions

"…the entrepreneur must be a person of "vision," of daring, willing to take chances, to strike out, largely on the basis of intuition…

…The entrepreneur is more of a "heroic" than an "economic" figure:

…must have the desire to create new things..."*

* Source - John E. Elliot.
Introduction to ***The Theory of Economic Development*** by Joseph A. Schumpeter

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Why Innovation and Entrepreneurship?

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Economic Activity	Level of Education
Sustaining transformational inventions and business growth	Innovation in research and development
Jobs and Wealth	
Inventing new products and services	PhD's with experience in entrepreneurship and innovation
Innovation Economy	
Improving existing products and services	Master and Bachelor degrees
Jobs	
Manufacturing of existing products	Associate – 2 year – and Bachelor degrees talent base
Knowledge Economy	

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The Case for Innovation
Global Competition

Manufacturing as a percentage of GDP, 2008***	
Malaysia	29.2
Singapore	27.6
Korea	24.7
Taiwan	21.4
Japan	21.0
USA	12.6
Jamaica	12.0
Trinidad and Tobago	7.2

*** Source: Economist.com Country Briefings, Economic Structure

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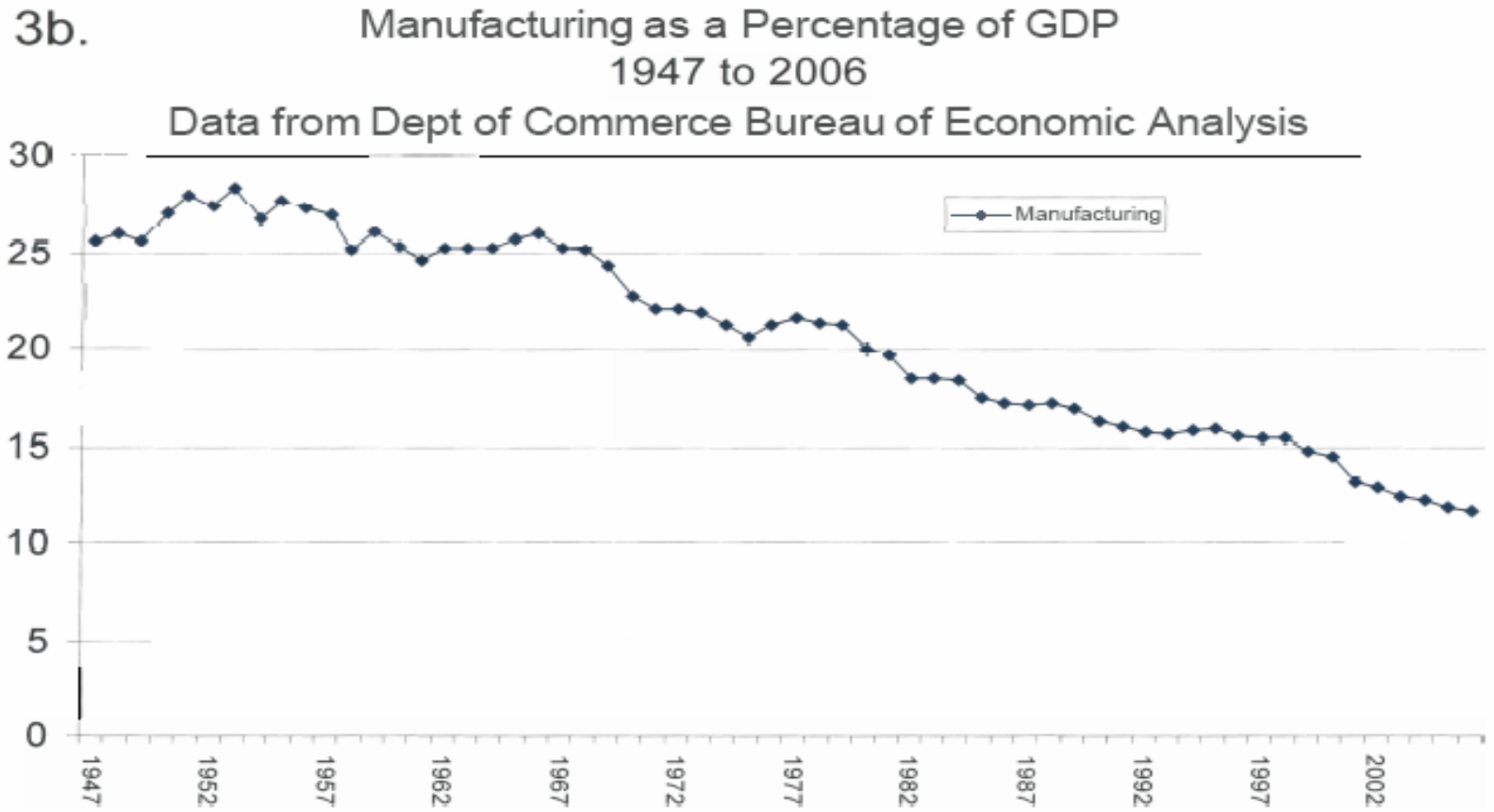
The Case for Innovation
Global Competition
Patents granted per 100,000 residents Year 2007

Korea	190.93
Japan	113.14
Taiwan	79.82
USA	26.42
China	24.1
Netherlands	10.95
Singapore	10.66
Israel	5.47
Trinidad and Tobago (could not find data)	Target goal in five years ?
Malaysia	0.66

Message: Create in-country talent pool

The Case for Innovation: United States Data



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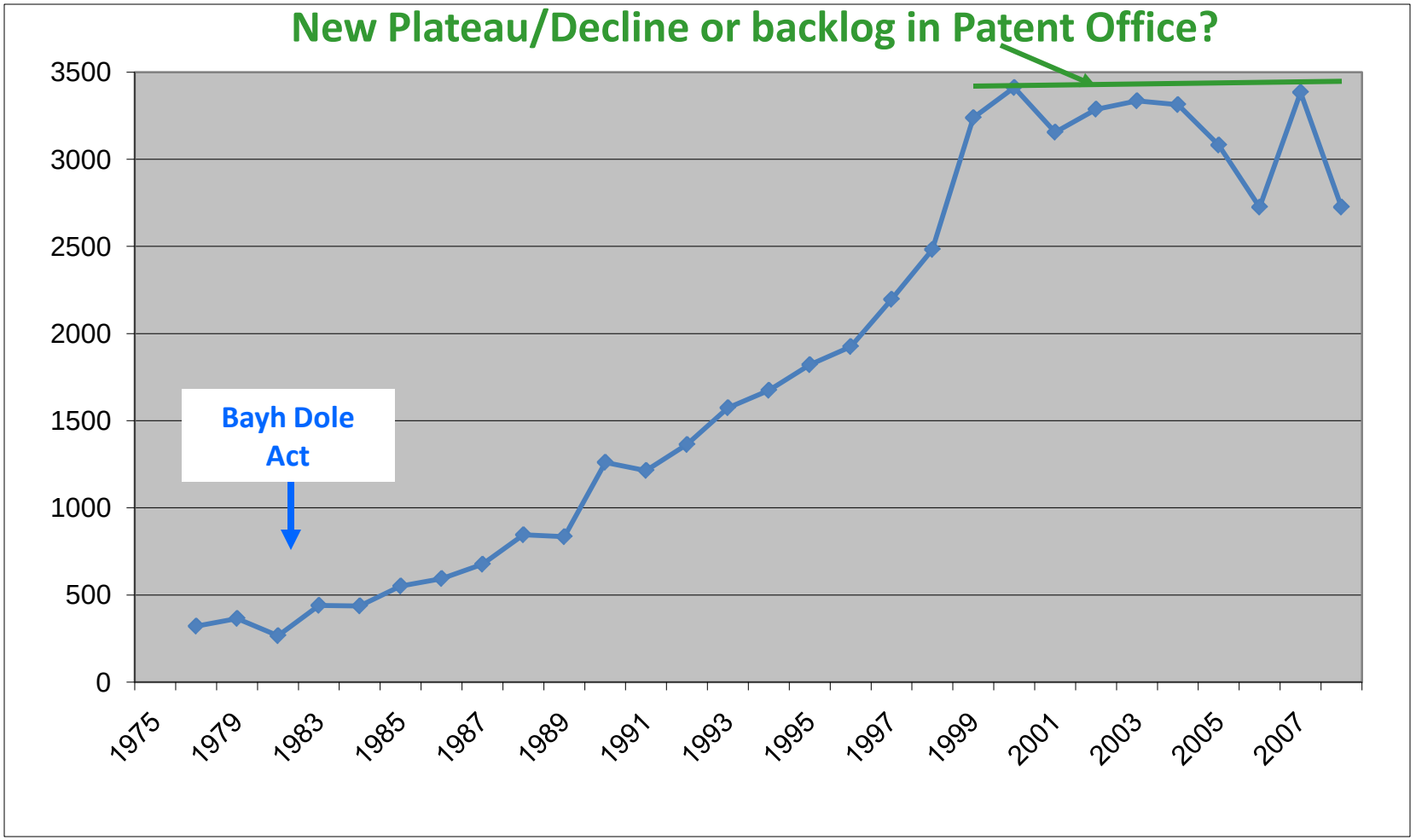
The Case for Innovation:

US Patents and Revenue from Traditional Model

Number of Patents granted to US Universities per year*



*Source: United States Patent and Trademark Office

**Source: Association of University Technology Managers

Recommended Strategy: Build an Innovation System

- **National agenda for innovation and entrepreneurship: highest level of government creating a national mindset throughout the public and private sectors.**
- **Champion to work across organizations and demonstrate early success**
- **Focus areas**

  examples
  - **manufacturing technologies**
  - **alternative energy**
  - **environmental stewardship for tourism and society**
  - **software development**
  - **improved processes for public and private sectors**
- **Growing SME's: R & D fund for university - SME partnerships**
- **Venture capital: angel funding for startups and later stage for SME's. Market place discipline.**

Recommended Strategy: Build an Innovation System

- **Engage universities**
  - Incentives for faculty and students
  - License technologies
  - Launch new enterprises – product prototypes, business model, CEO, venture capital
  - Develop courses and extracurricular programs for tomorrow's entrepreneurs – technological, business and organizational
- **Specialized training** for public and private sectors
- **Engage diaspora** – networking and investment capital
- **Business friendly policies**: tax incentives and avoid onerous regulations
- **National awards**

  technologies licensed; startup enterprises; SME growth; improved processes for public sector; and high school projects

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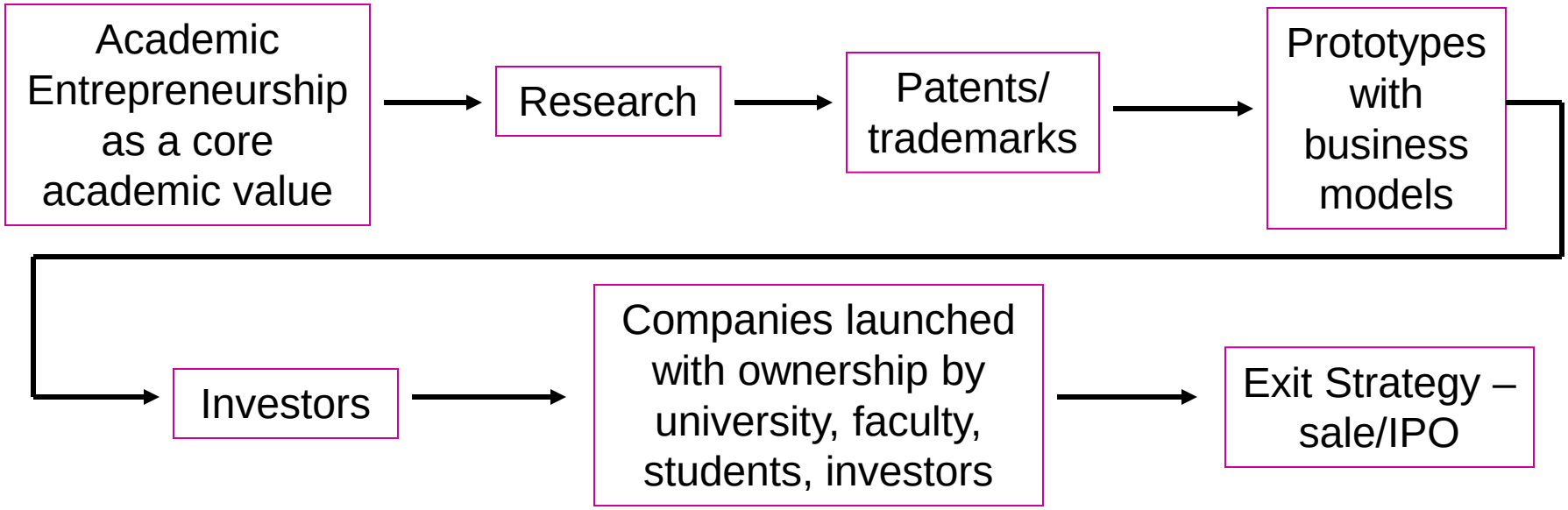
Traditional Research University Model

Research → **patents/ trademarks** → **license to outside** → **universities get royalties**

The Stevens Model: Path to Sustained Academic Entrepreneurship



Stevens Model Value Proposition

Enriched Student Learning

Students graduate with ability to grow and launch companies

Knowledge of Marketplace

Faculty and student inventors

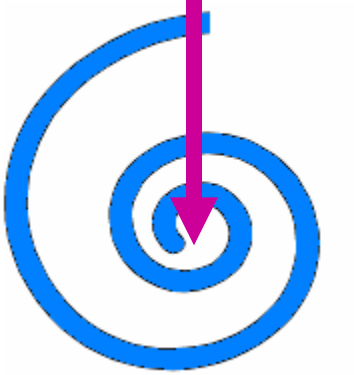
Research

New Companies

Patents/ trademarks

Investors

Prototypes and business models



Stevens is a source of Academic Entrepreneurship

August 30, 2007 – The Business Week article titled "Who Needs the Ivies?" cites the strong entrepreneurial environment at Stevens: "Schools like MIT and Stanford don't *graduate more founders* than *Stevens Institute of Technology* or Arizona State University. Even the famed Indian Institute ..."

Successful Examples

Company	Product	Disruptive Features	Status
HYDROGLOBE	Removes heavy metals from water	Effective at small scales	Sold to Graver
PLASMASOL CORPORATION	Medical Sterilization Equipment	Quick turn around sterilization, portable, safe for sensitive surgical instruments, no environmental disposal	Sold to Stryker
myideashare The idea generating exchange	Ideation software that helps organizations energize and manage their ideation process	Employs sophisticated gaming technology using an active stock market of ideas that empowers employees	Product actively being sold; seeking 1st round financing
Attila Technologies	Intelligent multi network wireless router/software that dynamically connects to multiple networks for high throughput, secure & non-interrupted service	First of a higher level class of communication systems – a cognitive network that senses and uses available bandwidth on the fly	First product in market; 1st round of financing complete in Dec 2009
AutoMap	Advanced robotic mapping system for site mapping and dimensionalized engineering drawings of buildings and terrain	Creates site plans in CAD format in <30 minutes. Replaces surveying teams and labor to produce as-build building drawings	Prototype complete: seeking 1st round of financing
DICE	A new Mass Spectrometry source that revolutionizes MS analysis from medical diagnostics to analytical chem.	Atmospheric ionization of non-polar compounds; GC/LC MS on a single machine without changing sources	Prototype complete; partnership with MS company; seeking 1st round of financing
Tidal Turbine	New design for harvesting power from currents and tides	Highly efficient duct and blade design , 6 by 3 meter unit produces 250 kilowatts with 2 knot current	Prototype for Hudson River application in process

September 12, 2008

Universities That Turn Research Into Revenue
Maureen Farrell, 09.12.08, 6:00 PM ET
“Stanford University's fertile breeding ground for breakthrough technology may have spawned the likes of Hewlett-Packard and Google, but little Stevens Institute of Technology in Hoboken, N.J., really knows how to get serious returns on its research and development.”

Stevens Institute of Technology Ranked 3rd in U.S.

Lessons Learned

1. **Incentives to align academic and marketplace timescales**
2. **Supportive infrastructure for licensing and launching startups**
3. **Engage alumni (and diaspora)**
   - **networking**
   - **domain Experts**
   - **venture capital**
   - **CEO talent Pool**

Conclusion

Building an innovation system will transform the economy.

Many examples: U.S., Taiwan, Korea, Japan, Singapore and BRIC