



OFFICE of RESEARCH



Graduate Research and Project Management Course W24

Intellectual Property, Commercialization & Entrepreneurship

February 6, 2024

TECHNICAL NOTES

- Andrew Burke, IT specialist, will moderate the session for technical issues.
- Please mute your microphone.
- Please switch off your camera.
- For questions, please use the Chat box.
- At the end, we will distribute a link to anonymous evaluation survey, in the Chat box.

Q&A SESSION

- Please use the chat box icon to enter your questions for the speakers.

DR. DAVID HOBSON DVM, DVSc. P.ENG

MANAGER, TECHNOLOGY TRANSFER & ENTREPRENEURSHIP
RESEARCH INNOVATION OFFICE



David Hobson has been managing the commercialization of academic research and inventions for over a decade at the University of Guelph. He also coaches and guides faculty and graduate students on creating start-up companies through the New Venture Creation division at the Research Innovation Office. David is a licensed mechanical engineer, small animal veterinarian, studied comparative pathology OVC and he has founded several small start-up companies.

Prior to joining the university, David held several positions in the pharmaceutical industry with Johnson & Johnson, was a clinical small animal veterinarian and assisted both the UK and Canadian governments with foreign animal disease outbreaks.

David has helped over a hundred faculty move their research from the lab to the real world to create greater impact.



RESEARCH
INNOVATION

Intellectual Property, Commercialization and Entrepreneurship

Agenda

Introducing the Research Innovation Office

What is Intellectual Property (IP)

Methods to protect IP

The cost and value of patents

Brief nudge for entrepreneurship

David Hobson

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6 February 2024



Industry Liaison
Building partnerships
with industry

Knowledge Mobilization
Getting new solutions into
the hands of end users



Research Impact



Technology Transfer
Licensing technology for
new products to industry

New Venture Creation
Connecting and enabling
entrepreneurs



UNIVERSITY
of GUELPH

RESEARCH
INNOVATION

Why care about IP?



The
BIG
Picture



Jennifer Doudna – CRISPR-Cas9

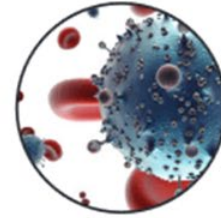
**Academics ...
change the world!**

**most often
through innovation...**

new products & services!



Google
Stanford University



HIV anti-viral
therapies
Emory University



Rocket fuel
Clark University



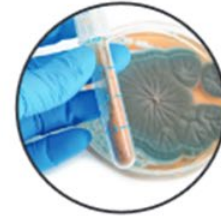
Insulin
University of Toronto



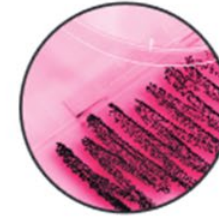
Vitamin D
fortification
University of
Wisconsin-Madison



Electron
microscope
University of Toronto



Penicillin
Oxford University



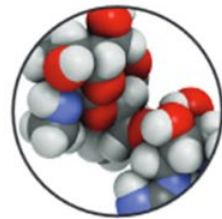
Pap smear
Cornell University



Blood
preservation
Columbia University



Ultrasound
University of Vienna



Streptomycin
Rutgers University



Heart-lung
machine
University of Minnesota



Polio vaccine
University of Pittsburgh



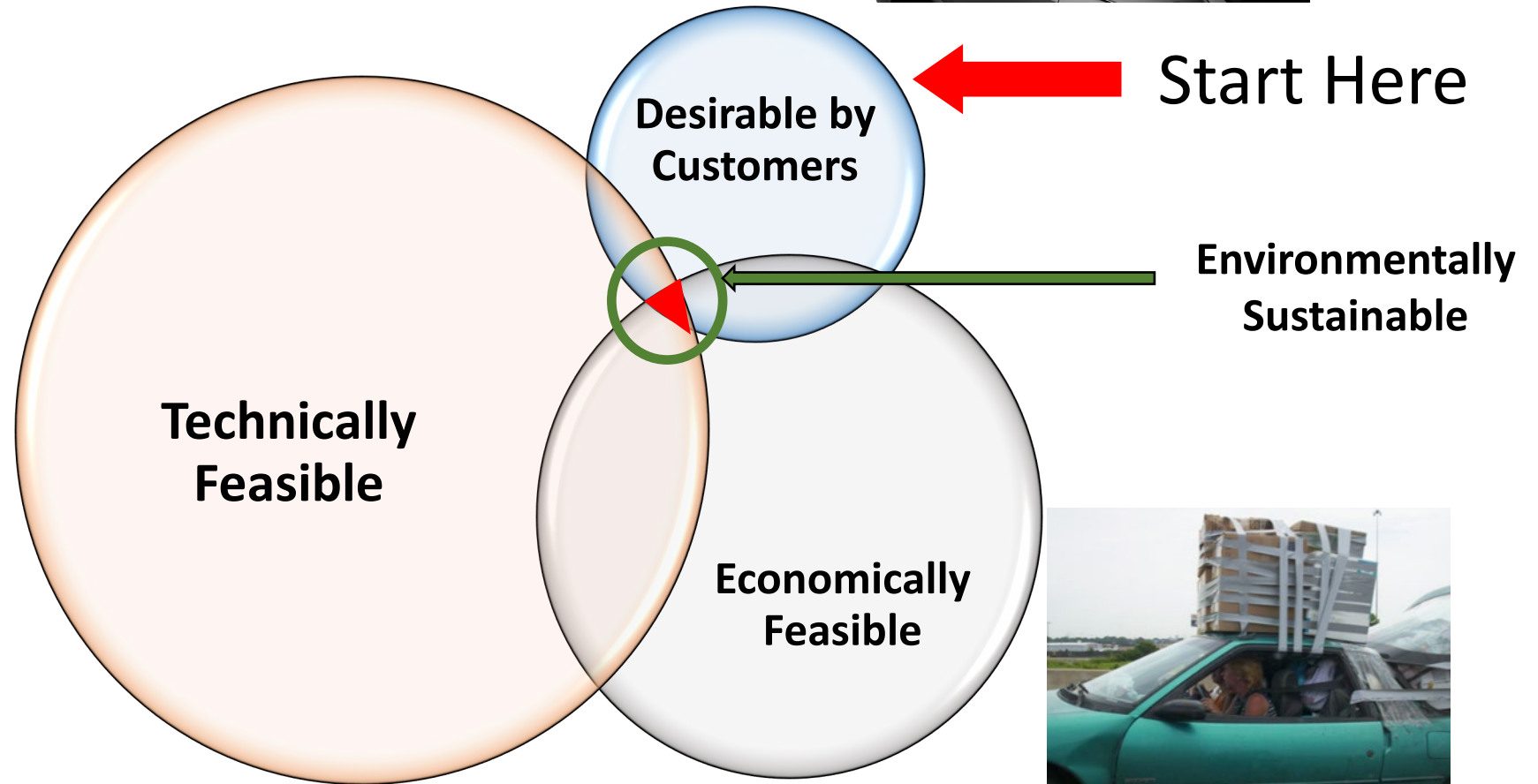
Pacemaker
University of Minnesota



Warfarin
University of
Wisconsin-Madison

Academics Invent but Entrepreneurs Innovate

Innovation doesn't exist until you have a **Customer**



How are Innovations created?

Uncertainty – associations - patterns

Increasing clarity – focus - purpose

Resource Hacking

Emotional roller coaster –
frustration, sadness, failures

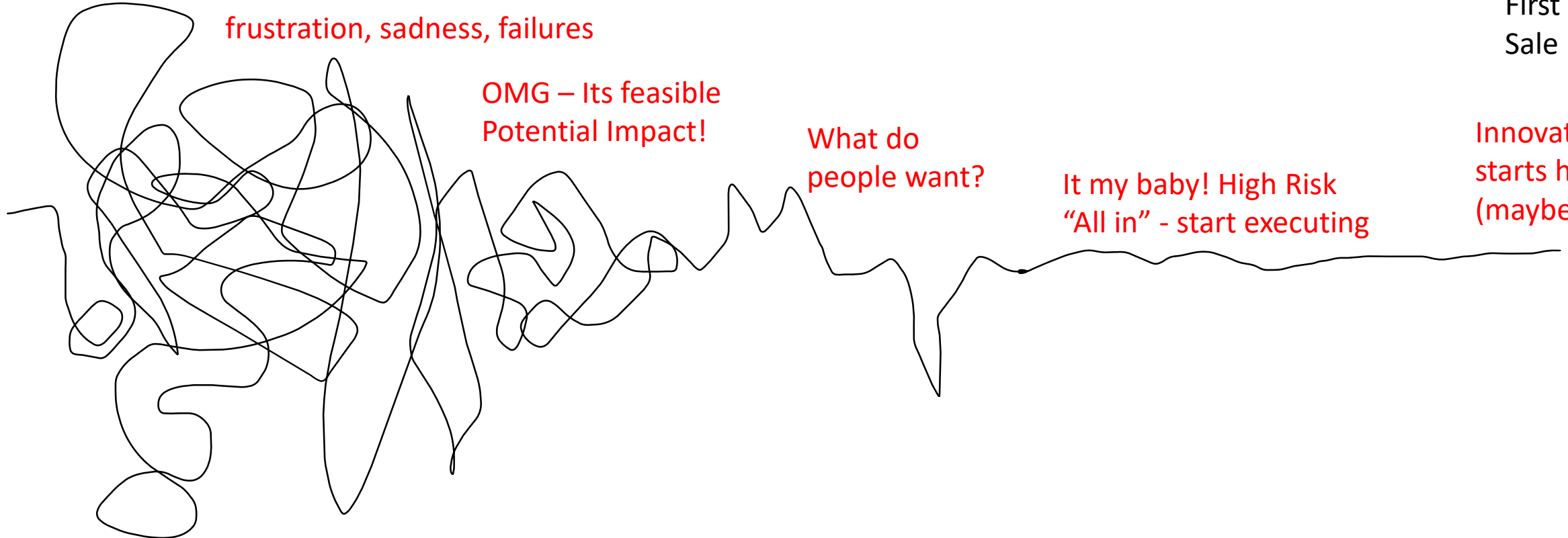
OMG – Its feasible
Potential Impact!

What do
people want?

It my baby! High Risk
“All in” - start executing

First
Sale

Innovation
starts here
(maybe?)



Discovery &
Applied Research

Product
Concepts

Product
Design

Product Manufacturing
and Delivery Optimization

Entrepreneurship
(Lean methods and
Product-Market Fit)

What is Intellectual Property (IP)

Original works - creations of the mind

Commercial IP

- Drugs, materials, machines, methods

Artistic IP

- Music, literature, software, paintings

IP is legally defined

- Intangible asset
- IP laws depend on the country
- Most countries are aligned



Who is an Inventor ?

INVENTOR:

Person with the novel idea in their head

Legally defined in law by each country

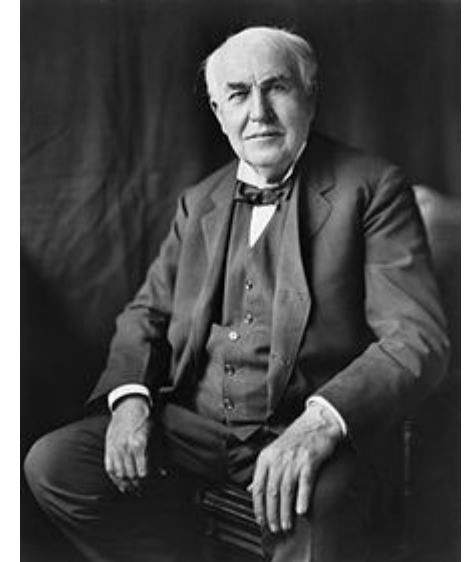
Inventors must prove they contributed intellectual value to at least one claim listed in an issued patent

It is not your Supervisor, or Employer, or Best friend or family member, or the hardest working technician or person following directions

It is the first person to be truly creative!

Advice: Keep excellent original signed records!

Thomas Edison
2333 Patents



Overview on Intellectual Property



Patents

Utility Models

Industrial Designs

Novel Function

Novel Function with lower standards (mainly China)

Appearance



Copyright

Trademarks

Personal Creative Expression

Branding + Reputation



Plant Breeders Rights

Novel Stable Plant Varieties

Integrated Circuit Design

Topography or Layout of a Circuit



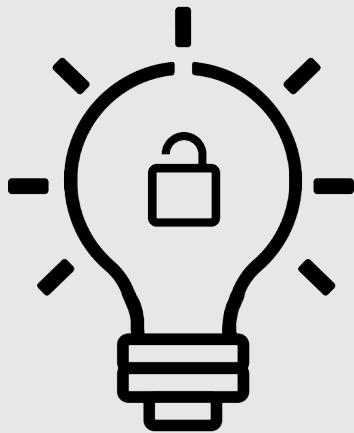
Trade Secret

Information you can keep secret

Legal Contract

Anything legally agreed to in an agreement
(ie proprietary information, data, or materials)

Who owns my IP at U of G?



Intellectual Property Policy (2014)

- All inventors own IP they create
- Inventors must report new inventions to RIO
- Inventors may choose to assign to UofG and use RIO
 - UG accepts costs/risk; but share revenue 50:50
- Inventors may place their IP in their start-up company
- Inventors may give/sell/share IP with an industry partner

Exceptions

- Invention/creation was your job ...your responsibility
- Written terms of funding state otherwise
 - OMAFRA funded projects
 - Industry-sponsored research

Managing Your Personal Intellectual Property

- All “**Creators**” (students/staff/faculty) are treated equally unless otherwise agreed in writing!
- Promises are often linked to funding – be careful
- Accepting funding ... often means giving up IP rights
- Industry – wants to control the IP
- Creators decide how to share profits among co-inventors

Question

A patent gives the patent-owner the legal right to:

- A. Make the invention
- B. Commercialize the invention
- C. Collect money from the government and others who use the invention
- D. Prevent others from making the invention
- E. All of the above

Protecting your IP

	Patents	Plant Breeder's Rights (PBR)	Trademarks TM or ®	Copyrights ©
Subject Matter	Comp of matter Machines Systems, Methods Use of material Software	New homogenous distinguishable plant species or sub-species that can be reproduced unchanged eg,. Granny Smith apple	Words-Designs-Sounds Names (company, product) Logos, Symbols & Shapes Pictures, Smells Brand name of plant variety	Original creative medium of expression Literature, Music Paintings, Software
Duration of Exclusivity	20 years Nonrenewable	25 years Nonrenewable	10 years Renewable indefinitely	Life of Author +70y in CA & USA
Cost	\$ 20K to \$ 500K (Country specific)	\$ 10K to \$ 25K	Free to \$ 25K	Free to \$ 5K
Approval time	2-5 years	2-3 years CFIA approval (not CIPO)	6-12 months	3-4 weeks

NOTE! Trade Secrets - the most common method used to protect Intellectual property !

Patent Criteria

Novel

- Never made, used, and never publicly disclosed

Useful

- Has a functional benefit

Non-obvious

- Someone 'skilled in the art' must not find the invention to be an obvious extension of prior art or any combination of past references
- Involves an inventive step

Patentable subject matter

- Anything man-made, except laws of nature, natural phenomena, or abstract ideas

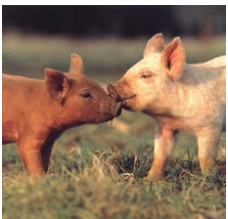
Adequately described

- Enough detail to use and copy
- Enable someone "skilled in the art" to make/use the invention
- AND – you are the **FIRST to FILE** your application at a patent office!

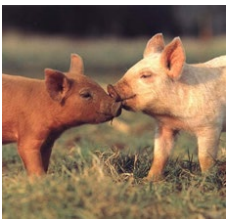
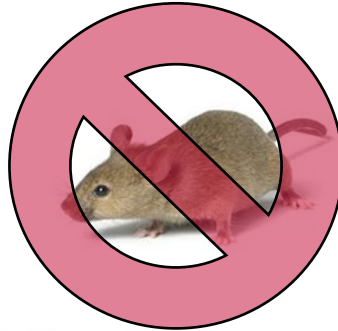




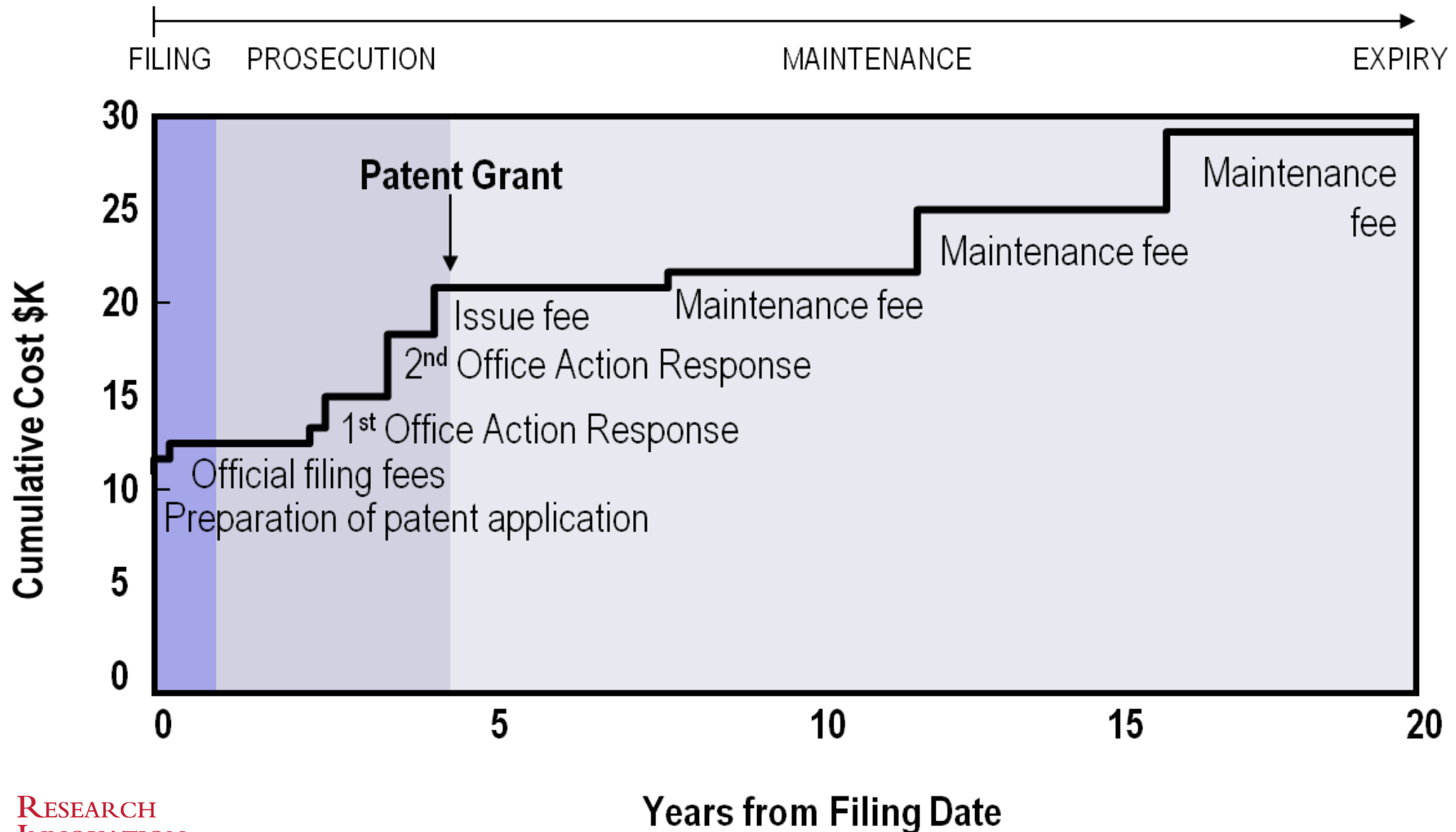
U of G – Research to Market



U of G – Research to Market



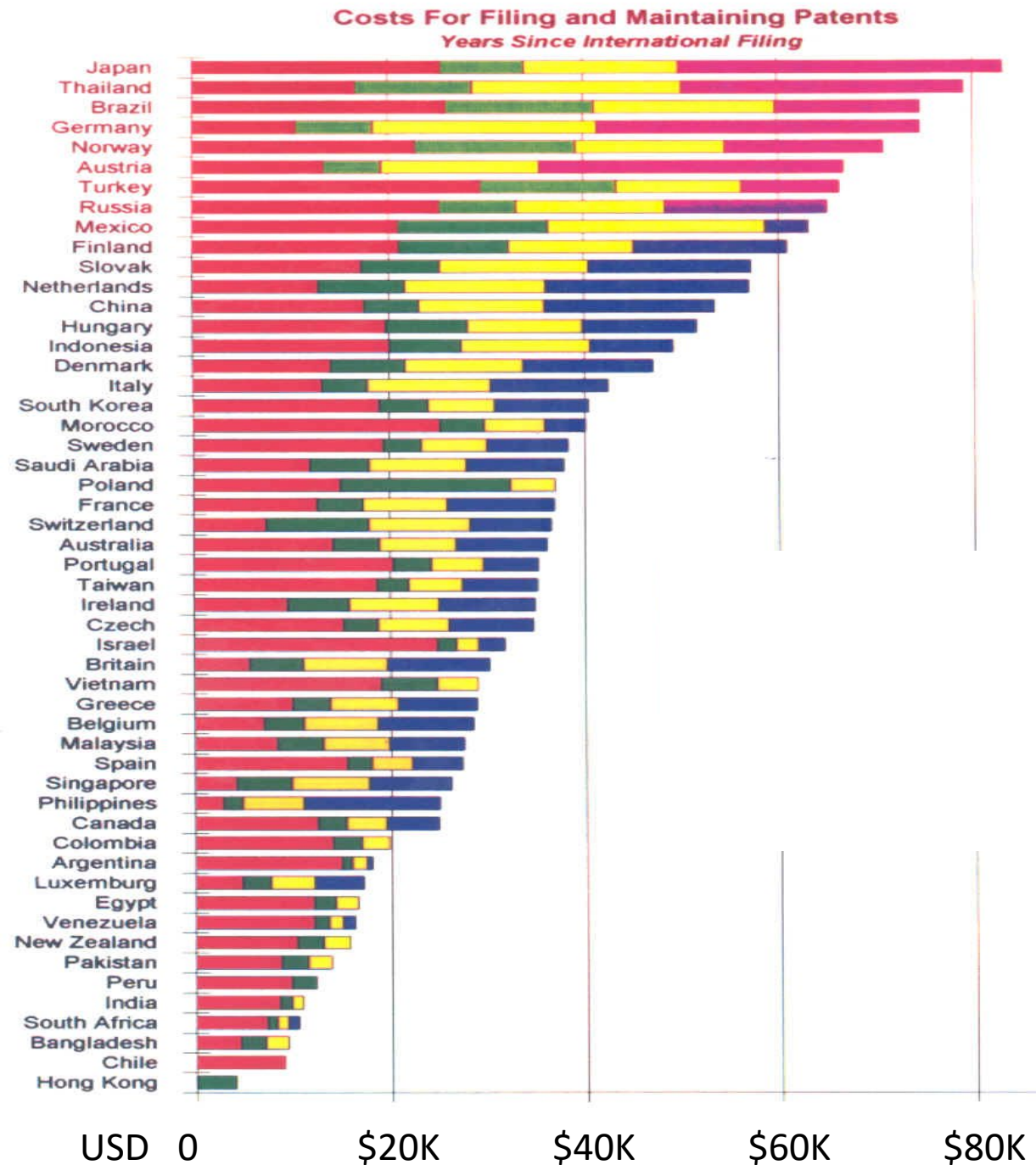
Minimum Cost to Hold a US Patent ~ \$30K



Global Patent Family

Cost to obtain and maintain a family of patents in the top 50 economic regions:

Minimum Grand Total ~ \$2M



Why do companies want Patents?



Slow down the competition!

Secure early-stage investors

Block the competition

Increase Sales & Profits: exclusive right to use for 20 years

Increase their market share (long term survival)

Generate new revenue: NPE can license or sell the patent (asset)

Create a positive image for your company - marketing

Increase negotiating power with potential partners or enemies

Companies can be altruistic too!

**Hewlett Packard, Facebook and Microsoft:
Grant Free Patent Access for Low-Carbon Innovators (April 2021).**

So... Companies can support important causes by enabling innovators to solve wicked problems and then the patent holders (companies) can get some FAME as a good corporate citizen.

“The world needs radical collaboration to meet this critical moment in the climate crisis,” said John Frey, Chief Technologist for Sustainable Transformation at Hewlett Packard Enterprise. **“To achieve net-zero emissions by 2050, we need to work together to innovate faster.** By opening up these patents, we hope to help accelerate and encourage innovation by enabling others to build upon our work.”



Question

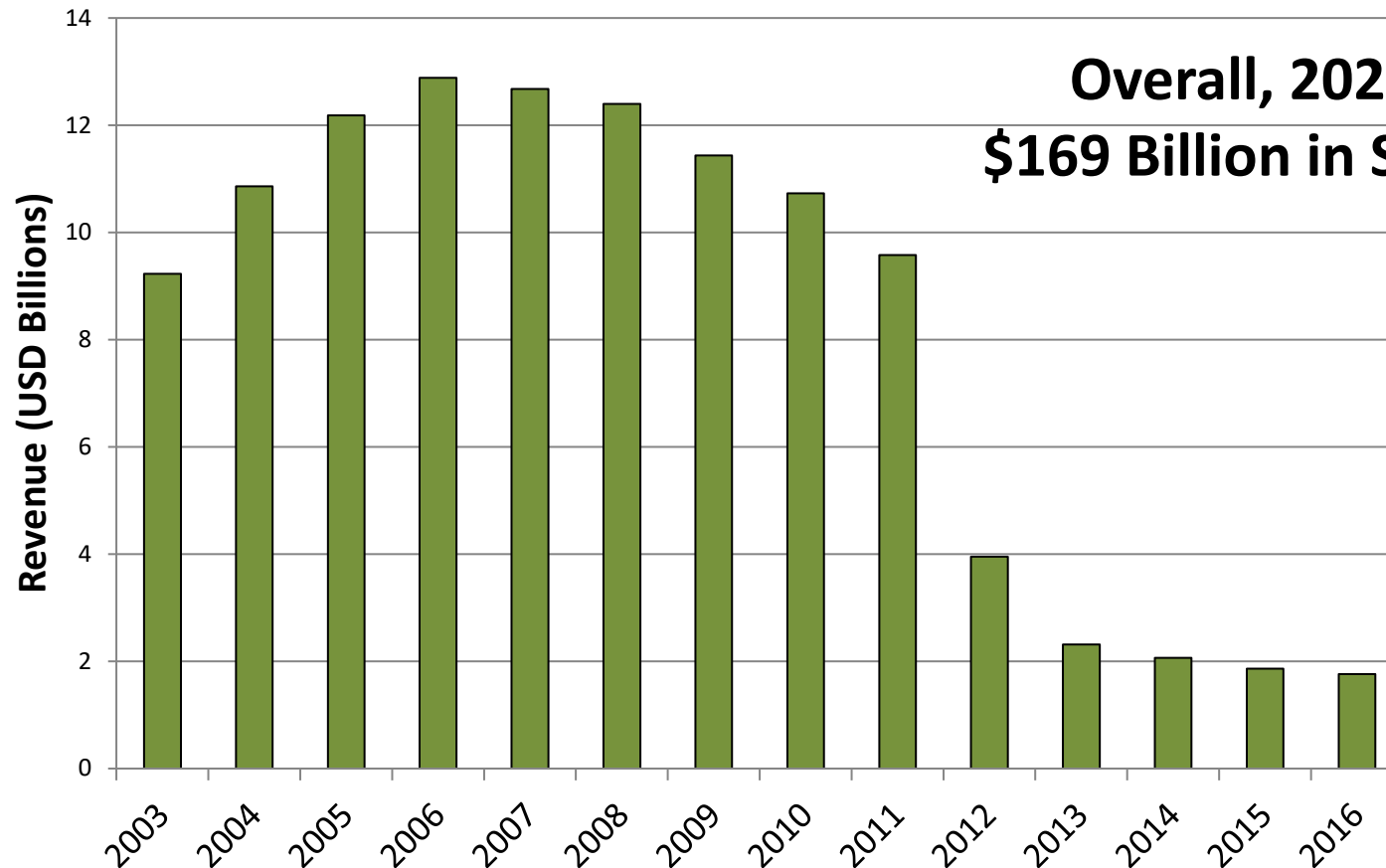
What is the most valuable patent ever approved.

- A. Telephone
- B. CPU chip
- C. Cholesterol inhibitor
- D. Dynamite
- E. Steam Engine



Actually, second most valuable patent ever approved?

Pfizer's Lipitor – Cholesterol lowering drug (statin)



**Overall, 2021
\$169 Billion in Sales**

**Recently displaced
by HUMIRA
(anti-inflam)
Overall, 2021
\$197 Billion in Sales
165 patents
Just off patent**

Why should academics care about patents ?

Access to Government
Research Funding



Business Opportunities
with Industry Sponsors



Also a great Educational Resource



- Get new research ideas
- Know your academic competition
- Find academic and industry research partners
- Determine patentability of your Invention for grants app's

Search the Prior Art

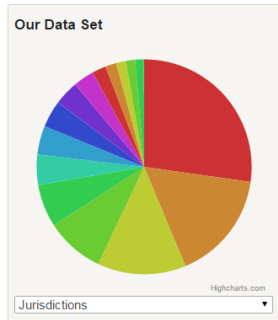
+70 Million Documents



Include non-patent literature (Google Scholar)



Open public resource for innovation cartography



What impact does public science really have?

Using The Lens you can search for patents that cite specific authors in the scientific literature. We put a selection of Nobel laureates to the test. Did their work lead to patented innovation? [Read More](#)

Media Highlight

Nature editorial discusses how The Lens "allows researchers to freely examine which and how many patents have cited their papers." [Read More](#)

PatSeq Facility

Examine & compare biological patent holdings in the Lens using our advanced patent sequences (patseq) exploration tools. [Enter PatSeq](#)

uspto UNITED STATES PATENT AND TRADEMARK OFFICE

Patents Trademarks IP Policy Learning and Resources

Has your invention already been patented at the USPTO?

New to Trademarks?

Don't be misled by imitators

Search the Database

worldwide.espacenet.com/advancedSearch?locale=en_EP

Espacenet Patent search

Advanced search

Worldwide - collection of published applications from 90+ countries

plastic and bicycle

hair

WO2008014520

DE19971031696

WO1995US15925



RESEARCH INNOVATION

Are Improvements Protectable IP

YES - “Improvement” is a new and novel protectable invention that builds on an existing invention or patent to make it better.

- 90% of new patents are Improvements
- But they may lack “Freedom to Operate”



DIY – Yes you can file your own patent application



US Provisional Patent Application

Go to uspto.gov

- Access EFS-Web online patent filing system
- Select utility patent – provisional (12m)
- Add word, text, jpeg or pdf documents

Submit electronically:

- Cover sheet
- Written Description + Examples + Drawing + One Claim
 - similar to a journal article
- Pay your fee (\$65 - \$260 USD)

Going to Court

.....

Know your Odds



Ref: Patent Litigation Study PWC - 2018

- Patent holder success rate in court
37% for Pract Entities; 25% for Non-Pract Entities
- **Median damages awarded** **\$10.2 M**
- Wait time to get to trial 2.6 years
- Median trial duration 1.1 year
- **Jury awards vs judges** **5X**
- **Cases that get appealed** **78%**
- **Award modified after appeal** **53%**
- Most lawsuits are:
 - 16% Consumer Products (think smart phones)
 - 15% Biotech (think drugs)

Patents vs Trade Secrets

Trade Secret may be better than a patent when:

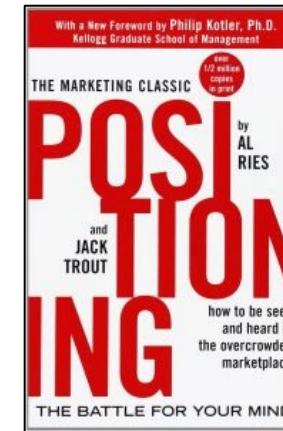
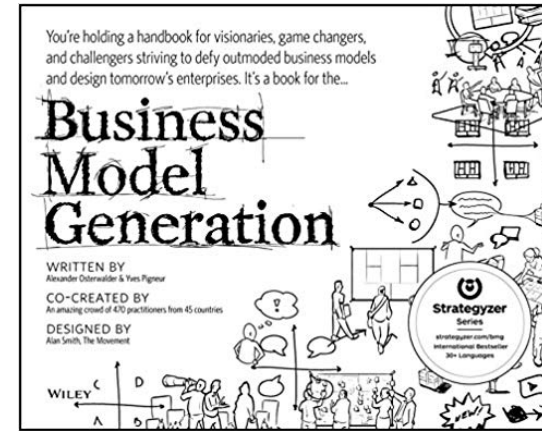
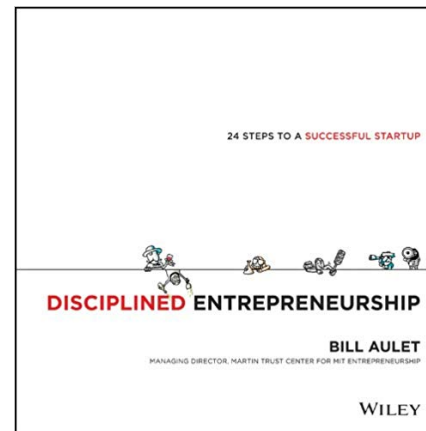
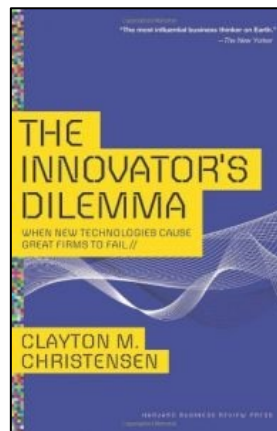
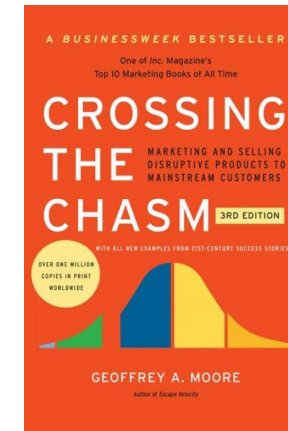
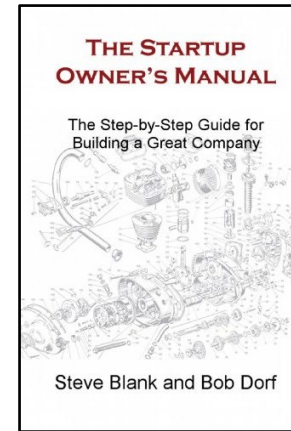
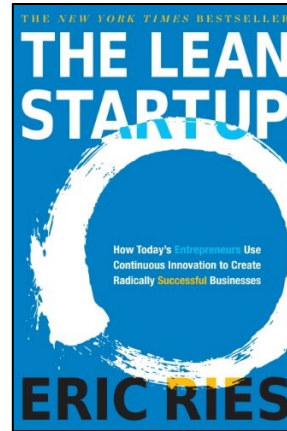
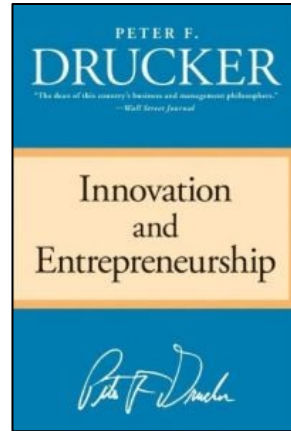
- Technology is difficult to reverse engineer
- Small company challenging a giant company
- Infringers (end-users) are individuals and academics
- Rapidly evolving market (i.e. software <5y life cycle)
- Technology is a recipe or one of many possible solutions
- Desire > 20 years of protection ...but nothing is forever

Entrepreneurial Aspirations?

A start-up company is just an experiment
looking for a sustainable business model

Start following ... SteveBlank.com

Entrepreneurship – Self-help Library



New Venture Creations – we're here to help.

We help UofG grad students and faculty to create startups

- Mission: Help you explore your business ideas (fun)
- When: Anytime – any idea - never too early
- Where: RIO is the blue building on Christie Lane: a confidential space to meet
- What: We have a network and mentors. If we don't know, we know who does
- Experience: We know your journey. We were graduate students too.

- Take an hour to learn more online: Intro to Entrepreneurship

<https://www.uoguelph.ca/research/innovation/collaborate/accelerator-guelph/introduction-entrepreneurship>

Other Resources - Entrepreneurship

New Venture Creations – Research Innovation Office (UofG R&D incubator)

The Hub – Wood Centre & Lang School of Business (UofG general incubator)

Care AI – ethical AI and engineering

Cyber Forge - cybersecurity

Enactus - Guelph, all across Canada – and UofG

Boundless Accelerator - City of Guelph RIC

Communitech – KW RIC

Founder Institute – KW/Toronto Global organization

MaRS Innovations - Toronto – largest RIC in Canada

Civic Accelerator - Guelph

Accelerator Centre - Waterloo

Ontario Centres for Innovation – Gov't ON





IP Resources

Canadian Intellectual Property Office

<http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/Home>

Canadian Intellectual Property Law for Dummies

<http://www.canadian-ip.com/>

Intellectual Property Law for Engineers & Scientists

<http://ca.wiley.com/WileyCDA/WileyTitle/productCd-0471449989.html>

US Patent & Trademark Office

<https://www.uspto.gov/>

How to File a US Patent Application

<http://www.basicpatents.com/pathtfpa.htm>

Research Innovation Office

<https://www.uoguelph.ca/research/innovation/>


Intellectual Property Policy

<https://www.uoguelph.ca/research/for-researchers/patenting-commercialization/ip-policy>

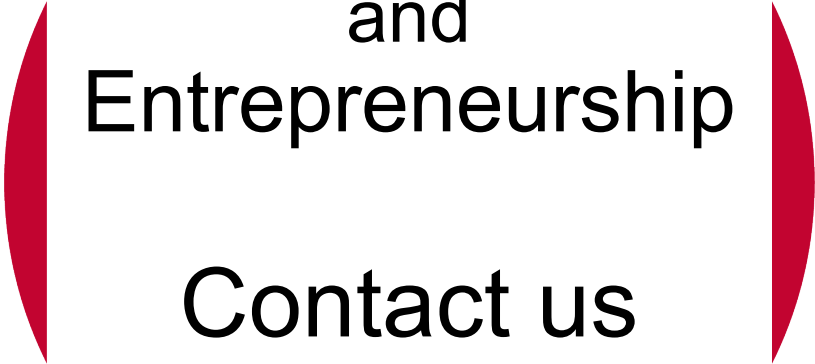


More IP Resources

- **The IP Academy** where you can find information of the seminars and webinars we deliver, as well as online training courses and case studies for students. (http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr04234.html)
- **The IP Toolbox** which is a suite of online information products and tools including roadmaps, fact sheets, going global guides, etc. (http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr04320.html)
- **The IP Hub** which is a growing digital platform for the IP community to connect (e.g. referrals, consultations, and advisory services enabling you to speak directly with our Client Service Center and/or our IP Advisors across Canada for guidance). (http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr04406.html)
- **Canadian IP Voices** is a collection of podcasts produced by CIPO (<https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr04967.html>)



IP
and
Entrepreneurship



Contact us
anytime!



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www.uoguelph.ca/research/innovation

 @CreatedAtGuelph

 #CreatedAtGuelph

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Thank you

Please leave a review and support continuous improvement

A link to the anonymous on-line evaluation survey will be in **Chat**.

We appreciate your feedback and participation.

https://uoguelph.eu.qualtrics.com/jfe/form/SV_8d1GbHtrRrvRKgm

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