Guidebook of IP/Technology Transfer

Track 1
Entry-level Tech Transfer Professional

Topic 1.1
Technology Transfer Defined

Technology Transfer defined

Since 1980s, “technology transfer” has become defined by certain key elements:

- It typically refers to an engagement between a public sector research institution (e.g., a university) and a private sector entity (e.g., a company) in which the university and company collaborate to commercialize a university invention
- It is based on the intellectual property (IP) of an invention
-

Myth: "Technology Transfer" is a new University function

FACT: Universities have been "transferring technology" for hundreds of years

- Students graduated
- Research publications
- Outreach (seminars, workshops, webinars, etc)
- Extension
- Libraries

University "Technology Transfer"

Universities have been "transferring technology" for hundreds of years, ….. but

a new form was established nearly 40 years ago* (*Cornell first licensed a patent in 1932)

- US Bayh-Dole Act 1980
- IP-based Technology Transfer
- Based on the principle that IP (patents)are essential for private sector investment in new technology development/commercialization

Myth: IP/Technology Transfer is a good way for universities to make money

FACTS:

- The goal is technology dissemination for the public good, never financial return
- With good management, it's reasonable to expect TTO to break-even sooner or later
- However, good TTO management, governance, leadership support, 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

The 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

  value capture (ROI for research)

University IP/Technology Transfer

Some *Myths* & Facts

Myths:

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

- Anyone with even a basic level of skill can commercialize these inventions

The Cornell TTO example:

Over a span of twenty years:

3000 inventions submitted

1500 (~ 50%) filed as patents

750 (~25%) licensed

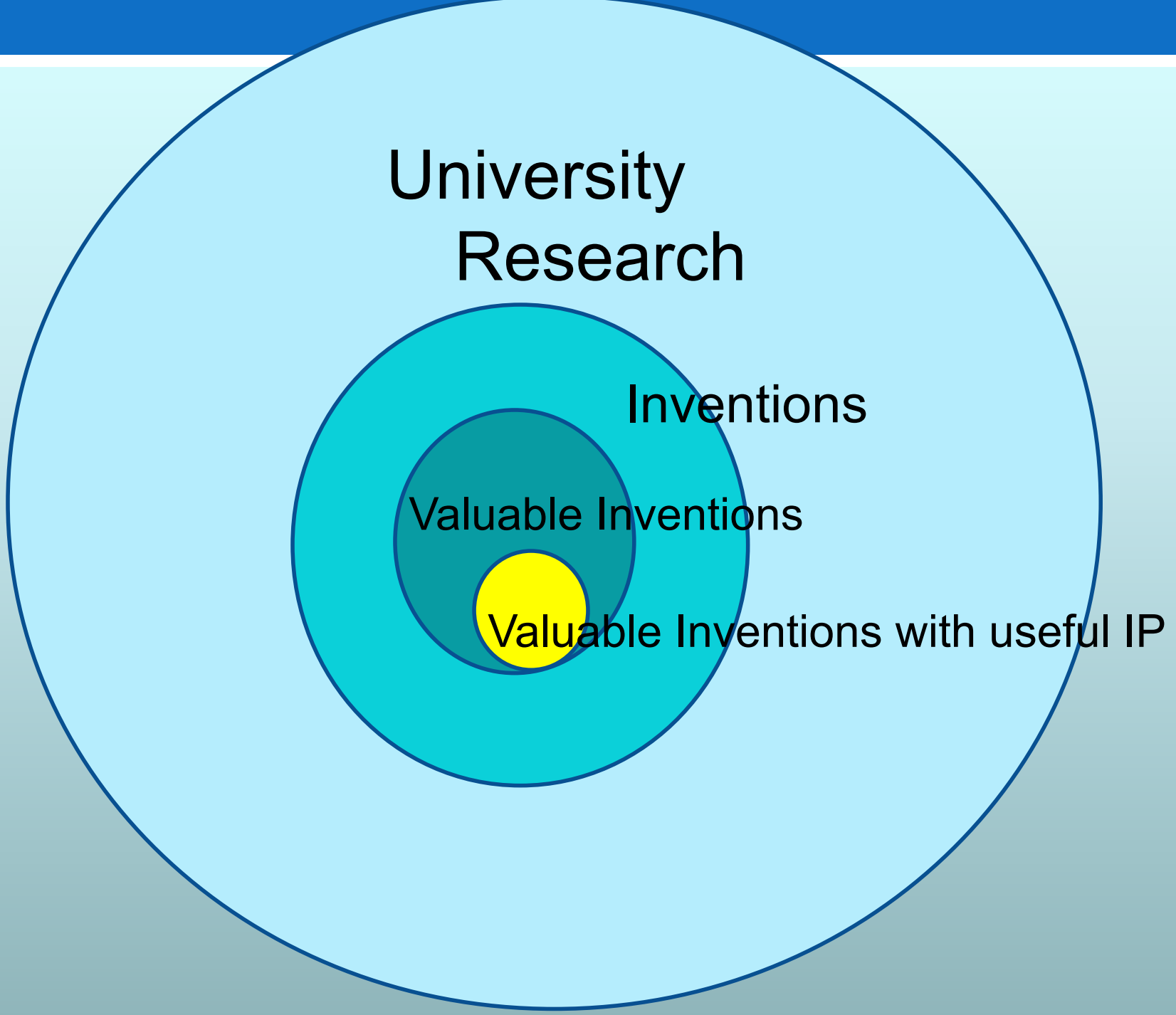
650 (~20%) generate revenue

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.

with these,

Skilled, creative, and motivated

Technology 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 most realize

  (1 disclosure/$2million in research/yr – at most)

- 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

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

Fact: **Identifying, preparing, protecting, promoting, strategizing, and securing university invention commercialization also requires a *special attitude*:**

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

Myth:

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

Facts:

- Only a small % of university researchers want to get-rich through IP/TT
- A few don't want to make any $$ from their invention
- Most won't refuse $$ 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 will remain 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/TT commercialization is a simple process

1. Invention made by university 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 difficult 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

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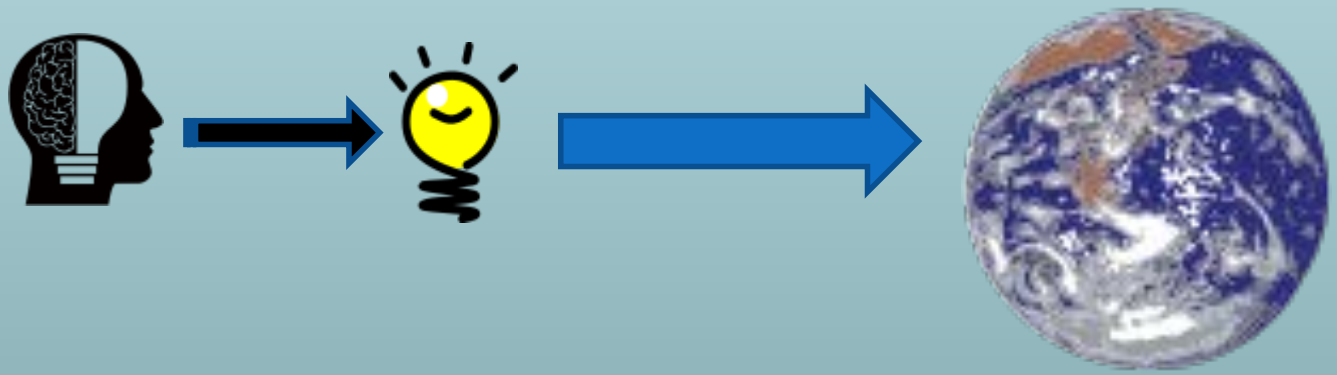
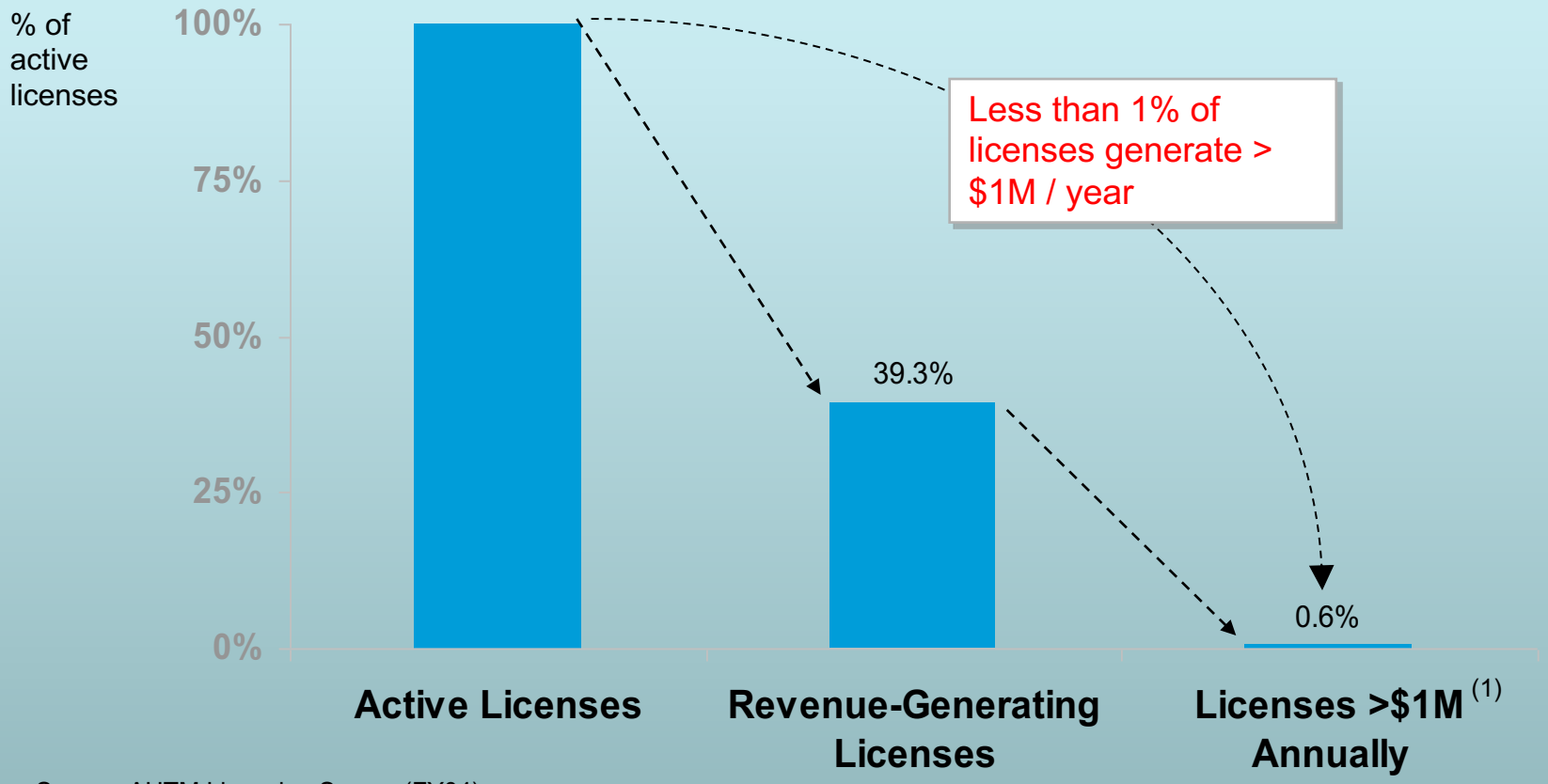
FACT:

The goal of IP-based, university technology transfer should never be revenue generation

The focus is on technology dissemination, a primary part of the university mission



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



Source: AUTM Licensing Survey (FY04)

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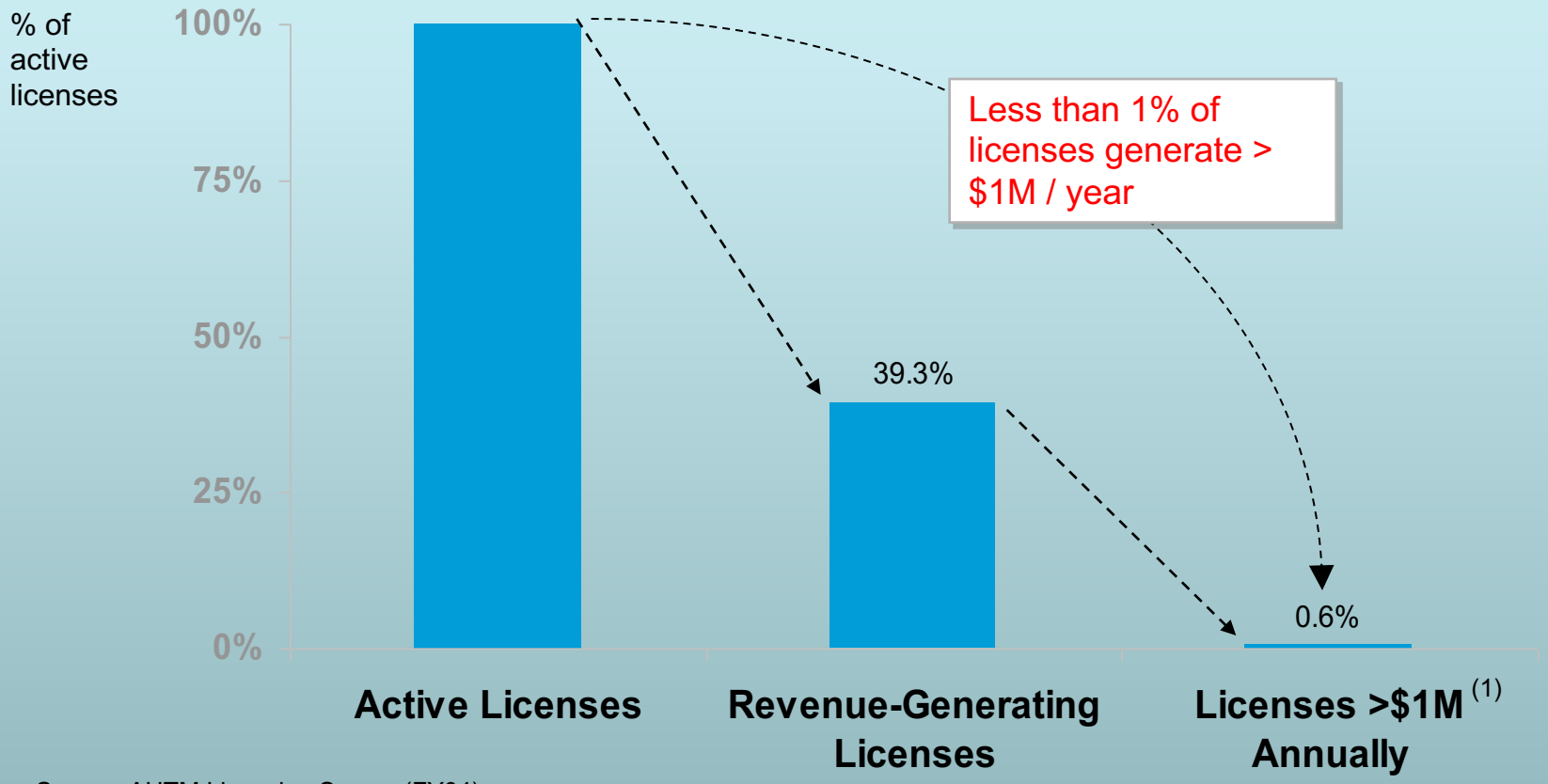
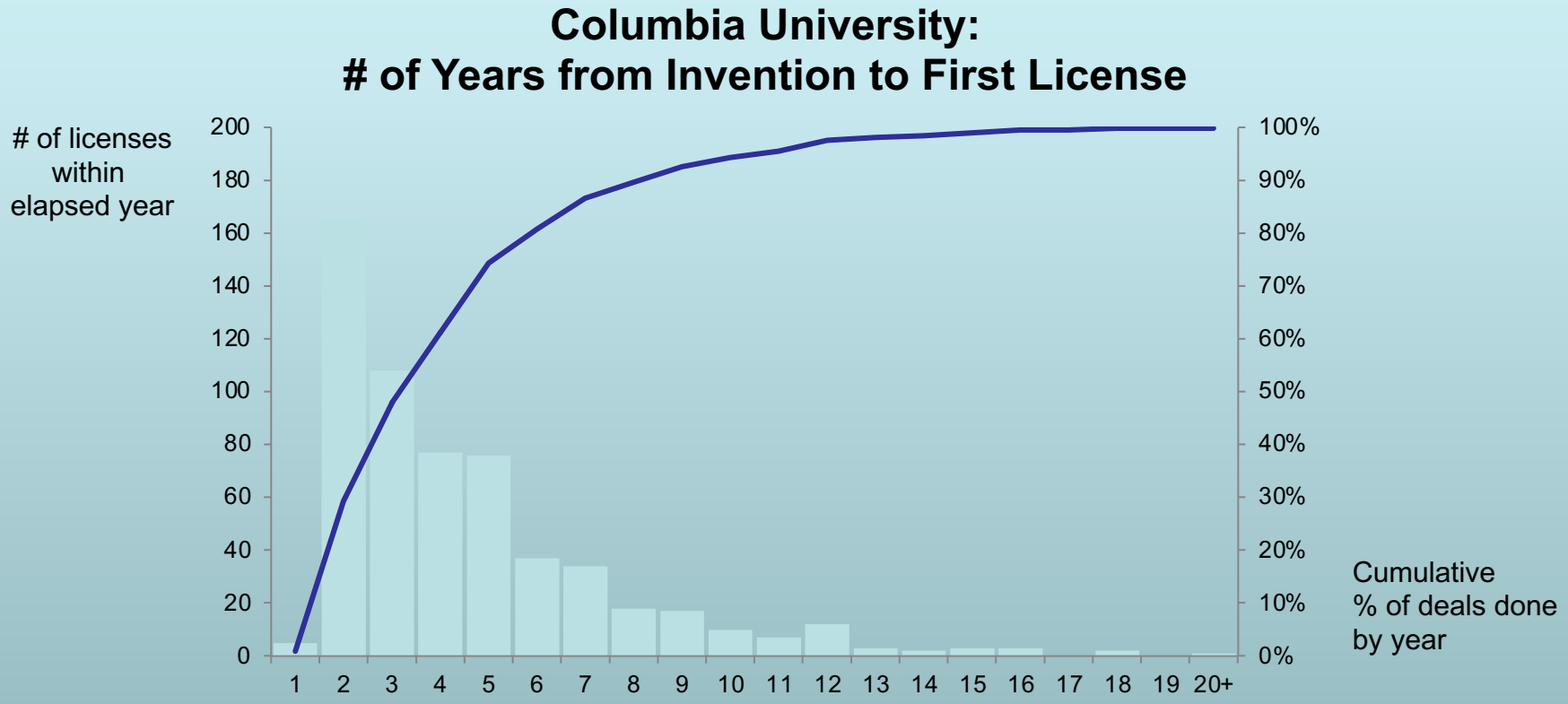


Source: AUTM Licensing Survey (FY04)

Inventions Often Take Years to Get Licensed:

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



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 and 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

IP/TT & the University Mission

Philosophical Premise:

Technology Transfer is based on the goal of technology dissemination

Practical Implications:

- Licensees must diligently pursue commercialization
- University technology must never be “shelved” for business reasons
- Exclusive licenses will have economic incentives and disincentives that assure diligent efforts

IP/TT & the University Mission

Philosophical Premise:

The University must protect and shepherd its technology for the public good

Practical Implications:

- The University will never sell its IP
- Licensees must adhere to legal and ethical standards of technology development and commercialization

IP/TT & the University Mission

Philosophical Premise:

Academic freedom is sacrosanct

Practical Implications:

- The University will never hinder publication by its faculty, staff, and students
- The University will never conduct secret research
- The University will never restrict academic information exchange

IP/TT & the University Mission

Philosophical Premise:

Education and research are primary,

technology transfer/commercialization secondary

Practical Implications:

- The TTO will never hinder thesis or other publication for IP/TT reasons
- IP and/or the TTO should never impede academic research or educational activities

IP/TT & the University Mission

Philosophical Premise:

TT/IP must never endanger the mission, interests, or basic character of the institution

Practical Implications:

- Licensees must shoulder ALL the burden of business risk and liability
- Licensees must protect the institution
- The university's name cannot be used to promote commercial interests
- The university cannot promise anything more than it owns its IP

IP/TT & the University Mission

Philosophical Premise:

TT/IP should always serve the public good

Practical Implications:

- Consider humanitarian and philanthropic concerns
- Revenue generation should not impede dissemination
- University always retain rights to its IP for research and education; extend that right to other institutions

Topic 6

Three Decades of University IP/TT: Lessons Learned

35 Years of University IP Technology Transfer: Lessons learned

- IP/TT is part of the university's basic mission
- Successful IP/TT will enhance the university's reputation
- Many faculty will embrace IP/TT;
  some will rely on it
- Local/regional company creation will result
- There are always challenges

35 Years of University IP Technology Transfer: Lessons learned

- TT must be embraced by top administration
- Effective policy framework is essential
- Institutional ownership of IP is necessary
- TTOs require patient investment

  …..but that investment will pay off eventually
- TTOs need sufficient resources, especially competent professional staff
- The growth process of TT in an institution is a crucible of issues and challenges

Technology Transfer: keys to success

A mindset that tech transfer is important

Support for tech transfer from top to bottom

Viable technologies

Knowledgeable IP management

Treat inventors well (like clients)

Understand for-profit sector needs

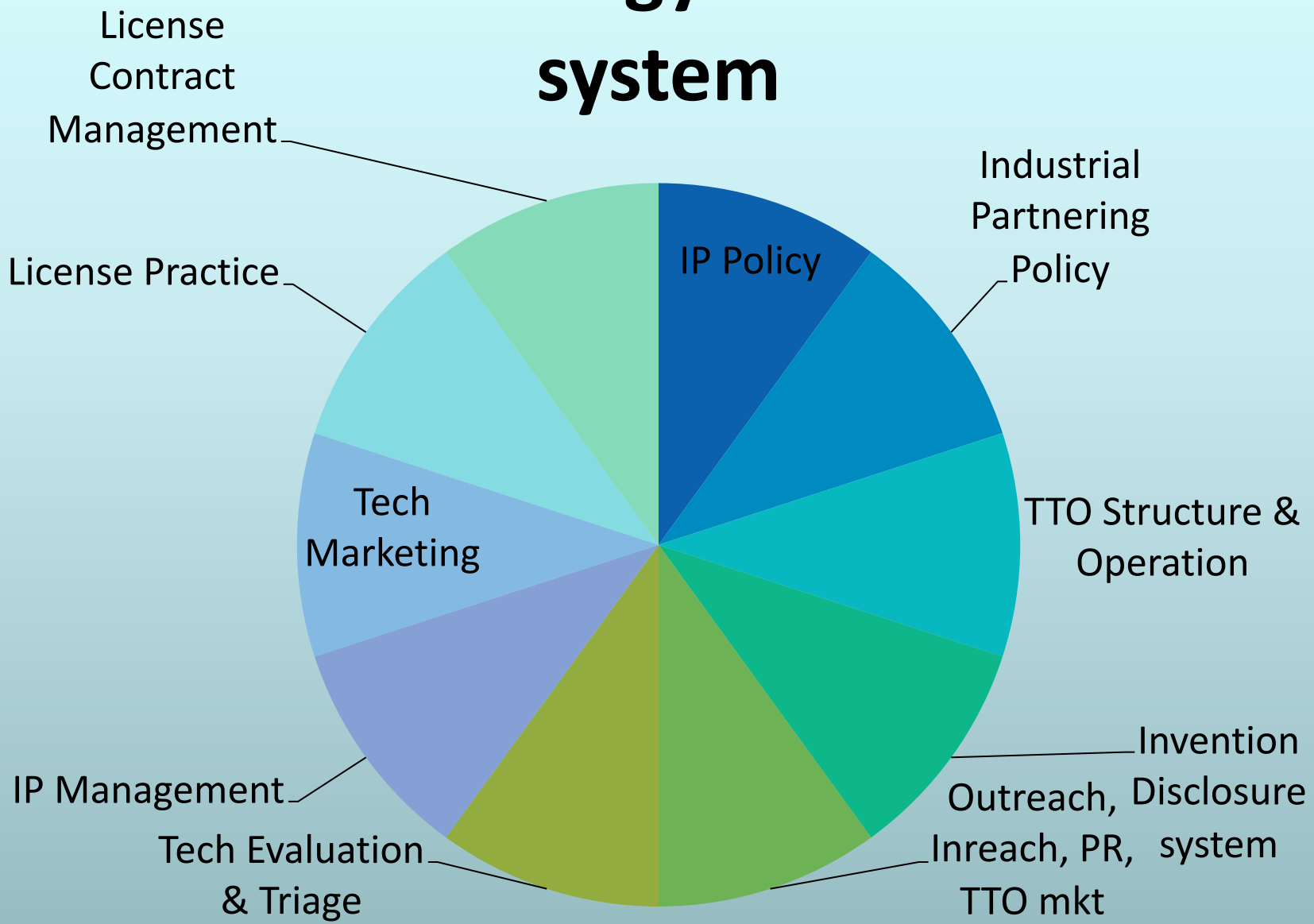
Marketing, marketing, marketing

35 Years of IP-Based University Technology Transfer: more lessons learned

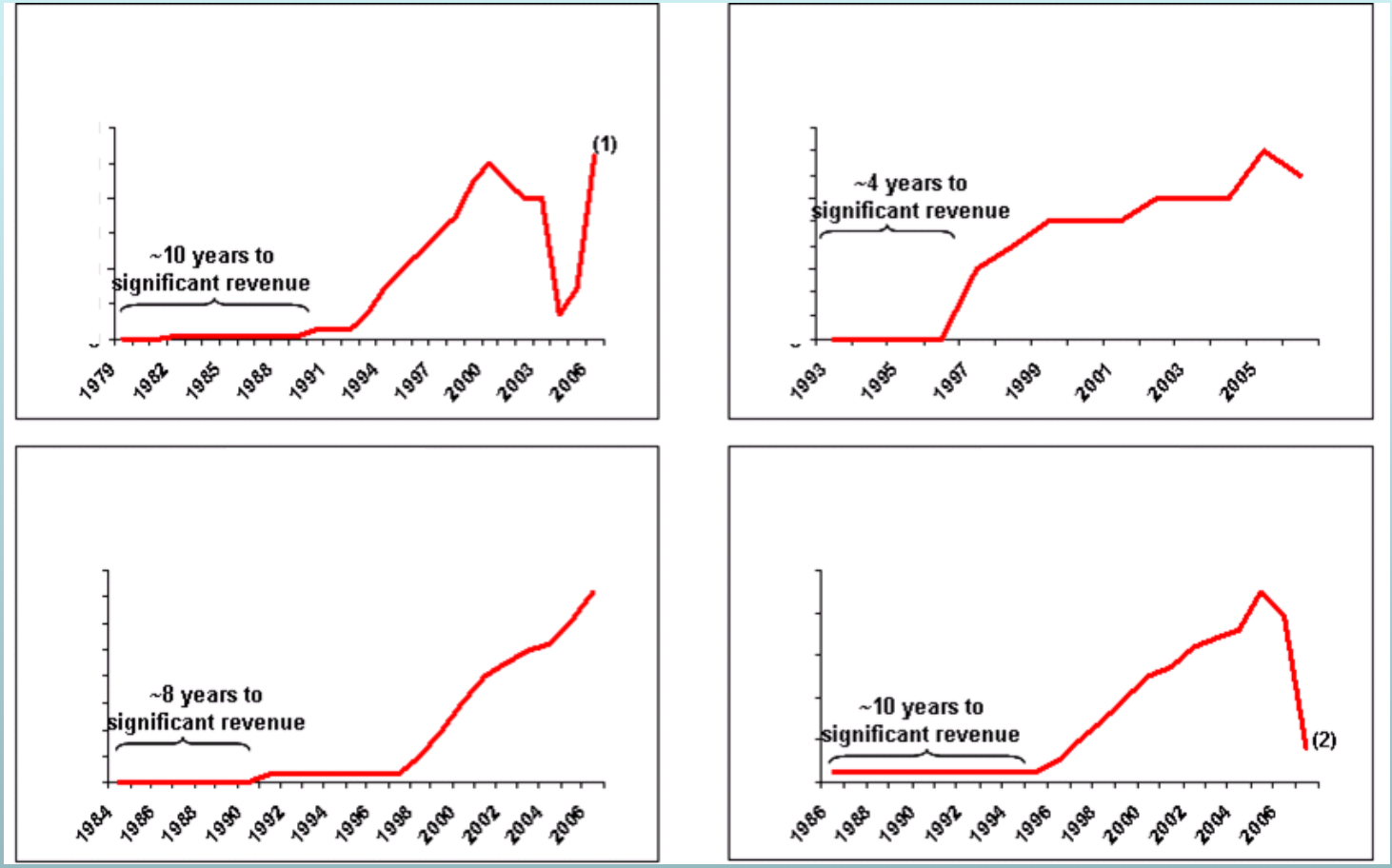
- A minority of disclosed inventions are licensed
- Often takes years to license an invention
- Usually takes years before a license produces product royalties
- Most licenses generate less than $1 million
- “Blockbusters” (>$1 million) are rare, take a long time to develop and aren’t always obvious initially
- Significant, consistent early investments in TTO & IP are required, often for many years

A sustainable, university IP-based “Technology Transfer” program requires much more than filing patents

Technology Transfer system



“Big Winners” Usually Take Many Years To Develop … and Aren’t Always Obvious at the Time



…… more lessons learned

IP-based university technology commercialization will be successful if the following are in place:

- valuable inventions with good IP
- good commercial partners
- good contracts
- risk capital
- effective legal infrastructure
- suitable markets and customers

…… more lessons learned

IP-based university technology commercialization will only be successful if the preceding are in place AND:

Skilled professionals with the right attitude, creativity, and passion are available to orchestrate the process

Creating economic value from invention requires these key elements:

- Technology-creating institutions with resources
- Inventors in those institutions
- Effective IP tools and infrastructure
- Skilled and motivated practitioners
- Technology-business development partners, supporters, and accelerators
- Commercialization implementers
- Professional service providers
- Innovators, Entrepreneurs, and Intrepreneurs
- Investors
- Markets and customers

Some final words on you and our profession:

- This is a noble profession
- You are serving the public good
- You are responsible for seeing good technologies are developed for the betterment of humanity
- Take your responsibilities seriously
- But, enjoy the process
- Stay curious and fascinated by new technologies
- Enjoy the engagement with other like-minded people
- Have fun; enjoy using your sense of humor
- Always be ethical; do the right thing; be honest and reliable
- Your reputation is your most valuable asset – protect it

Track I, Topic 1.2

Elements of Technology Transfer

Thank You