Pathways to Commercialization

Intro to IP, Tech Transfer and Research Commercialization

Western Innovation and Strategic Partnerships

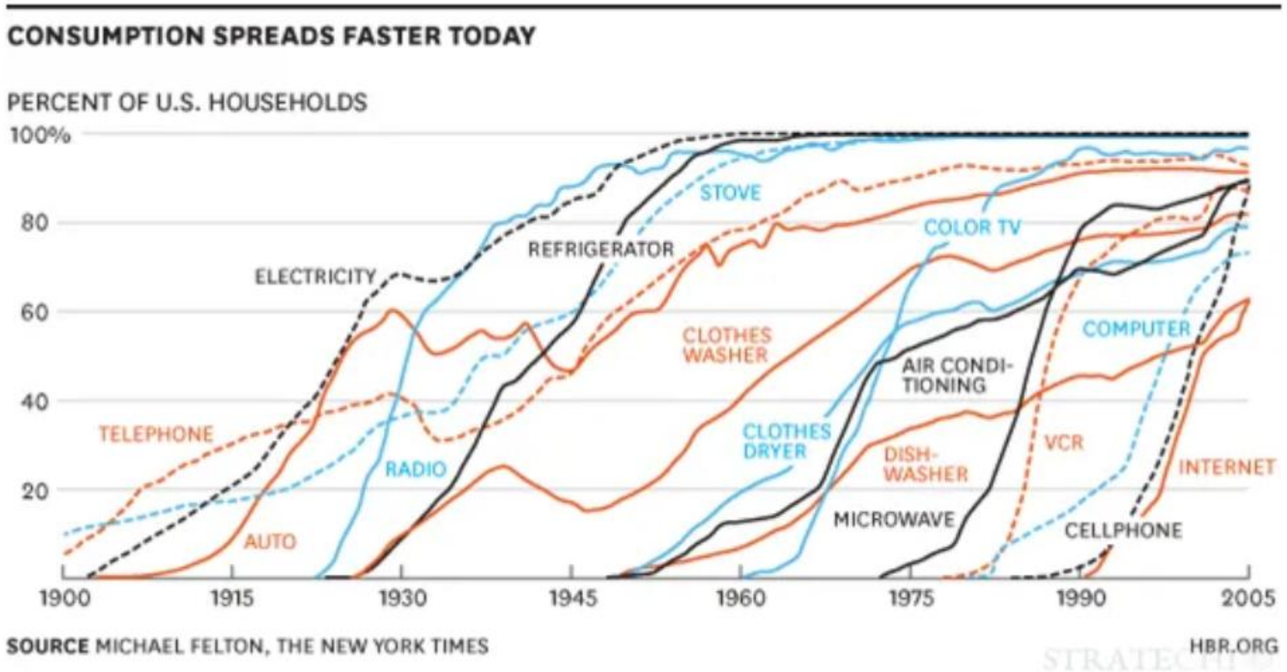
Pathways to Commercialization

- Economics of Knowledge Translation & Innovation
- Business Fundamentals
- Regulated Markets
- What is Intellectual Property (IP)
  - Why does it matter
  - What is an IP strategy and when should have one
  - Academic IP Policies
- Research Commercialization
  - Examples of Successful Research Commercialization
  - The role of the TTO

Economics of Knowledge Translation

- Research Institutions generate lots of ideas for change
- Change is work
- At an organization or a system level even simple changes take effort
- For every change most organizations look at
  - Value proposition
  - Opportunity Cost
  - Return on Investment (ROI)
- Money is energy that can drive change

Technology Adoption Take Times



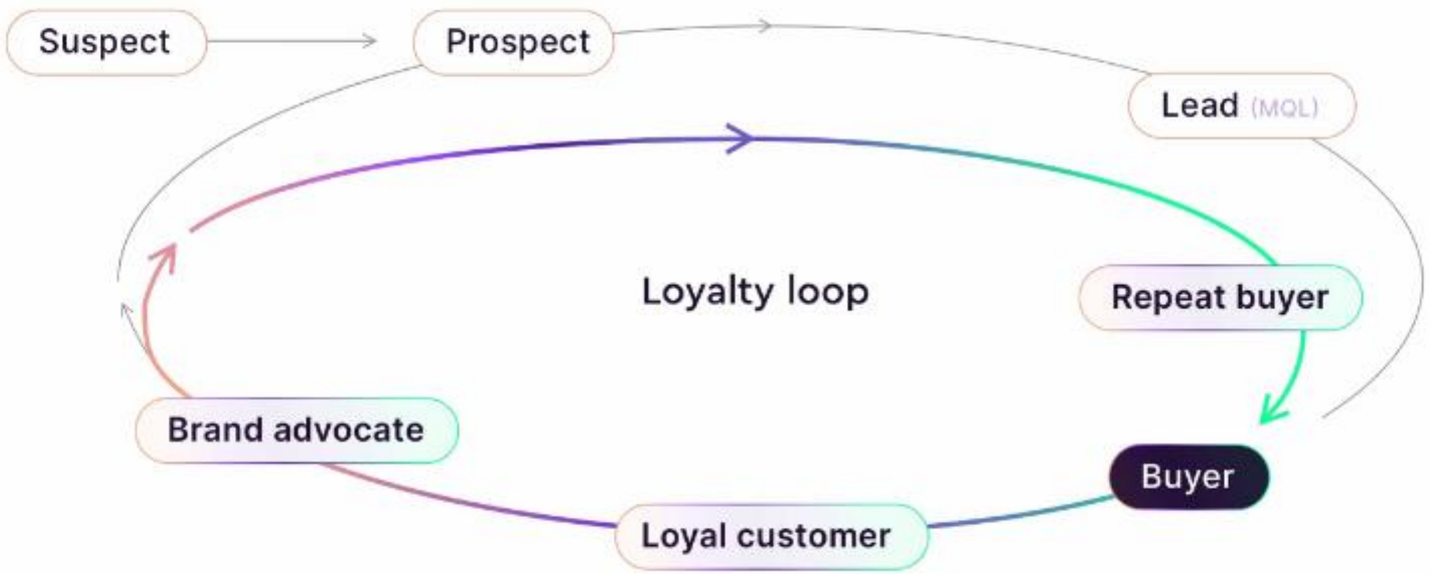
- Impact of Innovation gets overestimated in the short term and underestimated in the long run

Show me the incentives and
I will show you the outcome
– Charlie Munger

Business Basics: Markets

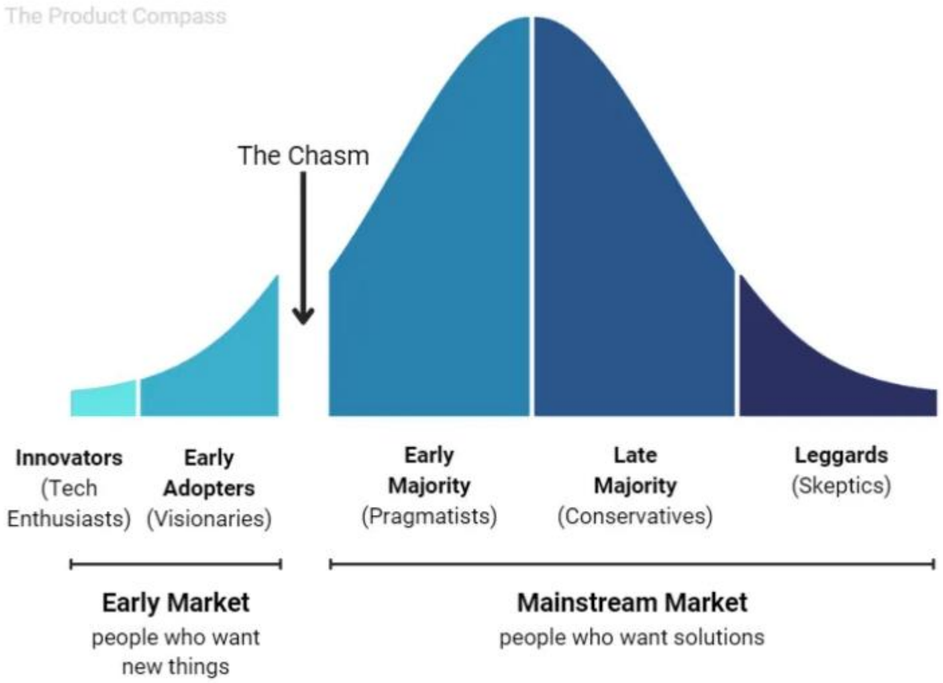
- Markets are defined by their characteristics
- All strategies are cost or differentiation at their core

Business Basics: Generating Sales/ Customer Journeys



- Customers are irrational
- People buy from People

Crossing the Chasm

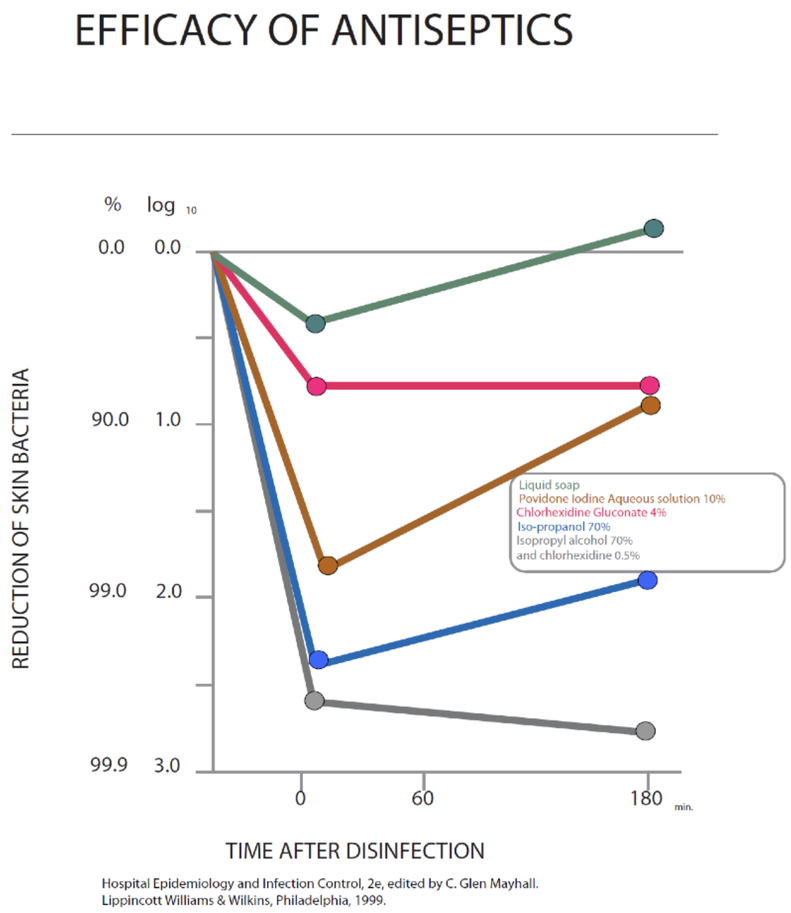


- Most ideas can find a few customers
- Scale requires larger adoption
- Most business models need scale

Regulated Markets

- Food and Health Products are regulated
- Regulations vary by country
  - In general higher the risk the higher regulations
  - Risk gets assessed through
    - For whom?
    - For what?
    - How?
- Can require
  - Disclosure of ingredients and manufacturing process
  - Proof of efficiecy/claims
  - Adherence to quality stds and process
- Regulations can create barriers to entry for markets

Example: 3M SoluPrep

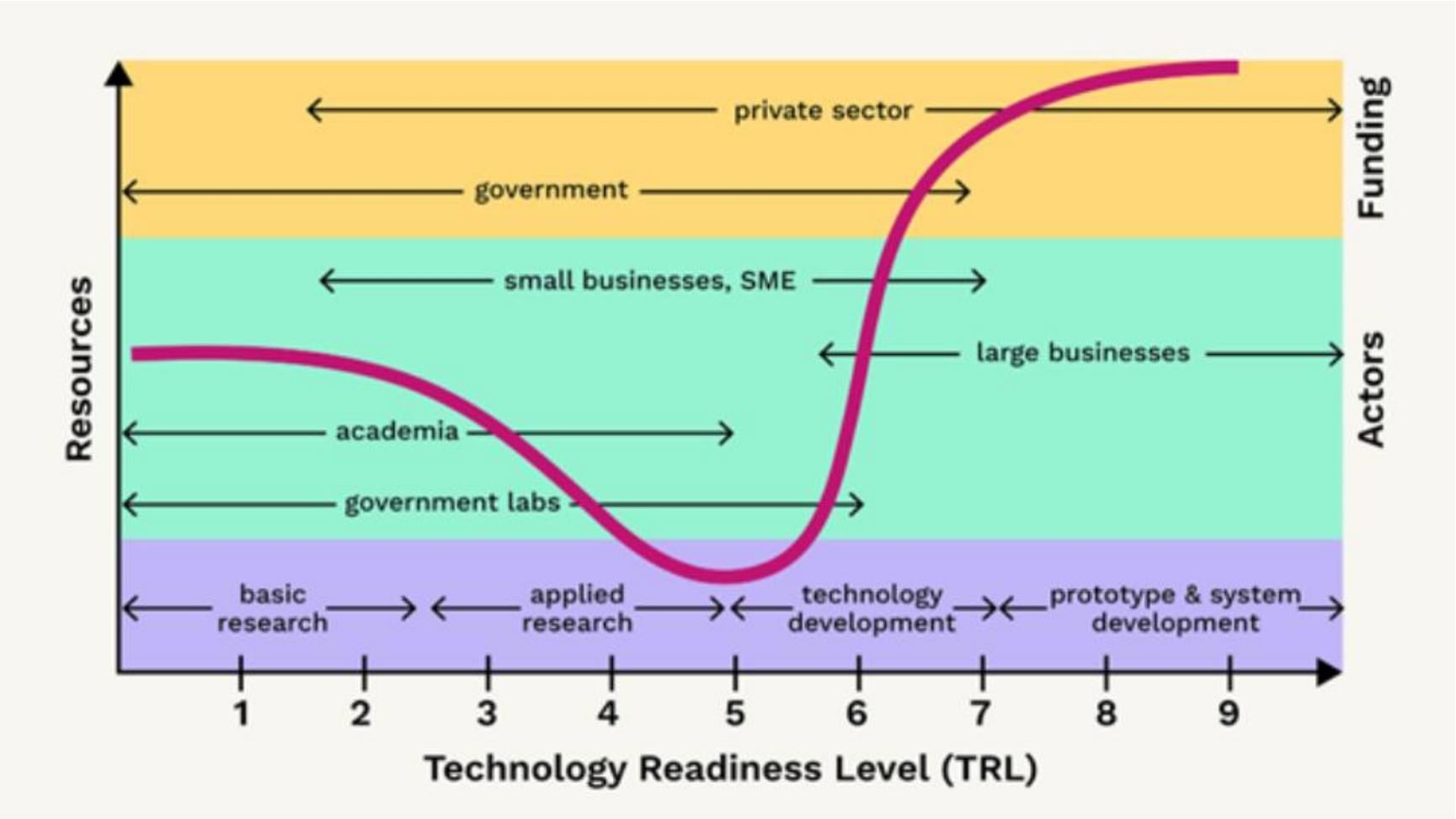


- Hospital acquired infections are a major issue
- To reduce surgical site infections research demonstrated:
  - Chlorohexidine & Alcohol the most effective & safest antiseptic for intact skin
  - Antiseptics are safest when delivered through “single use” doses
- Standards and recommendations started late 90s early 2000s
- 3M acquired Solumed (Montreal) in 2010
  - Invested ~$2M in regulatory

Going from Lab to Market

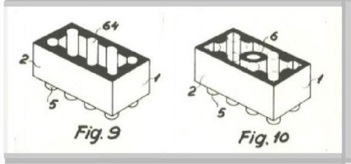
- ~1% of University "Inventions" are successfully commercialized
  - Very hard to predict what will succeed
  - Serendipity
- IP Policies are driven by the belief if a “profitable” idea comes out of funded research some of the value should go to the funder
- Protection and ownership IP is the vehicle to support idea

Technology Readiness Levels



What is IP and why does it matter

- Intellectual property (IP)-”creations of the mind”
  - Inventors/Creators have rights over their creations
  - Legal mechanisms acknowledge rights to the IP
    - Originated in the Industrial Revolution minor updates
- Owners have to enforce their rights
- IP is a potential barrier to entry for competitors in the market
- IP only has value if there is a market for it

	Patents	Industrial Designs	Trademarks	Copyrights	Trade Secrets
What is protected?	Technical aspects of an invention	Features of a products, devices, objects and services	Combination of letters words, sounds or designs that distinguishes goods or services	Original works of authorship (literary, dramatic, musical, artistic)	Valuable business information kept secret, like formulas, recipes, supplier lists, and client lists.
Example					
Eligibilitiy	1. New 2. Useful 3. Non-Obvious	1. Original 2. Human authorship 3. Fixed in a tangible medium of expression	1. Not clearly descriptive, misdecriptive, or generic 2. Distinguishes goods /services from others	1. Original 2. Human authorship 3. Fixed in a tangible medium of expression	1. Used in business 2. Not generially known 3. Has economic value 4. Kept confidental
Term of Protection	20 years max, with annual fees	15 years from filing, renew after 5	10 years, renewable in perpetuity	Author's life plus 70 years	While kept confidential
Timeframe: From filing to Registration	3-5 years	1.5 - 2.5 years	2 - 3 years	1 - 2 weeks	N/A
Estimated Fee Ranges	Drafting: $8,000 - $15,000 Filing: $1,800 Examination process varies	$2,500 - $3,000 Filing through registration (with no objections)	$2,500 Registering up to two classes (no objections)	Filing: $500	Time-based billing

IP Guidelines

Copyright

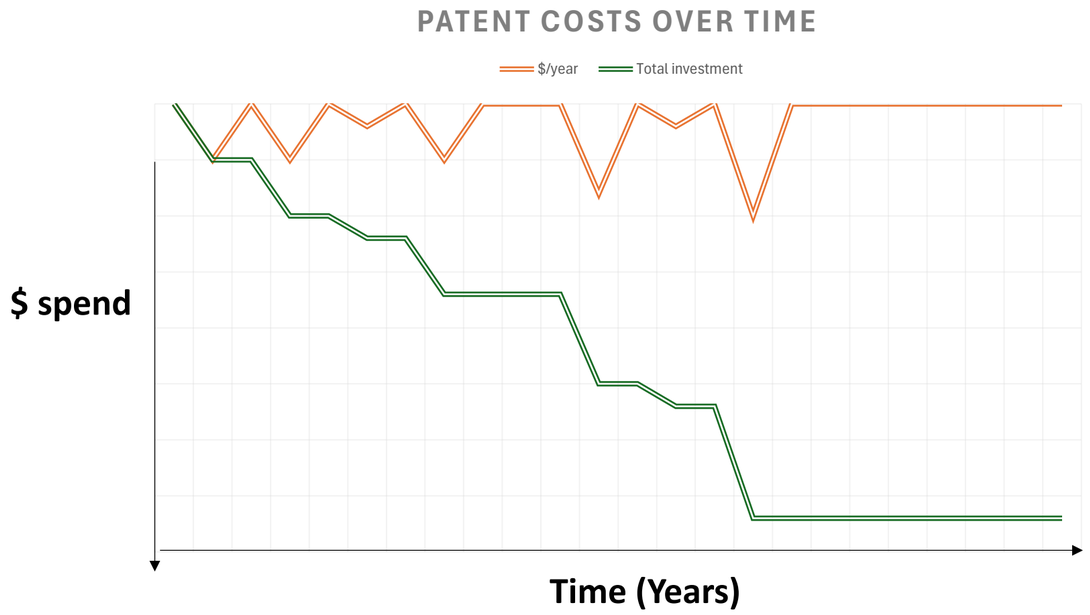
- Authorship
- Automatic
- Fair use/dealing governs non commercial

Patents

- Inventorship
- Has to be filed (before the idea is shared)
  - Provisional
  - National Phase
- Takes years to be granted
- Costs increase over time

Understanding Patent Costs

- Patent costs are incremental
- Cost to issue vary country
  - Filings can receive office actions that have to be responded to (time & money)
- Once issued patents have maintenance fees that increase over time



Inventorship

Inventor	Contributor
Conceives the idea or is part of the discussion that did, i.e. a 'light bulb moment'	Puts forward a hypothesis
Materially contributes to the development of the invention, e.g. identifying the significance of a result which led to the invention	Builds or tests the invention after the idea has been conceived
Follows the instructions of a supervisor using initiative and creativity to take the idea further (towards the inventive concept)	Carries out instructions of a supervisor without making significant changes over and above those instructions
Provides solutions to problems	Acts as a supervisor on the project but does not contribute to the inventive concept
	Writes up results, formulates and/or publishes a paper

https://www.bristol.ac.uk/media-library/sites/business/documents/commercialisation/Inventorship.pdf

IP Strategy

- Investing in IP makes sense when there is an intent for commercial use
- Ideas do not commercial themselves

Most well-known University Inventions?

Lessons from the Invention of Gatorade

1965
Dr. Cade and colleagues from the University of Florida (UofF) create Gatorade, a mix of water, salts and sugars, to replenish athletes' health after games.

October 1965
10 Gators tried the drink during a 14-7 victory, prompting the opposing coach to later admit they lost because "we didn't have Gatorade."

1966
After UofF declined a $10,000 offer for Gatorade, Dr. Cade bypassed the school and federal funders to independently secure FDA approval, a corporate charter and the product trademark.

Valuation inventions is hard

Lessons from the Invention of Gatorade

1971
The federal government launched an investigation into Gatorade's ownership due to the team’s use of government funding, but ultimately dropped it. Meanwhile, UofF sued Dr. Cade's team for 100% of royalties, citing use of its labs and athletes.

1973
The lawsuit was settled, granting UofF 20% of the Gatorade Trust royalties in perpetuity. This has generated over $281 million to fund university research.

1983
Quaker Oats won a bidding war against Pillsbury to acquire Stokely-Van Camp, scaling the Gatorade brand and expanding its footprint into Canada, Asia, South America and Europe.

Patents filed initially were dropped
US legislated Institution Ownership for all US universities

Lessons from the Invention of Gatorade

2007

Following Dr. Cade’s passing, the Gatorade Trust was valued at over $1 billion, and a dedicated museum was later opened in his honor to celebrate his legacy in the sports drinks industry.

Today

Operating in over 80 countries, Gatorade accounts for 15-17% of PepsiCo’s business and aggressively expands its product lines and athlete endorsements. The original trust continues paying perpetual royalties to UofF and the creator’s estates.

Lesson Learned: Successful commercialization creates a lasting legacy. A properly structured IP agreement can support an inventor’s estates for generations and fund institutional research in perpetuity.

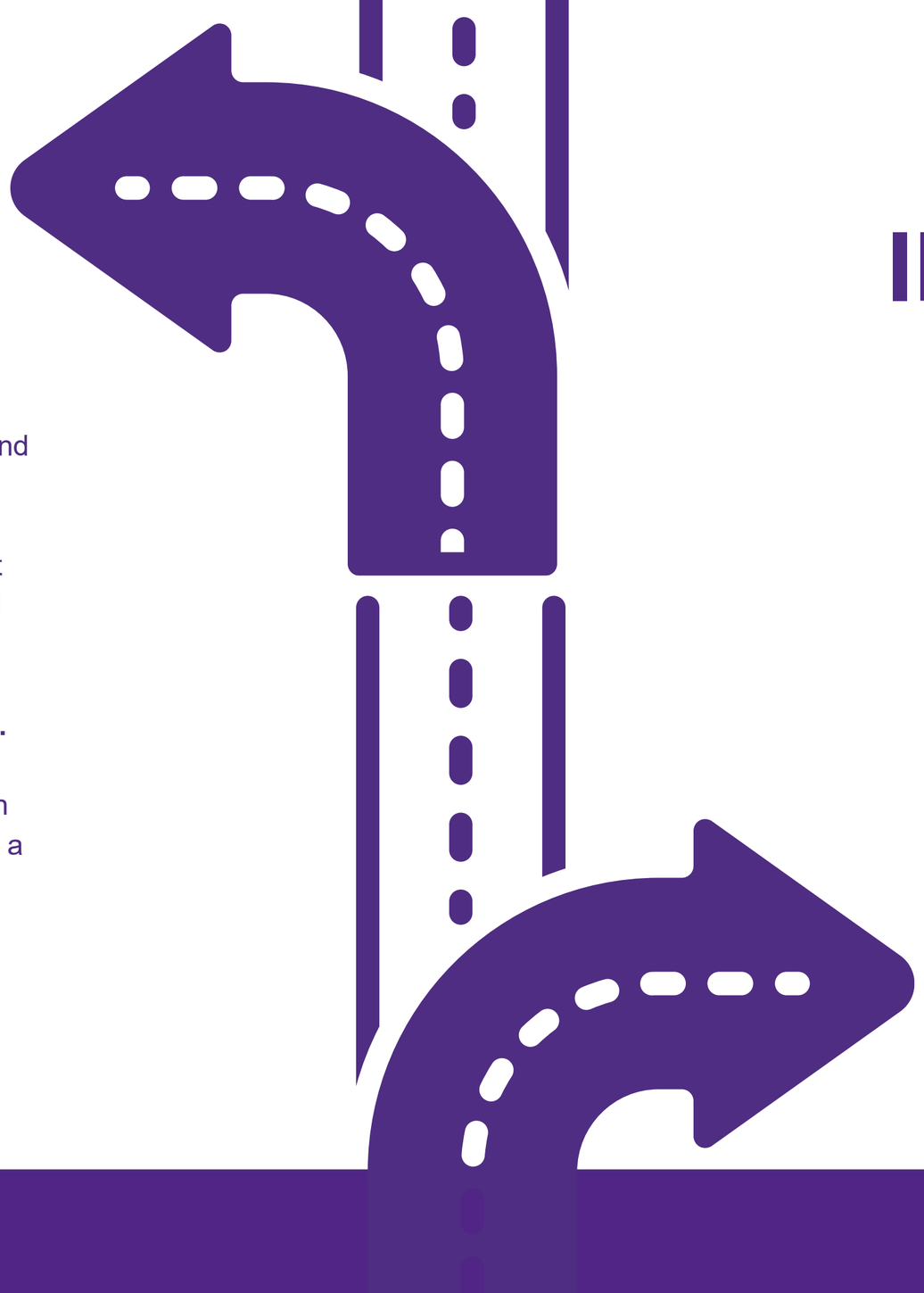
Understanding IP Policies

- Key Terms:
  - Disclosure-Formal Reporting of the Invention
  - Ownership-Who has the deciding vote in what happens
    - Institution owned
    - Inventor owned
  - Express License-Standard Terms to License and invention to Inventor lead start-up (Spinout)
  - Equity stake-Ownership share
  - Royalty- Revenue share
  - License- legal granting of rights
- Policies in Canada vary
- Nuances
  - Policies are role dependent
    - Students
    - Faculty
    - Staff
- Majority of disclosure have multiple inventors

Western IP Policy 101

Partner with the University

- Inventors assign IP to **Western University** for legal representation in commercialization efforts.
  - The institution takes all the risks and costs associated with commercialization.
- Inventors stay involved, giving input at key stages with university experts and assent to any contracts signed.
- **Upon success, net proceeds collected by the TTO are split 50:50.**
- Inventors may elect reassignment to pursue independent commercialization at any time provided no contracts with a third party have been signed.



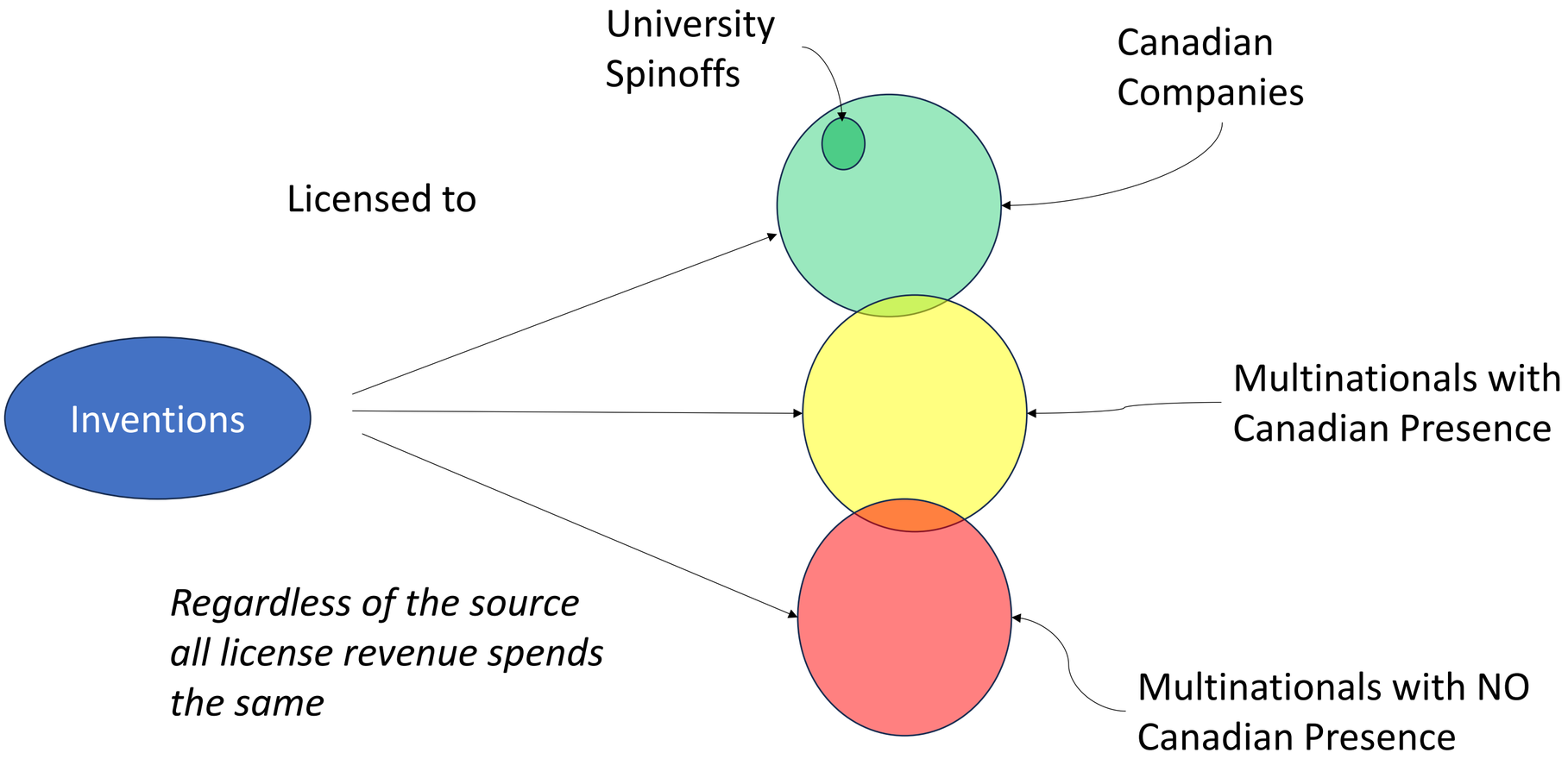
Go It Alone

- Inventors retain full ownership of their IP and are responsible for commercialization efforts.
- The university may offer informal advice, but commercialization support is only for inventors who assign their IP to Western.
- The university has no involvement in the commercialization process beyond acknowledging the inventor's rights.

Role of the TTO

- Assess the IP
- Discuss potential Commercialization Pathway
- Act as the honest broker

Politics of Technology Licensing



Supporting University Spinouts (Spinoffs)

- Companies that transform technological inventions developed from university research
- Western wants them to succeed and thrive
- Technology gets licensed back on favorable terms
  - Small equity share or royalty on sales
  - Only the revenue that comes to the TTO is subjected to the 50:50 split
  - Inventors that are active in the spinout get paid directly from the spinouts

The Eureka Myth

The **misleading belief** that innovation happens in a single, sudden burst of inspiration; that a lone inventor’s brilliant idea instantly changes the world.

Penicillin: debunking the Eureka Myth

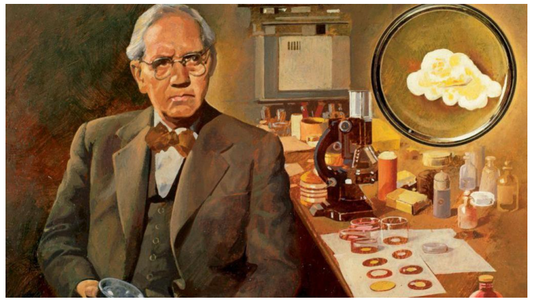
How persistence, collaboration, and Canadian innovation turned a lab curiosity into a medical revolution.

Innovation is **not** just one man's flash of genius

Innovation reality: trial, error, and scientific dead ends

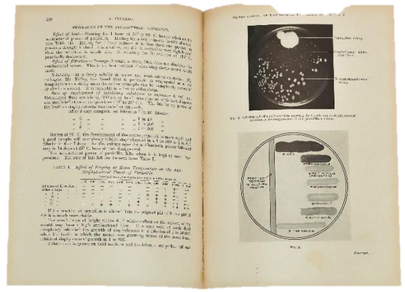
Necessities: infrastructure and expertise

The "Eureka!" Moment



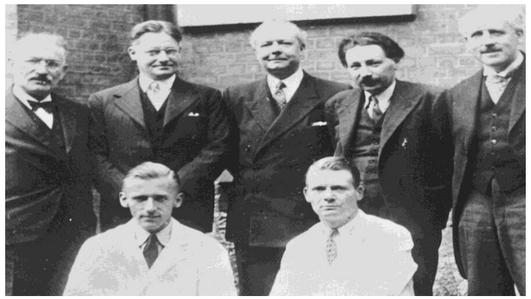
In **1928,** Alexander Fleming returns from holiday and notices mold (*Penicillium Notatum*) on a Petri dish of *Staphylococcus* bacteria that inhibited bacterial growth.

Years of Struggle



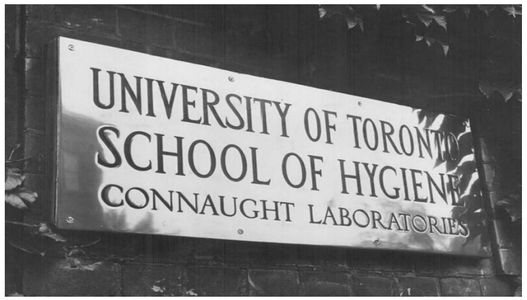
In **June 1929**, Fleming published his findings in the *British Journal of Experimental Pathology*, but was treated with disregard as a laboratory curiosity.

Breakthrough & Scale



1939-1941: Howard Florey, Ernst Chain, and their Oxford team revived the dormant idea to extract, purify, & test Penicillin for medical use. **In 1942**, the first successful treatment was recorded.

Canadian Impact

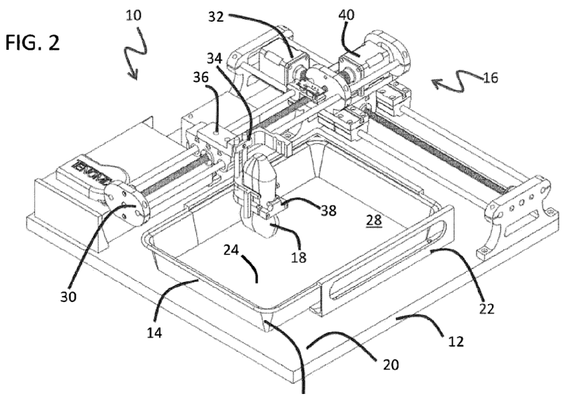


During WWII, *Connaught Laboratories* rapidly developed the large-scale fermentation methods needed to support Allied troops and civilians in April 1944, and D-Day, saving thousands of lives.

The success of Penicillin came not from a "Eureka!" moment, but from Canadian infrastructure, persistence, and scientific collaboration that transformed a lab discovery into a global medical breakthrough.

Technology Disclosure – Success Stories

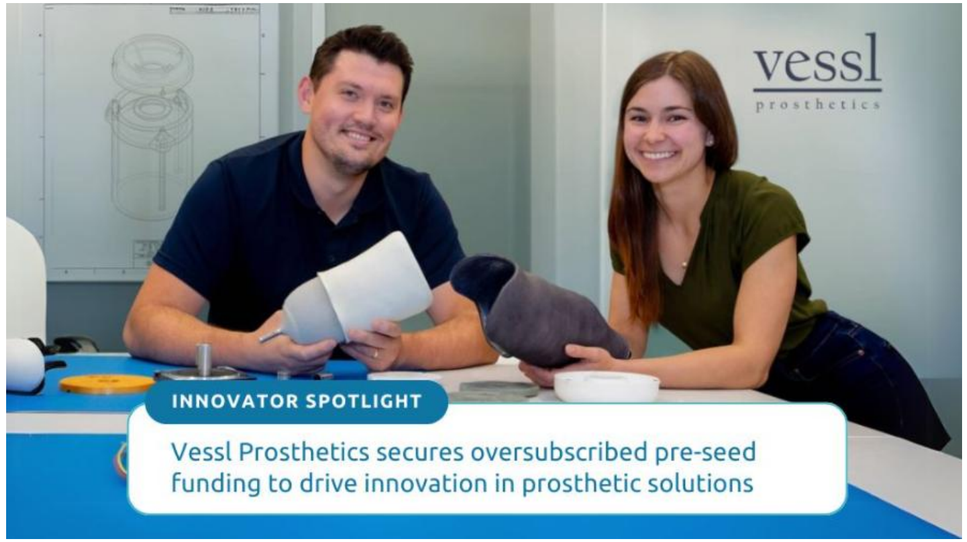
TENOMIX



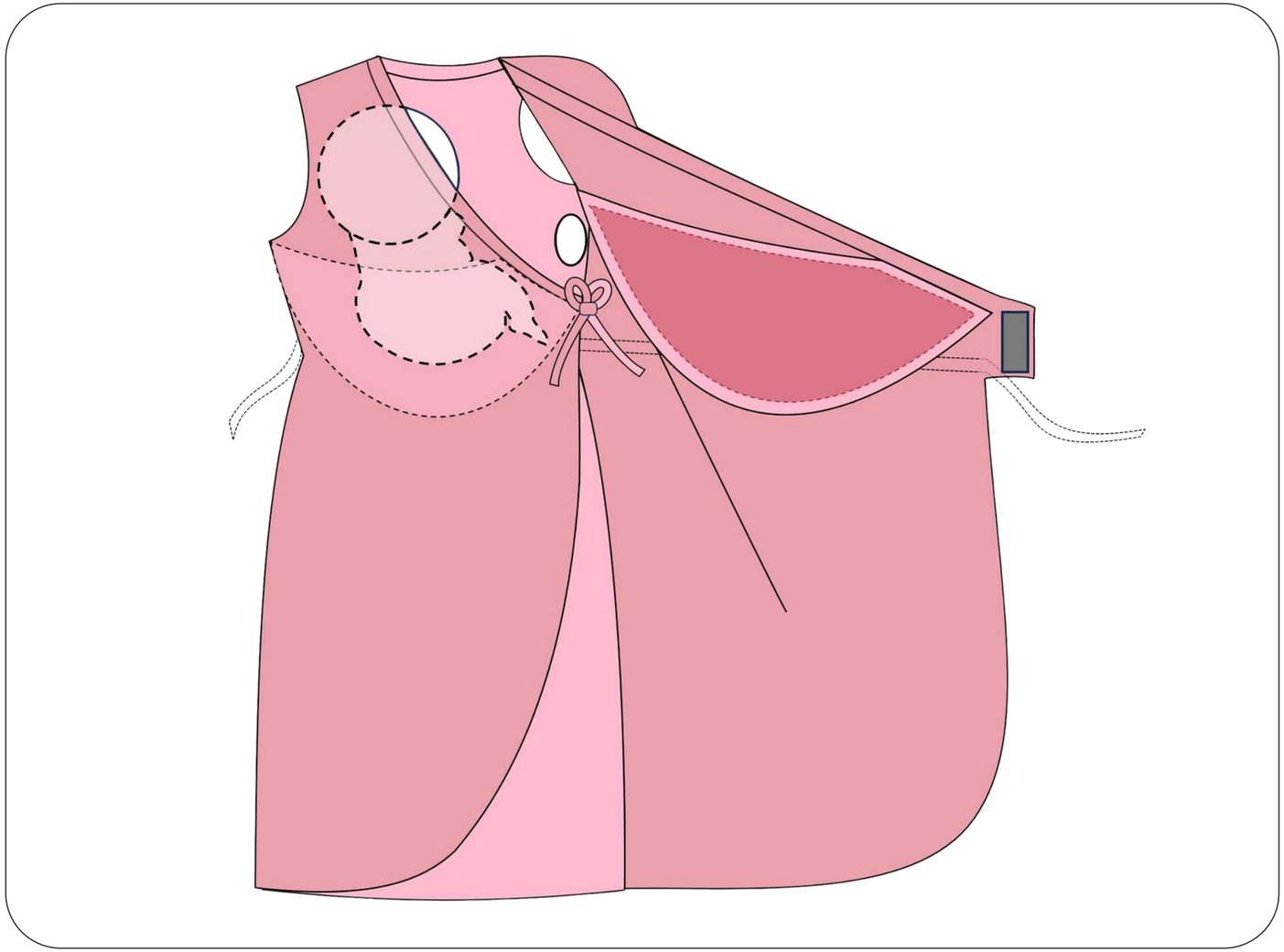
Lymph node Detector

vessl prosthetics

Kinn™ Automatic Volume Management System

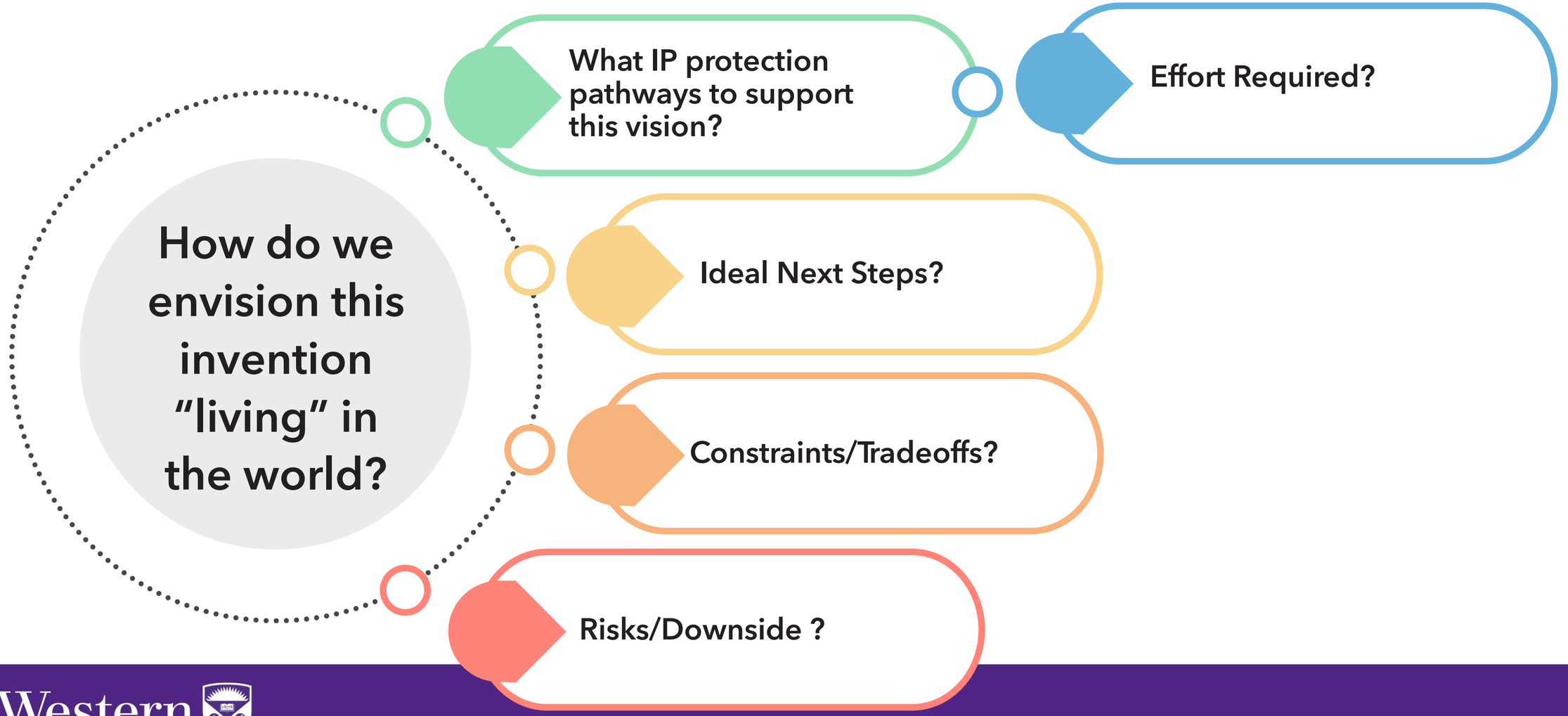


EMMA Gown Example



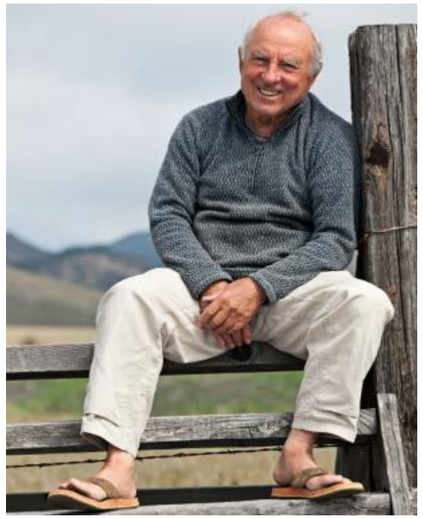
- Initial Provisional Patent filed- no feedback
- Express filing UK for feedback
- PCT filing-Global Placeholder

Exploring Commercialization Pathways



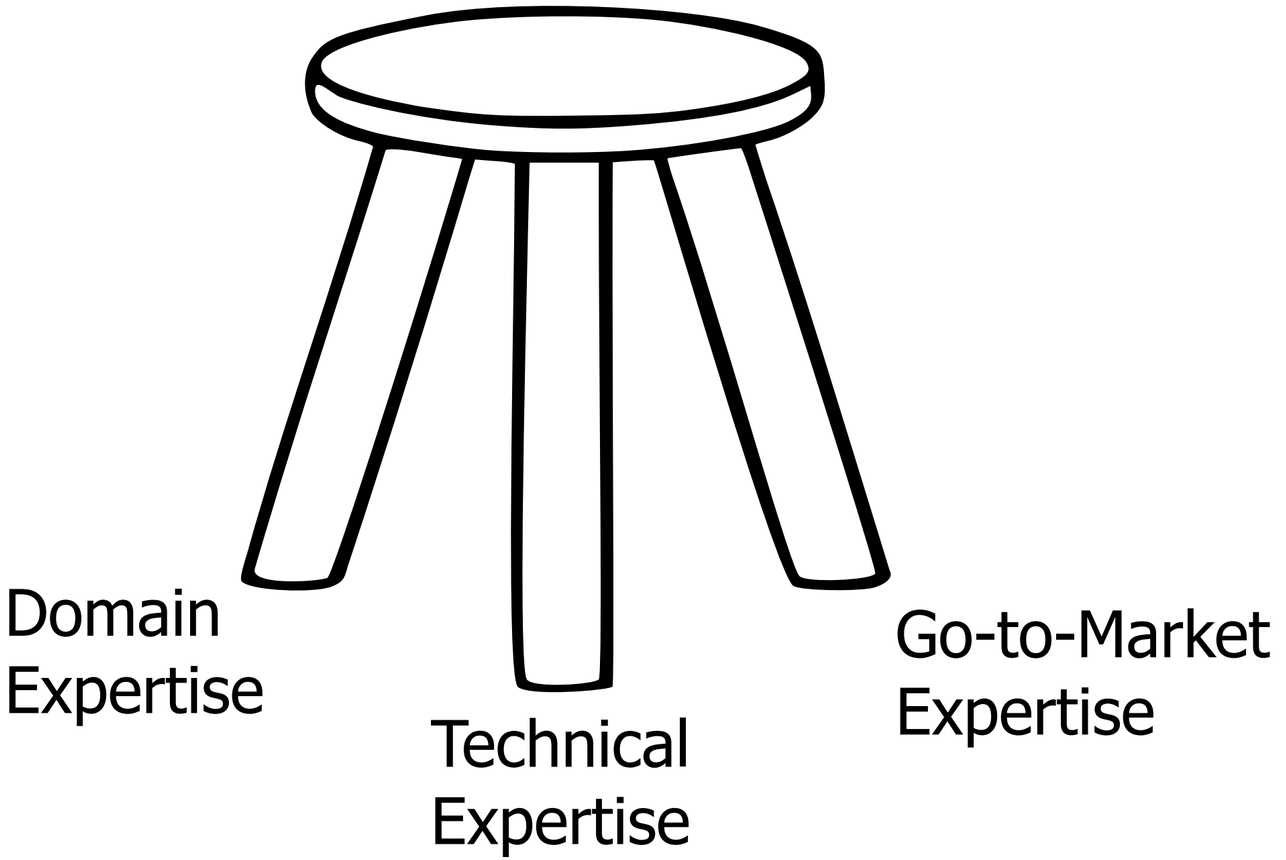
Entrepreneurship

There are lots of ways to be an Entrepreneur



Business Basics: Three Pillars of Successful Venture

- Can you address a need that a customer will “pay” to solve?
- Does the “business model” work?
  - Is the market large enough
  - Is it profitable enough
  - Do you have a competitive advantage



Making the Numbers Work

- Don’t be afraid to talk numbers
  - Rough estimates are fine
- Value Creati

Value Creation vs Value Extraction

Metric	Costco	Walmart
SCALE		
Total Revenue	~$254B	~$648B
Revenue Growth (YoY)	~5.0%	~5.0%
MARGINS		
Gross Margin	~12.6%	~23.7%
SG&A as % of Revenue	~9.0%	~20.2%
Operating Margin	~3.65%	~4.6%
Net Profit Margin	~2.9%	~2.4%
MEMBERSHIP / SUBSCRIPTION		
Membership Fee Revenue	~$4.8B	~$3.1B (Sam's Club)
Membership as % of Op. Income	>50%	~14%

The total amount of money a company makes before any costs are paid

How much a company's revenue has increased or decreased since last year

The percentage of revenue retained after paying direct costs involved in producing the goods

The percentage of revenue that is allocated to paying costs related to selling, general operations and administrative functions

The percentage of revenue retained after paying all operating expenses

The percentage of revenue retained after paying ALL expenses (operating expenses, tax, interest etc)

Numbers can not be judged in isolation, strategy shapes every metric

Gross Margin

Costco	12.6%
Walmart	23.7%

- Costco's lower margins are not a weakness, they are intentional
- Their low-markup policy passes savings directly to customers

SG&A Costs

Costco	9%
Walmart	20.2%

- Costco offsets thin margins by keeping operating costs low via bulk buying, warehouse stores, limited SKUs, Kirkland Signature, employee retention and exec pay caps

Membership Fees

Costco	>50%
Walmart	14%

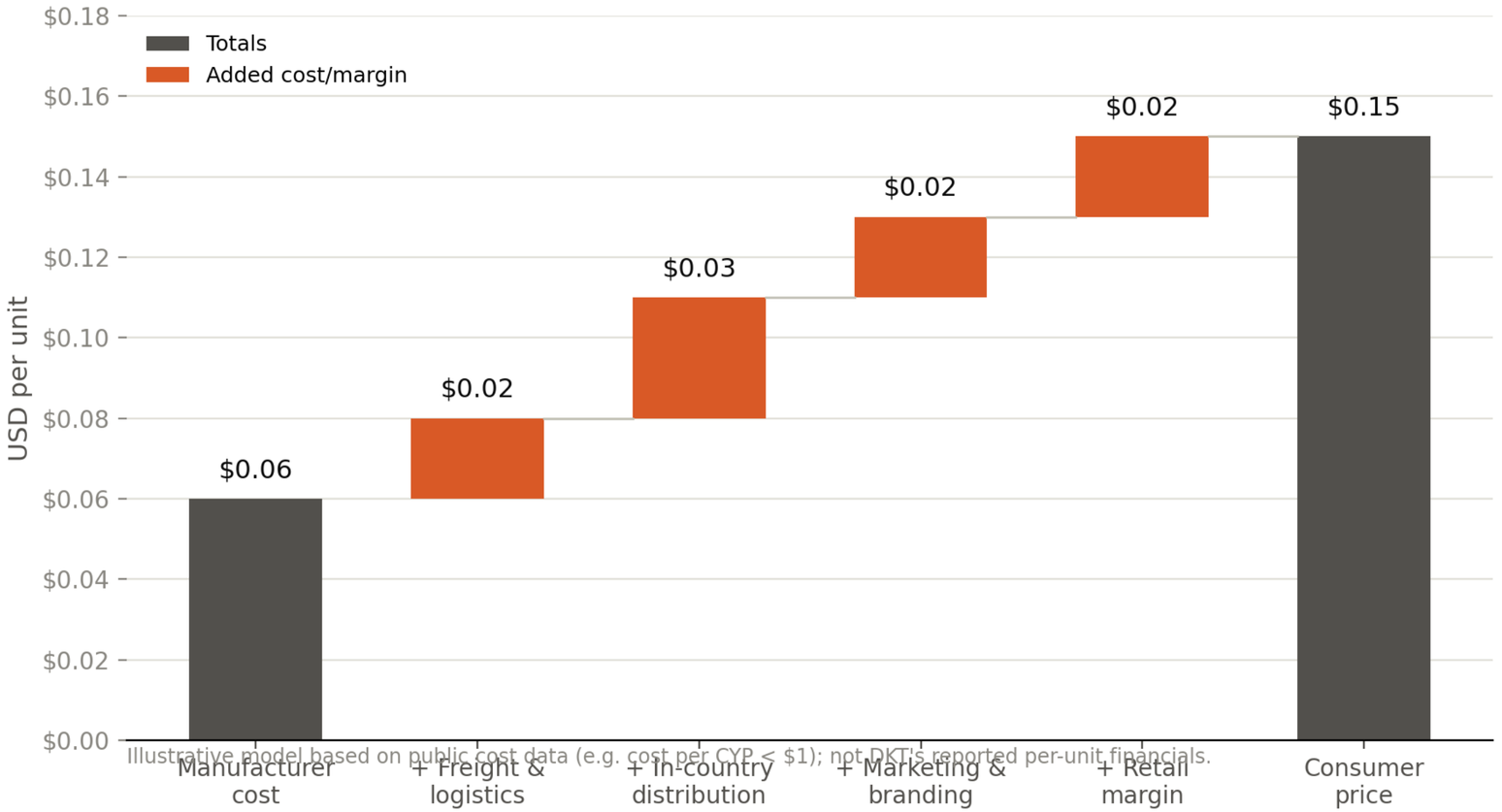
- More than half of Costcos operating income comes from their annual memberhip fees, NOT from retail
- This allows Costco to price goods at near cost

Net Margin

Costco	2.9%
Walmart	2.4%

- After all costs, Costco nets more per dollar revenue than Walmart
- This demonstrates the payoff of a cost strategy built around volume, not margin

Value Chain Economics

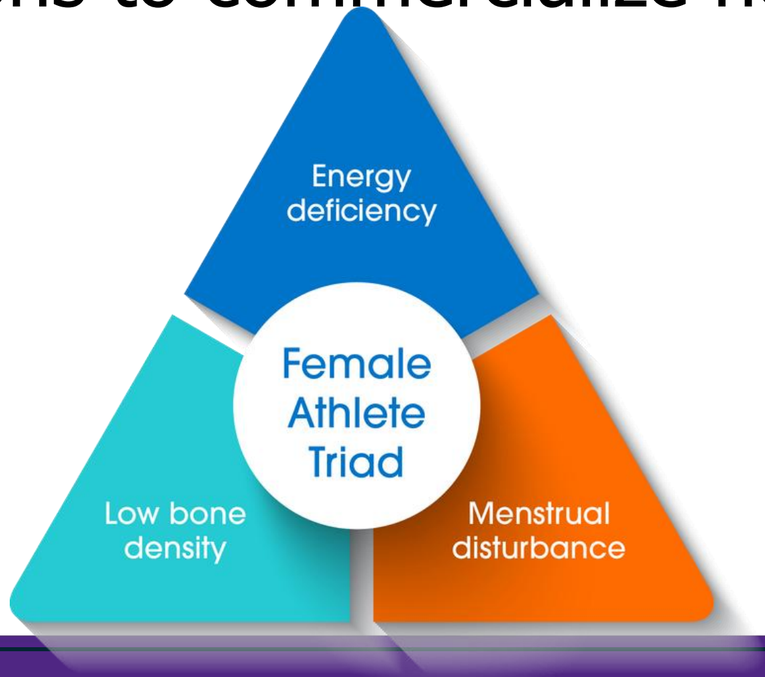


Illustrative model based on public cost data (e.g. cost per CYP < $1); not DKT's reported per-unit financials.

Hypothetical Case Study

Setting the Stage

- Role: Dr Chen, Researcher at Western University
  - Developed a training module to prevent and raise awareness to the female athlete triad
- Needs to make several desisions to commercialize her product:
  - Commercilization path
  - IP Strategy
  - Target market
  - Delivery method
  - Pricing model
  - Funding method



Discussion

- Why might an intervention that addresses energy availability be more effective than treatments that target individual symptoms?
- What does this suggest about how researchers should think about "the problem" when trying to create a product that can be commercialized?

Why might it matter that Dr. Chen talks to the TTO before negotiating further with Collective X? What could go wrong if she didn't?

The TTO will likely work with Dr. Chen to understand the market size and revenue potential of the training module before the commercialization process. If Dr. Chen doesn't have hard sales data yet, what kind of evidence could she use to help estimate the value of her innovation?

Discussion

What do you think the tradeoffs are between a $10K licensing deal vs a royalty-based deal? What about a non-exclusive vs exclusive licensing deal?

What are the pros and cons of a licensing deal, spinout and an industry partnership? What do you think is the best option for Dr. Chen?
Hint: Think about risk, control, time commitment, and financial upside

If Dr. Chen wanted to focus primarily on her academic research and teaching responsibilities, would your answer change?

How would Dr. Chen’s choice of target audience change the way that she structures her pricing and go-to-market strategy?

Discussion

What are the pros and cons of each funding option?
What option do you think is best for Dr. Chen?

In Summary

- Commercialization is messy, risky and unpredictable
- Commercialization can help create incentives
- There has never been a better to become an entrepreneur in Canada
  - Lab2Market