Welcome!

Innovation and Entrepreneurship

Spin Up Science
Academy

Who are We?
Spin Up Science

We are a team of **scientists** turned **innovators**, who upskilled through our time in spin-outs & start-ups

Our goal is to **empower** the next generation of leaders and innovators

We support Venture creation and upskill researchers through our Academy program.

Spin Up
SCIENCE

Who am I?

Spin Up SCIENCE

Founder and CEO

SCIENCE ANGEL SYNDICATE

Co-founder and Director

Protolyst

Co-founder and CEO

Spin Up VENTURES

Supporting

7 Science-backed Ventures

University of BRISTOL

Honorary Lecturer
Entrepreneurship

Transdermal Diagnostics

EnsiliTech

Albotherm

NED

ELBOW BEACH CAPITAL

Investment Advisor

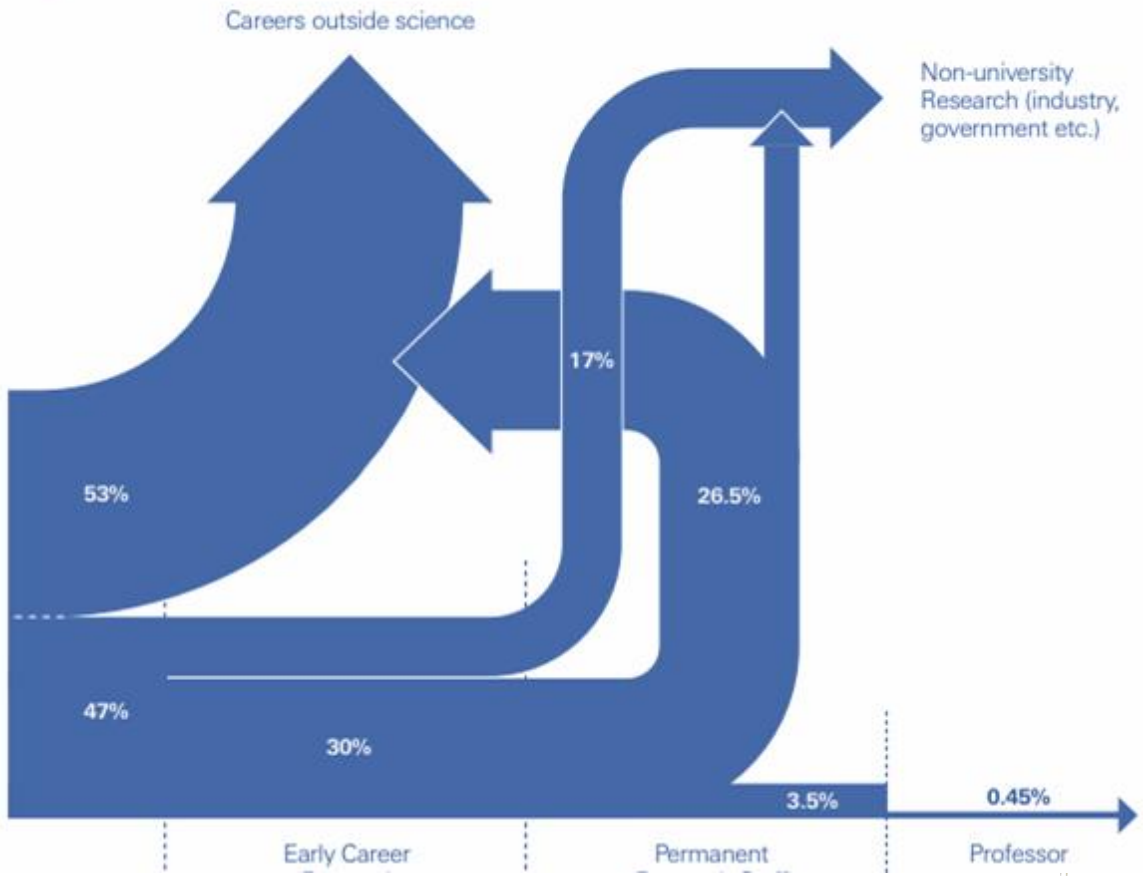
/DrBenMiles

Scientist to CEO

Podcast

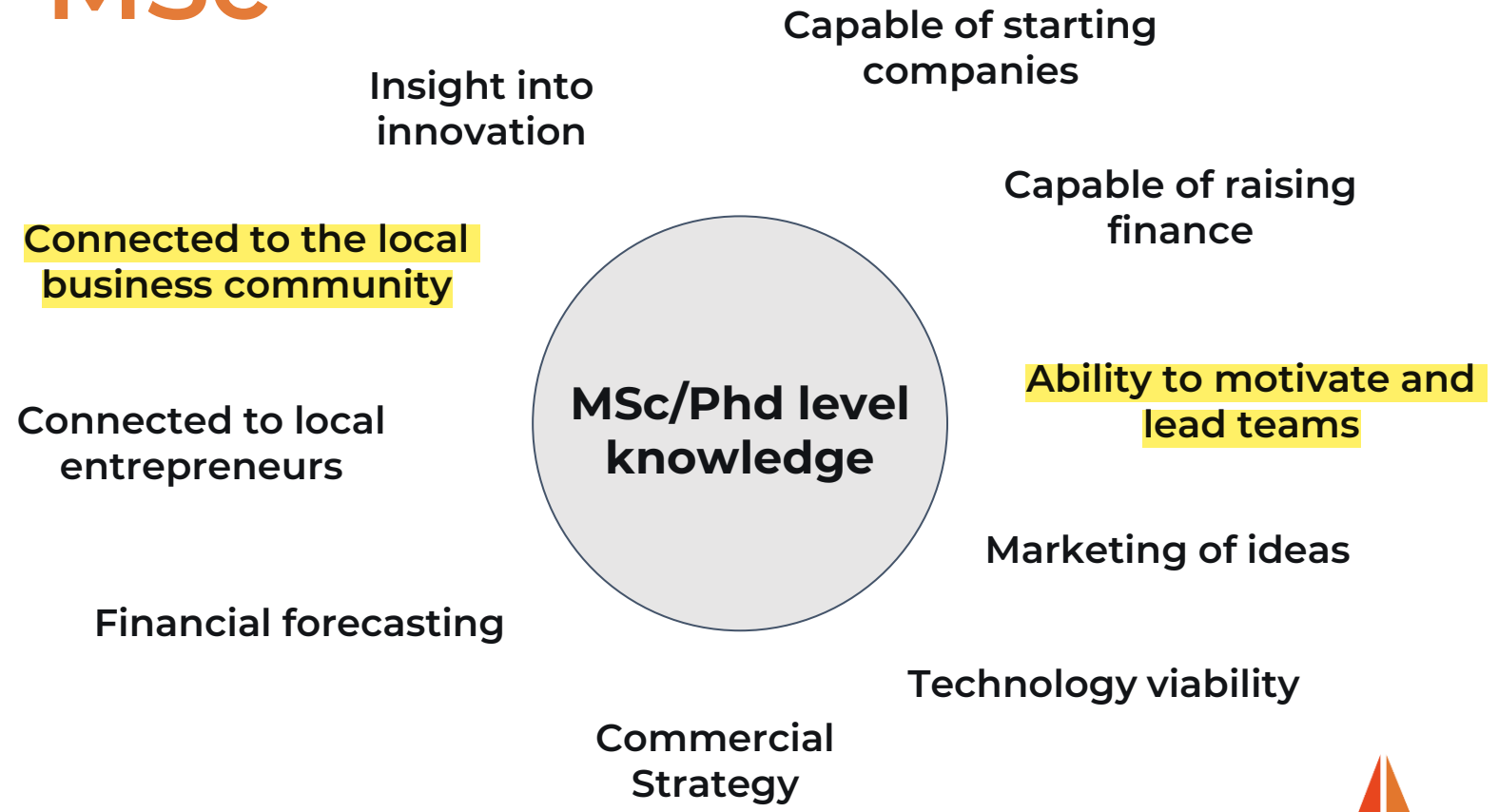
The Problem with Pure Technical Skills

Figure 1.6 **Careers in and outside science**



Enhance Your MSc

Build the skill sets to lead, launch, and leverage new ideas into the world



Future Pathways

Dr Mark Graham

- Joined us in 2018
- Intern @ Spin Up Science
- Consultant @ STL Tech
- Graduated PhD 2019

BD and Market Research - GE Healthcare

Dr Ery Hughes

- Joined us in 2018
- Interned QLM Tech 2019
- Graduated PhD 2019

Research Associate – Cal Tech University

Molly Allington

- Met in 2018 during PhD
- Wanted to start a company
- Met another Spin Up trainee
- Joined our Ventures pathway

Albotherm

CEO

Dr Maddy Nichols

Spin Up SCIENCE

COO

Protolyst

Co-founder

University of BRISTOL

Honorary Lecturer
Entrepreneurship

Building a Startup

Over 10 days, working in teams,
you will build a business

What to Expect

Learn by Doing, alongside current innovators

We don’t study entrepreneurs, we become entrepreneurs

And in doing so, we learn complementary skills to our technical capabilities

Assessments - Bioinformatics MSc

There are 3 assessments:

Due in Teaching Block 1

- Introduction to Innovation Quiz

Due in Teaching Block 2

- Business Pitch
- Commercial Opportunity Report

1. Introduction to Innovation Quiz

Type: Blackboard quiz

Duration: **2 hours** to complete, **in one sitting**

Multiple choice and longer form questions

Due: **1pm Friday 16th December**
Available after our Wednesday 14th December session

2. Business Pitch

- Team presentation
- Build a pitch for investors to raise money for your business
- Pitch template is provided
- Use information gathered over the 2 weeks of business building

2. Business Pitch

Type: Team presentation

Duration: **10 minute presentation, 10 minutes questions**

Pitch Template and Assessment Guidance on Blackboard
We'll revisit in more detail in week 13

2. Business Pitch Deadlines

Team Slides submission - 1 person from your team
Due: midday, Thursday 2nd February

Team presentation - everyone in the team
Due: 5pm Friday 3rd February
Teams will book a pitch slot in week 13

3. Commercial Opportunity Report

Complete a Commercial Report as a Team

Document to compliment your Pitch Deck

Template and Assessment Guidance on Blackboard

3. Commercial Opportunity Report

Type: Team Report

Length: ~10 pages

Team Report submission - 1 person from your team
Due: 1pm, Friday 10th February

Today

- Intro to Deep Tech and Research Commercialisation
- History of Innovation in Bristol (2016-2021)
- Introduction to Opportunity
- Case Study Selection

Introduction to Deep Technology Innovation

Supporting Research Commercialisation

"**Publicly-funded** organisations developing knowledge that can directly benefit the **public** have a responsibility to deliver those discoveries **into the hands of the public**"

This creates jobs for scientists and economic return for university, inventor, and society

Research Dissemination

Journal Publications

Science Policy

Science Communication

Market Translation

Tesla Vs. Scientific literature

Discussion Point:

“Tesla has done more to move the average person away from dependence on fossil fuels than the entire body of scientific literature”

Agree or disagree?

What is Deep Tech?

Deep Technology originates from substantial scientific advances or engineering innovation.

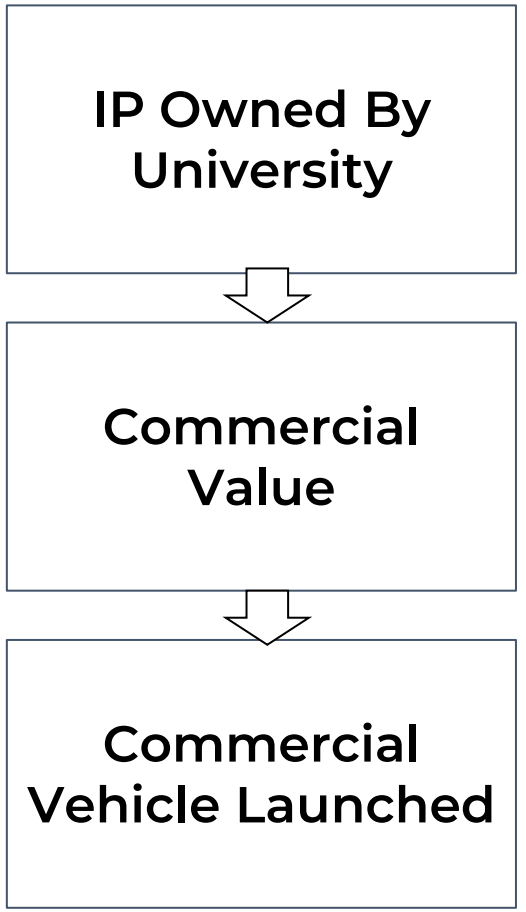
- require lengthy R&D,
- take a long time to reach commercial application,
- require large investment to achieve commercial success.

Spinning Out from a University

IP ownership: If the IP is owned by the university

Value target: and could have commercial value:

Exploitation pathway: University launches a business, known as ‘spin-out’



Technology Transfer Office

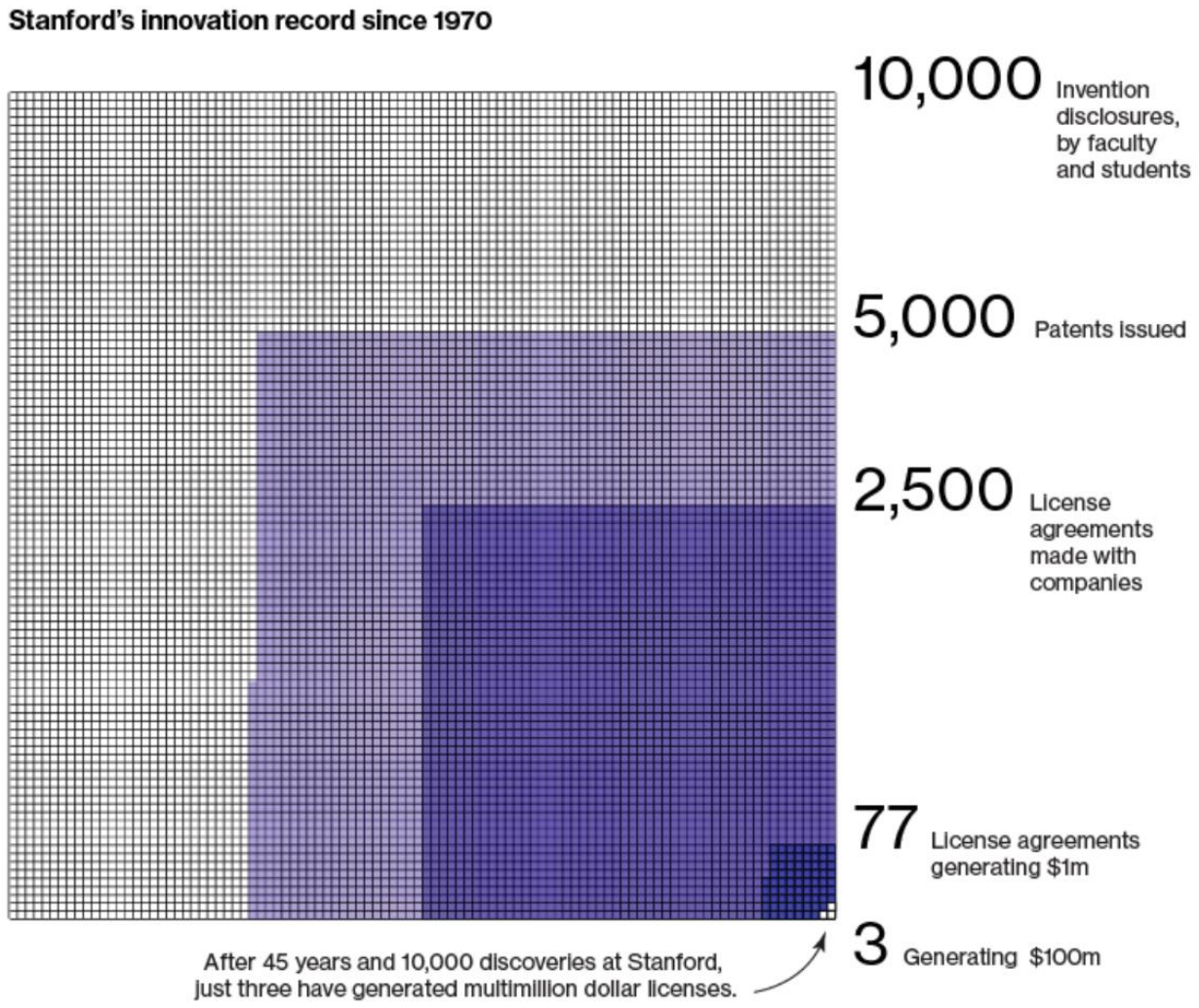
Is responsible for supporting the commercialisation of research and translation of technology that takes place in a university

Drive innovation activity through research collaboration, spin-outs, services and consultancy

University of BRISTOL

Research and Enterprise Development

This is Hard



https://www.bloomberg.com/graphics/2016-university-patents/

Why is the technology transfer important?

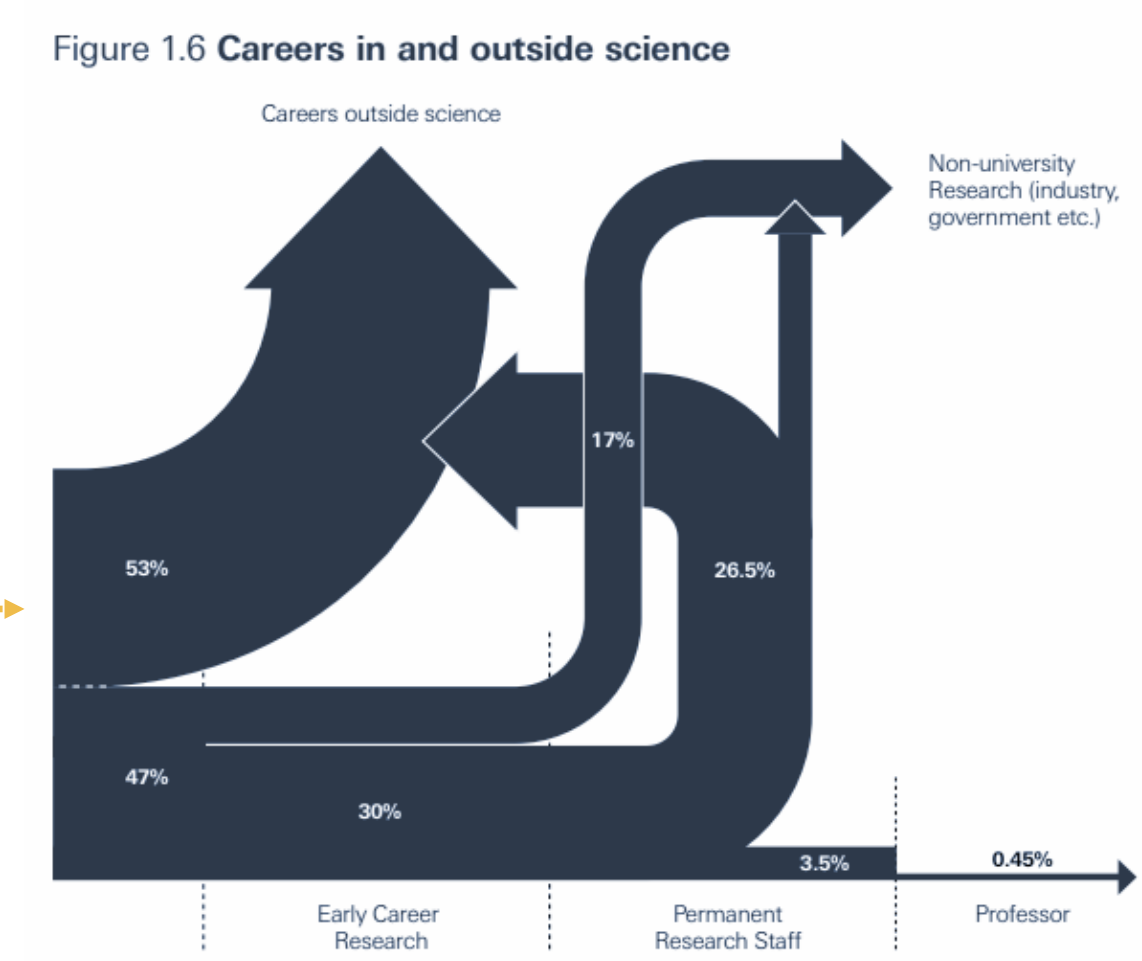
Discuss

Academic makes a discovery

The “real” world

Knock On Effects

Masters/PhD/Postdoc



-RS 2014

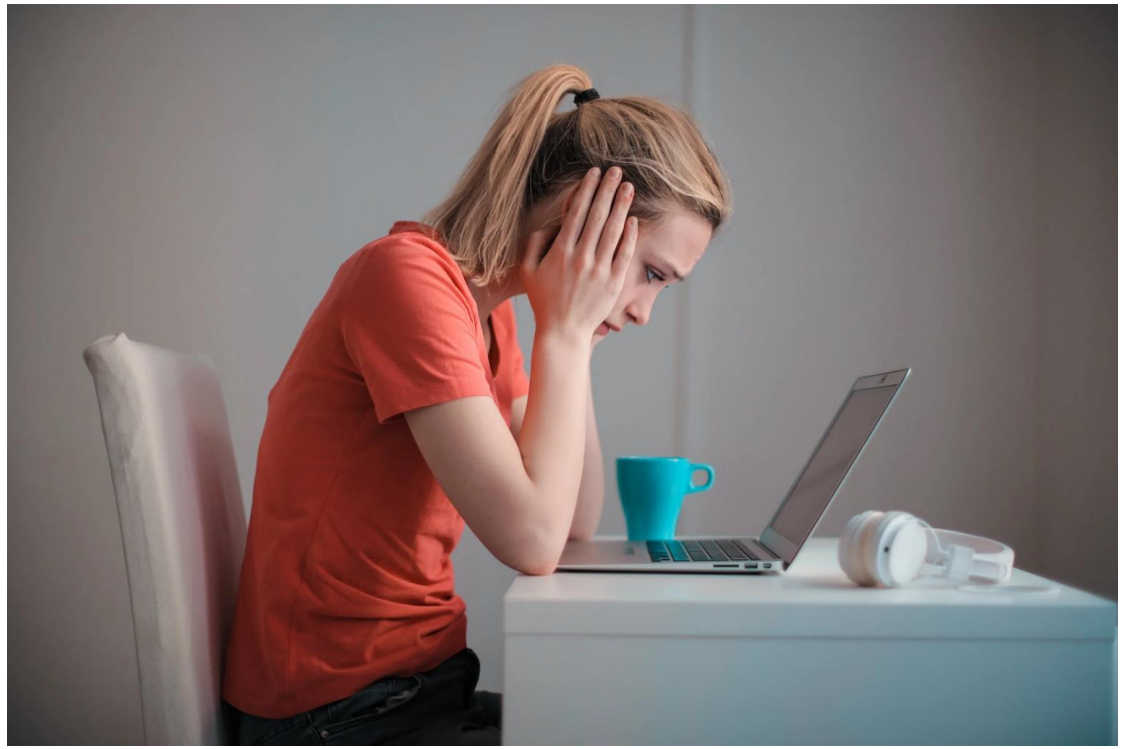
Compounding Problem

Can’t find people to take ideas forward

Academics are busy

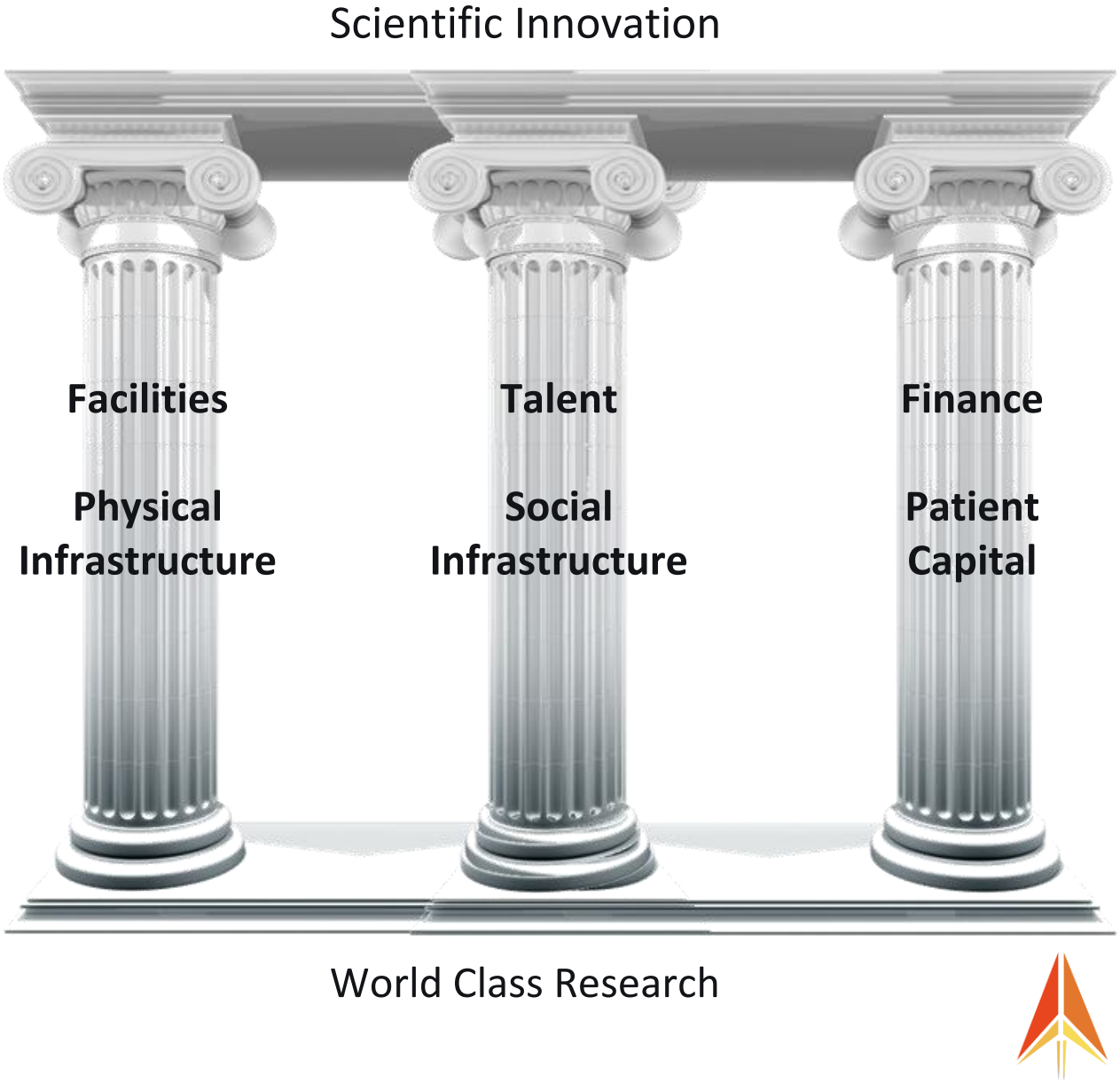
Good entrepreneurs are usually otherwise engaged

…Masters/PhD graduates can’t find jobs



Why Build Deep Tech Ecosystems?

- Prospective solutions to the world's problems will often be found within research organisations
- Create jobs for scientists and engineers
- Investment in deep tech has increased by over 20% every year since 2015, and in 2018 nearly $18bn was privately invested worldwide



Brain Drain

No start up facilities for science

No community of innovators

No exciting jobs to jump into

No funding for high-risk ventures

Compounding problem,
good ideas leave

What did the journey look like in Bristol?

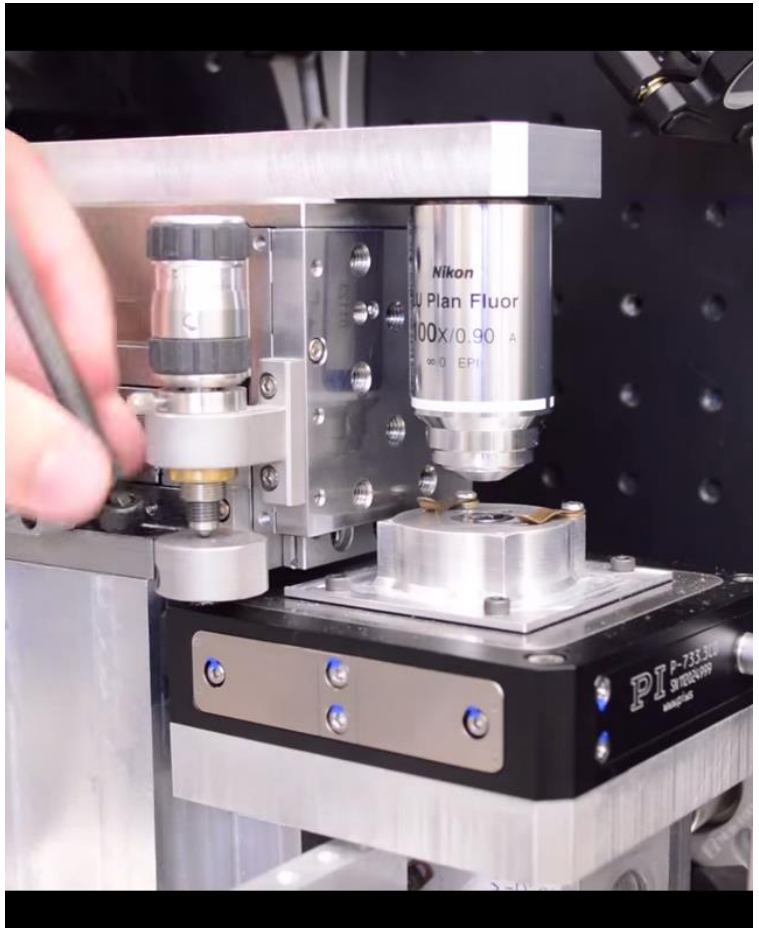
Bristol 2016

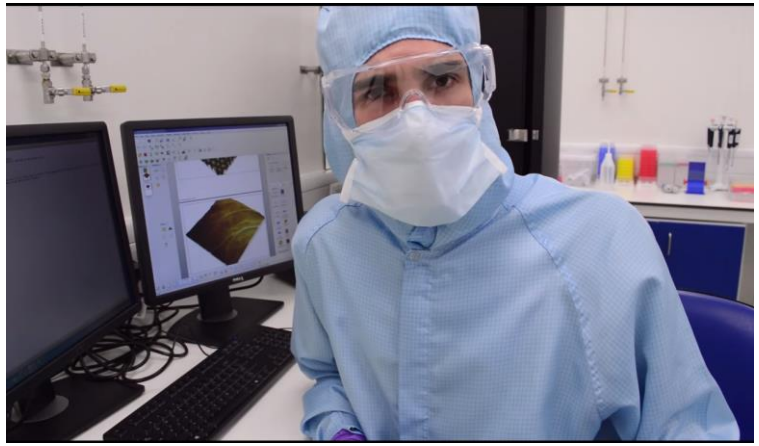
2 science spinout companies

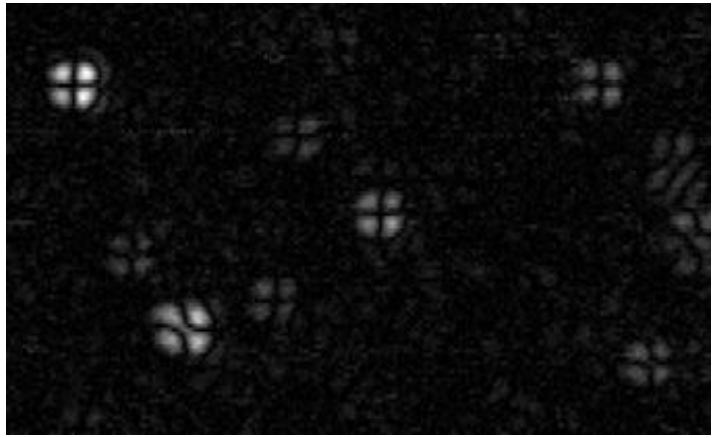
Most past ventures **leave** the city

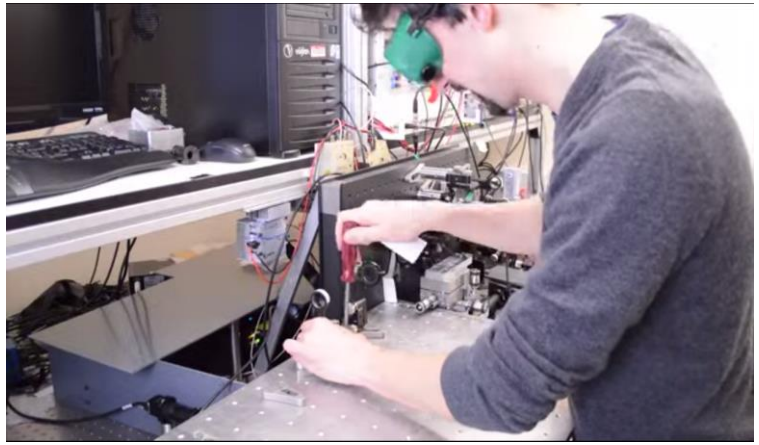
No jobs for optical physicists

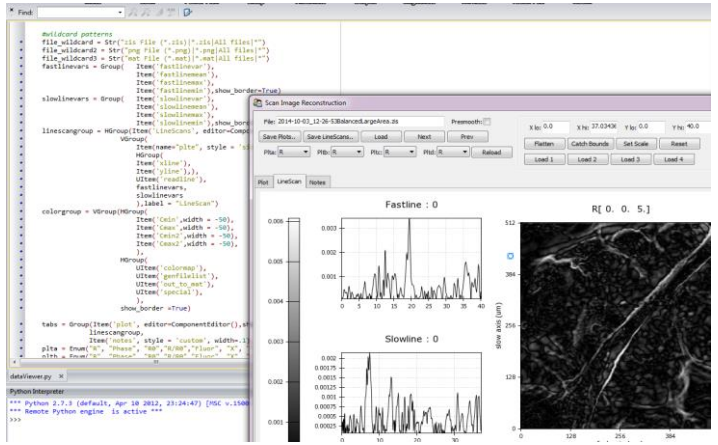
Bristol MSci Physics - > Bristol PhD Physics - > ?











Hired by 1 of those 2 companies

ziylo™

University of Bristol Spin Out 2015

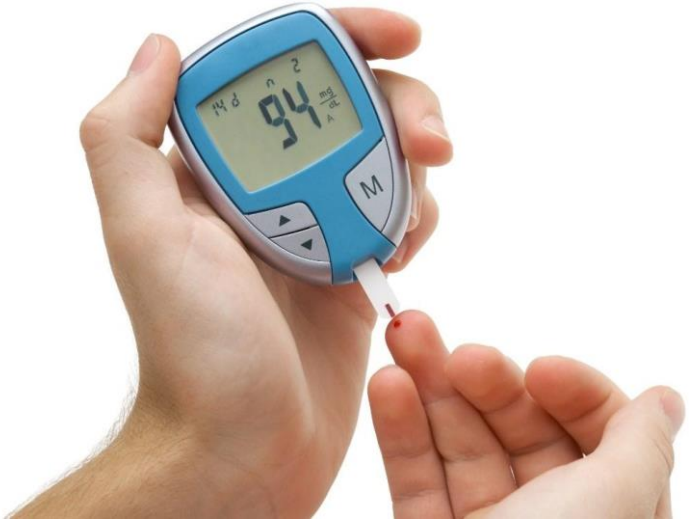
Commercialising glucose sensing IP

Constructed a functional molecule that strongly binds to glucose

Why is that difficult?

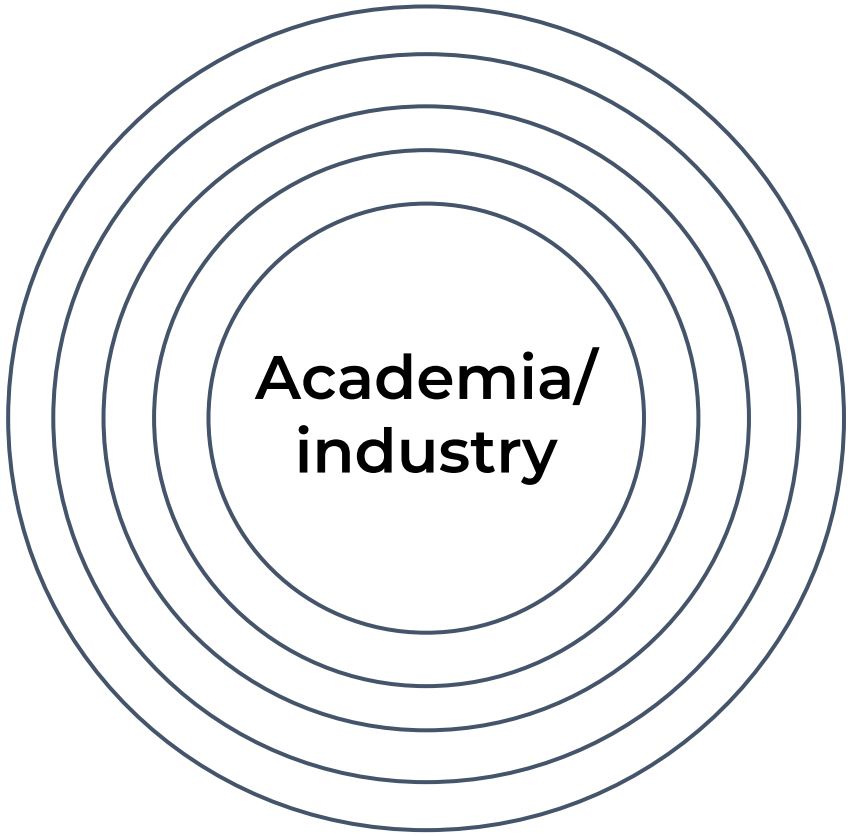
Hired as a physicist…

- Me?
  - Pitch for investment
  - Managing budget + forecasting
  - Assessing the competition
  - Develop branding and website
  - Find market

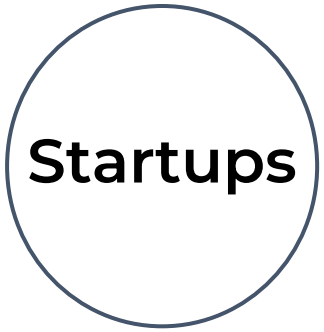


Spotting opportunities

Place helps:



Outside World



Scarier, but the view is less obstructed

Solving the problem

£2.5m raised from business angels

Design to completion in 18 months

Capacity : 100 scientists

Now We Just Need Companies

Academic makes a discovery

Masters and PhDs

The “real” world

Ziylo Ltd

ziylo™

Glucose binding chemistry

Billionaires | Innovation | Leadership | Money | Consumer | Inc

4,590 views | Aug 17, 2018, 04:37am

Bristol Diabetes Spin-Out Acquired By Novo Nordisk For $800M

Gemma Milne Contributor ⓘ

I cover the world of deep tech and science startups

Bristol University spin-out Ziylo announced today that Danish pharmaceutical Novo Nordisk has acquired all the shares in the company. Novo Nordisk will now have full rights to Ziylo's glucose

The hardest thing to understand when looking to emulate someone's success is how to get started.

So very few people do.

By placing Masters and PhD students in innovation settings...

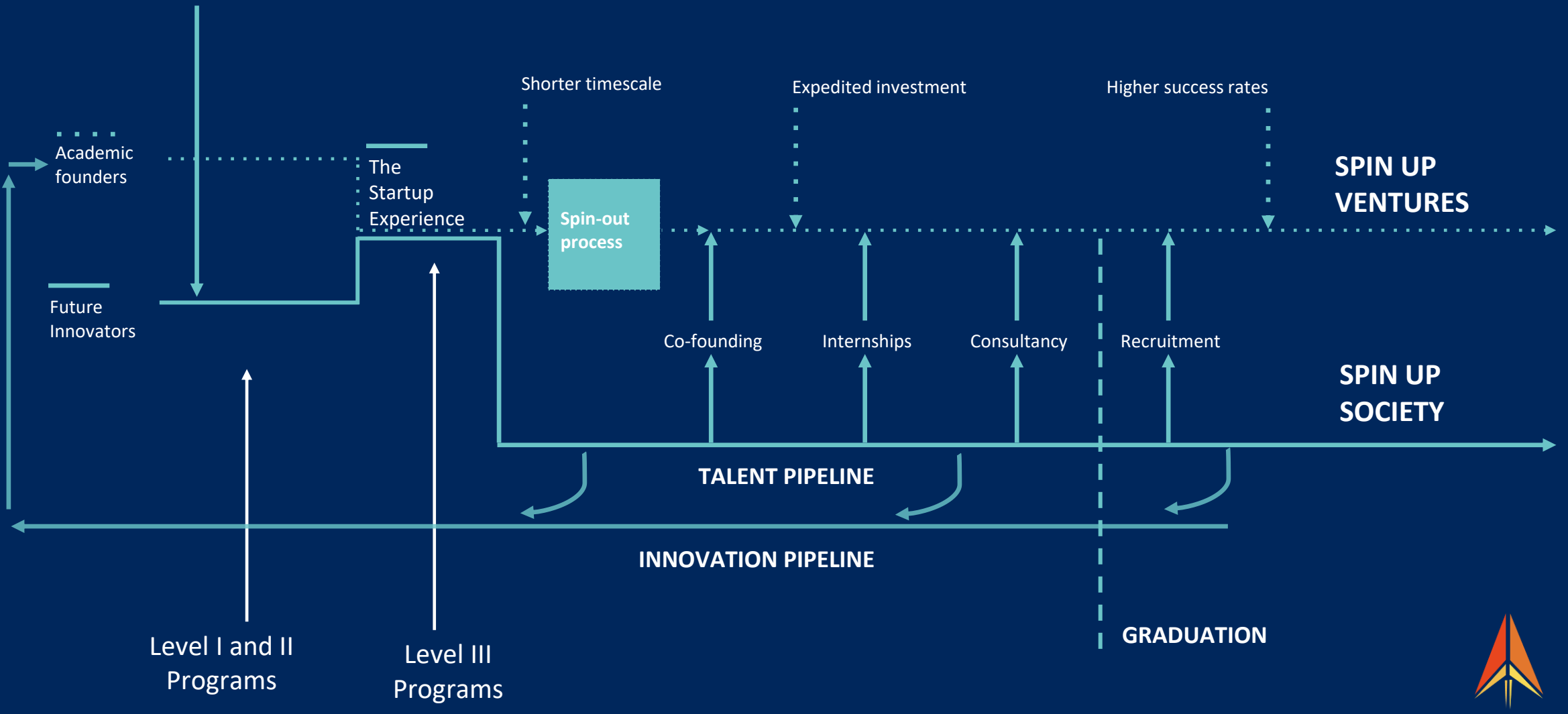
Then

Find their own idea

Find better jobs

Deploy their technical knowledge

You are here


Shorter timescale
Expedited investment
Higher success rates
Academic founders
The Startup Experience
Spin-out process
SPIN UP VENTURES
Future Innovators
Co-founding
Internships
Consultancy
Recruitment
SPIN UP SOCIETY
TALENT PIPELINE
INNOVATION PIPELINE
Level I and II Programs
Level III Programs
GRADUATION

A Short History of Bristol

~6 years in Bristol

2016

2 science startups

2022

>50 science startups

Venture Successes

Ensilitech Ltd

Vaccines without refrigeration

Raised £1.2m

University of Bath

Transdermal Diagnostics Ltd

Non-invasive blood glucose monitoring

Raised £1.1m

University of Bath

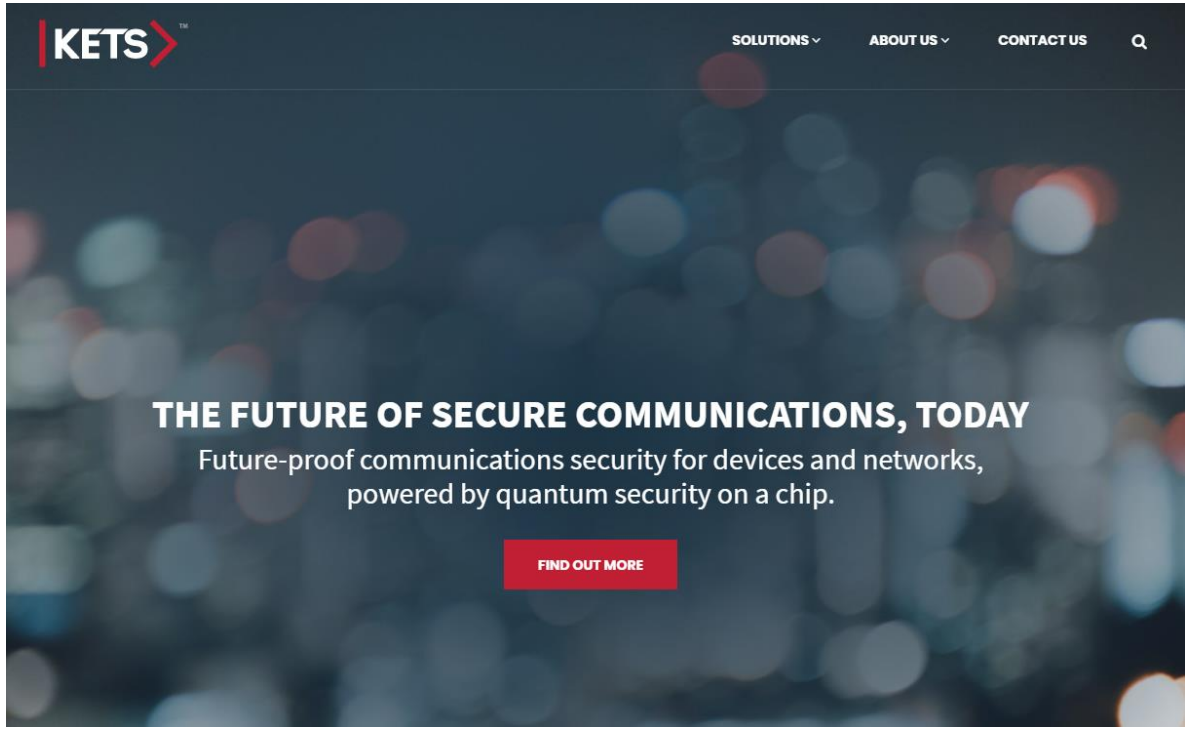
Albotherm Ltd

Net-zero adaptive shading

Raised £500,000

University of Bristol

KETs Quantum



Quantum secured communications systems

QLM

Drone mounted CO2 and methane sensing using quantum-inspired detection protocol

Rosa Biotech

Early disease diagnosis and industrial biotechnology platform using novel protein cages and differential sensing

CytoSeek

Next generation cell therapies using cell membrane augmentation technology

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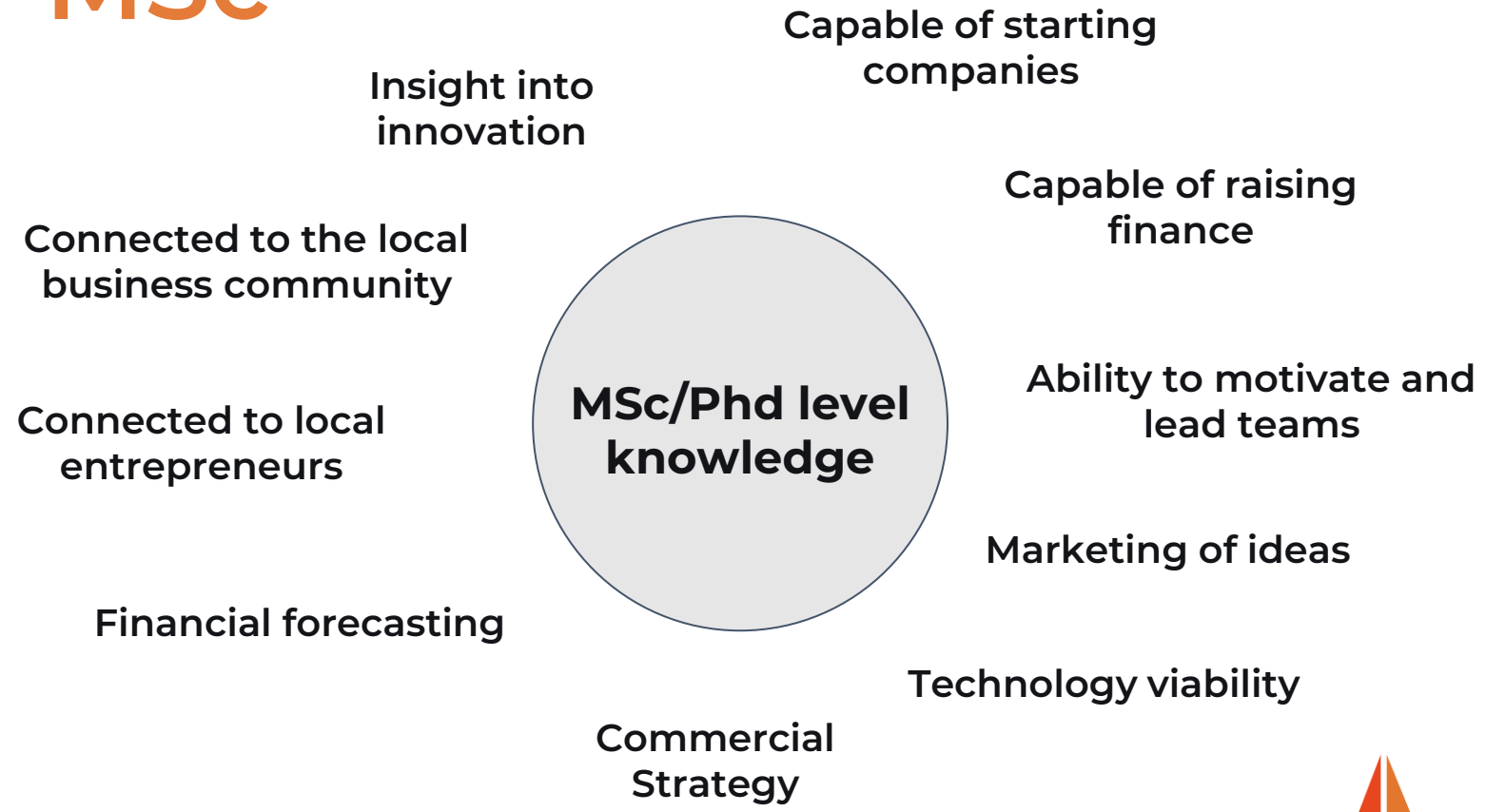


Break - 10 mins

Where do opportunities come from?

The Next 2 Weeks

Your Task

- Understand an identified commercial application
- From this prompt, you'll build a business to present to the Dragon's
- You can direct the business however you want, we are here to offer advice

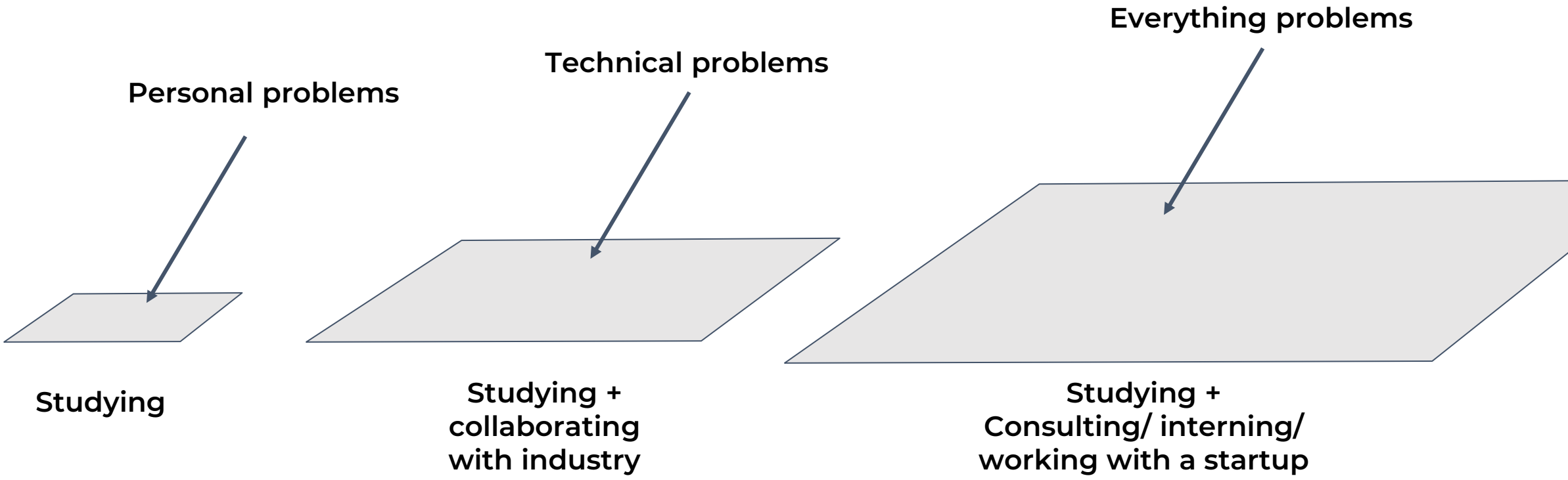
Your goal is to build a **defensible business**

Entrepreneurs usually solve problems they are personally connected to

The goal

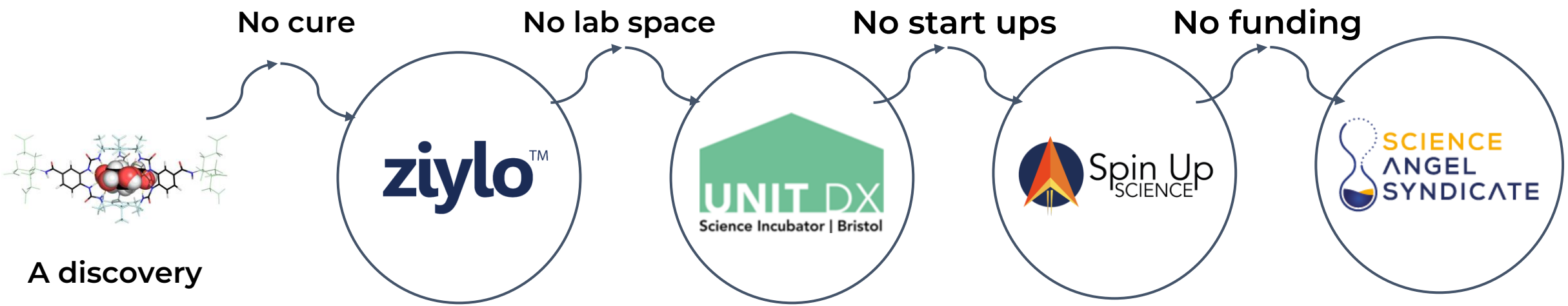
Become familiar with a large enough problem space to increase the chance of finding a problem.

Serendipity Surface Area



Running a side business, spending time around used car salesmen, run some consultancy

Opportunity from Proximity



Opportunity Comes from Solving Problems

The easiest **Problems** to spot are those that arise from **Change**

3 themes of change:

- A change in capability - a discovery, technology, or understanding
- An appetite for change - intrinsic(fashion) or extrinsic(phone contract)
- A change in environment - recession, regulation, revolution

Examples

- A change in capability → Researchers develop a glass coatings to reduce heat gain through windows on a summer day

  Problem: Greenhouses overheat in the summer and spoil crops

- An appetite for change → Customers are becoming environmentally conscious

  Problem: Customers refuse unethical clothing options

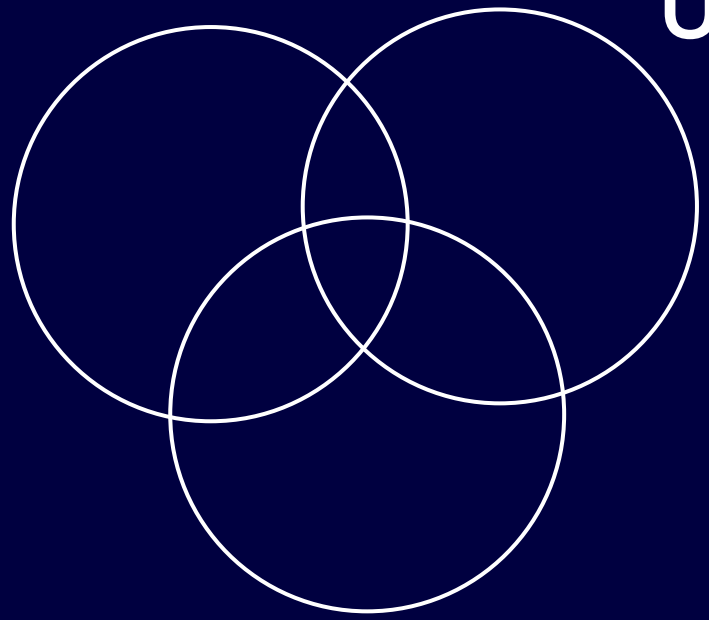
- A change in environment → COVID forces lockdowns and work-from-home (WFH)

  Problem: Workers lack effective home offices to WFH

3 U’s of (Great) Opportunity

Upside Potential

Unfair Advantage



Unseen Change

Upside Potential

Upside refers to the potential increase in value, measured in monetary or other terms, of an investment.

Why This?

- What is the worst case outcome?
- What is the best case outcome?
- What is the most likely outcome?

Unfair Advantage

The skill, insight, assets, connections, or technology you have that give you an edge over the competition.

Why You?

- **What is the skill, insight, assets, connections, or technology?**
- **Why does it give you an advantage?**

Unseen Change

A change that few others are aware of, granting the possibility of first mover advantage

Why Now?

- What has happened recently that means now is the right time?
- A new position, technology, capability, environment or behaviour

An Example

- Movie Star

Great upside potential - fame and wealth

Poor unseen change - many aspire to this goal

Unfair advantage? - connections, beauty, wealth, talent

- Non-invasive blood sugar sensing company

Great upside potential - $10-20b market opportunity

Poor unseen change - many companies target diabetes

->**Good** unseen change - target prediabetics and Type II

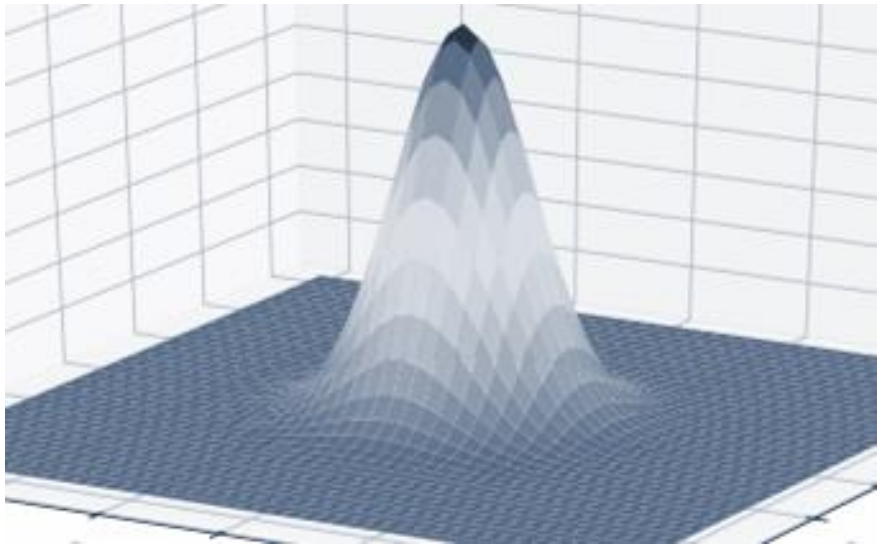
Strong Unfair advantage - unique tech, patent protected

Requirements for opportunity

Two directions for opportunity discovery

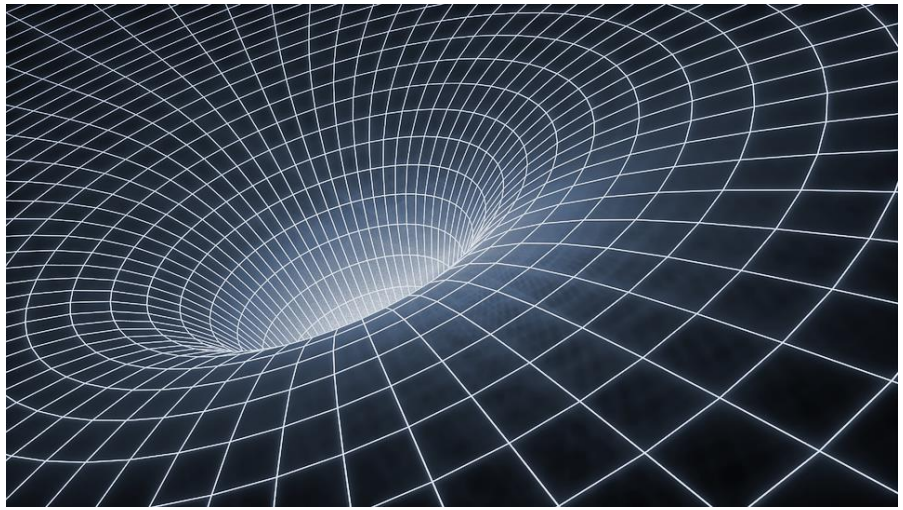
Technology Push

A technology looking for a problem



Market Pull

A market need searching for a solution



Technology Push

Touch screen technology first published in 1960s

HP release Touch Screen Computer in 1980s

IPod touch

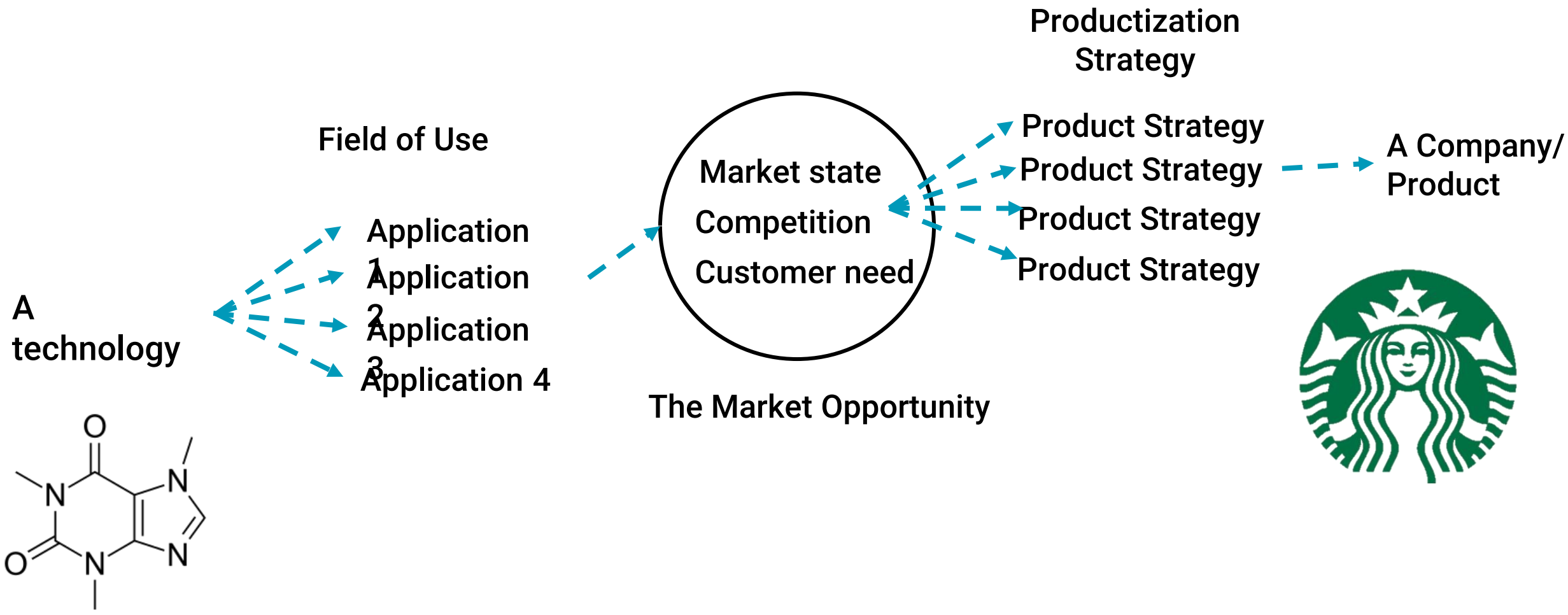
Further R&D

PDA Touch Screen in 1990s

IPhone and smart phones with touch screens

Touch screen technology developed within other markets improved the mobile phone market

Pushing a Technology

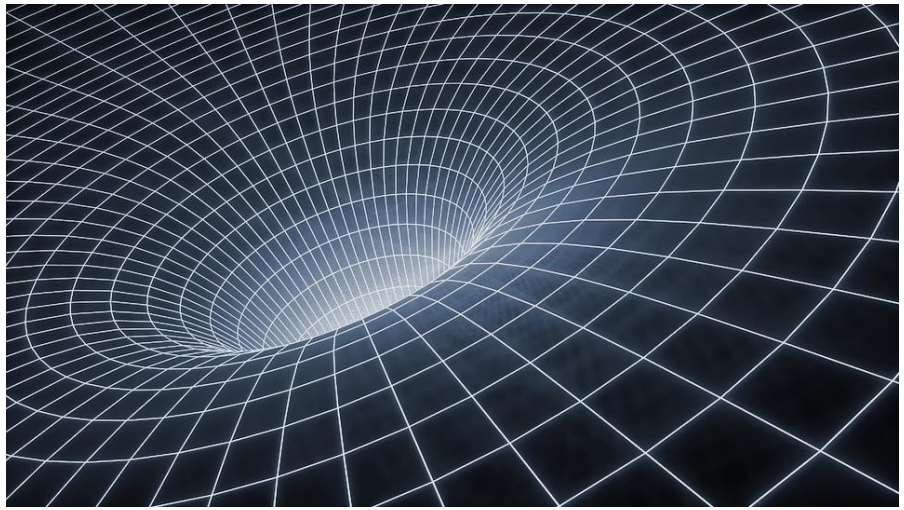


What is Market Pull?

Market Pull: customers draw to find solutions that solve a particular **Customer Need**

Customer Need: a requirement of customers

This could reflect changing resources, like the decrease in disposable income during a recession



A **Customer Need** has 3 parts:

- A clear **customer group** or demographic
- A defined **problem** that must be solved
- An **urgency** of that need

- We'll cover this deeper tomorrow

Market Pull

Solving **Customer Needs** influences the evolution and creation of products

Evolution of the camera

- Better quality
- Brighter colours
- Improved experience
- Ease of use
- More compact

How Urgent is the Pull?

An itch?

A headache?

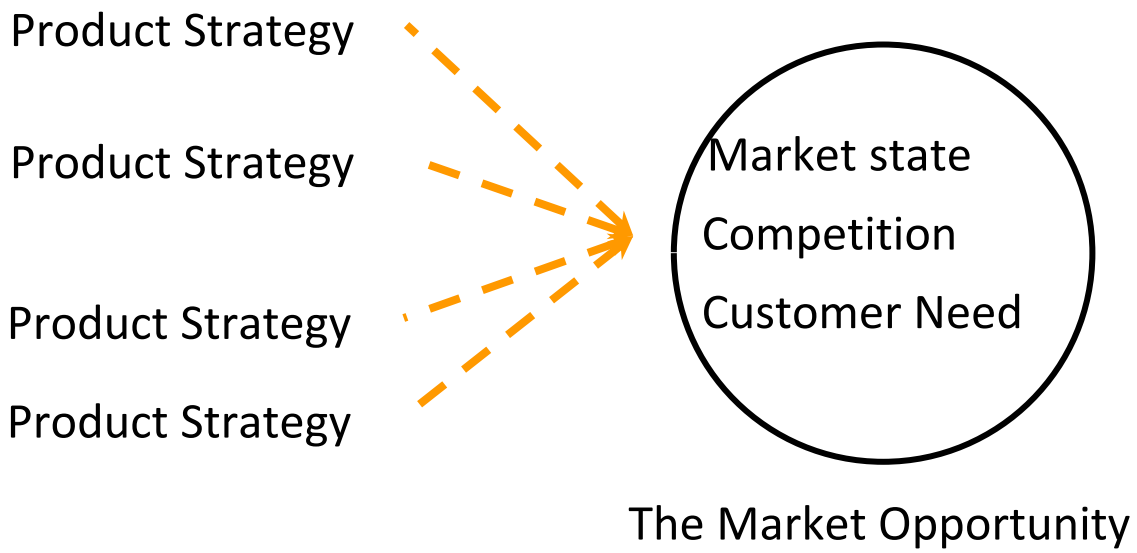
A migraine?

Different levels of customer motivation to solve that problem

Finding the “Best” Solution

The “best” approach to solving the problem

Typically: **Cheapest, easiest, requiring the least change from current behaviours**



Choose a Case Study

UX

Identify the 3 U's

- Upside Potential?
- Unfair Advantage?
- Unseen Change?

Tech Push and Market Pull

- What else could the technology do?
- Start to define the **Customer Need**
  - A **customer group**
  - A **problem**
  - An **urgency**
- What does the best solution look like?

- Start high level, we'll get into more detail for all sections