Guidebook of IP/Technology Transfer

Track 1
Entry-level Tech Transfer Professional

Topic 1.1.4

The Big Picture:

Tech Transfer, Innovation, and the Public Good, Institutional Motivation for Involvement in Technology Transfer

IP-based “technology transfer”

A process,

fundamentally based on legal contracts,

in which an owner of IP of a technology

(a university)

Grants another party (a company)

rights to use the IP (usually commercial use)

In exchange for compensation and/or other obligations (such as diligence in use)

What is IP-based technology transfer and commercialization?

Universities have a long tradition of education, research, and outreach

This tradition includes our long-standing types of "technology transfer":

- producing new graduates every year
- the next generation of graduate students
- research publications
- text books
- seminars, workshops
- extension
- libraries

Intellectual Property allows a new and additional type of university technology transfer

University researchers have been inventing in their research programs for a very long time

However, these inventions are almost never converted into useful solutions for society.

Why not?

Transforming inventions into practical solutions requires investment and commercialization

know-how

Example: no commercialization of inventions in US prior to 1980

Intellectual Property allows a new and additional type of university technology transfer

No IP, no incentive for investment

No investment,

no invention development

no new product or service

Intellectual Property allows a new and additional type of university technology transfer

IP (typically patents) is designed as a tool for converting invention into products, services, companies, and jobs

By granting an inventor ownership of their invention, a legal and economic mechanism is created

which can incentivize investment in the development of the invention

and provide the inventor the power to control the invention's use and development

Patents: the essence of IP-based Technology Transfer

They are a powerful tool for catalyzing, shepherding, and realizing the real transfer of inventions from creators to implementers

By using patents and other IP, inventions can be transformed from laboratory invention to products and services that serve the good of society

Patents and other IP form the basis for technology transfer from university to private sector

How does it work?

University invents and files for patents on economically viable inventions

University finds a commercial partner interested in developing and selling a product or service based on the patent

In a contract (license) the university grants commercial-use rights (not ownership) to the partner in exchange for

fees, royalties, and

diligent investment and commercialization

Patents and technology transfer contracts give universities a new mode of serving society

producing new graduates every year

the next generation of graduate students

research publications

text books

seminars, workshops

extension

Libraries

New products and services based on university invention that solve societal problems

IP-based technology transfer serves the university's fundamental mission

by enhancing the university's educational and research enterprise and contributing to the greater public good by creatively managing university IP assets to:

Develop and disseminate university technology
Encourage and reward innovation by faculty, staff, and students
Elevate the university's reputation
Attract and retain talented faculty and students
Foster corporate partnerships and research engagement with industry
Generate financial benefits for the inventor and the university "family"

IP-based technology transfer serves the university's fundamental mission

by enhancing the university's educational and research enterprise and contributing to the greater public good by creatively managing university IP assets to:

Provide and support entrepreneurial opportunities and activities

Enhance the competitiveness of small, medium and large corporations

Generate economic benefits at the local, regional and national levels

Be an engine of technology creation in the Sri Lankan "innovation ecosystem"

Intellectual and Tangible Property: Cornerstone of IP-based Technology Transfer

Creating and using property rights in technology:

- Allows the formation of mutually-advantageous, legally-binding linkages between technology creators and implementers
- Creates the basis to incentivize investment in technology development
- Provides important control mechanisms
- Creates leverage necessary for diligent pursuit that converts ideas into products/services, jobs, enterprise, and revenue

IP-based technology transfer : the U.S. experience

1980 “Bayh-Dole Act”

Granted universities ownership of any patentable invention made using US government funds (90% of all university inventions)

but, the *quid pro quo*:

University owners of government-funded IP **MUST** actively commercialize through licensing (NO SALES)

and……

must use a share of financial return to enhance the research enterprise

IP-based university technology transfer: summary of benefits

- University technology advancement, and direct benefit to society
- University reputation enhanced
- Culture of innovation grows on campus
- Graduates are educated and more entrepreneurial ("the creative class" impact on SL society)
- Universities play an enhanced role in economic development

The University Mission, and IP-based technology transfer

When University invention is converted into IP

and then, through contracts,

into new products, services, and companies

by a commercial partner (licensee):

The University accomplishes one of its basic missions:

the creation and dissemination of technology for the public good

The university's unique societal role in technology creation and development

The university as a commons

Public good as primary mission
(education, research, outreach, technology)

Public funding

Long-term vision
("high risk" research; paradigm shifts)

Technology steward

Stable ownership

Serves any good collaborator

Fundamentally different from industry
Public expectations of tech transfer
(economic development)

Essential principles guide university IP-based technology transfer

Academic freedom is paramount
(no secrets, no censorship, no barrier to science)

Education and research are primary;
technology secondary; financial return tertiary

Fostering inventiveness, technology development & dissemination are essential goals

Technology should serve the public good
(private gain is legitimate means to this end)

University should steward its technology for the public

Essential principles guide university 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 education and research objectives

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

University maintains its sovereignty (IP ownership)

IP-based university technology transfer: some benefits

- University a key participant in innovation ecosystem and technology-based economic development
- Enhanced relationship with local, regional, and national governments
- University/industry collaboration creates synergy for technical solutions
- Increased research funding
- Increased discretionary funding
- Enhanced job opportunities for graduates

The University Role in the Innovation Value Chain

- Creator of inventions
  - most are very early stage (embryonic)
  - many are not marketplace-relevant
  - some are paradigm shifts
  - many can become the basis of new products, services, companies
- Not a commercial implementer
- The university needs commercial partners
  - to convert its invention into economic development
- How does the process work?

University IP-based Technology Transfer: in a nutshell

1. University personnel invents in the course of their research and related duties
2. University owns invention; inventor reports it to the university (TTO)
3. TTO determines IP and market viability of invention; decides whether to pursue
4. TTO files for patent, looks for commercial partner
5. TTO negotiates commercial-use rights license with partner (retains ownership – no sale)
6. License = university grants commercial rights & obligations in exchange for fees & royalties

IP-based inventions catalyze University participation in the innovation value chain

- Converting invention into goods and services requires investment!
- Private sector investment requires a return
- Return on investment in invention commercialization almost always requires IP
- IP gives the university the power to:

  "shepherd" technology for the public good,

  to capture a share of value (and use it to

  enhance the University and its Mission)
- IP provides control to assure commercialization serves the public good

  (through contractual diligence requirements)

IP-based University Technology Transfer: essential premises

- Private sector investment and profit is a powerful route to achieving the public good
- Technology creators deserve a share of financial benefits of marketplace success

  (but must understand the risk and role of partner)
- University sovereignty (cannot be bought or sold)
- Strict academic freedom (no secrets;

  researcher/author has absolute right to publish
- It is ethical and appropriate that inventors receive a share of financial returns from their inventions

IP-based University Technology Transfer: essential premises

- Tech transfer should never interfere with academic exchanges, education, research
- Inventors (faculty, grad students, staff) treated as equals: receive 1/3 of net license revenue
- The goal is technology dissemination and the public good

  ……..NOT $$$
- Technology transfer goals should never dominate: education, research, public good

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

- Technology transfer (TT) is an integral and essential part of the university mission
- Financial sustainability is the goal, not big money
- The reason for TT:

  Technology development and dissemination

  Service to faculty and administration

  University reputation

  Economic development

  The public good
- Tech Transfer fits most naturally within the university research enterprise

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

- Only a minority of disclosed inventions are licensed
- Often takes years to license an invention

- Often takes years before a license produces product/service royalties

- Most licenses generate much less than $1 million, over their lifetime

- “Blockbusters” (>$1 million) rare, take a long time to develop; often not obvious initially

- Significant and consistent early investments in TTO and IP are required, often for many years

35 Years of IP-Based University Technology Transfer: more 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

Summary and Take Home Message

IP-based Technology Transfer can become a vital part of a modern university's mission

IP is an essential tool in converting new university technology into products and services that serve the public good

University's should engage in IP-based technology transfer only if they adhere to principles that protect and conserve their special character

Summary and Take Home Message

Through IP-based technology transfer, university's can become active participants in the local and national innovation ecosystem

This role is appreciated by alumni, the public, governments, politicians

The goal of IP-based technology transfer should not be large financial gain (breaking even is ok)

Summary and Take Home Message

IP-based Technology Transfer takes nothing away from the university; it only adds a new dimension to its essential nature

Education, research, and the public good take precedence over IP and technology transfer

Establishing a sustainable and effective IP/technology transfer system in a university requires patient investment

Effective IP Policy is the foundation of university IP-based technology transfer

Universities

What characterizes this new mode?

- An awareness of the role IP can play in serving the university's overarching goals for society
- University protection and transfer of its IP
- Collaborative engagement and contracts with private sector
- An active university role in entrepreneurship, new ventures, economic development
- Added dynamism to the university mission
- Rewards for inventive faculty and staff
- Renewed interest by alumni
- Enhanced student entrepreneurship

The Modern Convergence: Universities as 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!
- IP as a tool for new technology development
- Universities as technology creators
- Society's expectations of universities
- The Experiment:
  - Bayh-Dole Act 1980
- Almost 40 decades of success (trial & error)
- Why?
  - new technology development requires investment; IP an essential factor

Universities

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, ventures – all this is a social good!
- While individual IP/tech transfer acts are important, it is the overall process that truly accelerates the university's crucial role as *fons et origo* 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 totally aligned with, the historic university mission of teaching, research, and extension……. for the public good
- Otherwise, there is a danger of harming the basic nature of the university, in the process.

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
- The university becomes a vital factor in a dynamic "innovation ecosystem"

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

Innovative and Enterprising Universities

based on IP/technology transfer

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,

……revives interest by Alumni,

and positions the university as key catalyst 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

Innovative and Enterprising Universities

based on IP/technology transfer

This “new” IP-based Innovation and Enterprise dynamism absolutely depends on a solid foundation of the university’s basic mission of serving the public good as society’s:

- creator, archiver, and disseminator of knowledge
- educator
- ultimate arbiter of truth
- “fair broker”

IP-based Innovation & Enterprise does not change 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

Innovative and Enterprising Universities

based on our fundamental values

- The primacy of the “public good”
- Scholarship, education, and research the holy triumvirate; IP always secondary
- Stewardship of knowledge and technology
- Non-profit, not a marketplace participant
- The supremacy of truth and the search for it

Innovative and Enterprising Universities

WIPO's Enabling IP Environment (EIE) Project is based on this premise:

Universities can play an enhanced role in the economic development of a country,

through implementation of proven, sound policies and practices of IP management and technology transfer, and appropriate partnering with the private sector.....

..... and all this ultimately benefits the institution,

and society.

IP-based Innovative & Enterprising

University and the EIE Project

Active participation 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…..

… a thriving

"innovation ecosystem"

IP-based Innovative & Enterprising University

and the EIE Project

Universities can effectively add this new mode of their mission, and become an active element in the innovation ecosystem if:

- effective IP Policy and practices in place
- investment in IP/TT infrastructure
- knowledgeable professionals to manage
- creative faculty & staff
- valuable technology/IP
- willingness to partner with private sector
- good private sector partners