

Regional High-Level Summit for University Presidents and Senior Policy Makers: Creating an Enabling Innovation Environment (EIE) for Intellectual Property and Technology

**Osaka, Japan
26-28 November 2019**

organized by
World Intellectual Property Organization (**WIPO**)
Japan Patent Office (**JPO**)

Session 1.3

History and Evolution of University IP-based
Technology Transfer:

The Relationship with the University Mission,
& Societal Impact

***Myth:* “Technology Transfer” is a new University function**

FACT: Universities have been “transferring technology” for hundreds of years

Students graduated

Academic scholarship

Research & other publications

Outreach (seminars, workshops, webinars, etc)

Extension

Libraries

Technology Creators & Society's Economic Needs

- In the US (1970's), a growing awareness of the untapped university intellectual asset
in addition to graduates and publications
..... new technology!
- Universities as technology creators
- IP as a tool for new technology development
- Society's growing expectations of universities
- The Experiment: Bayh-Dole Act 1980
- Why?
new technology development requires investment; IP an essential tool

Technology Creators & Society's Economic Needs

- Four decades of success (trial & error)
- Abundant “lessons learned”
- Good Management Practices (GMP) have been established
- While global standards have emerged, these should be adapted to institutional needs and cultural milieu

Technology Creators & Society's Economic Needs

Why is this mode important?

- Bringing new technology to fruition requires investment; IP is an essential tool
- IP in combination with entrepreneurship and intrapreneurship spawns new products, services, and ventures – all this is a social good!
- While individual IP/tech transfer acts are important, it is engagement in the overall process that truly accelerates the university's crucial role as source and catalyst in the economic

“innovation ecosystem”

Creators & Society's Economic Needs

University IP/tech transfer: lessons learned

The process of using IP to catalyze the transformation of laboratory discovery to product, service, or new company

Can* naturally fit within, and enhance, the university's mission

*if done properly

Creators, and Society's Economic Needs

University IP/tech transfer: Lessons learned

- Adds a new and vital dimension to the University's historic mission
- But, must be based firmly on, and absolutely aligned with, the historic university mission of teaching, research, and extension.....
for the public good
- Otherwise, there is a real danger of harming the basic nature of the university, in the process.
- Sound IP Policy is essential

Creators, and Society's Economic Needs

University IP/tech transfer: Lessons learned

- Produces many new products, services, companies, jobs
- Done right, it satisfies university's mission of disseminating knowledge/solutions for the public good
- It can be accomplished with no harm to the university's basic mission of education, knowledge creation/archiving, dissemination
- Engagement in the process enhances the university's reputation

Creators, and Society's Economic Needs

More lessons learned:

A university should embrace and actively engage in the IP process,
to widely disseminate its' technology
for the public good

NOT as a source of revenue

Society's Economic Needs

IP-based technology transfer adds a very dynamic feature to the university's pact with society

Invention, IP, new products and services,
entrepreneurship and new ventures spawned by
the innovative and enterprising university.....

.....fulfills the university's mission,

..... enhances the university's reputation,

Stimulates a creative and entrepreneurial campus culture,

.....inspires interest by Alumni,

and positions the university as an essential element in the
innovation ecosystem of economic development

Innovative and Enterprising Universities

based on IP/technology transfer

Generates new university ways:

IP creation, ownership, management

direct interaction with private sector

proactive role in new technology development

entrepreneurial culture and atmosphere

new revenue sources

ethical choices, questions, and dilemmas

These new ways must never hinder or negatively alter the university's traditional *modus operandi* or its basic social undertaking

the University's Fundamental Values

- An open community of discourse, and freedom of exchange of ideas and information
- No secrets, no censorship
- A public resource, a “commons” of knowledge creation, education
- Academic freedom, free intellectual exchange
- Research freedom
- The university is not for sale
institutional sovereignty

is based on our fundamental values

- The primacy of the “public good”
- The “holy” trio of scholarship, education, and research always primary;

IP/commercialization always secondary

- Stewardship of knowledge and technology
- Non-profit, not a marketplace participant
- The supremacy of truth, the search for it, and its distribution

What is the relationship of University

IP/Technology Transfer and revenue generation?

- While the goal is technology dissemination for the public good, never financial return.....
- With good management, it's reasonable to expect the TTO to eventually break-even.
- However, good TTO management, governance, leadership support, investment, and patience....
is likely to eventually produce significant revenue

As a by-product of a successful process

University IP/Technology Transfer is more about the process than the results

- While a well-managed IP/TT function is striving to break even, and
- The combination of good TTO management, governance, sr. leaders' support, and patience, will eventually produce significant revenue.....
- The university is actively using its IP assets to catalyze an innovation ecosystem, spawning economic development, and a ripple-effect of societal benefits

A Premise of University

IP-based “Technology Transfer”

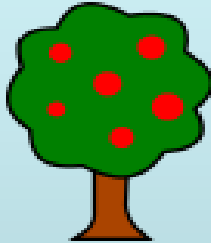
- Private investment necessary for invention development and commercialization
- Private investment requires a ROI
(patents provide the mechanism)
- University ownership of patents maintains essential, close link between inventors and patent use, and provides control for:
 - technology stewardship
 - assured diligence in tech advancement
 - value capture (ROI for research)
 - protects interests of institution & inventor

University IP/Technology Transfer

Some *Myths* & Facts

Myths:

- Universities are filled with many valuable inventions that are waiting to be picked like “low hanging fruit”



- It's easy to commercialize these inventions
- Anyone with basic skills can transfer them

FACT: The Cornell TTO example:

Over a span of twenty years:

3000 inventions submitted

1500 (~ 50%) filed as patents

750 (~25%) licensed

650 (~20%) generate revenue

50% of Cornell's patent expenses reimbursed by licensees
Compare: 95% of all US patents produce NO revenue!

How did we do it?

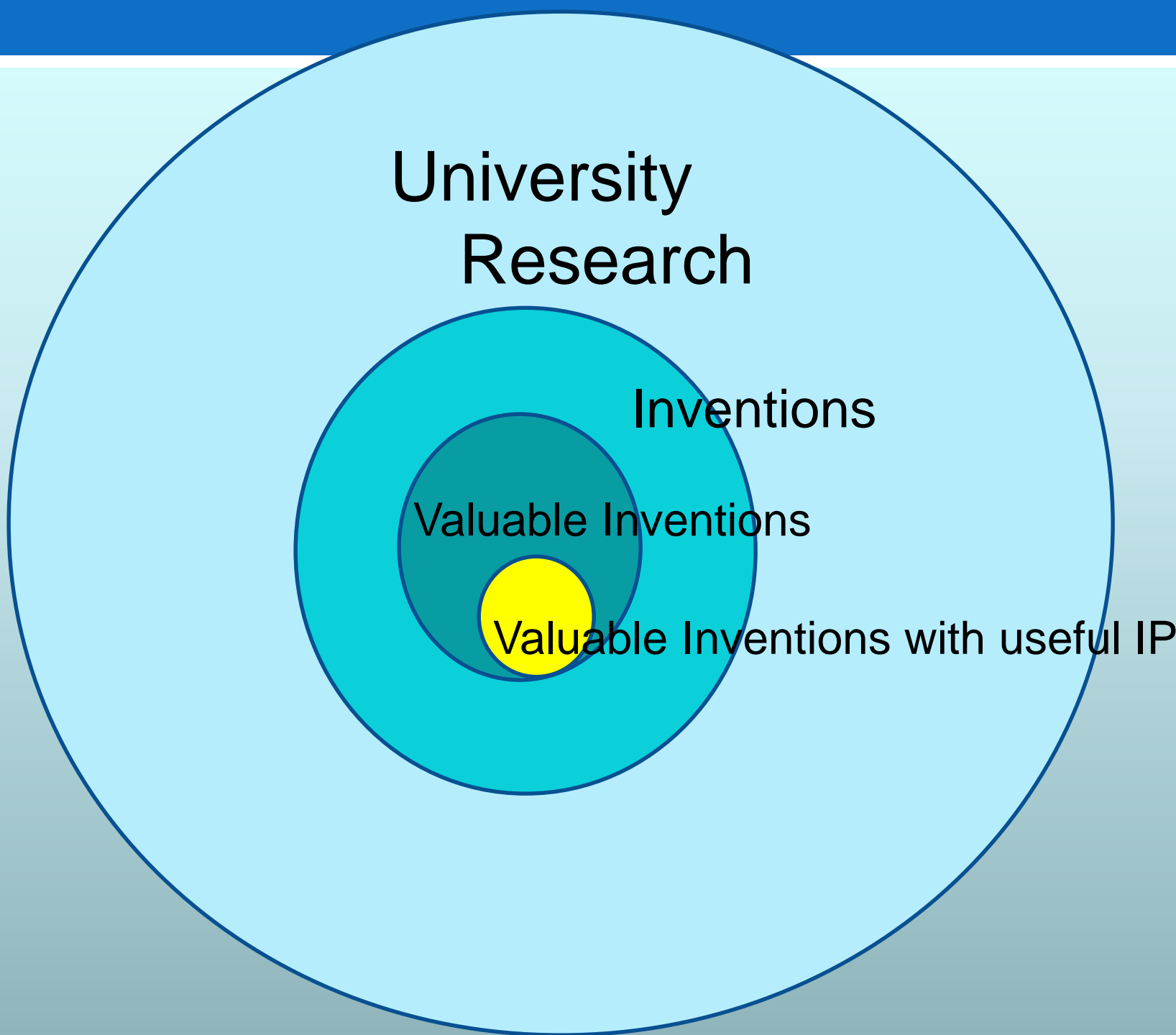
*Triage *judgement *built a business case *good IP
management *proactive technology marketing *luck

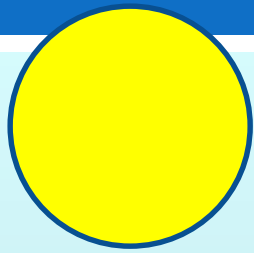
University Research

Inventions

Valuable Inventions

Valuable Inventions with useful IP





Valuable Inventions with useful IP

For universities, this is both goal and launch point.

because..... with these,

Skilled, creative, and motivated

Tech Transfer/commercialization professionals,

Entrepreneurs and Intrapreneurs,

visionary supporters, accelerators,

and investors....

Create new products, services, companies, jobs,
revenue, and.....

Economic Development

Facts:

- There are many fewer “commercializable” university inventions than many realize
 - (1 disclosure/\$2million in research/yr)
- Most university inventions will never be commercialized because they:
 - don't solve an economically important problem
 - aren't better than what's currently available
 - can't be scaled-up
 - aren't cost-effective
 - don't allow meaningful IP

While economics is a key driver in IP commercialization.....

... we should never lose sight of our philanthropic and humanitarian mission

Examples:

Prosthetic hand invention

Improvement of subsistence farming

Myth:

Anyone can do university IP-technology transfer

Fact:

Identifying, preparing, protecting, promoting, strategizing, and securing university invention commercialization requires significant skill:

- technophile, working knowledge of science and engineering disciplines
- IP strategy, tactics, management
- Business analysis and practices
- Technology/IP valuation
- Contracts and business law practice
- Negotiation and contract drafting
- People skills and emotional intelligence
- Aware of university politics

Fact: Identifying, preparing, protecting, promoting, strategizing, and securing university invention commercialization also requires

a special attitude:

- Visionary
- Optimistic
- Curious
- Honesty, integrity, transparent, ethical
- Analytical & Synthetical
- Thoughtful risk-taker, skeptical dreamer
- “dot finder & connector”
- Entrepreneurial

Myth:

All university researchers are motivated by
the financial \$\$ success of their invention

Facts:

A small % of university researchers want to get-rich
through IP/tech transfer

A few don't want to make any money from their
invention

Most won't refuse money if their invention is
successful

but.....

**100% want their invention to be used to
solve real-world problems!**

Myth: *The number of inventions/researcher/year is a constant*

FACTS:

- Outreach and promotion of tech transfer, and successes will increase invention disclosure rate

Cornell example:

1990: 90 disclosures/2700 researchers/yr
= **0.03/researcher/yr**

2010: 350 disclosures/2700 researchers/yr
= **0.13/researcher/yr**

a 4X increase in disclosures/researcher

Myth: University IP/Tech Transfer & commercialization is a simple process

1. Invention made by researcher
2. Patent filed by university
3. Company signs license
4. Company sells product or service
5. Company pays university royalty
6. Everybody wins
7. Repeat

Fact: University IP/TT is complex, time consuming, and very challenging

1. Identifying viable inventions is big challenge
2. “Good” patents are challenging, and costly
3. Finding suitable company-licensees is time-consuming, tedious, frustrating
4. Negotiating a win-win license is difficult
5. Success of licensed product in marketplace is highly probabilistic
6. Probability of significant license \$\$ to university is low

Myths:

A good university invention will

“sell (license) itself” ...

...and filing a patent application is
sufficient for commercialization
of an invention

Facts:

Without marketing.....

technology is very rarely transferred and commercialized

Successful commercialization of university invention requires sustained, proactive and creative “technology marketing”

..... in order to make the link with suitable commercialization partners (licensees)

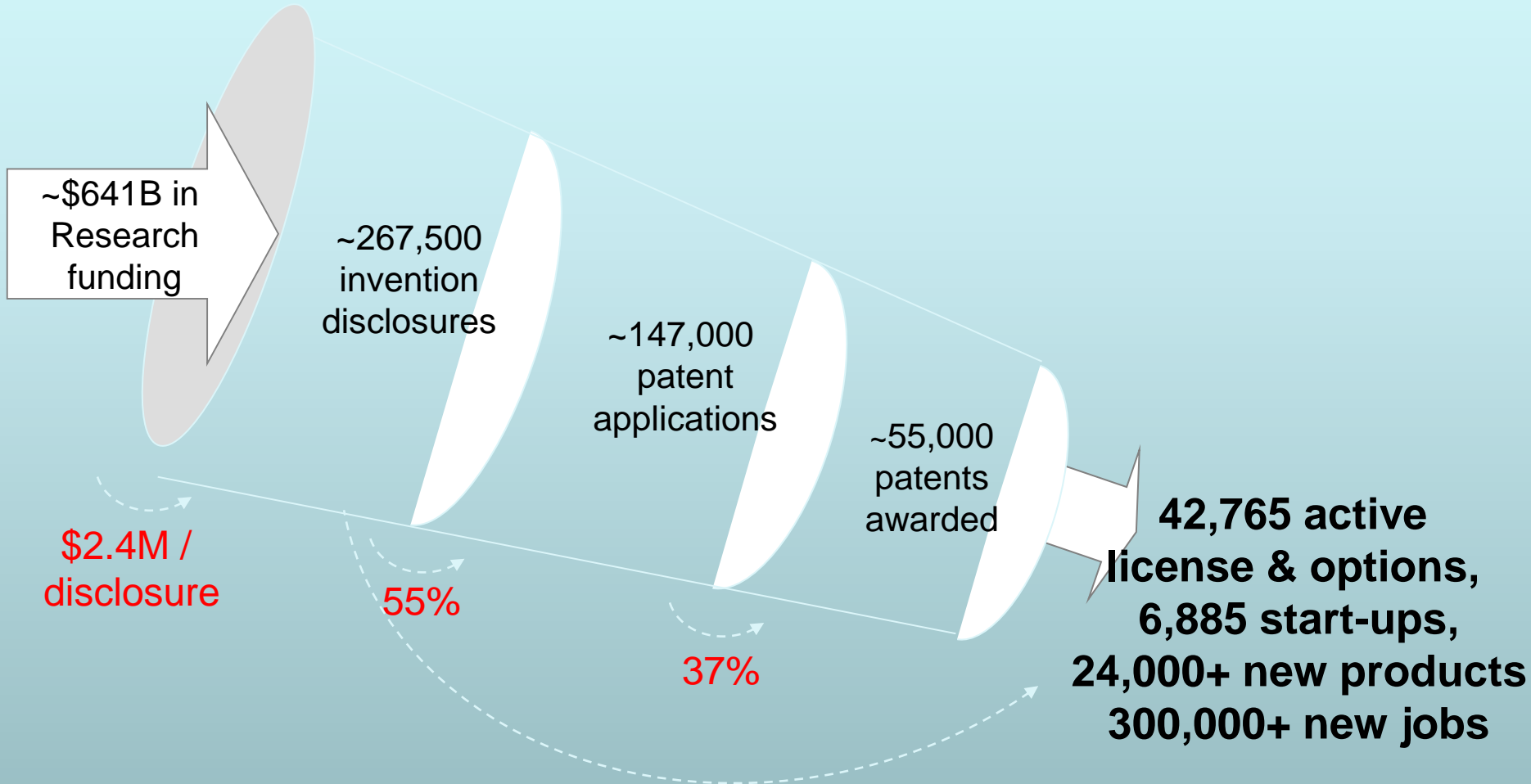
Myth:

IP-based technology transfer
is a good way for universities
to make a lot of money



U.S. Tech Transfer Productivity “By The Numbers”:

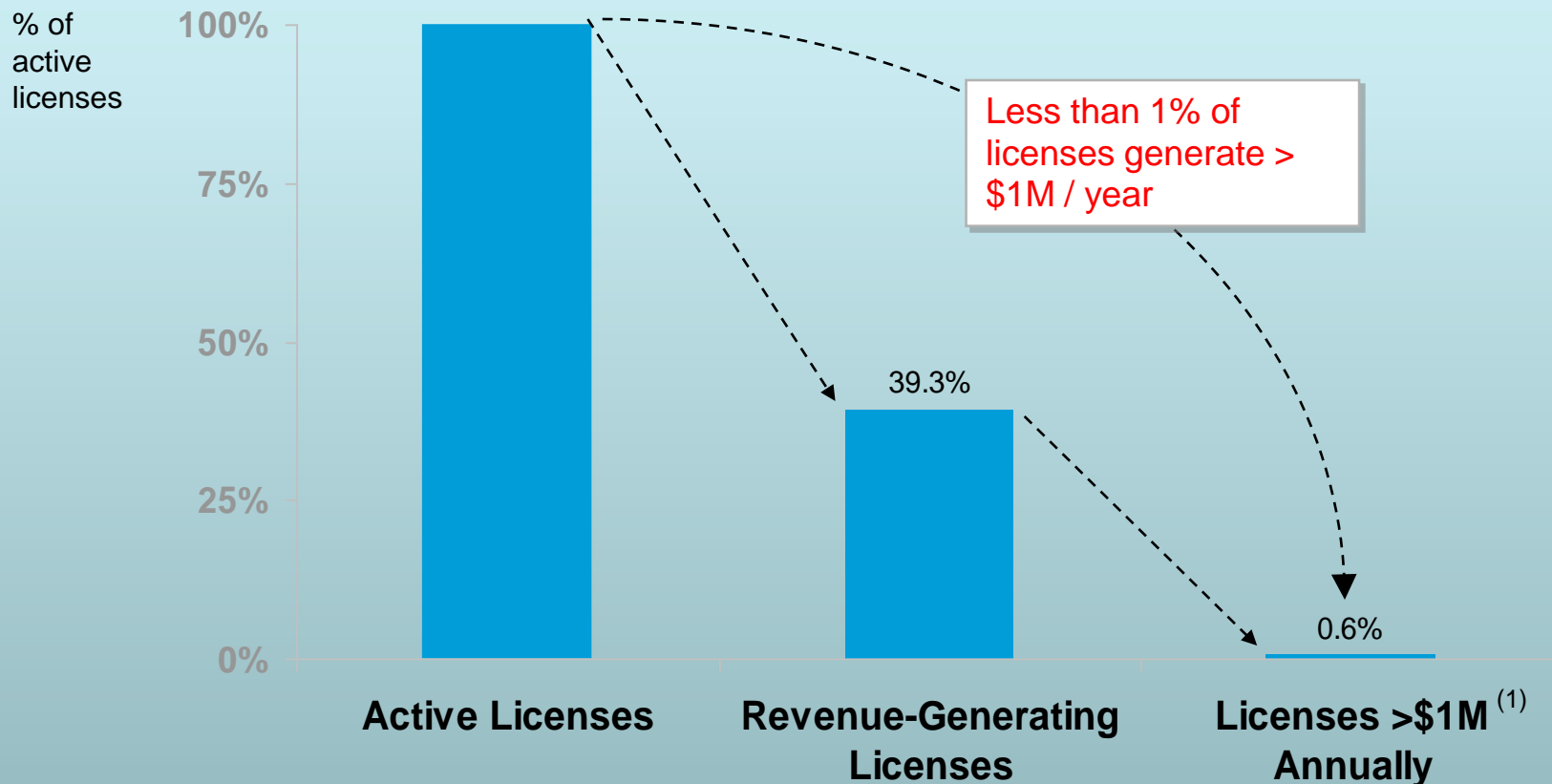
Cumulative Inputs and Outputs, 1991 - 2010



**16% or ~1 in 6 inventions
Ever get licensed**

Source: AUTM Licensing Surveys (FY91- FY10)

“Blockbusters” Drive Most of the Revenue, But are Rare

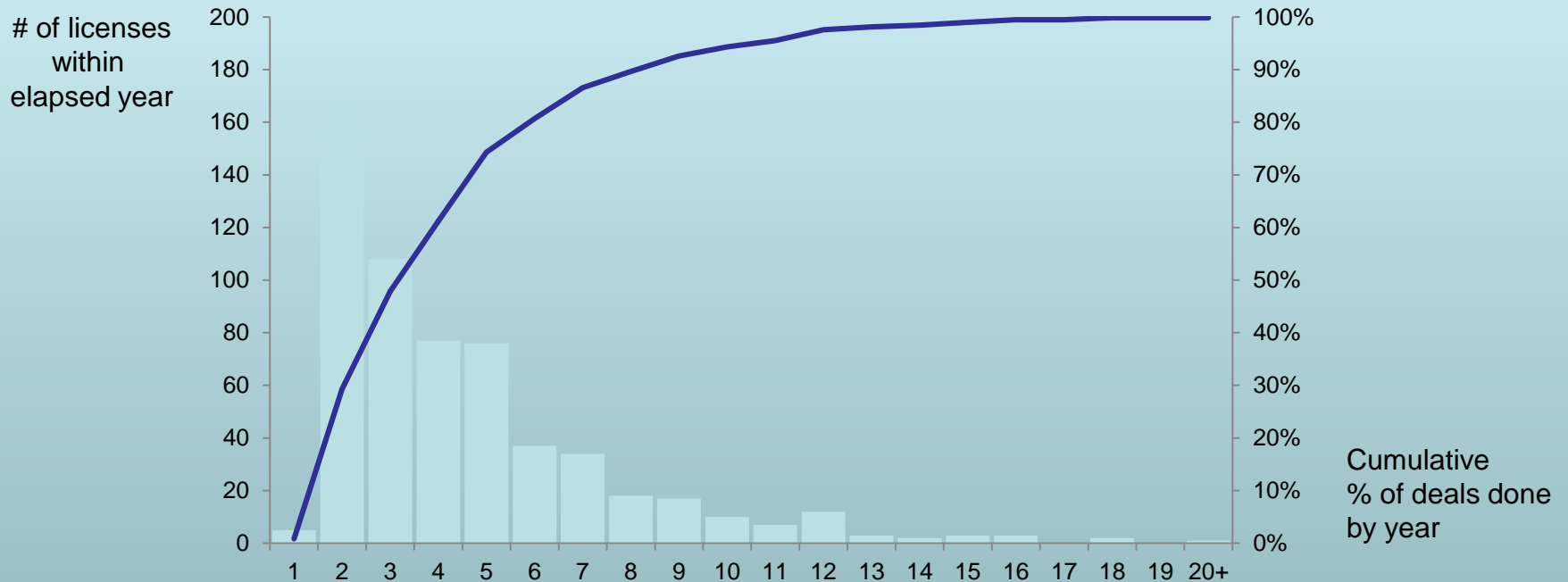


Source: AUTM Licensing Survey (FY04)

Inventions Often Take Years to Get Licensed:

~50% of Deals Done by Year 3, 70% by Year 5

Columbia University: # of Years from Invention to First License



Source: Review of elapsed time from invention submission to executed license, for all 580 of Columbia's executed licenses from 1982 until 2011 (29 years)

Myths: Establishing an effective university IP/TT function requires little investment; staffing a TTO is easy; the IP/TT function is peripheral to real university interests

FACTS:

- Effective IP/TT requires dedicated and qualified staff
- Good people and good IP require significant, long-term investment
- IP/TT will evolve into one of the pillars of the university mission
- Investment in IP/TT will transform the university into a more proactive participant and patron of the innovation economy for the widest public good

Thank You