WIPO Enabling Intellectual Property Environment (EIE) Project – Malaysia

National Workshop I

IP Management & Technology Commercialization

organized by World Intellectual Property Organization (**WIPO**)
in cooperation with
The Intellectual Property Corporation of Malaysia **(MyIPO)**,
and with assistance of the Japan Patent Office (**JPO**)

Kuala Lumpur, Malaysia
16-19 April 2018

Purpose of the Workshop

To help establish a cadre* of Technology Transfer professionals,

within select “technology-creating” institutions,

with the skill, motivation, and creativity ……

…..to use institutional technology-IP,

to orchestrate innovation through the early-stage commercialization process

*a group of devoted, trained or otherwise qualified personnel capable of forming, training, or leading an organization, or a skilled work force

Workshop Faculty

Dr. Richard Cahoon (Dick)

Ms. Yumiko Hamano (Yumiko)

Mr. John Fraser (John)

Dr. Surya Raghu (Raghu)

Workshop Schedule:

Day 1

- EIE overview and status
- TTO Governance, Operation, Funding, Interaction with Sr. Management, Promotion of TTO on Campus; Various types of University/Industry Interactions
- The Technology Triage Process
- Triage Exercises

Workshop Schedule:

Day 2

- Technology characterization, evaluation, assessment, market viability assessment
- The Tech Brief: process and product
- Tech Brief exercises
- Market research & assessment; exercises
- Licensing strategy

Workshop Schedule:

Day 3

- Institutional Mission & the Licensing Imperative, License Agreements as Value- capture Envelope, intro to Pre-negotiation Valuation
- Value-capture Envelope exercises
- Win-Win license negotiations & getting the deal done
- IP Management
- Using separate entities for IP/tech transfer
- License terms and drafting; Exercises
- Closing the deal

Workshop Schedule:

Day 4

- Technology marketing
- Interacting with senior management

Joint Sessions with Company Intrapreneurs

- The benefits of collaboration
- Putra Science Park UPM
- Negotiation Exercises

Workshop Schedule:

Day 5

- University/Industry collaboration: MOSTI
- Malaysian Innovation Hub
- SME Corp.
- ITMA's role
- University/Industry panel discussion
- University & Industry presentations
- Speed-dating session

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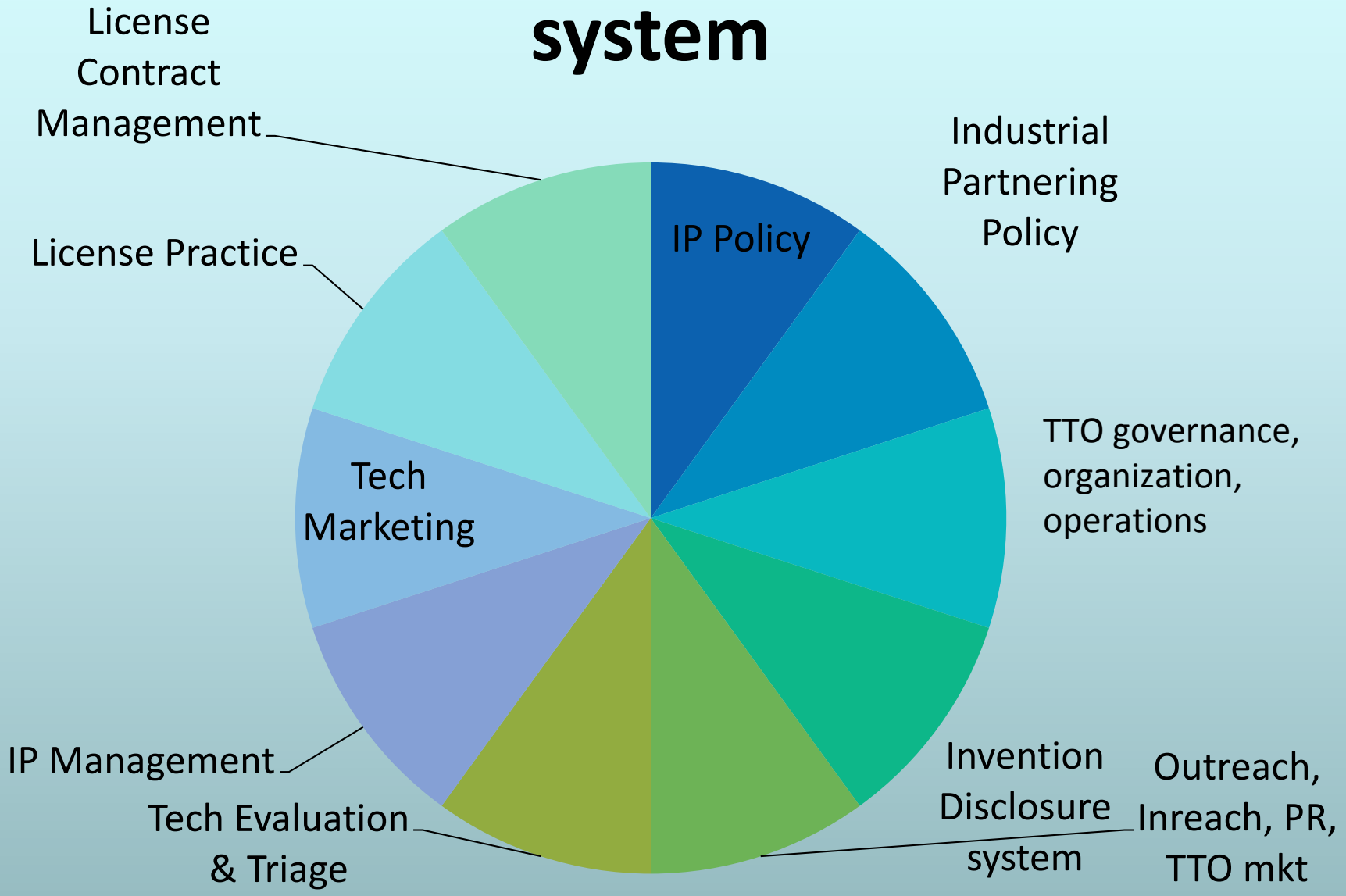
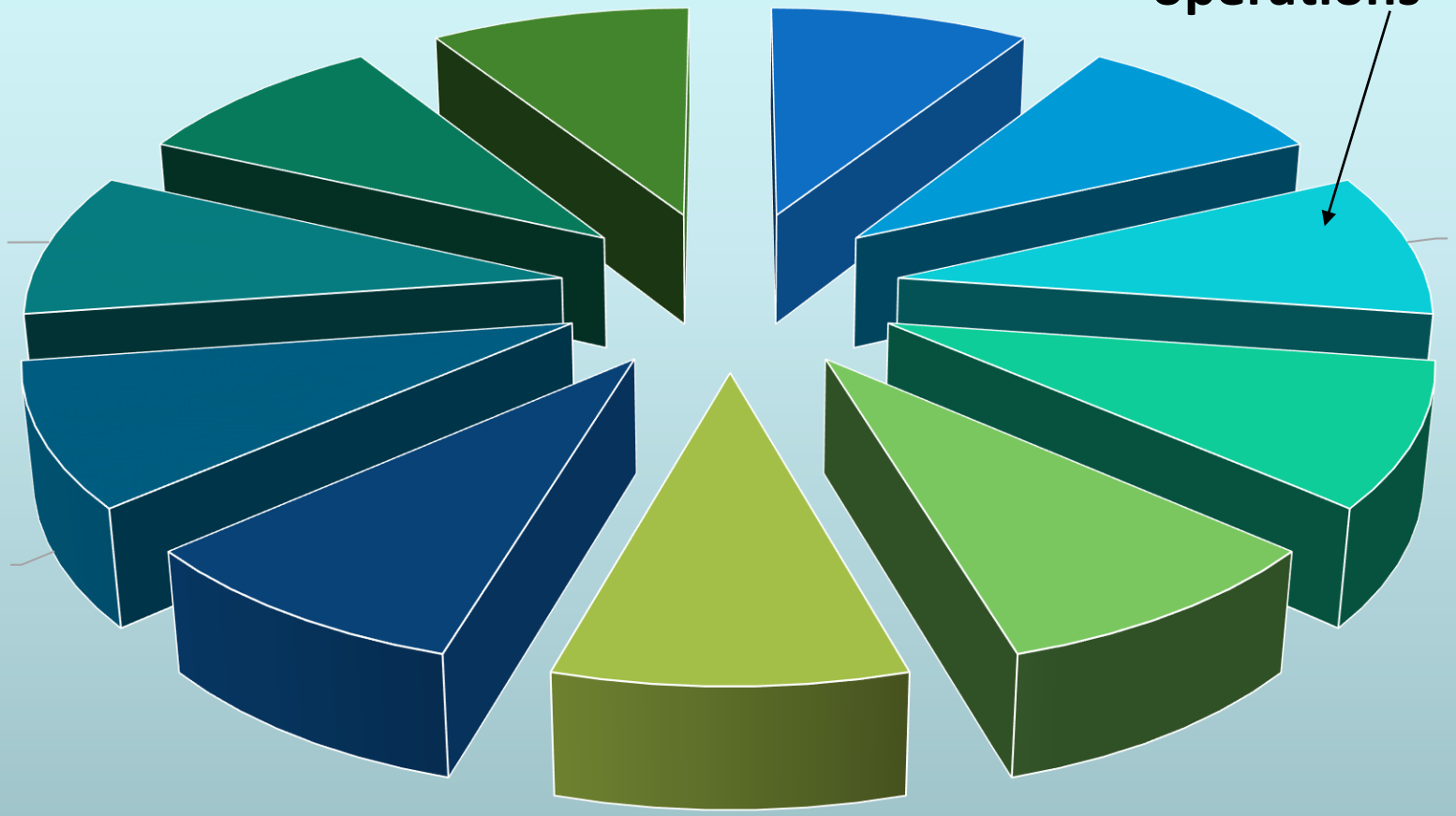
Governance, Operation, & Funding of a Technology Transfer Office (TTO)

Technology Transfer system



Technology Transfer



TTO Governance

Where does the TTO fall administratively? What is the "chain of command"?

Who does TTO report to? (President? VP? of Research?)

Is there a governing board? Who comprises the board?

Are there advisory boards? Internal, external, both?

TTO Organization: the typical model

Technology Transfer Office responsible for:

- All IP Policy implementation
- Manage Invention Disclosure process
- Relationship management with inventors
- Invention evaluation & triage
- Patent filing, prosecution, maintenance
- Other IP management
- Technology Marketing, proactive “partnering”
- License negotiation, drafting, signing
- Contract monitoring and management
- Revenue collection and distribution
- IP Policy “troubleshooting”

TTO Governance

Policy Creation vs. Implementation

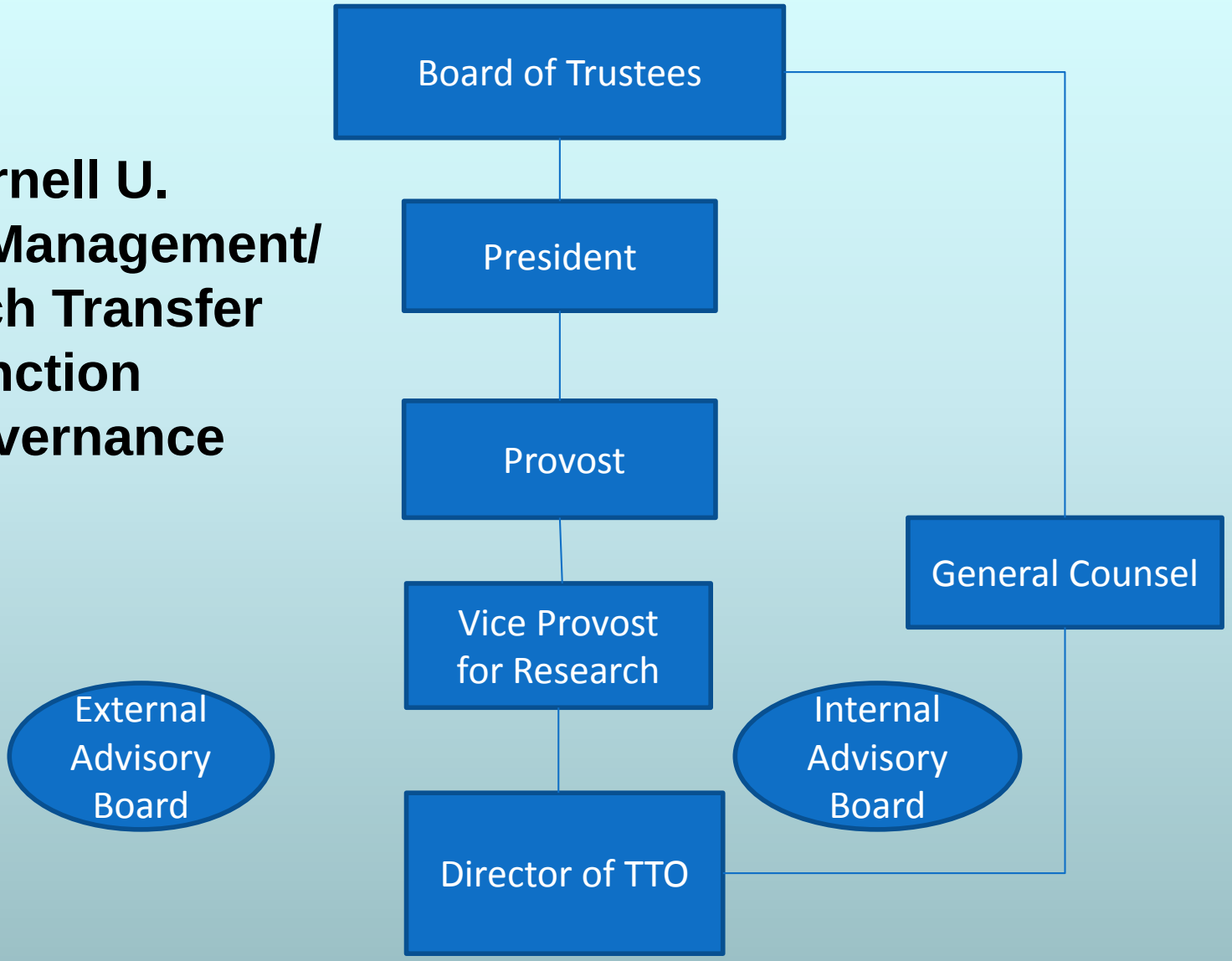
Operational Management and the Chain of Command

TT business decision-making and signature authority

Policy is campus-wide

no “one offs” or exceptions

Cornell U. IP Management/ Tech Transfer Function Governance



TTO Organization

Is there a Director? Full-time?

Is there sufficient administrative staff support? (linked to IP/TT activity)

What is the number and skill-level of staff?

(#TT Mgrs linked to # disclosures)

"Rule of Thumb":

no more than 24 new cases/TT Mgr/year

Sufficient business infrastructure (records, accounting, contract management, etc.)

TTO Organization

In-house legal?

Authority to retain and manage outside lawyers?

What is focus of Tech Mgrs time? (analysis, marketing, CRM, entrepreneurship, etc)

Can some business functions (HR, accounts) be shared with other offices?

TTO Organization

Sufficient business infrastructure (records, accounting, contract management, etc.)

What is the funding mechanism for TTO?

TTO Organization: a fundamental question

What is the funding mechanism for TTO?

- An item in an executive's budget?
- Guaranteed share of license revenue?

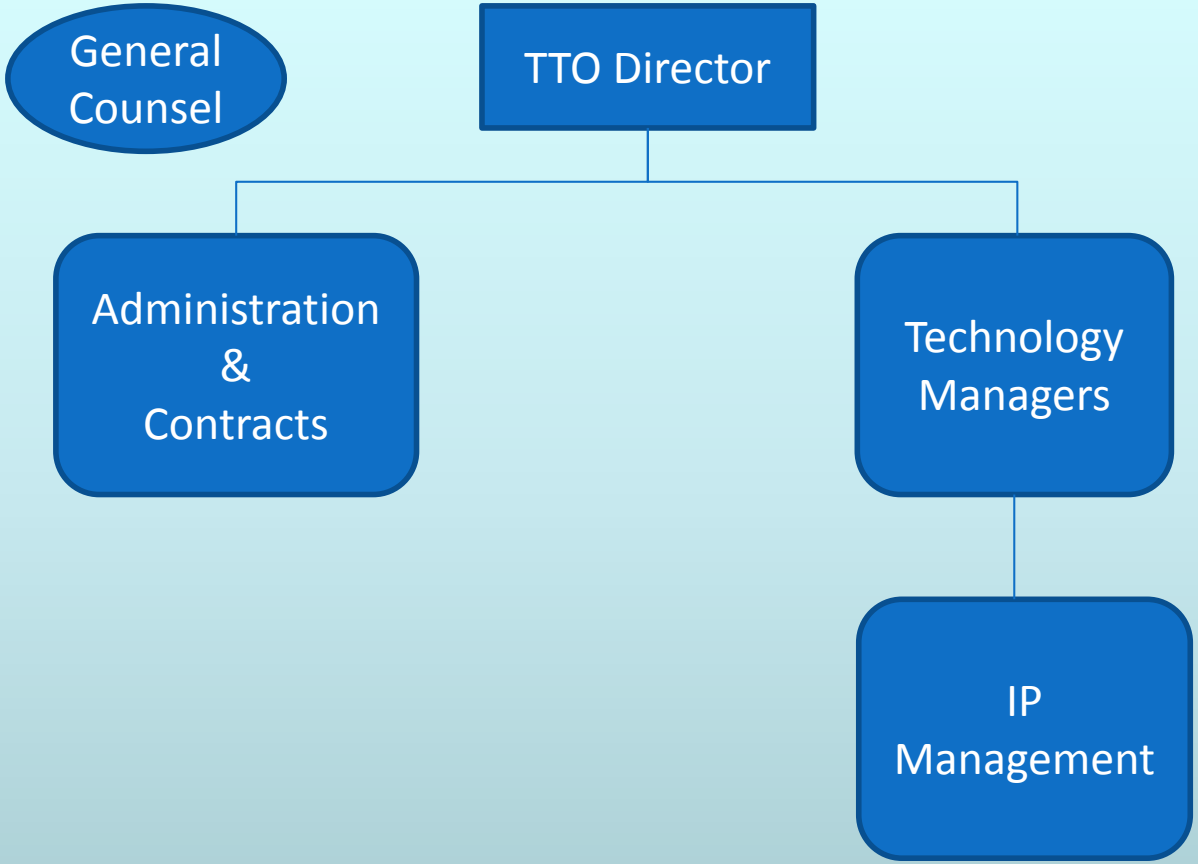
Issues to consider:

- Start-up and early stages vs. maturity
- Sustainability vs. variability
- Salaries and stability
- Sufficient funding for IP protection

TTO Organization: Key role of Tech Manager

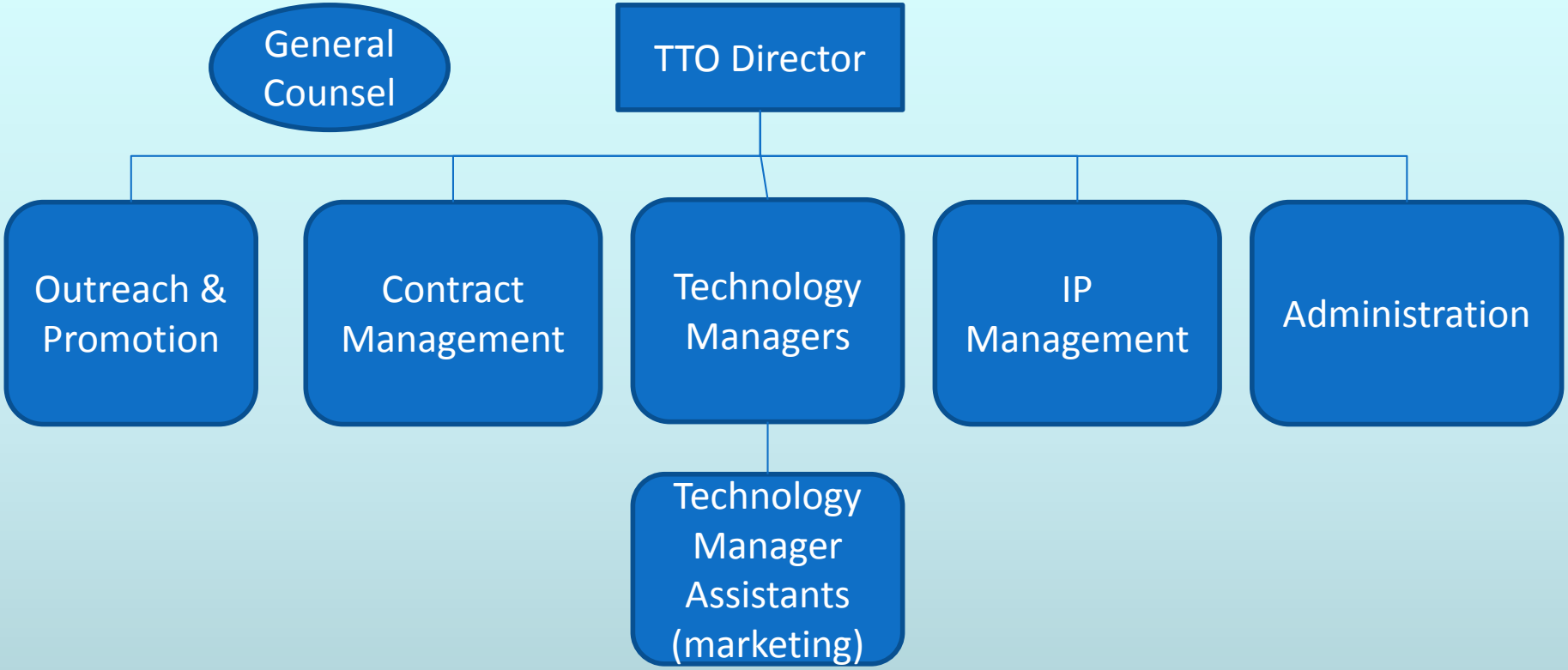
In a typical model, the Technology Manager:

- Has “turn-key” responsibility for each assigned invention disclosure
- Responsible for shepherding invention through entire process
- Primary relationship with inventor(s)
- Actively markets technology
- Primary contact with potential licensees
- Negotiates and drafts license contract
- Remains “ombudsman” for relationship and contract



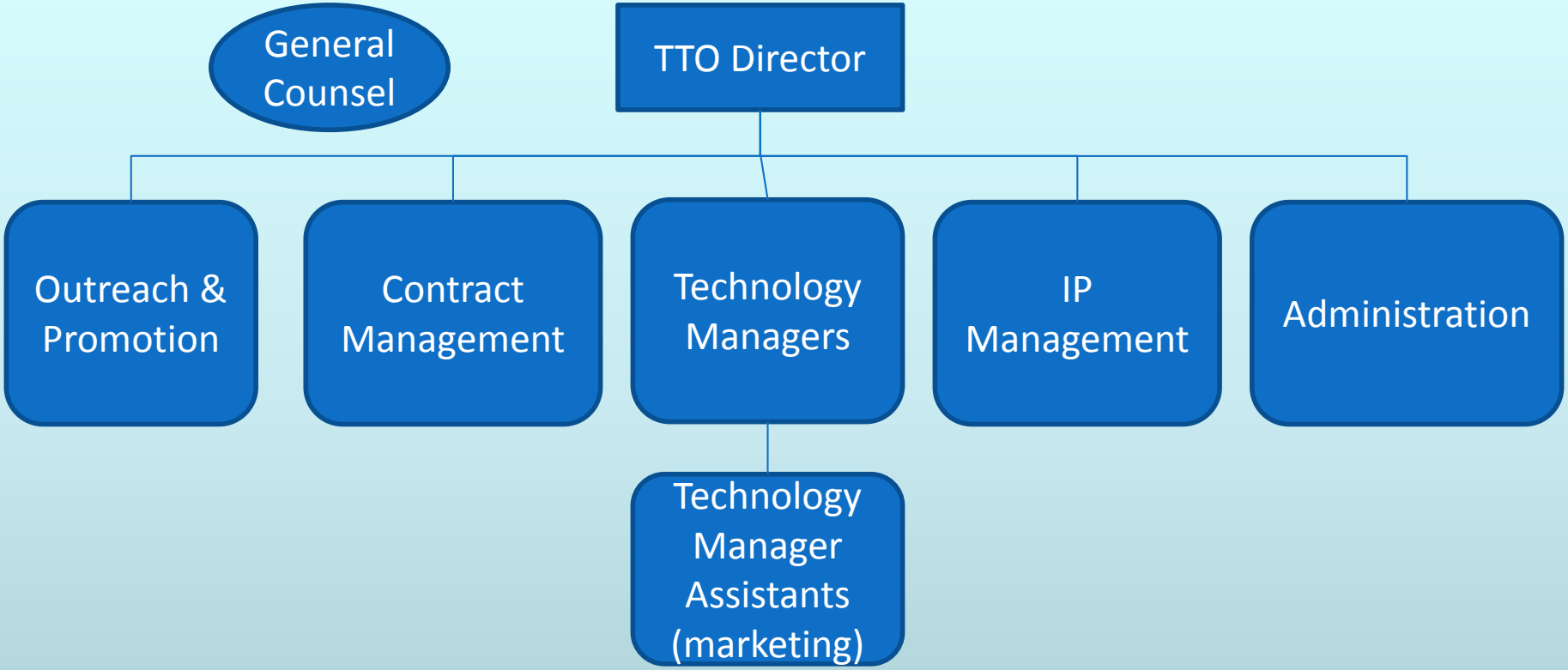
Cornell University 1990

Technology Transfer Office, Functions/Departments



Cornell University 2010

Technology Transfer Office, Functions/Departments



Cornell University 2010

Technology Transfer Office, Functions/Departments

TTO Organization: the Evolution

Cornell 1990 (90 disclosures/yr)

- 1 FT Director (also a Tech Mgr)
- 2 Technology Managers
- 1 Admin Mgr
- 1 Contract and Account Mgr
- 2 Secretaries

Rule of thumb: max 24 new disclosures/year per Tech Manager

There's never enough staff!

TTO Organization: the Evolution

Cornell 2010 (385 disclosures/yr)

- 1 FT Director
- 10 Technology Mgrs/4 TM Assistants
- 1 Admin Mgr, 2 Outreach Coordinators
- 5 Contract and Account Mgrs
- 2 Secretaries

Rule of thumb: max 24 new disclosures/year per Tech Manager

TTO Governance, Organization, Operations

There are several critical relations between TTO Governance, Organization, & Operations

- TTO funding mechanism
  (independence, sustainable?)
- IP Policy appeal process
- Conflict of Interest Policy
- License Negotiations and Signature Authority
- License income sharing

TTO Governance, Organization, Operations

IP Policy appeal process: a critical connection

IP Policy should have explicit appeal process

The process above TTO

(at Cornell, VP for Research decision final)

TTO Governance, Organization, Operations

Conflict of Interest Policy

TTO does not write or enforce

(but is very supportive)

TTO Governance, Organization, Operations

License Negotiations: a critical nexus

The TTO should be independent in its negotiation and signing of license and related agreements

NO interference by

upper Chain-of-Command

TTO Governance, Organization, Operations

License Revenue Sharing a critical nexus

Which stakeholders should share?

- inventors, TTO, College, University, others?

What is inventor's "fair share"?

Should TTO share? How much?

Share to research program?

University share?

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Technology Triage

Technology triage

What is it?

….. and

Why is it the single most important step in the IP/technology commercialization process?

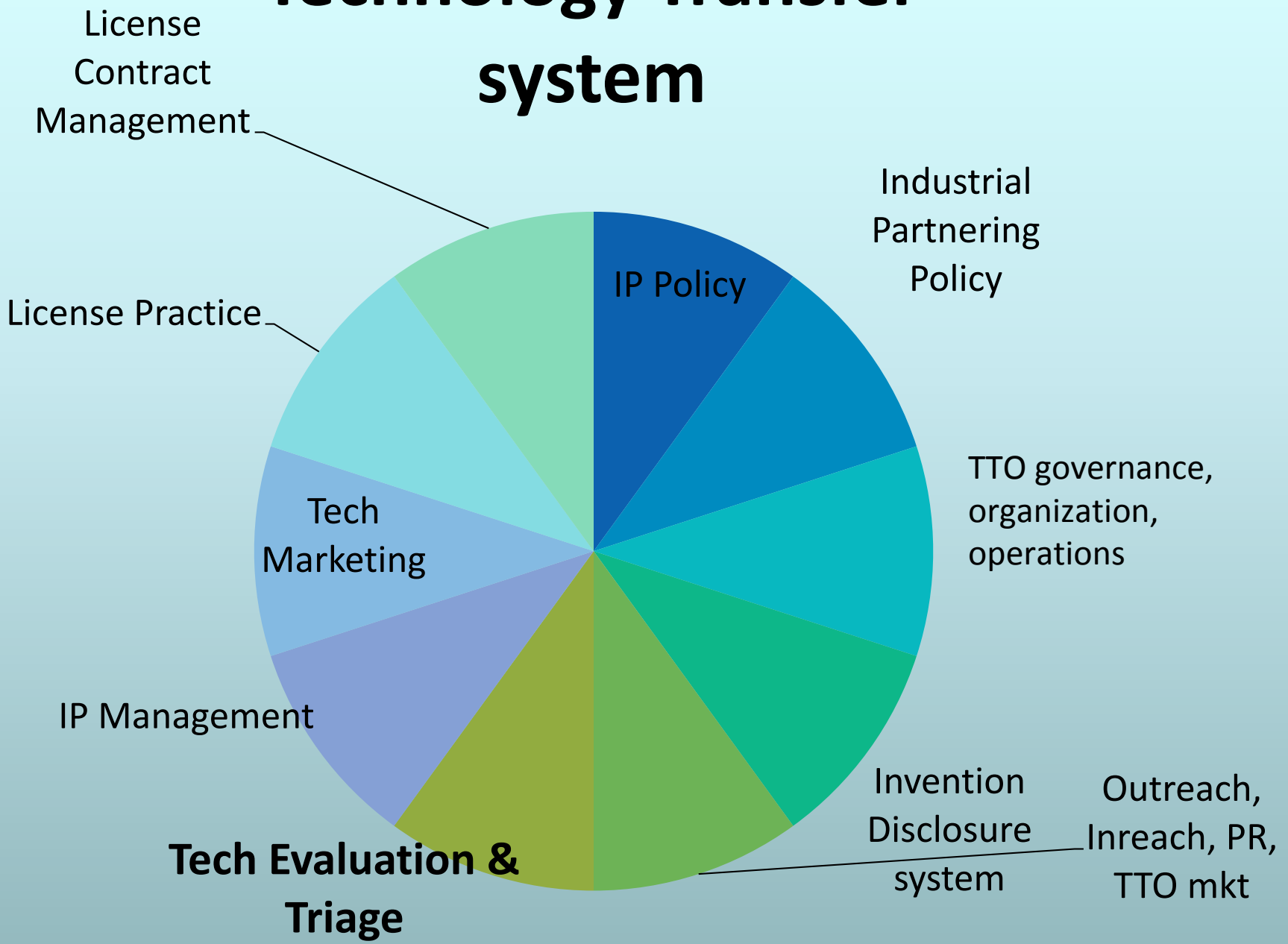
Technology Triage

1. the process of sorting invention disclosures, based on their licensability
2. understanding their strengths, weaknesses, and the related risk factors of their potential success

“Licensability”

An invention which has a reasonable chance of being licensed to an entity with the financial, technical, and business capability of commercializing it

Technology Transfer system



Why is triage essential?

Managing IP/technology commercialization takes a lot of professional time and money

Investing time & money on a technology which has little or no chance of signing a licensee (let alone a financial return) is an unacceptable waste

Without triage, the TTO will suffer gradual implosion and ultimate failure

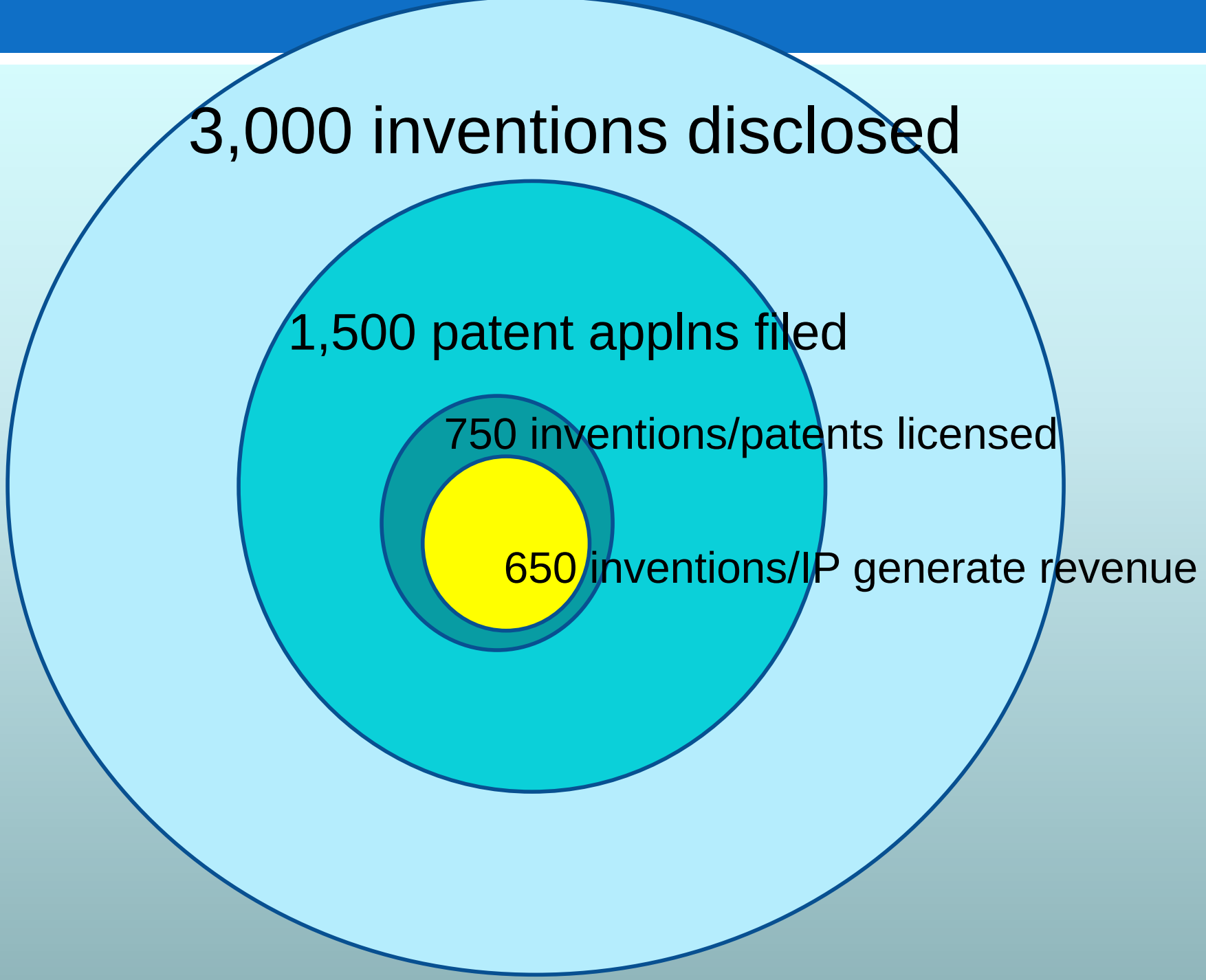
The Cornell Example

Over a span of twenty years:

- 3000 inventions submitted to TTO
  - 1500 filed as patents (~ 50%)
    - 750 licensed (~25%)
      - 650 generate revenue (~20%)

50% of all Cornell's patent expense reimbursed by licensees

Compare: 95% of US patents produce NO revenue!

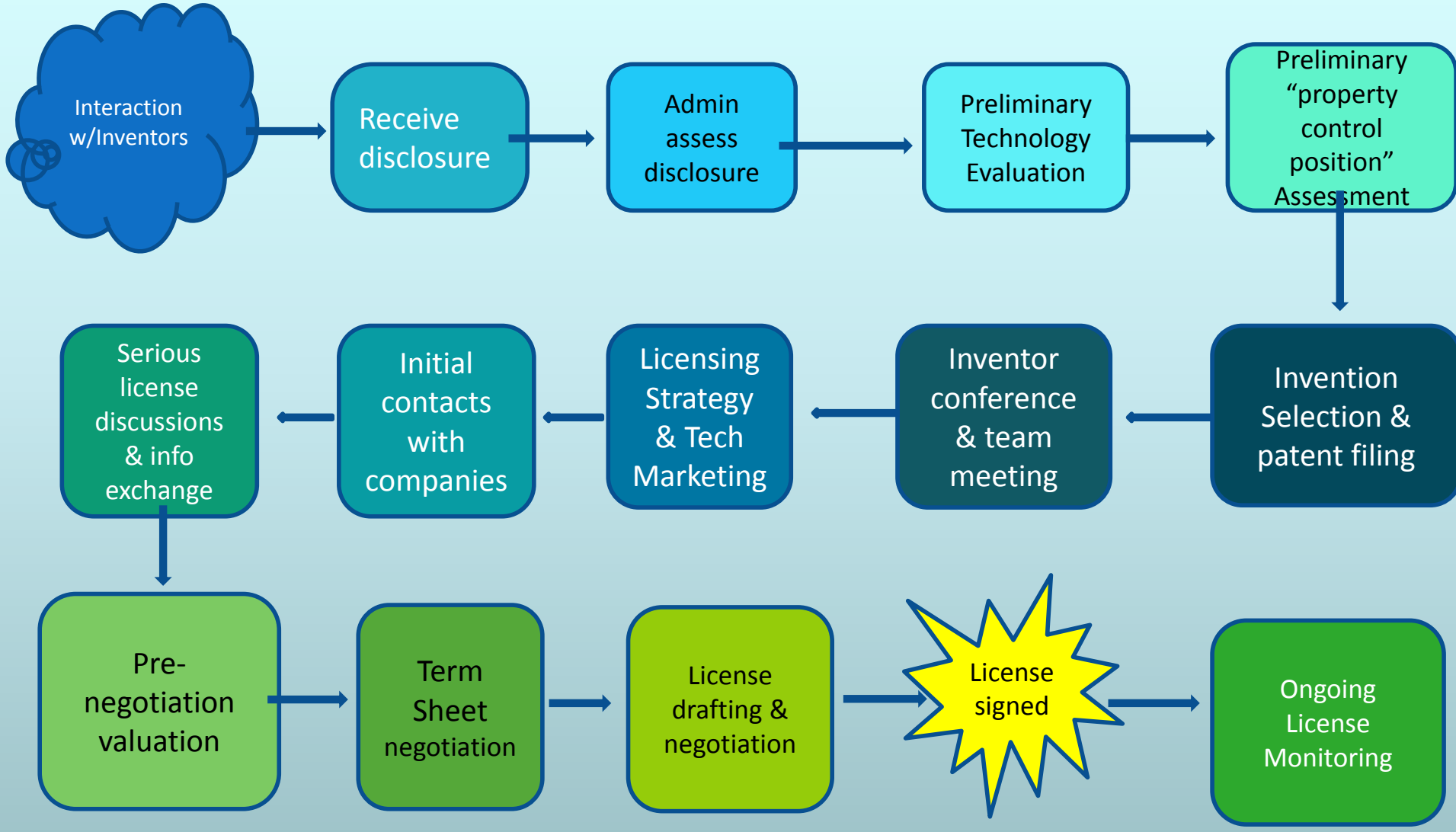

3,000 inventions disclosed
1,500 patent applns filed
750 inventions/patents licensed
650 inventions/IP generate revenue

The Technology Transfer System

Tech Evaluation & Triage,
Pre-negotiation valuation

Technology Evaluation, Triage, and pre-negotiation Valuation

- Technology assessment & characterization
- Market applications and potential competitive advantages
- Effective patentability (other IP/bioproperty)
- The key decision: file or not to file?
- Preliminary valuation as basis for negotiating position



The IP/invention Commercialization Process

Receive disclosure

- This is where the process formally begins
- Initially all you need is: title, inventors, description
- Don’t hassle the inventor for more detail at the beginning
- Treat the disclosure like it’s a $10,000 bill (very carefully!)
- Make sure it is properly registered into the system
- Schedule an appointment with the inventor(s) right away
- Start doing your homework about the invention

The IP/invention Commercialization Process

Administrative Assessment of disclosure

- All inventors named (and only inventors)
- What is the institutional affiliation of all inventors? (ownership issues)
- Sponsorship? Who funded the work? Do they have IP rights?
- Publications planned or submitted? Timing?
- Did inventors use 3rd party materials (MTA?)

The IP/invention Commercialization Process

Preliminary Technology Evaluation

- What is the invention exactly?
- How does it work?
- What makes it unique?
- Is it superior in some way?
- What problems does it solve? What opportunities does it create?
- Are these problems of economic importance?
- What applications are important and why?
- Is the marketplace potentially profitable?
- Are there any inherent flaws that will make commercialization difficult?

Study the disclosure, do your own homework
Make a list of questions. Meet with the inventor, Ask ??s

The IP/invention Commercialization Process

Preliminary "property control position" Assessment

- Prior art search – formal and/or informal
- Patentability opinion
- Potential scope of claims meaningful?
- Will potential claims be enforceable?
- Publication schedule
- Other IP possible?
- Tangible biological material?

The IP/invention Commercialization Process

- Can you make a compelling case for the commercial potential?
- Is the potential “property control position” sufficient?
- Are you convinced that you can convince others of
- it’s potential?
- Will the inventor(s) be helpful? Are they committed?
- Get going in parallel: patent filing & tech marketing

Invention Selection & patent filing

Other factors

- Inventor’s longevity at institution is important
- “Capturing” a potentially good inventor/client
- Scientific reputation of inventor(s)
- Are there humanitarian/philanthropic issues?

The IP/invention Commercialization Process

Triage Statistics

50% of all inventions will never be licensed, regardless of how much effort is put into technology marketing

50% of all inventions have some potential to be licensed **IF** you proactively marketing

AND you have some luck

25% of all inventions will be licensed eventually, but only with proactive technology marketing

How do you find the 25%?

Thoughtful analysis and evaluation of all inventions for their:

- Technical performance qualities
- Relevance to market needs
- Property Control Position quality

The essence of Technology Triage

- Select only those inventions where you are convinced that you can convince a potential commercial partner that investing in the invention is a reasonable risk, given the potential value of the technology.
- Do not select inventions that you will be embarrassed to later find a “fatal” flaw in the technology, IP, or business case (that you should have known about)
- Only invest your time and money on inventions that have a chance of being licensed

The True Goal of University Technology Transfer

- A signed contract (i.e., license) in which a financially, technically, and business-competent partner is obligated to invest time and money on YOUR technology.
- This is the best you can hope for.
- Beyond that, commercial success of the technology is out of your hands and dependent on market and other forces out of your control

Assessing technical and market attributes: performing invention triage

- What is it? How exactly does it work?
- What are its inventive features? How do they compare with current solutions?
- What problems does it solve? Is it important? What is the economic basis of that importance?
- Is the inventive solution economically feasible?

Assessing technical and market attributes: performing triage

- What are its superior attributes?

  Faster? More accurate? Cheaper? New capabilities, more durable? Etc., etc,…

- How do these attributes translate into economic benefits? Quantify benefits whenever possible

- What is the stage of development (where in the R&D continuum?)

Characterizing technical viability/market relevance

- Understand the economics of the problem solved
- What are its market applications?
- What are the market characteristics?
  - Size
  - # of companies
  - Typical profit margins
  - What is the innovation landscape? Are there any dominant companies?
- Are there significant regulatory hurdles?
- How does it compare with current alternatives

  Different is usually not sufficient… you need superiority
- Quantify performance superiority, if possible

Always be alert for “fatal flaws”

It is a “blessing in disguise” to discover that an invention is one of the 50% DOA,

before investment of much time and money (and embarrassment)

Characterizing technical viability/market relevance

- Is the technology:
  - a paradigm shift (truly disruptive)?
  - a significant improvement?
  - a minor improvement?
  - no better than the alternatives?

Characterizing technical viability/market relevance

- Can the invention be commercialized as a “stand-alone……or are other components needed?

  (will licensing be complicated?)
- Is the surrounding technology space in a declining, advancing, or stagnate stage?

Secondary Factors in triage

- Inventor's status: Faculty? Student? Retiring? New Hire?
  - Their funding track record, industrial exposure, commitment to the technology transfer process and level of cooperative-ness
- Co-owners? (this adds complexity)
- Ongoing research funding, surrounding the invention
- Any "strings" attached or other complications?
- Industrial sponsors of research/researcher?
- Part of expected stream of prior/future inventions

Assessing the Property Control Position

Intellectual Property

- Is it patentable? Patent filed? Issued?
  - Scope of claims?
  - Enforceability?
- Is the "patent field" crowded?
- Is "Freedom to Operate" an issue?
- Geographical extent of patent coverage
- Life of patent
- Other IP? Trademark, Copyright, Trade Secret(?)

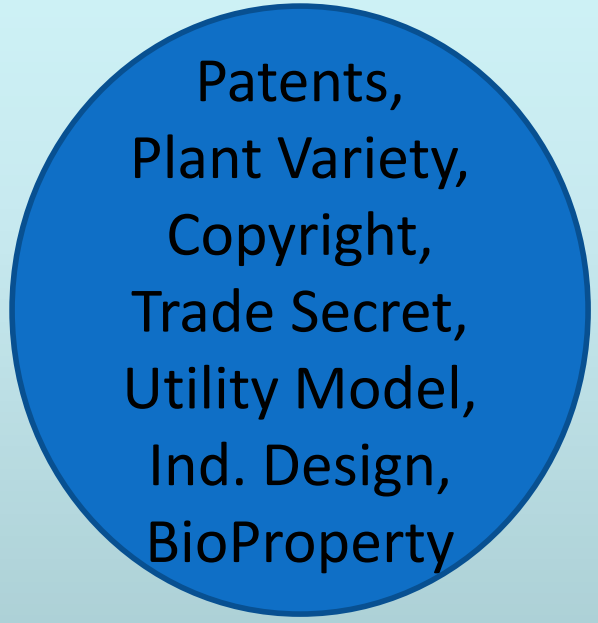
  UPOV (plants)

Assessing the Property Control Position

Tangible (personal) property

- Bailment law (MTAs) (transfer of possession not title)
- Organisms, (individual and/or populations), tissues, cell cultures, DNA, etc
- Reproducibility
- Non-biological
- Feasibility of implementing bailment control through R&D or commercialization?
- Bailments effectively implemented to date?

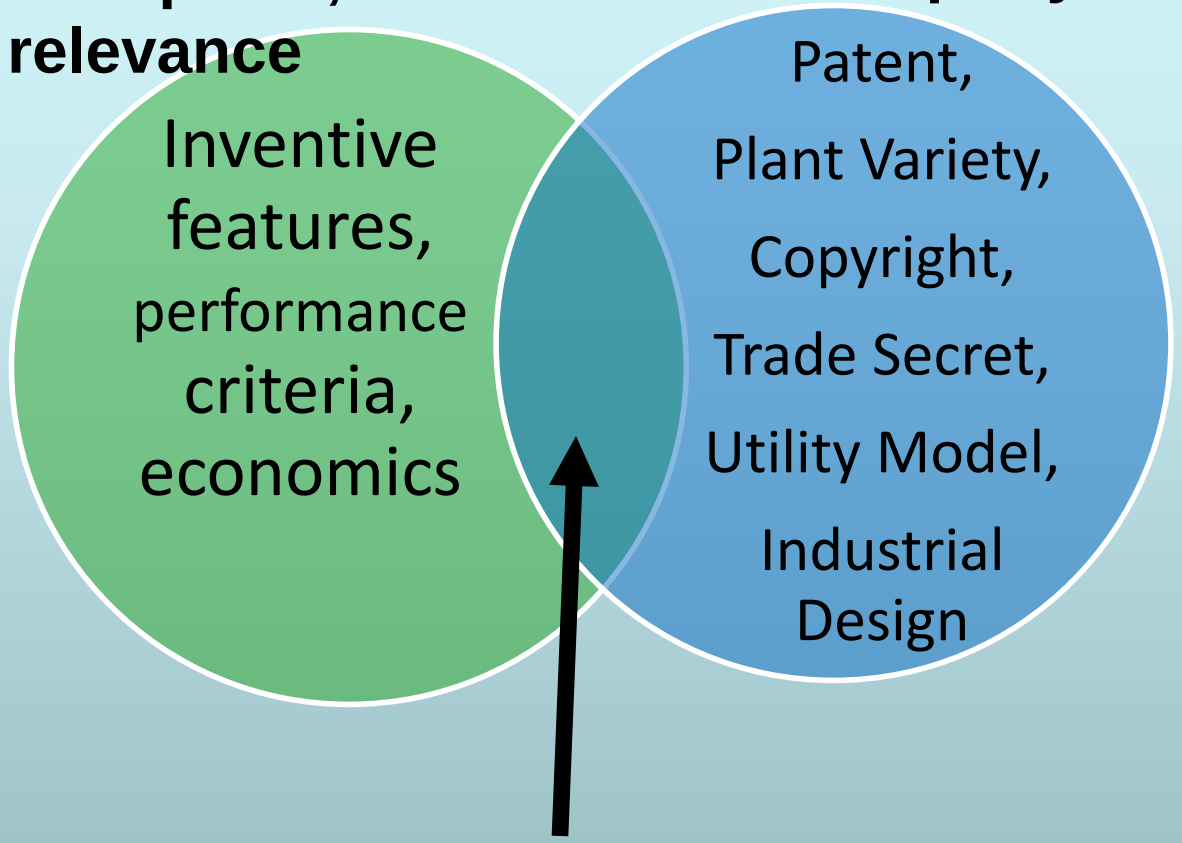
Technical aspects & market relevance



Potential Property Control Position

Technical aspects, market relevance

Potential Property Position



Invest in these: inventions with market potential and meaningful property control

Assessing technical and market attributes:

a precursor to early valuation

Define and quantify at least one "value proposition"

(performance and economic justification for why someone will buy the product or service)

What will be sold? Who will buy it? Why and how much will they pay?

What portion of the product can be attributed to the invention?

(the "Product Enabling Value")

Car vs. windshield analogy

Are there extraordinary market factors?

(regulatory hurdles, PR issues, unique competitors

What are typical profit margins in the market(s)

Pharma vs. Farming

Assessing technical and market attributes: a precursor to early valuation

- Cost of manufacture

  (wheat, semi-conductor, human drug)

- Investment required vs. ”ROI”

- Is there a development “bottle neck”?

  potential flaws, difficult hurdles (e.g. human safety issues, environmental impacts, unreliable supplies, etc.?

- Consider the “equation”: stage of development vs. risk

Stage of development vs. risk "equation"

Initial invention: highest risk

Proof of principle: high risk

Patent application: high risk

Prototype: medium risk

alpha-test (lowers prototype risk)

beta-test (further lowers risk)

Patent issued: medium risk

1st product sale: significantly lowered risk

Initial sales: lower risk

Repeat sales: lowest risk

Steps to Strengthening the Business Case

- Define the technical advantages over existing alternatives
- Describe how those advantages lead to economic benefit
- Define who has an interest in the economic benefit
- Quantify the economic benefit

Strengthening the Business Case:

define a feasible business model

Describe how the technology will be turned into a product and/or service?

How will the product/service be sold and to who?

Why will they buy it?

Describe the feasibility of scale-up of manufacture, distribution, and sale

Strengthening the Business Case

Develop at least one

Unique Value Proposition ("UVP")

The UVP of an invention concisely describes:

The benefit(s) it will provide……

[describe them clearly, concisely, and thoroughly]

….at a cost, that a future buyer (the customer) will perceive as a compelling “value”

“Value” = Benefits – Cost

[define and quantify the benefits and costs]

The Unique Value Proposition (UVP)

- Explains how the invention provides this unique value (specific benefits – cost) to a future buyer, compared to alternatives.
- Is a clear and concise statement that summarizes why someone would buy the product or service based on the invention.
- Describes how the invention will produce a product or service that will add more value, create more profit, or better solve a problem than current alternatives.

The Unique Value Proposition (UVP)

- Makes it clear how the invention will solve future buyers' problems or improves their situation such that profitability is enhanced
- Identifies why the technology is superior to the competition (unique differentiation).

What makes a good UVP?

- Clarity! It's easy to understand.
- Communicates concrete results that will result from using the technology and its products and/or services.
- States how it's different (and better) than the alternatives.
- Avoids hype (… "never seen before, amazing miracle product"), superlatives ("best"), and business jargon ("value-added interactions").
- Can be read/understood in about 10 seconds.

UVP Examples

“Achieves the same level of pest control as current chemistries at 30% cost reduction.”

“Produces materials that exhibit 25% increased life at temperatures above 450°C at a cost comparable to existing high temperature materials.”

“Increases the manufacturing yield of large Li batteries by 50% with no cost increase”

UVP Examples

"A natural topical antiseptic 90% as effective as current chemical antiseptics."

"A tomato variety that exhibits 50% more solids and 25% more sugar per unit weight than currently available varieties."

"Reduces scours mortality in new-born calves from 15% to 1.5% at a cost of less than 6 Pesos per animal."

A Triage Scoring Template

- Ten categories
- Scoring: 1-5

  1= Very Unfavorable

  2= Unfavorable

  3= Neutral

  4= Favorable

  5= Very Favorable

A Triage Scoring Template: the 10 categories

1. *Description of Invention and Inventiveness*
2. *Potential Value of Intellectual Property*
3. *Market Relevance*
4. *Market Size & Characteristics*
5. *Value Proposition/Potential for Reasonable Business Model*
6. *Potential for Significant Economic Value*
7. *Stage of Development/Technology Readiness*
8. *Scale-up Feasibility*
9. *Support, Funding and Resources*
10. *Existing or Potential for Private-sector Partnerships*

A Triage Scoring Template: the 10 categories

1. ***Description of Invention and Inventiveness***

Does the Invention Disclosure thoroughly and clearly describe the invention; what it is and how it works?

Are the inventive features clearly delineated and explained?

Do the inventive features appear to be technically meaningful/significant?

(not simply a distinction without a difference)

Are the superior performance features described clearly?

Does it work? As hoped?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

2. *Potential Value of Intellectual Property*

Is it patentable *vis a vis* the prior art

Is there an issued or pending patent on the invention?

Do the claims effectively cover the invention?

Will the claims be reasonably enforceable?

In which countries do potential or existing patent claims exist and are these relevant to the market for the invention?

Are other types of IP possible or existing (trademark, copyright, Plant Breeders' Right, Trade Secret)?

Is there potential or existing "bioproperty" that may have value in commercialization of the technology?

1=VeryUnfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

3. *Market Relevance*

Does the invention solve a problem that is economically meaningful?

Is the problem widespread and significant or localized and trivial?

Is there a definable market for the problem solved?

How does the technology compare to existing solutions to the problem?

1=VeryUnfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

4. *Market Size & Characteristics*

Is there one or more identifiable markets for the problem solved?

How large are these markets?

Are the markets characterized by few/large firms or many/medium-small firms?

Will these markets sufficiently value the problem solved?

Does governmental regulation have a significant impact on the market for new products/services?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

5. ***Value Proposition/Potential for Reasonable Business Model***

Can at least one "value proposition"

(Quantitative Benefit – Quantifiable Cost = Value)
be described and substantiated for the invention, in at least one market application?

Is the value proposition feasible?

Can at least one reasonable business model be elucidated in conjunction with the selected value proposition?

Is the business model suitable for: 1) disruptive/paradigm shift; 2) revolutionary; 3) incremental (large or small) innovation?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

6. *Potential for Significant Economic Value*

Does the combination of value proposition, market size, business model, and market characteristic establish the basis for significant economic value?

Will the realization of that value require very large, large, moderate, or small investment and will the potential return on that investment be sufficient to justify the investment required?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

7. *Stage of Development/Technology Readiness*

What is the current stage of technical development of the invention (idea, “test-tube proof”, bench-test validation, extensive testing, pilot scale, beta-test in application, etc)?

What level of risk (that the technology will not work as expected/hoped) is the technology currently at?

Will the steps to lowered technical risk be relatively easy or difficult (in terms of time and money)?

Will the cost required to de-risk the technology be overcompensated by the potential return on investment (see previous category)?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

8. *Scale-up Feasibility*

Can the technology be cost-effectively scaled-up to a level of profitable manufacture or service delivery?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

9. *Support, Funding and Resources*

Are there resources readily available to further develop the invention (money, staff, facilities)?

Is development funding readily available?

Are there additional resources available that might play a role in development of the technology from its current stage to commercialization?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

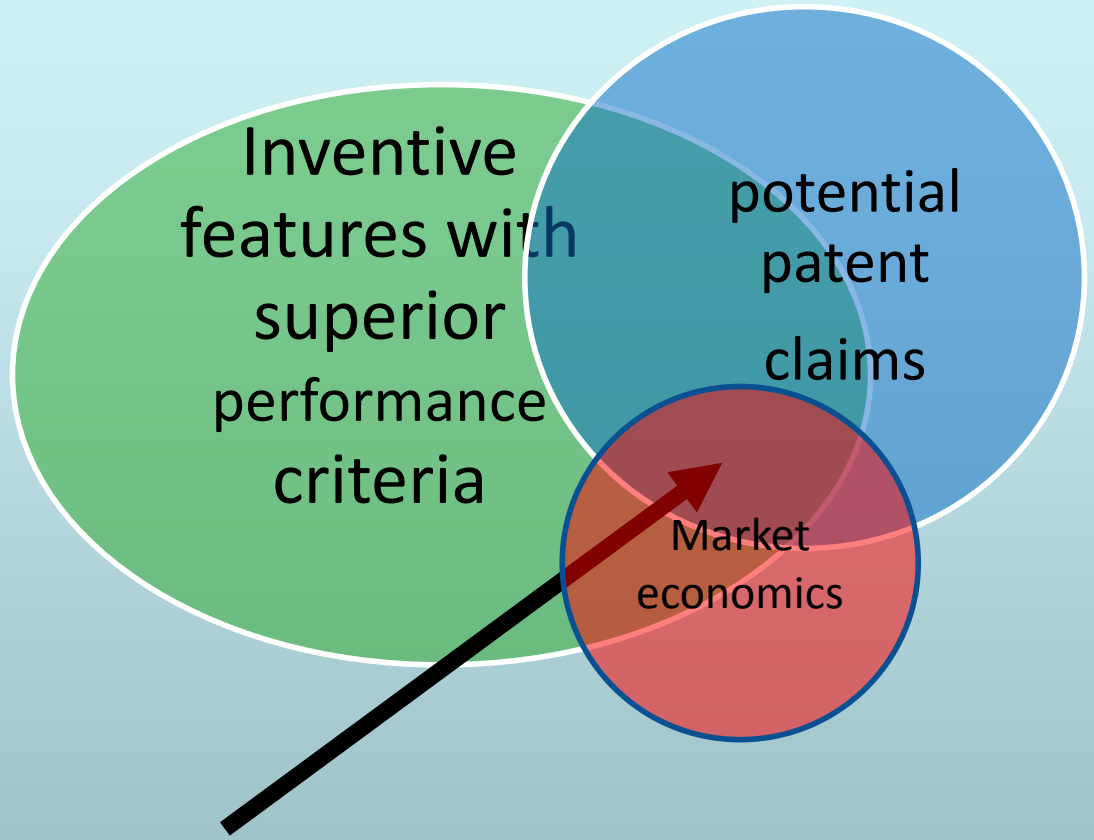
10. Existing or Potential for Private-sector Partnerships

Do relationships with private sector partners exist? Are these partnerships closely linked to commercialization activity?

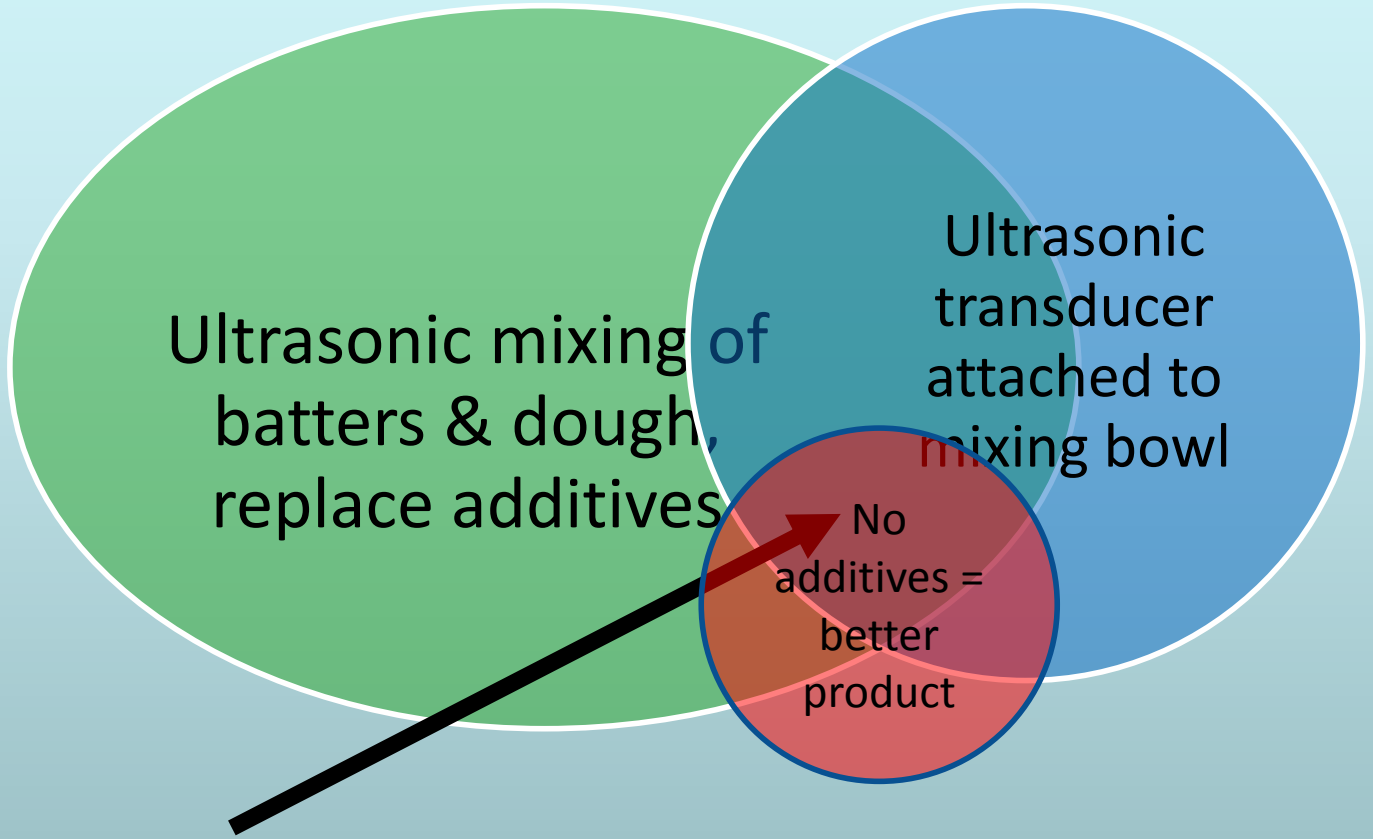
1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

The essence of Technology Triage

- Select only those inventions where you are convinced that you can convince a potential commercial partner that investing in the invention is a reasonable risk, given the potential value of the technology.
- You DO NOT need to write a Business Plan to triage
- You only need to do as much as necessary to convince a potential licensee to take the risk
- They write the Business Plan!



Invest in these: inventions with superior performance, market relevant economics, and meaningful patent claims



Invest in these: inventions with market potential and meaningful property control

The essence of Technology Triage

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The Technology Brief: Process and Product

The Technology Brief

Your goal should be to have

a Tech Brief for

every technology which you pursue

The Technology Brief

The Product:

an effective marketing tool

The Process:

a deep understanding of the technology, its risks, and

value proposition

Technology Marketing

- Essential for successful technology transfer
- The Technology Brief is central to the technology marketing mindset and campaign
- Necessary for active/targeted and passive tech marketing
- Every technology will have a Tech Brief

The Technology Brief

- Formats and media

  “Tech Briefs”

  Hard copy; Electronic

  Web-based; links, photos, drawings, video

The Technology Brief

- Initially, less-is-more
- Define the technical innovation/ invention

  What is it precisely? How does it work?

    its benefits over existing technologies; DATA!
- IP and tangible property status
- Stage of development (technical, market, business)
- Types of deals to be considered
- Formats and media

  “Tech Briefs”

  Hard copy; Electronic

  Web-based; links, photos, drawings, video

Technology Brief (template)

Title

Technology description: [1 or 2 sentences]

Technical qualities and advantages: [2 or 3 sentences}

Market applications and commercial opportunities: [1-3 paragraphs]

IP and tangible property status: [1 or 2 sentences]

Development status: [1 or 2 sentences]

Types of deals sought: [< 1 sentence]

Contact details: [< 1 sentence]

Technology
- Cornell Products
- Cornell Patents
- Startup Technologies
- Featured Technologies

CCTEC Tools
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- Express Licenses Available Online

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Alter Plant Cell Wall Structure for Cellulosic Ethanol Production

Docket Number D4182

Invention

Plant cellulases typically cannot degrade crystalline cellulose. This inability is thought to be due to the lack of carbohydrate binding domains (CBD). Cornell inventors have identified glycosyl hydrolases from plant origin that contain CBDs. Over expression of these proteins, results in less crystalline microfibrils and/or altered xylan structure and size. These changes in cell wall composition would improve plants as candidates for biofuel production because they would have better characteristics for bioprocessing, including better hydrolysis properties.

Potential Commercial Applications:

This invention can be used to alter characteristics of plant cell walls, making them more amenable to break down for the conversion to biomass. Currently limitations exist for the use of biomass as a biofuel, mainly in the hydrolysis step of production.

The use of GHs that have CBDs to transform plants will allow for more efficient cellulose degradation. Hydrolysis of cellulose is critically important in the carbon cycle but now recognized as an important and limiting step in breaking down cellulose in plants to access the sugars for fermentation to use biomass for fuel production. Specifically, CBDs will allow the enzyme to attach to its substrate. GHs with CBDs will more efficiently break down plant cell walls, making these transformed plants better candidates for biomass production.

Advantages:

- These enzymes address the need for more efficient hydrolysis of plant biomass.
- Binding of enzymes to their substrate is considered a limiting step in cellulose hydrolysis, thus the presence of CBDs is critical for effective hydrolysis.
- SICel9C1 represents the first example of a plant EGase that can bind crystalline cellulose.

Additional Information (publications, web sites, and patent links)

- Newly discovered plant enzymes could lead to more efficient--and less costly--ethanol production from cellulose
- Patent Application: PCT/US08/067900;

Supporting Documents

- Tech brief (123KB PDF)

Innovators & Portfolio

Published on *Office of Technology Transfer* (http://www.ott.arizona.edu)

Compact Snapshot Polarimetry Camera

Compact Snapshot Polarimetry Camera

Non-Confidential Summary

Background: Polarization data can provide valuable information about an object, such as distribution of internal stresses or whether the object is natural or man-made. With an expanding range of applications, polarization imaging devices are increasingly deployed outside of controlled environments, where factors such as compactness and mechanical ruggedness become important. Therefore, there is a need to develop polarization imaging devices that are simple, robust, and feature a small form factor.

Summary: Researchers at The University of Arizona have developed a novel device that answers these challenges. By manipulating quasi-monochromatic light from a scene in the object space, this device produces a map of the Stokes parameters, completely characterizing distribution of polarization states across the scene. Furthermore, it accomplishes this in a small form factor, without moving parts, and no extra power. Information about the entire scene is captured at once, yielding fast, snapshot operation.

Lead investigator: Michael W. Kudenov.

Stage of development: A laboratory prototype has been constructed and tested, validating principles of its operation and design.

Applications:

- Industrial process monitoring
- Environmental monitoring
- Defense and security

Advantages:

- Monochromatic operation allows customization for a specific use
- Lack of moving parts greatly reduces sensitivity to vibration and mechanical stress
- Snapshot operation captures information about the entire scene at once

Status: A U.S. utility patent application has been filed. Currently seeking commercial partner for licensing.

Thinking through the Tech Brief and understanding the technology

- In your triage, you've determined the cost-effective IP and/or bioproperty that is possible
- Now, link the possible IP/bioproperty with the potential applications and value of the technology you've uncovered in your initial evaluation/triage
- Use the Unique Value Proposition as a guide to writing the Tech Brief

EIE National Workshop I - Malaysia

Institutional Mission & the Licensing Imperative,

License Agreements

as Value- capture Envelope,

Introduction to Pre-negotiation Valuation

IP-based Technology Transfer & Licensing

Some Basic Principles

Institutional Mission &

The Licensing Imperative

The University as a Social Treasure

What is IP-based Technology Transfer?

Universities have been "transferring technology" for hundreds of years

- Academic scholarship & publications

Creators and Keepers of the Written Word

What is IP-based Technology Transfer?

Universities have been "transferring technology" for hundreds of years

- Academic scholarship & publications
- Research
- Outreach (seminars, workshops, webinars, etc)

A Community of Scholars and Teachers

Researchers/Teachers (advancing knowledge)

The Morrill Act (U.S.) 1862
applied science & technology taught, and brought to farmers

What is IP-based Technology Transfer?

Universities have been "transferring technology" for hundreds of years

- Academic scholarship & publications
- Research
- Outreach (seminars, workshops, webinars, etc)
- Students graduated

The Next Generation of Creators

What is IP-based Technology Transfer?

Universities have been "transferring technology" for hundreds of years

- Academic scholarship & publications
- Research
- Outreach (seminars, workshops, webinars, etc)
- Students graduated
- Libraries
- Conferences & Workshops
- Why do we do it?

To serve the public good!

Cornell University

University IP-based Technology Transfer

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

a new form was established nearly 40 years ago

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


BJA

IP: What role does it play in University Technology Transfer?

- Technology development requires investment (typically significant amounts)
- IP provides mechanism for a return on investment
- IP allows value to be shared between creator and implementer
- IP gives university control to assure its interest are protected and public good is served
- IP provides means for establishing clear inventorship and ownership

What is IP-based Technology Transfer?

- "Capture" of invention with IP mechanisms
- Transfer of commercial-use rights to that IP to a private sector partner
- Under conditions that protect the interests of the institution and the public….
- ….and that foster the development and dissemination of the invention for the benefit of the institution, its inventors, the commercial partner, and the public

University "Technology Transfer":

Why do we do it?

- To make money, of course…….

just like with

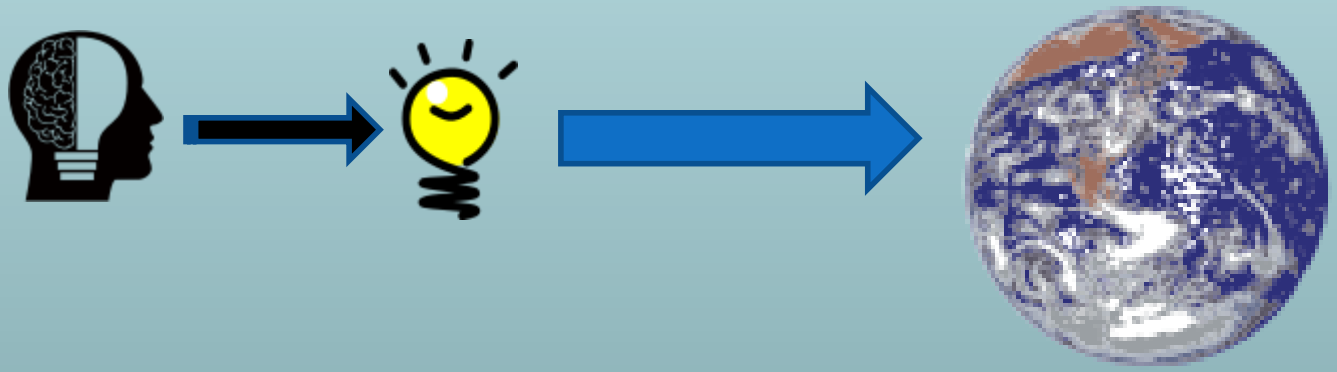
- Students
- Scholarship & Academic work
- Research
- outreach

Myth: IP-based technology transfer

is a good way for universities to make a lot of money

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

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



University IP-based Technology Transfer:

Why do we do it?

- Technology transfer is an integral and essential part of the university mission
- Technology development and dissemination
- To serve the public good
- Service to faculty, administration, inventors
- Enhance the university reputation
- Economic development

  new products, services, companies, jobs
- To produce “creators”

University IP-based Technology Transfer:

Why do we do it?

Active engagement in university IP-based technology transfer has a much more profound effect than the creation of new products, services, companies, and jobs

The ***PROCESS*** itself generates

a "creative economy" of innovators, entrepreneurs, investors and supporters…..

creators… in a thriving

"innovation ecosystem"

Essential principles

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**

IP-based technology transfer

University should maintain some control of its technology (IP)

University not a market participant (it serves all; it has no market-place competitors)

Commercial concerns should never influence academic, education, or research goals

The university has a duty to see that its inventions are made available to the public

Why is University IP ownership so critical?

- Maintains connection between inventor and invention
- University can steward its technology
- University can protect its' and inventor's interests
- Assures delivery of the IP to public
- Protects educational and research uses of IP
- Few benefits to university with loss of control

University-Industry Engagement Overview

"Good fences make good neighbors"

IP rights are the fence that make university and industry good neighbors

University should **NEVER** give up its IP ownership

but…..

Should be very flexible in negotiating commercial use rights with partners

University IP-based Technology Transfer:

Why do we do it?

- Encourage and reward creative faculty and staff
- Foster invention and the creative arts to improve the standard of living
- Help create an innovation ecosystem that leads to economic development for local, regional, national economies
- Generate unrestricted revenue for the institution and its constituents
- TTO financial sustainability is the goal, not big money

University IP-based Technology Transfer:

Sale vs. License

- Sale = transfer ownership, lump-sum payments, loss of control over future use
- License = retain ownership, grants certain commercial-use rights, revenue spread out over time, shares risk, allows ongoing influence for use in the public good

University IP-based Technology Transfer:

Sale vs. License

- Universities (vast majority) in US and Europe never sell their IP
- Successful tech transfer operations are, however very flexible negotiators in license terms
- Philanthropic and humanitarian concerns
- IP ownership by university serves inventor's interests in the long run
- License retains research/education use for university and its "sister" institutions

with Industry

Standard IP ownership rules at US and majority of other universities:

Inventions made solely by university

are owned solely by the university

Inventions made solely by company funder

are owned solely by the company funder

Inventions made jointly by university & company

are owned jointly

(companies cannot buy IP ownership from university)

University IP-based Technology Transfer:

the Licensing Imperative

- Universities/government can create new technologies but can't commercialize them
- University needs a private sector partner to bring its technology to fruition for the public good
- The license agreement is the key

  without a transfer of rights

  the university doesn't achieve its mission
- The goal of the license is effective technology transfer – not making money!

University IP-based Technology Transfer: the Licensing Imperative

The TTO's Absolute Goal:

Transfer the Technology

Allow the licensee to profit

Design a mechanism to share some of that profit

University IP-based Technology Transfer: the Licensing Imperative

- While the goal of the license is effective technology transfer – **not maximizing return**
- The TTO should strive to craft a fair balance of risk and reward between the university and the private sector partner
- Throughout the negotiation, the TTO should ask themselves:

"am I helping or hindering the process of getting the invention developed and disseminated, where it can benefit the public?"

University IP-based Technology Transfer: the Licensing Imperative

The TTO's Secret:

- It is rare to have more than one company that wants to license a university technology
- The result of a failed license negotiation:

  no tech transfer

  technology sits "on the shelf"

  faculty unhappy

  solution never benefits society

The True Goal of University Technology Transfer

- A signed contract (i.e., license) in which a financially, technically, and business-competent partner is obligated to invest time and money on YOUR technology.
- This is the best you can hope for.
- Beyond that, commercial success of the technology is out of your hands and dependent on market and other forces out of your control

University IP-based Technology Transfer:

The TTO Goal: "buying lottery tickets"

- The chances of significant market success for an individual technology is low
- You cannot predict which will and which won't be successful
- Each one is like a lottery ticket…….

  ….**IF you have a licensee/license contract**
- You can't win if you don't buy a ticket
- "Buying a ticket" = signing a license
- The more tickets you buy, the greater your chances of success

University IP-based Technology Transfer:

The TTO Goal: "buying lottery tickets"

- Selling a technology is very difficult… because
- Getting two sides to agree on a lump-sum price on an unproven, new technology is extremely difficult and very time consuming

  (practically impossible)
- Fortunately,

  the license structure and process

  make it much, much easier
- Why?
- The License is a

"Mutual Risk-Sharing & Value Capture Envelope"

IP-based Technology Transfer & Licensing

Some Basic Principles

The License as Value-Capture Envelope

creative sharing of risk & reward

The "Value-Capture Envelope"

A multi-component (terms and conditions)

agreement that balances the sharing of risk & reward of new IP/technology commercialization

University IP-based Technology Transfer:

License as "Value-capture Envelope"

- The license has various mechanisms for allocating the share of risk and reward between the parties
- The ideal balance accounts for

  the potential value of the technology,

  the risk it may not achieve that value,

  the investment risk the licensee must make,

  the value of the IP (inventiveness),

  the IP owner's "opportunity cost"

The License as Value-capture Envelope:

Various mechanisms allow balance

- Scope of the license
- License fee
- Royalty on sales
- Milestone payments
- Minimum annual royalty
- Sublicensing rights and revenue sharing
- Future IP
- IP costs
- IP enforcement
- Transfer of License to 3rd parties

The License as Value-capture Envelope:

Scope of the license

- Exclusive vs. non-Exclusive, co-Exclusive, time-limited
- Field-of-use
- Territory
- All commercial-use rights, sales only, etc.

The License as Value-capture Envelope:

License Fee (typically upfront, non-refundable)

- Opportunity cost
- Earnest money (depends some on company size)
- Investment is at its riskiest

  this can make for difficult negotiations since the sides may not agree on risk level and/or potential value of technology

- Upfront vs. spread out (time or event-based)

  risk sharing, especially if event based

The License as Value-capture Envelope:

Royalty (typically on sales)

- Based on business reality

  COGS vs pricing: gross profit margins

- Excellent means of getting the parties on same page (important for building the partnership)
- Typically % of Net Sales (not fixed-price)

  allows both parties to share market risk

- Industry standards (use as guide, not absolute)
- Remember: the licensee must be able to sell profitably

The License as Value-capture Envelope:

Milestone Payments

- Should be based on business and technology reality
- Parties should agree on development plan and timeline, understanding hurdles and their risks
- At key de-risk events, a payment to be made
- Time-based milestones can also useful

The License as Value-capture Envelope:

Minimum Annual Royalty

- Should be based on business and technology reality
- Parties should agree on development plan and timeline, understanding hurdles and their risks
- Based on sales projections (timing and amounts) of Licensee
- Economic “teeth” of duty of commercial diligence
- Protects the public interest by economically penalizing failure to commercialize
- Ongoing leverage by university to assure development

The License as Value-capture Envelope:

Sublicensing rights and revenue sharing

- A value to be negotiated not given away lightly
- Licensee/licensor can share sublicense revenue in any manner they negotiate
- Mandatory sublicensing clauses can be used
- Incentives for sublicensing can be used

(assures widespread dissemination)

may be integrated with milestones or minimums owed

The License as Value-capture Envelope:

Future Inventions/IP

- A value to be negotiated not given away lightly
- Ownership and disposition

  based on trust-filled relationship

  (and focus on success of IP/technology)
- Try to find solution that is in best interest of both parties

The TTO's "Beacon"

Always keep your primary client in mind;

everything you do should be in alignment with your primary clients' best interests

Who is your primary client?

- The University?
- The Vice Chancellor/President?
- Your boss?
- The inventor?
- The licensee?
- The public?

it's the Technology !!

Building the Value Capture Envelope

- Create multiple value-capture mechanisms
  - Upfront fees, milestone payments, exclusivity payments
    - Royalty on sales
      - Sub-license revenue sharing
        - equipment, other in-kind
- Establish valuation assumptions, justify them, be prepared to modify them in the professional dialogue
- Consider alternative benefits (e.g. research support) philanthropic/ humanitarian issues?
- “front-loaded” vs. “back-loaded” value capture

Building the Value- Capture Envelope, continued

Determining (and justifying) up-fronts and milestones

Based on eventual revenue generation (market size, sales, etc.)

Risk factors

Cost-to-develop

Are there other who want it?

the “Buyer/Seller” negotiation

Determining royalty rates:

Cost-of-goods sold

Sales price

Gross profits

The “Goldschieder Rule”

Creative Adjustment of Value Capture Envelope

- Maintains basic valuation scale and terms
- Adjusts terms and payments to suit the parties

An Example with License Fee & Royalty:

Creating a Value-Capture Envelope:

Invention valued at $250k NPV

$250k up-front, no minimums, 2% royalty

…….or

$100k up-front, (3) $50K annual payments, 2% royalty……or

$50k up-front, (4) $50k annual payments, 3% royalty……..or

$25k up-front, (5) $45k annual payments, 5% royalty…….or

Be flexible and creative in creating the value-capture envelope

Creative Adjustment of Value Capture Envelope

- Maintains basic valuation scale and terms
- Adjusts terms and payments to suit the parties

Consider all these as “moving parts” in a fine-tuned “value capture” device:

Scope of the license
License fee
Royalty on sales
Milestone payments
Minimum annual royalty
Sublicensing rights and revenue sharing
Future IP
IP costs
IP enforcement
Transfer of License to 3rd parties

Pre-Negotiation Valuation;

(Preparing to Negotiate Terms of an IP License)

Pre-negotiation Valuation:

Building the Business Case

- Define the technical advantages over existing alternatives
- Describe how those advantages lead to economic benefit
- Define who has an interest in the economic benefit
- Quantify the economic benefit

Pre-negotiation Valuation

Underlying Principles

- It is impossible to accurately define a value of a new technology and its IP
- 10 “Valuation Experts” will give 10 different values for the same technology/IP
- Experts talk in valuation ranges and use different methods to arrive at approximate values
- There is no single number which will reasonably account for potential value
- All valuation is simply a basis for a give-and-take dialogue

Pre-negotiation Valuation

Underlying Principles

- Approximations are your only choice
- A pre-negotiation valuation prepares for an opening position in a negotiation
- It is built on many assumptions
- It is fraught with risk

  technical (will it work? as hoped?)

  marketplace (will customers value it?)

  business (can it be profitably manufactured? and sold?

  regulatory issues?

  how will the competition respond?

Pre-negotiation Valuation

Practical Implications

- Although it is practically impossible to develop a precise value of a new technology in preparation for a negotiation
- It is entirely feasible to develop a rough estimate of the scale of value
- And establish some assumptions and expectations of ranges of value as opening discussion points

Pre-negotiation Valuation

Estimating the Scale of Value

- What is the industry?
  - Agriculture
  - Pharmaceutical
  - Material Science
  - IT

What problem is solved?

What is the economic basis of the problem?

of the solution?

How does the solution compare (qualitatively and quantitatively) to alternative solutions

Valuation methods for early stage technology

- Comparables (benchmark against similar technologies already commercialized)
- Replication cost
- Direct cost of development

  Typically add IP value, uniqueness, other multipliers
- Active Market (market place sets price)
- Net Present Value (NPV)

New Technology Valuation: Income Projections

Regardless of the method you use:

- Your valuation of a technology that is unproven in the marketplace is an “educated crystal ball”

It is the starting point for negotiation

- The best valuation is the price a willing buyer will pay to a willing seller

Rough Income Projections

- Understand where the technology fits in the market
- Rough estimate of the size of the market
- Enabling value of IP to product
- COGS of product and profit margins
- Conservative estimates of market penetration

Pre-negotiation valuation

Cost Recovery

- Cost to invent, develop, patent

Pre-negotiation Valuation

Underlying Principles

- Given the licensing imperative to get a good deal done…….
- Good TTOs:

  negotiate more “good deals”

  rather than fewer “perfect deals”
- The license terms need to work sustainably for both licensor and licensee

Bridging the University-Industry Cultural Divide

- Despite major differences in structure, goals, and culture, the divide can be bridged
- Mutual respect is essential
- Understanding each other's basic needs and motivations is necessary
- Regarding IP commercialization, university and industry need each other
- University must empathize with industry's time lines and sense of urgency
- Universities must be responsive and timely

Bridging the University-Industry Cultural Divide

- Universities must be willing to keep a company's secrets
- Industry must accept the university's absolute right to publish its research results
- Industry must accept the university's cost of conducting research (overhead cost)
- University must understand the risk taken and the investment made by industry in commercializing new technology
- Industry must understand the university's need to bring its technology to market

Bridging the University-Industry Cultural Divide

In any research collaboration or license agreement, each side should designate a "relationship manager" responsible for maintaining the relationship

Industry must accept that the university deserves a fair share of financial benefits from IP commercialization

University must understand that making the invention is only a small part of the overall cost and risk of creating a new product or service

Pre-negotiation value

and License Negotiations: the approach

Get ready for a dialogue with your potential commercial partner

Establish the Scale of Value

Do your homework to understand the market, current products, etc.

Build a business case

Use the UVP as your “lense”

Consider stage of development and

risk involved

Pre-negotiation value and License Negotiations: the approach

Establish a framework for negotiation

Know your "BATNA" (Best Alternative to Negotiated Agreement)

Establish valuation assumptions and your ability to justify them

Build a "value-capture envelope"

Consider the "big picture" *vis a vis* your technology, institution, inventor, society

Have a license template ready….and understand its provisions

Understand and appreciate the needs of your commercialization partner

Pre-negotiation value and License Negotiations: the approach

Use your in-depth understanding of the invention:

- its stage of development, and cost to develop
- its uniqueness and superiority over existing

Listen and be knowledgeable about marketplace characteristics and relevant product details

Know the strength & scope of your Property Control Position

Reliable data on key criteria

A valuation you can justify

Remember the effect (rare) of competitive bidders

A final word: Entrepreneurship & Start-ups

Entrepreneurship at universities is vital for societal economic development based on creativity and intellectual assets

it should be fostered and supported

Start-up companies based on university IP is an important factor in commercializing university technology

and…..

In fostering a creative and vibrant entrepreneurial society

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Tricks of the Trade:

Getting a License Deal Done

Tricks of the Trade:

Getting a License Deal Done

Framing the Negotiation

- It's a two-way dialogue between licensor and licensee
- Transparency, honesty, fact-based negotiations
- Licenses must be sustainable – they're long-term relationships, unlike a sale
- Establish lines of communication, be clear on lines of authority and the decision-process

Tricks of the Trade:

Getting a License Deal Done

Diligently and in good faith, work towards mutual agreement on:

- The enabling value of the technology in the future product
- The product's market characteristics, margins, market size and share
- Use the above to arrive at a rational license fee, royalty structure and amount (don't lose sight of their risk)
- Be aware of royalty-stacking issues and accounting complexities

Tricks of the Trade:

Getting a License Deal Done

- Agree on the state of development of the technology, what is needed for commercialization, time-line and investment
- Agree on any special development hurdles and commercialization barriers, including costs to overcome and timelines
- Discuss how the parties can and will collaborate on the development/commercialization process
- Establish the whole development equation

  creation -> testing -> development -> commercialization

Tricks of the Trade:

Getting a License Deal Done

- You're on the same side of the table – this is a design problem…..not poker!
- Hold firm to your assumptions and valuation….but be prepared to adjust with their persuasive arguments good supporting data, and information
- Be creative in capturing value
- Be empathetic and understand each other's needs and risk
- Transparency, full-disclosure, honesty, personal reputation as a "straight shooter"
- Listen more than talk – use info to your advantage

Tricks of the Trade:

Getting a License Deal Done

- Understand the technology (not every detail, leave that to the inventor)
- Know the IP situation thoroughly
- Get emotional commitment by inventors
- Do the homework (competing technology, industrial application, potential licensees)
- Maintain momentum in discussions

  Don’t let unimportant details distract/derail the process)

  Defer big issues until after “tenor of agreement” is reached
- Focus on points of agreement, set aside disagreements to allow “cooling off” and reflection

Tricks of the Trade:

Getting a License Deal Done

- In negotiations, be creative in satisfying each party's needs
- Honesty, transparency
- No bargaining: use rational arguments and data
- Develop rapport/be empathetic
- Seek win-win
- Engineer solutions

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Using Separate Entities
For University Technology Transfer

Using Separate Entities

for University Technology Transfer

What are "separate entities"?

- Organizations outside the university's administration
- Various degrees of separation
  - University office with separate reporting structure
  - Separate corporation governed by university
  - Separate corporation not governed by university but bound by charter to its interests
  - Corporation linked to university by mutual business contract

Using Separate Entities

for University Technology Transfer

What is their purpose?

- Provide buffer between university and commercialization activity and LIABILITY
- Allow freedom from bureaucracy that hinders IP management/technology commercialization
- Offer business options for commercialization strategies and tactics not available to university
- Avoid financial limitations on IP management, licensing
- More business minded, responsive, and “friendly”

Using Separate Entities

for University Technology Transfer

What are the key issues?

- To what extent is the entity obligated to receive and process all university disclosures?
- Can the entity refuse disclosures?
- To what extent is university obligated to send all university disclosures to the entity?
- What is the business model of the entity and how does that effect its selection of disclosures?
- Does the entity prioritize revenue generation over other concerns of importance to the university?
- Is the entity for-profit or not-for-profit?
- Does entity funding affect the university TT mission?

Using Separate Entities

for University Technology Transfer

What are the key issues?

- If the entity selects only disclosures that can make money, what about the majority of disclosures?
- What effect will that have on faculty/staff inventors?
- What about philanthropic and humanitarian concerns
- University's mission to develop and disseminate technology for the public good?

Using Separate Entities

for University Technology Transfer

Some key advantages

- Hiring and HR practices often much more conducive to the IP management and technology commercialization enterprise
- Business practices also more conducive (travel, marketing, pilot studies, etc)
- Allows various types of partnering structures with various types of partners

Using Separate Entities

for University Technology Transfer

Carefully constructed entities may be the answer

- Separate entity that has freedom in IP management commercialization and embraces university's tech transfer values
- Examples

  Wisconsin Alumni Research Foundation

  Cornell Research Foundation

Using Separate Entities

for University Technology Transfer

Wisconsin Alumni Research Foundation (WARF)

Cornell Research Foundation (CRF)

- Both separate corporations
- WARF is 501(3)(c)
- CRF is 501(2)(c)
- University is sole beneficiary and shareholder
- WARF has separate governance (President is COB)
- CRF governed from within university (with external advisors)
- Both act like an internal TTO in policy and practice

Using Separate Entities for University Technology Transfer

Summary

- Separate entities can have significant advantages
- Too profit-minded may distort the technology transfer mission
- Careful design and construction of the governance, university link, policies, practices, and hiring of right-minded people is necessary

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Technology Marketing

Technology Transfer

Key Points

- What is technology marketing?
- Why is it important?
- The “3 Rs” approach to tech marketing
- Tech marketing materials

What is Technology Marketing?

It’s not like marketing a product…and…

…. it’s not like sales

What is it?

Putting the **R**ight information…..

into the **R**ight hands…..

at the **R**ight time

Why is it important?

Technology /IP does not sell or license itself……

(even “good” technology)

Why is technology marketing important?

Technology /IP does not sell or license itself……
(even “good” technology)

Technology Transfer without technology marketing…..

……..is like one hand clapping

Identifying potential licensees

This naturally flows from analysis of market application(s)

Sometimes it's relatively easy

Cancer drug candidate, new orange variety, microprocessor design

Sometimes its hard

Medical imaging algorithm, new material

Multiple uses can be complicated

use exploratory marketing

Corporate intelligence sources

- Web searching, industrial technology reviews
- Trade associations
- Professional societies (e.g., LES, AUTM)

Licensing strategy

- Does investment needed to develop invention require exclusivity?
- Is the invention suitable for non-exclusive?
- Exclusive by country?
- Exclusive by field-of-use?
- Exclusive consortia?

Technology Marketing and Licensing Strategy

Prioritize the markets to pursue

- Largest vs. easiest

Implementation

- Market research

  small, medium, large companies
- Initial contact (all non-confidential)
- Tech Brief, non-confidential
- More non-confidential information, then NDA
- Confidential discussions and information exchange
- Inventor involvement
- Monitoring & follow-up
- Improving response rate

Technology Marketing: The "Right" information

- Initially, less-is-more
- Define the technical innovation/ invention

  What is it precisely? How does it work?

  its benefits over existing technologies; DATA!
- IP and tangible property status
- Stage of development (technical, market, business)
- Types of deals to be considered
- Formats and media

  "Tech Briefs"

  Hard copy; Electronic

  Web-based; links, photos, drawings, video

Technology Marketing: the "Right" hands

- Obvious, non-obvious company/technology fits
- Initial contacts: upper-level management

  VP (R&D, Business Development, Licensing)
- Technical contacts (Professor's contacts)
- Licensing professionals (e.g. STEM, LES, AUTM)

Technology Marketing

Without marketing……..
technology is rarely transferred

Always be marketing your technologies!

Technology Marketing

Finding commercial partners
Market application(s)
Research into companies in industry
Identification of potentially suitable partners
Marketing tools: passive & active
Contacts and follow-ups
Web-based tech marketing
Professional networking
Agents and brokers

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Start-up Policies

Start-up Policies

Some Definitions

- Start-up:

  Any company recently (0-36 months?) created

- Spin-off:

  A start-up based on university's IP

- Spin-out:

  A spin-off created by university personnel

For today's discussion:

- Start-up = a company created for the initial purpose of commercializing university IP/technology

  through a license to the university's IP

Start-up Policies

Why are Start-ups important to university technology transfer?

- They are often the only viable route to commercialization
  existing companies aren't interested (too risky)
- Faculty and staff inventors want to pursue a start-up
- They allow the university to be more actively involved in the commercialization process
- They are the life-blood of an "innovation ecosystem"
  they're the basis of the "creative economy"
- Available government resources
- They can be the source of significant future revenue

Start-up Policies

Should the university encourage start-up licenses?

Should the university support them?

If so, how?

Start-up Policies

Should the university encourage start-up licenses?

Yes, if it wants to:

- Maximize the development and dissemination of its IP/technology
- Participate in the innovation ecosystem and play an active role in fostering the creative economy
- Be supportive of entrepreneurial faculty & staff

Start-up Policies

How can the university support start-up licenses?

Licensing policies and practices

- Reasonable preference for start-up licenses
- Allow acceptance of equity in start-up in lieu of cash license fee
- Allow faculty and staff to participate in the management/operation of the start-up

requires adequate Policies:

Conflict of Interest

Conflict of Commitment

Start-up Policies

How can the university support start-up licenses?

Licensing policies and practices

- Be flexible and generous in patent expense reimbursement requirement
- Give start-up licensees preferred treatment in arms-length arrangements for access to facilities and resources

Start-up Policies

Licensing issues

- Require royalty in licenses?
- Can university inventors that participate financially in a start-up licensee of their invention, also receive their "Inventor's Share" of license income from the start-up? ("Double-dipping")
- How should university manage its ownership stock in the start-up?

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Introduction to Intrapreneurship

&

Overview of the Technology Transfer Process

Entrepreneurs and Intrapreneurs

- What is an “Intrapreneur”?
- What does an Intrapreneur do
- Innovation Management
- Innovation through
  - internally generated innovation
  - acquisition of external innovation

What is an Intrapreneur?

- Similar to an Entrepreneur

  but launches innovation within an enterprise
- Many of the same personality traits, skills, and pursuits
- Doesn't worry about creating a new company

  but has unique challenges
- It's not easy to innovate in an existing company

What is an Intrapreneur?

- Innovation is a proven business growth strategy
- Doing it successfully requires certain critical elements and “moving parts”
- Many companies are not good at innovation
- Innovation requires a certain mindset and supportive structure
- And thoughtful management to:

  identify, evaluate, select, and implement

  innovative opportunities

What is an Intrapreneur?

Successful innovation requires dynamic integration of:

- Idea creation and/or identification
- Resource acquisition and management
- Cross disciplinary evaluation, testing, validation
- Implementation, monitoring, adjustment

This is Innovation Management

- The Intrapreneur is the central figure for Innovation Management

Intrapreneur = Innovation Manager

Why is Innovation Difficult in a Company?

- Two basic reasons:
  - Innovation is built on risk
  - Companies “hate” risk
- It’s very difficult to go against the flow of the status quo
- Innovation requires interdisciplinary collaboration and companies are built in functional silos
  - R&D, marketing, finance, legal, sales, management

Why is Innovation Difficult in a Company?

- Innovation requires a certain level of failure (trial and error)
- Failure is not rewarded
- The result of failure is a huge deterrent to risk-taking in a company
- “Turf protection” – others fear loss of control, power, resources, acknowledgement
- Management may not fully support innovation
  - lack of understanding of process
  - fractionalized leadership (R&D vs. finance)

Why is Innovation Difficult in a Company?

- Momentum – the path of least resistance is always the status quo
- Funding is always scarce for new ideas, especially risky ones
- Many people are not optimists
- Innovation requires people get “out of their groove” – it is uncomfortable and anxiety-producing

What is an Intrapreneur?

Entrepreneurs and Intrapreneurs

- Create business opportunities through initiative and risk taking
- Thrive in new and uncertain situations
- See opportunities before others
- Have a vision for the path ahead
- Inherently know what steps to take next
- Are not overly fearful of failure
- Know how to identify and secure the resources needed to achieve objectives and goals

What is an Intrapreneur?

Entrepreneurs and Intrapreneurs

- Are not overly fearful of failure
- Work well with people
- Are energetic, optimistic, creative, curious, interested and interesting, passionate, persistent
- Both engage in “creative destruction” (Schumpeter)

What is an Intrapreneur?

Entrepreneurs and Intrapreneurs

- Are talented at organizing people and resources
- Are energetic, passionate, creative, interested, interesting, persistent,

What does the Intrapreneur do?

Identifies Innovation Opportunities

- Organized, internal networks that detect and capture ideas, inventions, creative works
- Open to serendipitous discoveries
- “Radar” searching for external opportunities
- Good “connector of dots”
- Facilitates the creation of ideas, inventions

  brainstorming, etc.

What does the Intrapreneur do?

Evaluates Opportunities

- Understands the scope of relevant opportunities

  but, capable of "thinking outside the box" and being open to paradigm-shifts and disruptors

- Knows which disciplines to plug into the evaluation and when – good at creating and managing cross-disciplinary teams

- Assembles and orchestrates teams for innovation creation, screening, testing, implementation

What does the Intrapreneur do?

Lives at the Edge

Creativity

Structure, rules, discipline

What does the Intrapreneur do?

Coordinates Testing & Validation

- Connects outside inventors/technologists with internal R&D staff
- Facilitates testing procedures
- Shepherds the testing and validation process

What does the Intrapreneur do?

Coordinates Legal Interaction

- Manages the NDA process with outside partners
- Coordinates MTAs
- Facilitator of Term Sheet and agreement negotiations

What does the Intrapreneur do?

Champions implementation

- Monitors progress
- Troubleshoots delays and problems
- Maintains teams awareness and energy

What does the Intrapreneur do?

The Key Contact/Liaison with Partners

- Initial contacts rapport building
- “traffic cop” for information flow between parties
- Coordinator of meetings
- Facilitator of communication
- Shepherd the agreements
- Ombudsman for internal and external constitutents

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Overview of the Technology Transfer Process

Overview of the Technology Transfer Process

Transfer of technology from creator

(university or government research agency)

to implementer (company)

Four (sometimes five) components:

- Information/knowledge
- property rights in technology

  (sometimes tangible material too)
- legal contract
- people

Steps of the Technology Transfer Process

1. Technology/IP owner (TTO) contacts company with intro and non-confidential info

or

1. Company finds technology/IP and contacts owner (TTO)
2. Initial exchange of non-confidential information
3. Signing of NDA
4. Exchange of confidential information
   (including patent application)
5. Face-to-face meeting (business & technical)
6. Further exchange of info

Steps of the Technology Transfer Process

7. License discussions concerning scope, financial terms, other conditions
8. Term Sheet drafted by technology/IP owner and sent to company for review
9. Back-and-forth negotiation and redrafts of Term Sheet
10. Agreement reached and signed
11. Miscellaneous:
    - consulting with inventors
    - personnel exchange
    - equipment sharing
    - ongoing collaboration
    - future inventions

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The Technology Transfer Process: Explaining the University Position

Steps of the Technology Transfer Process

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Managing IP & Other Property Protection

- Be very aware of the link between scope of potential patent claims and value in the marketplace

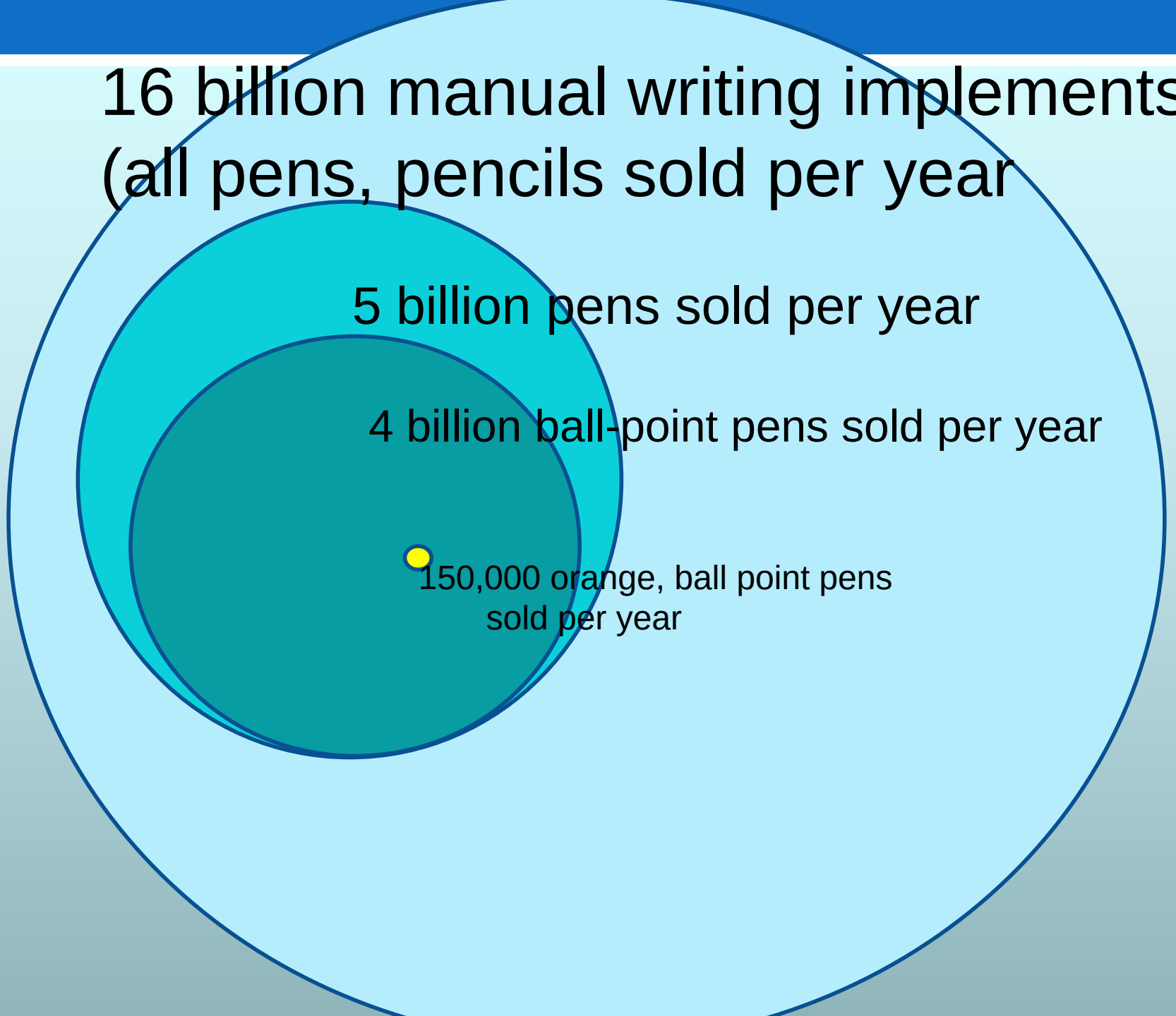
  Example: patent claims on

  "An ink pen"

  versus

  "An orange, ball-point, ink pen"

16 billion manual writing implements (all pens, pencils sold per year



Managing IP & Other Property Protection

- Be very aware of the link between scope of potential patent claims and value in the marketplace

  Example: patent claims on

  "A ball-point, ink pen"

  versus

  "A blue-striped, ball-point, ink pen"

Don't pursue patent claims that have little or no value in the marketplace

Managing IP & Other Property Protection

Consider the “suite” of your property control options:

- patent
- know-how
- copyright
- plant breeder’s rights
- trademark
- bioproperty

Managing IP & Other Property Protection

Managing bioproperty:

It's tangible, personal property rules

(possession is primary, bailment secondary)

Material Transfer Agreements

(has ownership been maintained regardless of physical transfers/)

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Introduction to Intrapreneurship

and

An Overview of

the Technology Transfer Process