INFO5992 Understanding IT Innovations

Week 12: Unit Review

Weeks 7 to 11

Semester 2, 2025

THE UNIVERSITY OF SYDNEY

Acknowledgement of Country

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UoS Semester Outline

Week	Learning Outcomes	Lectures
Module 2: Innovation Framework		
Week 01	L01, LO2, LO3	Unit of Study Introduction, Administrivia, Definition of IT Innovation, Importance of Innovation to a Country, General Purpose Technologies, Overview of Emerging Technologies
Week 02	LO4, LO5	Innovation Frameworks I: Dynamics of IT Innovation, Dominant Design
Week 03	LO6	Innovation Frameworks II: Disruptive Innovation, Innovator's Dilemma, Value Chain & Value Network
Module 2: Development of Key Intellectual Property in the Modern Age		
Week 04	LO7	Introduction to Open Innovation and Closed Innovation Distributed Innovation I: Product Platforms, Web APIs
Week 05		Distributed Innovation II: Crowdsourcing, Free and Open- Source Software, Open Data
Week 06		Distributed Innovation III: Platform Ecosystems, User Innovation
Module 3: Commercialisation Process and Business Strategies for Emerging Technologies		
Week 07	LO8	Commercialisation I: Startup vs Traditional Companies, Lean Startup Methodology and Agile Development
Week 08		Commercialisation II: Customer Development Process, Value Proposition Canvas
Mid semester break		
Week 09	LO8, LO9	Commercialisation III: Innovation Management, Business Model Canvas Commercialisation IV: Capital & Fundraising for IT Innovation
Week 10	LO11, LO12	Organisational Cultures and Structures Supporting Innovation, Judging IT Innovation
Module 4: Innovation At-Scale		
Week 11	LO10	Innovation Ecosystem: Silicon Valley and Australia
Week 12	L01 - L10	Unit Review
Week 13	N/A	Innovation Pitch Presentation
Final Exam		

Agenda

- Unit of Study Review

Complete your Unit of Study Survey

The Unit of Study Survey for your Semester 2 units opens from 27 October and will close on 16 November.

This is a great opportunity for you to let us know how we're going and for us to make continuous improvements to our units of study. Scan the QR code below to access all your surveys.

INFO5992 Review

About this Review

- List of topics covered in the unit at a very high level – you should understand these main topics!
- Don't assume that by reading this, you will pass the exam
  - It is just a list of topics – refer to full lecture notes for the actual content
  - You can use this as a checklist – if you don't fully understand one of these topics, you will need to read notes/readings, etc.
  - Study among your friends (group mates) where applicable

Week 7 Commercialisation I: Innovation by Start-up companies and Opportunities

Some approaches to distributed innovation

– These are some approaches companies use to get external companies/individuals involved in their innovation:

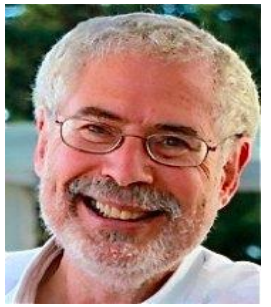
A. Product platforms
B. Web APIs
C. Crowdsourcing innovation / Crowdfunding Innovation
D. Releasing data sets “Open data”
E. Free and Open Source Software
F. User innovation
G. Platform ecosystems
H. Accelerators, investment and others

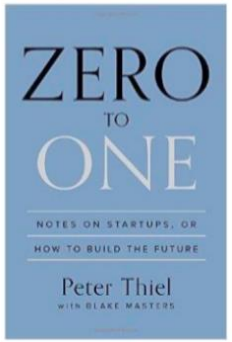
The Unicorn Club – Billion dollar Startups

- Coined in a TechCrunch article "Welcome To The **Unicorn Club**: Learning from Billion-Dollar Startups".
- A unicorn is generally defined as a privately held startup that has a $1 billion valuation – something rare (like a unicorn).
  - **Private** companies are run the same way as public companies, except that ownership in the **company** is limited to a relatively small number of investors. Some of the most famous companies in the world are **private** companies, including Facebook, Ikea, agriculture giant Cargill, and candy maker Mars.
  - **Valuation** – how much the company is valued based on its assests, future cash flow, profit etc.

H. Accelerators, investment and others
Innovation by start-up companies

- The importance of the entrepreneur
- Definitions of startups (e.g. from Steve Blank, Eric Reis)
- How to get startup ideas (Paul Graham)
- Why traditional product processes are not suitable for startups
- New approaches for startups:
  - The Customer Development process
  - The Lean Startup approach
  - The Business Model Canvas
  - The Value Proposition Canvas
  - Big visions for short-term monopoly





Some differences between established companies and startups

	Established companies	Startup companies
Markets for products	Known	Mostly unknown (hypothesis only)
Customers	Known	Mostly unknown (hypothesis only)
Products	Known	Mostly unknown (hypothesis only)
Future product features	Learn from customers	Learn from potential customers and test hypotheses
Business model	Company executes the current business model	Company searches for the best business model
Product	Full specifications as needed by market	Minimum feature set (for speed to market and flexibility for change)
Product development	Smooth execution using proven methods	Pivots (until find market, customers, products, business model)
Structure	Relatively stable	Fluid

Based on work of Steve Blank
eg *http://www.slideshare.net/sblank/why-product-managers-need-sneakers?from=ss_embed*

The startup – 3 key principles

- Customer Development
  "get out of the building"
  - including hypothesis-driven experiments with customers, pivoting etc.

- Business Model Canvas
  "Sketch Out Your Hypotheses."

- Agile software development
  "Quick, Responsive Development."

Steve Blank, Why the Lean Start-Up Changes Everything, Harvard Business Review, 2013, https://hbr.org/2013/05/why-the-lean-start-up-changes-everything

What's wrong with the New Product Introduction Model (for startups)

– "The **9 Deadly Sins** of the New Product Introduction Model":

1. Assuming "I know what the customer wants"
2. The "I know what features to build" flaw
3. Focus on a Launch date
4. Emphasis on execution instead of hypotheses, testing, learning and iteration
5. Traditional business plans assume no trial and no errors
6. Confusing traditional job titles with what a startup needs to accomplish
7. Sales and marketing execute a plan
8. Presumption of success leads to premature scaling
9. Management by crisis leads to a death spiral

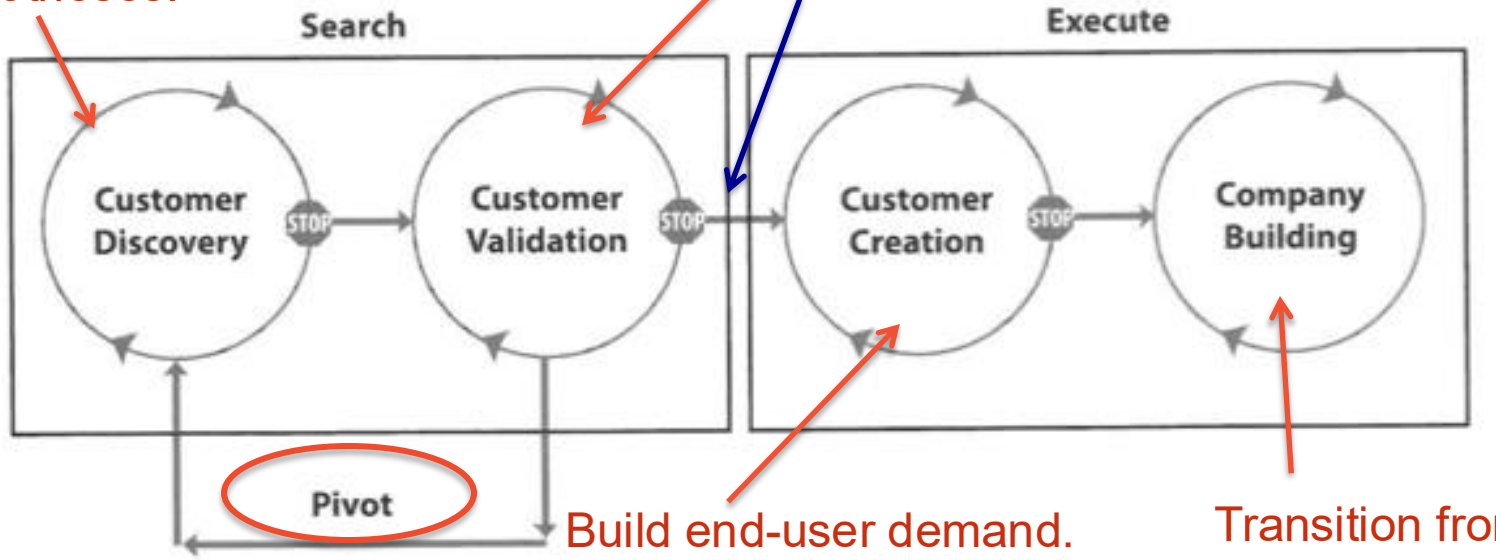
Source: Steve Blank and Bob Dorf, "The Startup Owner's Manual" (2012)

Alternative approach for startups: Customer Development Process

Capture vision and turn it into business model hypotheses.
Develop plan to test hypotheses with customers.
Test hypotheses.

Test whether related business model is repeatable and scalable

Product-Market Fit



Build end-user demand.
Build sales channel.
Scale business.

Transition from startup to typical company

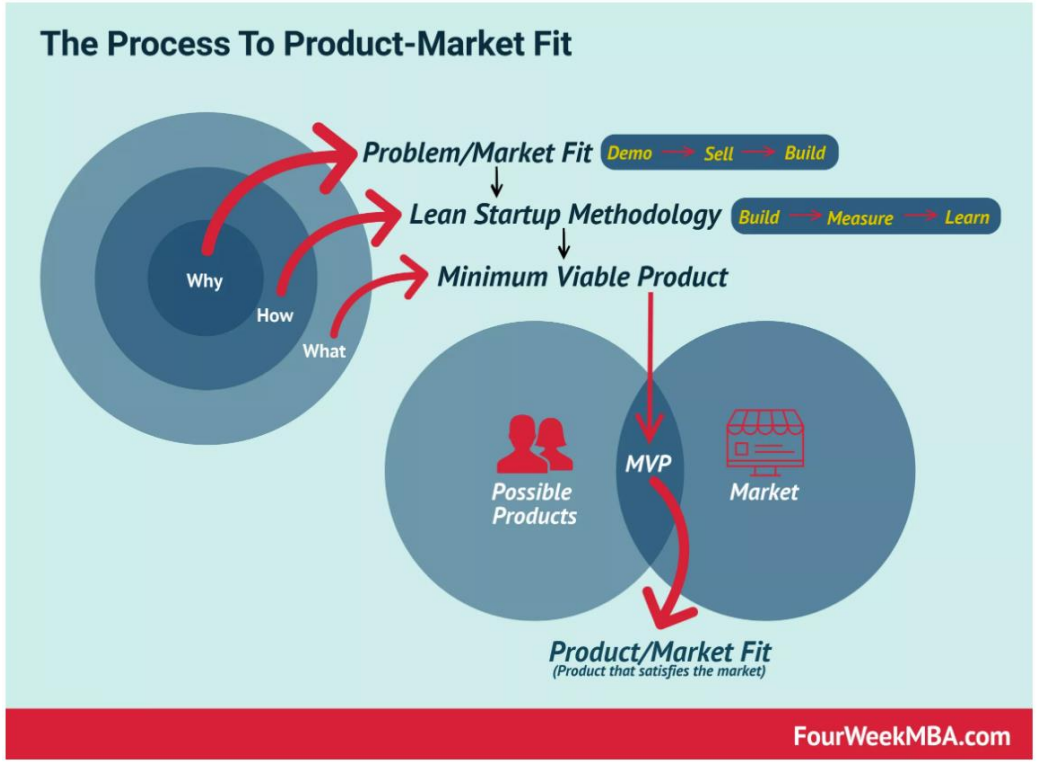
Customer creation: turn prospects into purchasers (Sep'25)

Source: Steve Blank and Bob Dorf, "The Startup Owner's Manual" (2012)

Product-Market Fit

- A degree to which a product satisfies a strong market demand.
- A step in between customer validation and customer creation

- Steve Blank



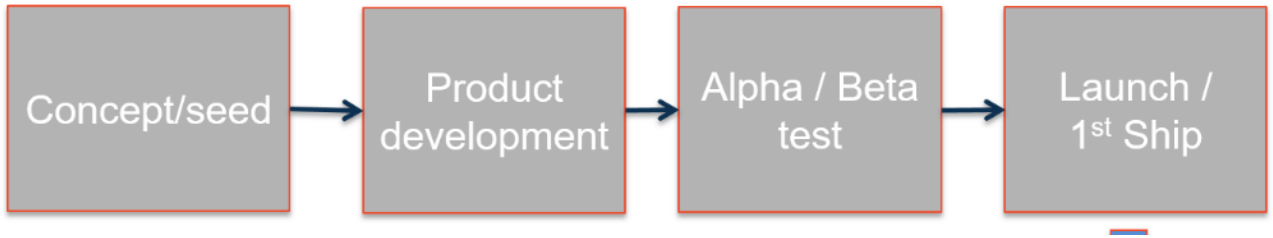
https://fourweekmba.com/product-market-fit/

How can project management be done for innovation?

Problem with traditional Development approaches

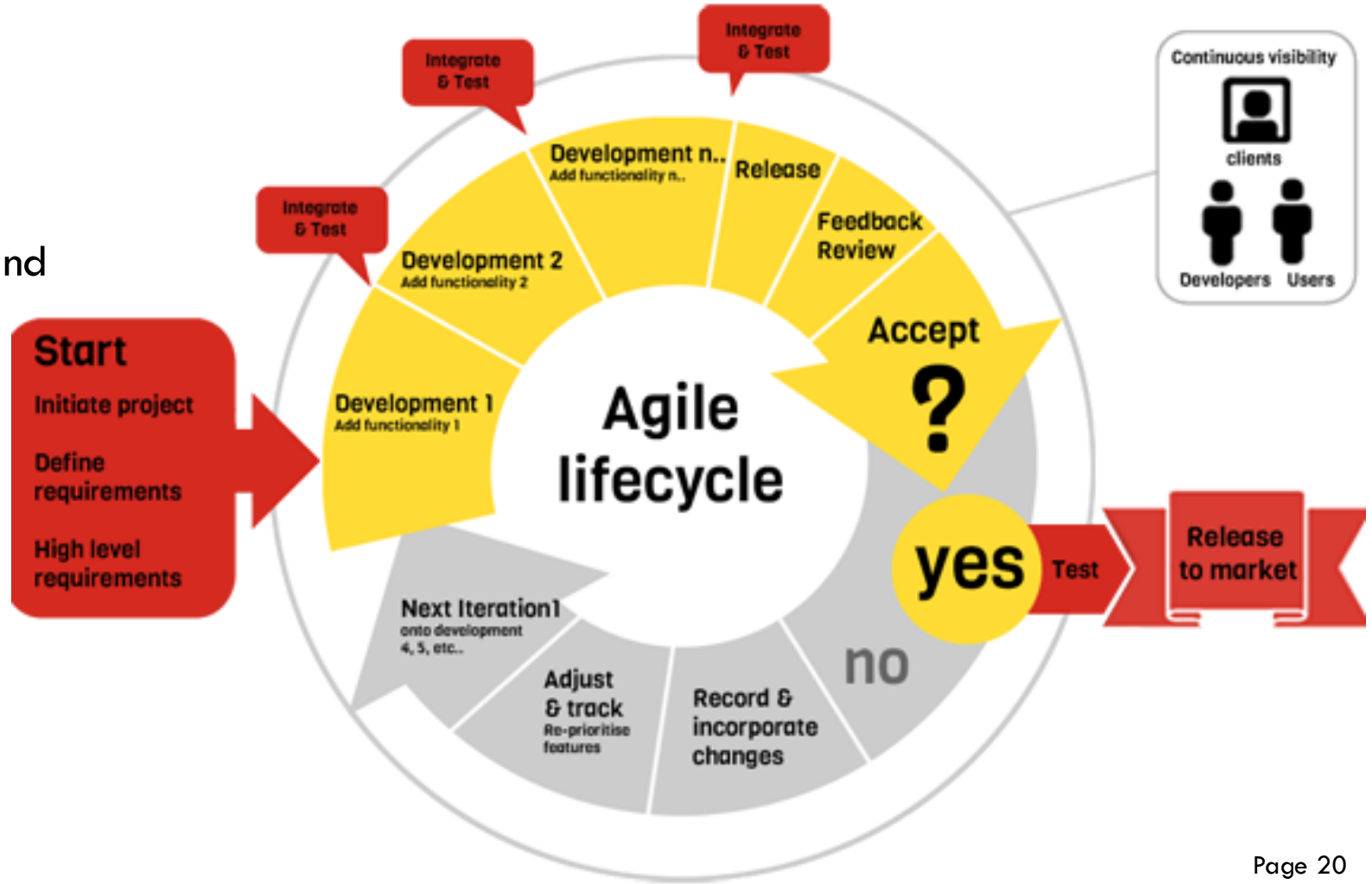
- Impossible to know all requirements in advance
  - The project takes time so the requirements at the time of capture may be different from those at the time of delivery
  - Some requirements are only clear when users are using the product
  - Too long to get customer validation of product

- Doesn't fit to the Customer Development Process!



Agile development

- Iterative, incremental and evolutionary
- Efficient and face-to-face communication
- Very short feedback loop and adaption cycle
- Quality focus



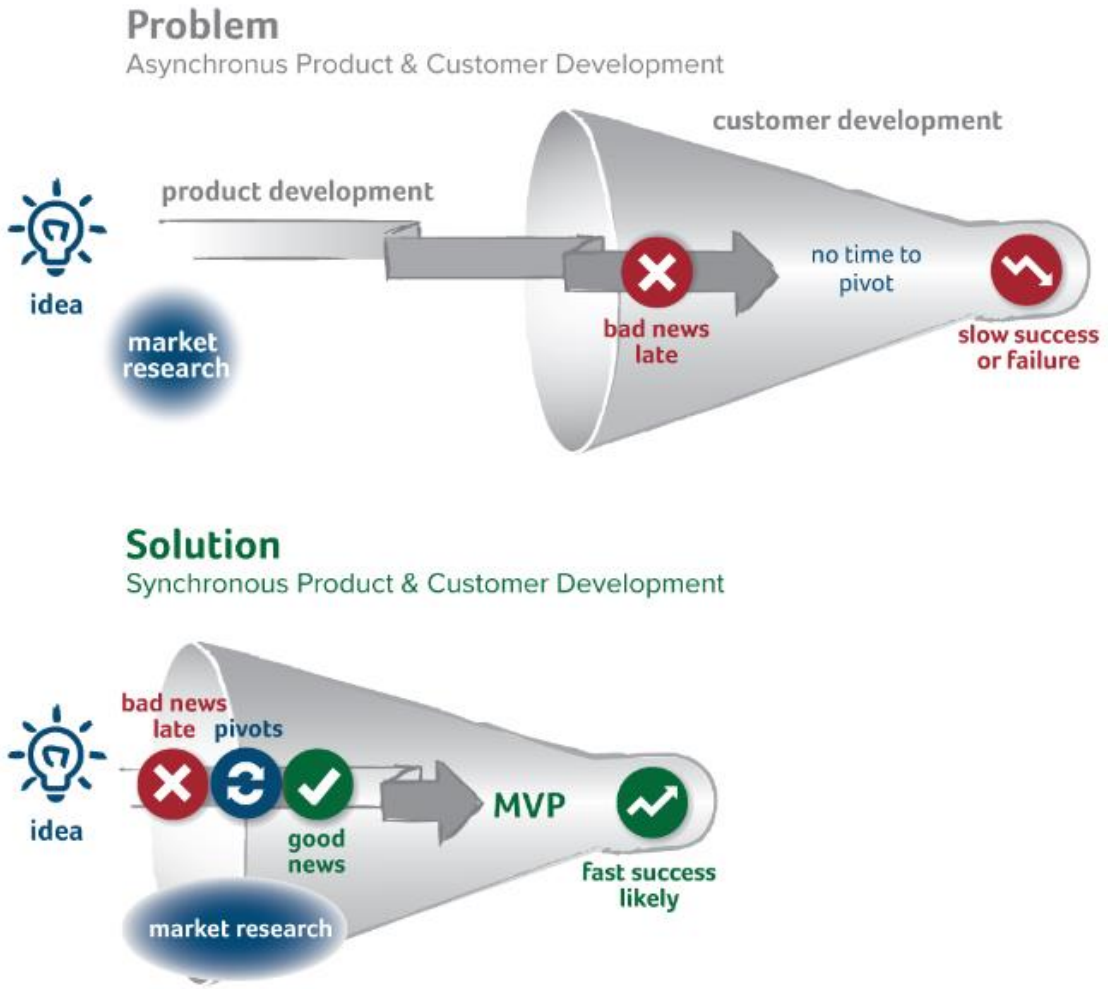
The Minimum Viable Product (MVP)

- Definition (from Eric Reis):
  "the minimum viable product is that version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort."

- The MVP is a crucial solution for new product releases, balancing the need for essential features with the risk of overwhelming complexity.

"*Customer discovery in the quickest time frame with minimum effort*"

The Minimum Viable Product (MVP)



Frank Robinson,
CEO, SyncDev, Inc.

"When I first said 'minimum viable product' I never had to repeat myself. The words went viral right before my eyes."

http://www.syncdev.com/minimum-viable-product/
(Sep'25)

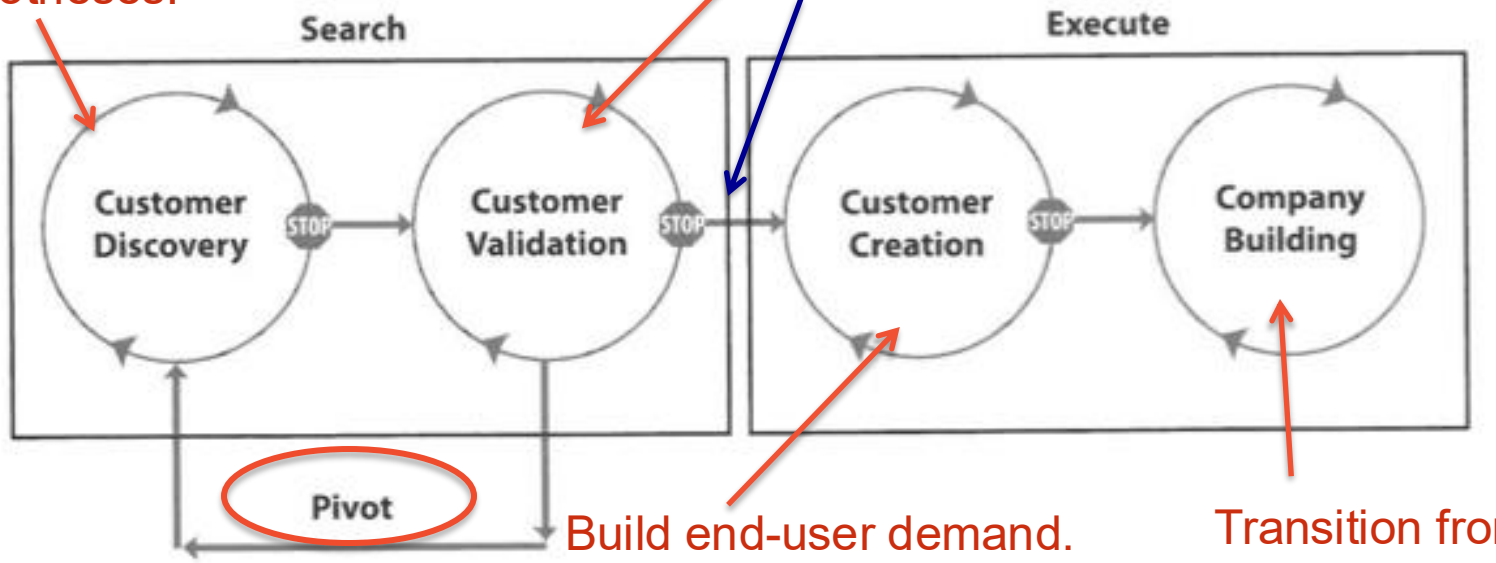
Week 8 Commercialisation II: Customer Development Process

Alternative approach for startups: Customer Development Process

Capture vision and turn it into business model hypotheses.
Develop plan to test hypotheses with customers.
Test hypotheses.

Test whether related business model is repeatable and scalable

Product/market fit



Build end-user demand.
Build sales channel.
Scale business.

Transition from startup to typical company

Source: Steve Blank and Bob Dorf, "The Startup Owner's Manual" (2012)

Customer Discovery

Phase 1 – Forming Hypothesis

a) State problem and solution hypothesis
b) Develop a hypothesis for the business model canvas

Phase 2 – Testing the problem

a) Get out of the building
b) Build wireframe or prototype
c) Test your understanding of customers' problem or need

Phase 3 – Test the solution

a) Build low fidelity app or prototype
b) Test your understanding of the customers' agreement that you have the solution
c) Test whether your solution matches with the customer expectations

Match: Product-Market fit -> Match between Value Proposition and Customer Segment

Phase 4 – Verify or Pivot

a) Do people agree that you are solving a high-value problem or need?
b) Do you understand your business model enough to start test selling?
c) Is it big enough to be a business?

Customer Validation

Phase 1 – Get Ready and Sell

a) Acquire/ activate customers
b) Build high-fidelity MVP
c) Develop sales collaterals
d) Develop sales roadmap

Phase 2 – "Test sell"

a) Get out of the building and sell to evangelists and early adopters

Phase 3 – Develop positioning

a) Develop corporate and product positioning
b) Based on customer feedback, how should we describe what we do?

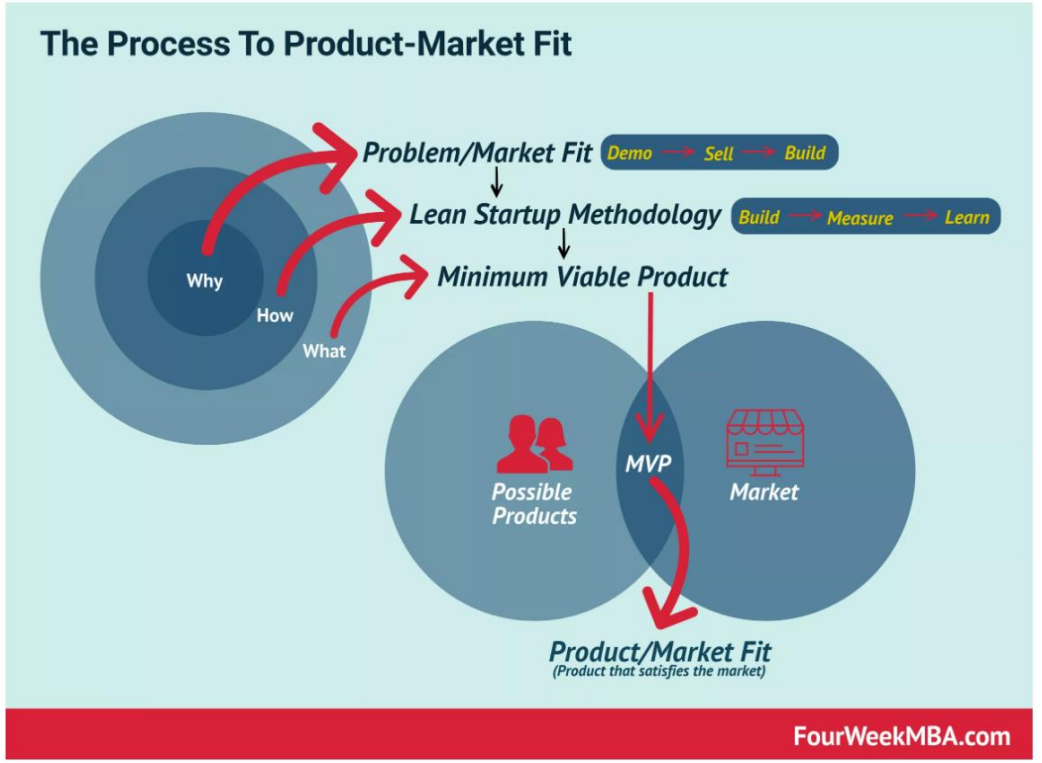
Phase 4 – Verify repeatable and scalable business model

a) Are you ready to scale marketing and sales?

Product-Market Fit

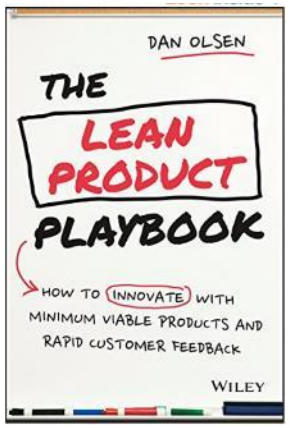
- A degree to which a product satisfies a strong market demand.
- A step in between customer validation and customer creation

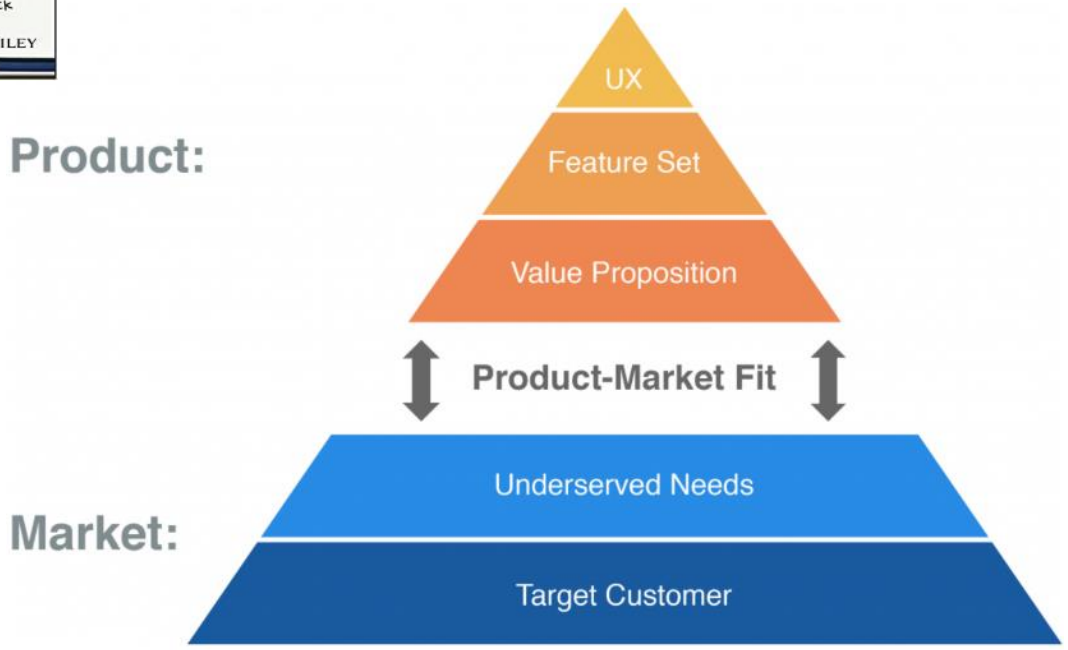
- Steve Blank



https://fourweekmba.com/product-market-fit/ (Sep'25)

Product-Market Fit Pyramid for Lean Product Process





The Product-Market Fit Pyramid

- Test your MVP with customers
- Create your MVP prototype
- Specify your Minimum Viable Product (MVP) feature set
- Define your value proposition

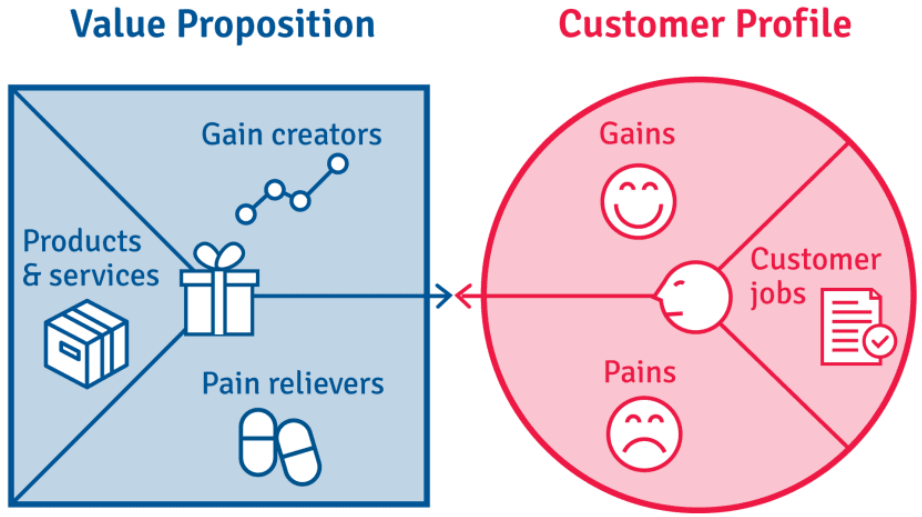
- Identify underserved customer needs
- Determine your target customer

https://leanstartup.co/a-playbook-for-achieving-product-market-fit/

Value Proposition Canvas

- The Value Proposition Canvas helps you to design and test great value propositions in an iterative search for what customers want. Value proposition design is a never-ending process in which you must constantly evolve the value proposition(s) to keep them relevant to customers.

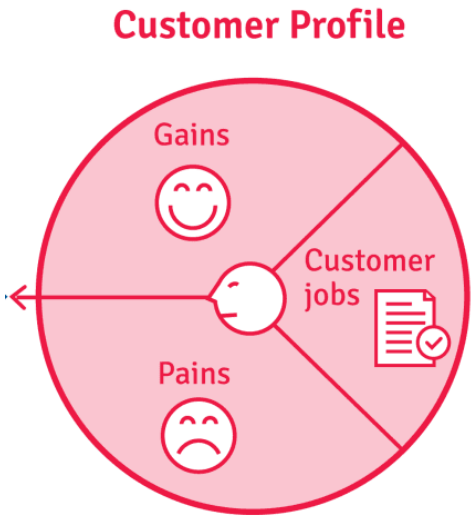
- The Value Proposition Canvas has two sides. With the Customer Profile, you clarify your customer understanding. With the Value Map, you describe how you intend to create value for that customer. You achieve Fit between the two when one meets the other.

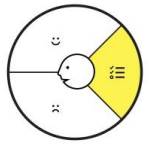


Part 1: Customer Profile

- The Customer Profile describes a specific customer segment in your business model. It analyses what the customer does (customer jobs) and, in doing so, the gains that the customer wants and the pains it experiences.

- There are three components:
  - Customer Jobs: Describe what customers are trying to accomplish in their **work and lives**, as expressed in their own words.
  - Gains: Describes the outcomes customers want to achieve or the benefits they are seeking
  - Pains: Describes terrible outcomes, risks, and obstacles related to the customer's job.





Job importance

Rank jobs according to their importance to customers.

Pain severity

Rank pains according to how extreme they are in the customers' eyes.

Gain relevance

Rank gains according to how essential they are in the customers' eyes.

Important

- improve skill set + advance career
- run "day job" well
- improve or build a business
- assess and reduce risk
- collaborate with others or help them
- find, learn, + apply methods
- look good with colleagues, boss, clients
- make decisions with confidence
- communicate + sell ideas
- make things people want
- convince others about preferred methods
- stay up to date

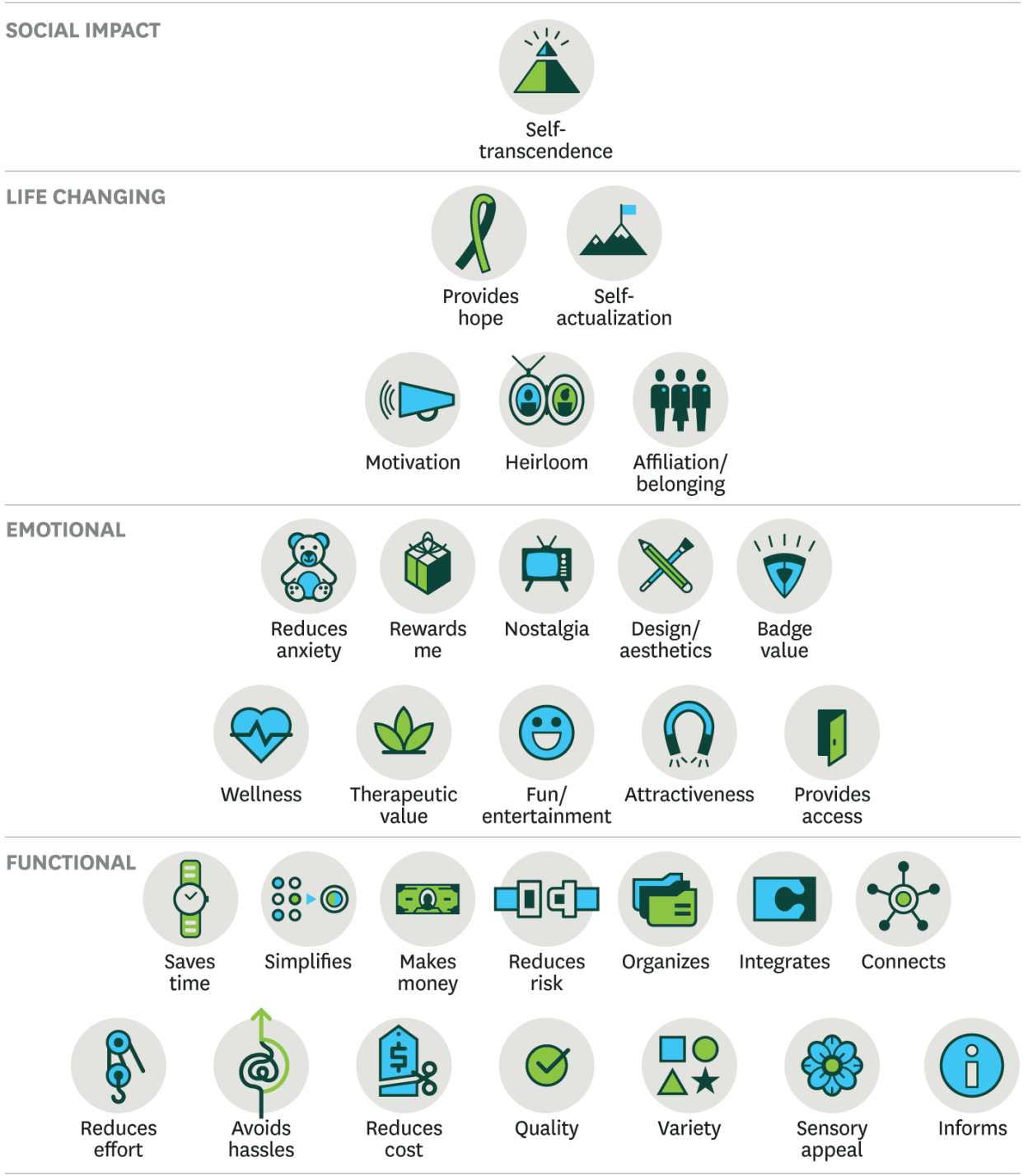
Extreme

- getting stuck in career or jeopardizing it
- going down wrong path
- management "not getting it"
- dealing with risk + uncertainty
- wasting time with ideas that don't work
- "translating" methods to own context
- too much theory
- being associated with a big failure
- lack of sufficient budget
- making things nobody wants
- lack of time
- no clear path to applying method
- boring content that's hard to work through

Essential

- helps with promotion or pay raise
- buy-in from leadership + team
- get recognized by team
- help when stuck
- applicable ideas
- can apply with confidence
- easy to understand
- home run value propositions
- leads to results (ideally quick wins)
- helps me communicate my ideas clearly
- clear indicators to measure progress
- connect with like-minded people
- leads to better collaboration
- concrete tips (e.g., to reduce risk)

Value Proposition Pyramid



Week 9 Commercialisation II: Innovation Management, Value Proposition Canvas, Business Model Canvas

Capital & Fundraising for IT Innovation

20,000 Feet View

- Business Model Canvas
- Value Proposition Canvas
- Value Proposition Pyramid

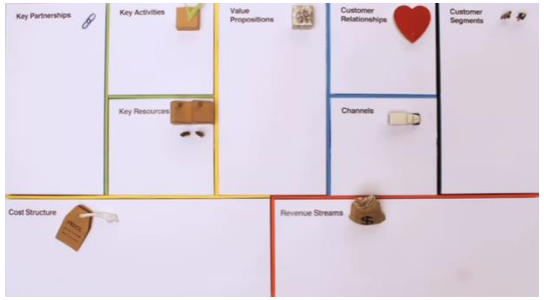
- Lean Startup Methodology;
- Customer Development Process
- Agile Development

- Organisational Culture & Structures Supporting Innovation

The Business Model Canvas

- Created by Alexander Osterwalder et al, 2010
- Involved 470 practitioners in 45 countries
- Studied hundreds of business models and extracted key aspects into a model to make a common framework and tested it
- The global standard for companies of all sizes
- Describe, design, challenge and pivot the business model
- Works with other strategic management, execution tools and processes.

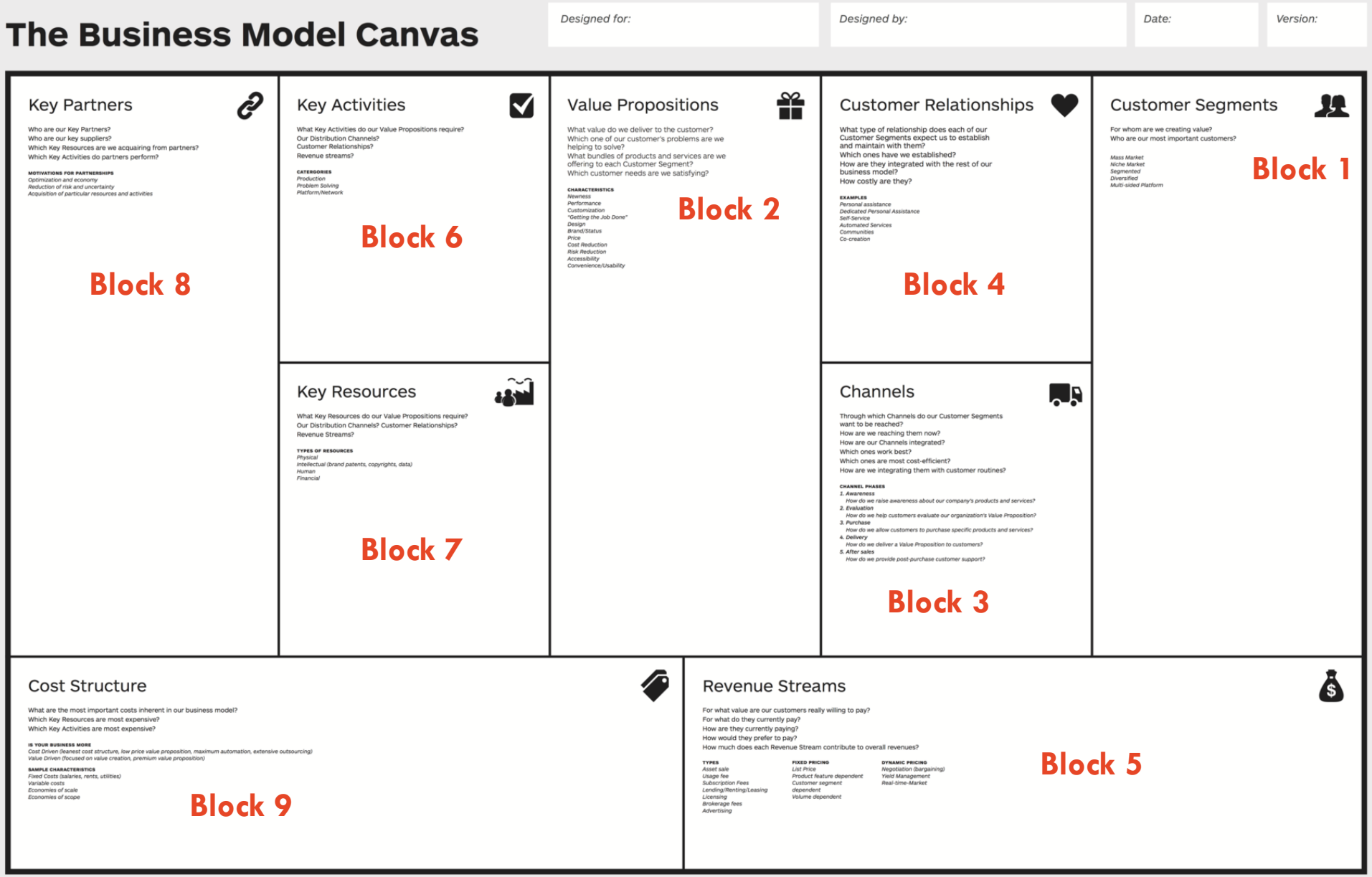
Alexander Osterwalder
http://alexosterwalder.com/



https://youtu.be/QoAOzMTLP5s (Oct'25)
http://www.slideshare.net/Alex.Osterwalder/presentations (Oct'25)

9 Building

– There are 9 building blocks in the Business Model Canvas:



Capital Raising for IT Innovation - Funding needs for IT innovation: An example

- Travelling
- Phone
- Basic website
- Coffee/ food

- Cloud and/or hardware components
- Additional developers + research

- Engineering Team
- R&D
- Data

- Hire Business Development Manager
- Overhead costs

- Hire sales & marketing team
- Ad campaigns

- Product & Technology
- Team
- Operations

The Valley of Death – "The J Curve"

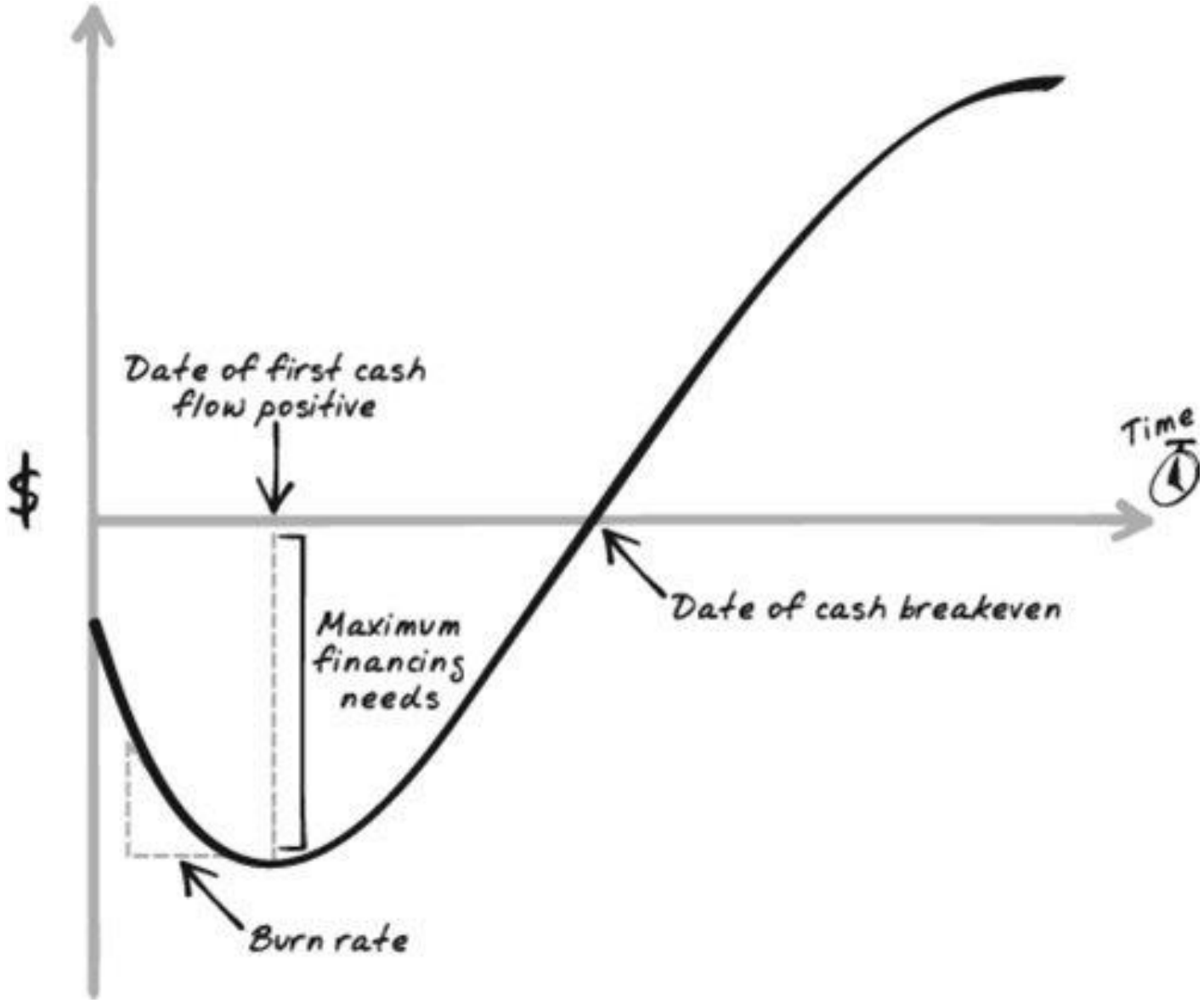
Massive losses in early-stage startups

What does it mean to have a loss?

Revenue

-- Expenses

= Profit OR Loss



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Key Players in Venture Capital / Alternate Pathways

Investor Types

Angel Investors

Sydney Angels

Sydney Angels

AngelList

Build, Lead, Invest | AngelList

Venture Capital

AirTree

Home | AirTree Ventures

cicada INNOVATIONS

About | Cicada Innovations

ANDREESSEN HOROWITZ

Andreessen Horowitz | Software Is Eating the World (a16z.com)

Strategic Investors

Google ventures

GV - Home

Telstra

Telstra Ventures | Venture Capital Investing Based in Data Science

Incubators & Accelerators

Y Combinator

Y Combinator

techstars

Techstars

Startmate

Startmate

MELBOURNE ACCELERATOR PROGRAM

The Melbourne Accelerator Program (themap.co)

INCUBATE

INCUBATE | Launching startups at The University of Sydney.

Week 10 Organisational culture and Structures Supporting Innovation; Judging IT Innovations

Organisational culture: "Scientific Management" (Taylorism)

Frederick Winslow Taylor
Mechanical engineer
Efficiency expert
Management consultant
1856-1915

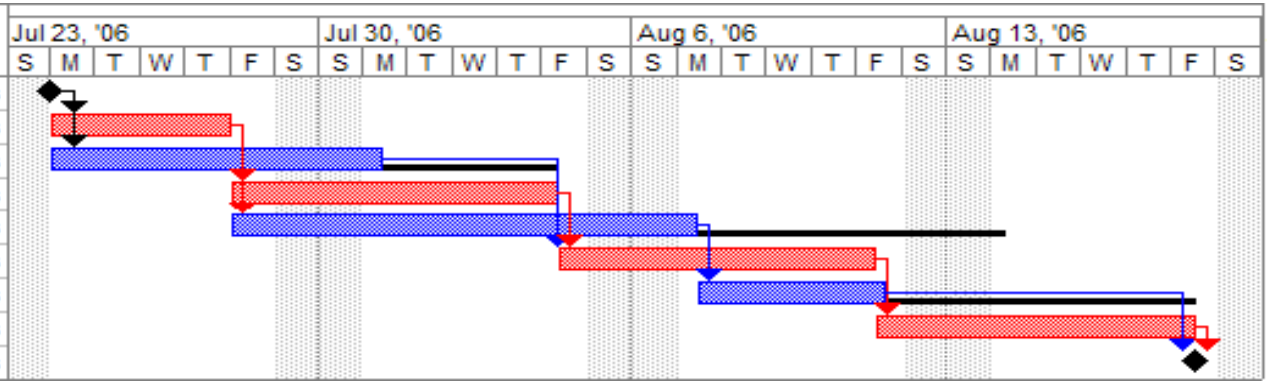
"In the past, the man was first.
In the future, the system will be first." (1911)

- **Standardise** work into separate tasks
- Scientifically study each task
- Continually measure performance of task
- Compensate workers based on performance

Influence of Taylorism in organisations

- Scientific management used not just in factories, but in most organisations
- Gantt charts (by Henry Gantt who worked with Taylor)

ID	Task Name	Predecessors	Duration
1	Start		0 days
2	a	1	4 days
3	b	1	5.33 days
4	c	2	5.17 days
5	d	2	6.33 days
6	e	3,4	5.17 days
7	f	5	4.5 days
8	g	6	5.17 days
9	Finish	7,8	0 days



- **Using budgets for accountability and performance measurement**
- **Key performance indicators, linked to Incentives**

Taylorism and Innovation

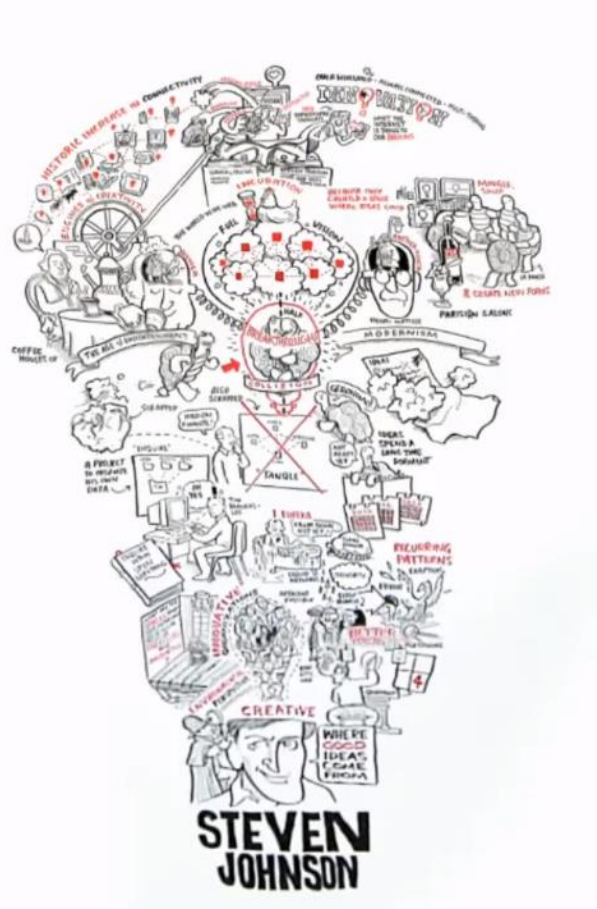
- But Taylorism was designed for repetitive work with known functions
  - e.g., the production of known items in the factory

- Not suitable for creative work with many unknowns
  - e.g., technological innovation
  - Taylorism does not promote new ideas/thinking

- **Not for startups**

Creating a culture for generation of new ideas

- **Liquid Networks** – having a diversity of expertise, and it's ideas bouncing between different expertise that so often triggers the big breakthrough
- **Slow Hunch** – a great idea **slowly** fades into view over a long period of time
- **Connecting vs Protecting** – interaction leads to the overall best result… keeping an idea to oneself leads to thought stagnation, because our experiences and genetic makeup usually take us down the same thought path repeatedly



https://www.youtube.com/watch?v=NugRZGDbPFU

Innovations: 1800 – now

Market (devised for financial gain)

Non-market (not devised for financial gain)

Individual

Networked

Steven Johnson, *Where good ideas come from: The natural history of innovation*. ePenguin, 2010.

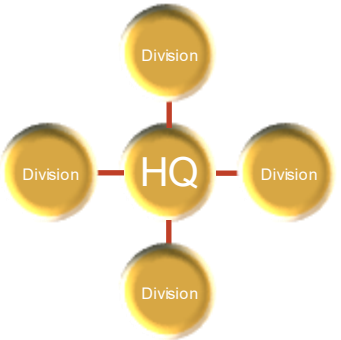
Culture for Digital Age

- The only thing that's going to enable you to keep building new capabilities and trying out new concepts long before they are conventional wisdom is culture. Culture so that you can continue to cultivate new capabilities and new concepts. – Satya Nadella
- Cultural intervention points
  - An appetite for risk
  - Making bold bets
  - A customer-centric organizational culture
    - Data and tools / Unifying force
  - Busting silos
  - Instilling accountability

Structure and management for innovation

- Size and structural dimensions of firms affecting innovation:
  - Formalisation
  - Standardisation
  - Centralisation
  - Differences between large companies, small businesses and scalable start-ups
- Approaches to organising firms for innovation:
  - Decentralised vs centralised R&D
  - Mechanistic vs organic structures

http://www.kingserv.org/design_examples.htm



Size and structural dimensions of companies

- Many big companies have found ways of "feeling small"
  - Break overall company into several subunits
  - Can utilize different culture and controls in different units
  - E.g. "skunk works" teams for doing new product development (in later case study)

- Ambidexterity strategy (week 3 recap): The ability of a firm to simultaneously explore and exploit, enabling the firm to adapt over time

Examples of Ambidexterity strategy

- Social Networking
- Invested in exploring new technologies and business models:
  - Oculus VR - virtual reality technology
  - WhatsApp - a messaging app

- PC operating system market
- Invested in exploring new technologies and business models:
  - Xbox – video game platform
  - LinkedIn – social network for professional network
  - GitHub – source code repo

Examples of culture for innovation

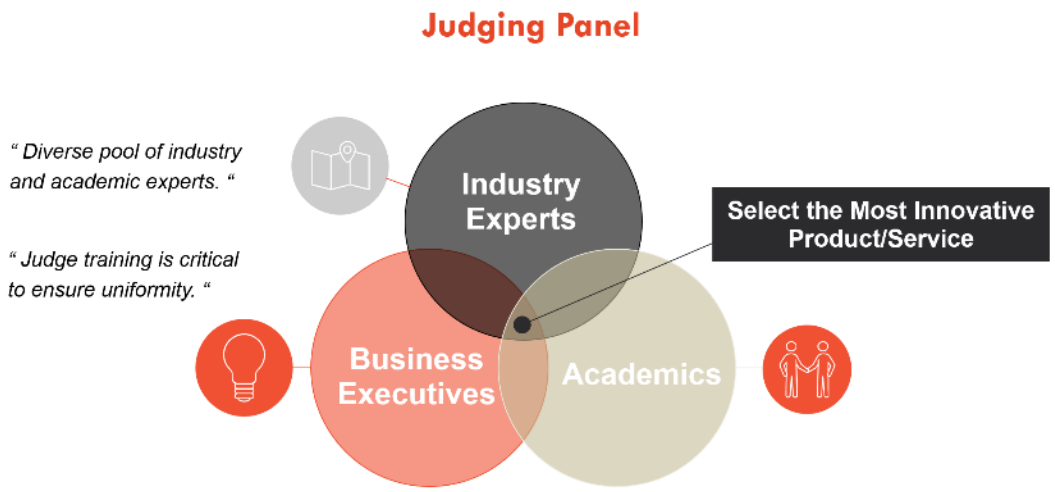
- Skunk work
- Apple
- Google
- Microsoft (rebooting with the new CEO)

- These companies, and many others, adopt culture and structure that support innovation.
- IT innovation has its own unique needs e.g., digital culture

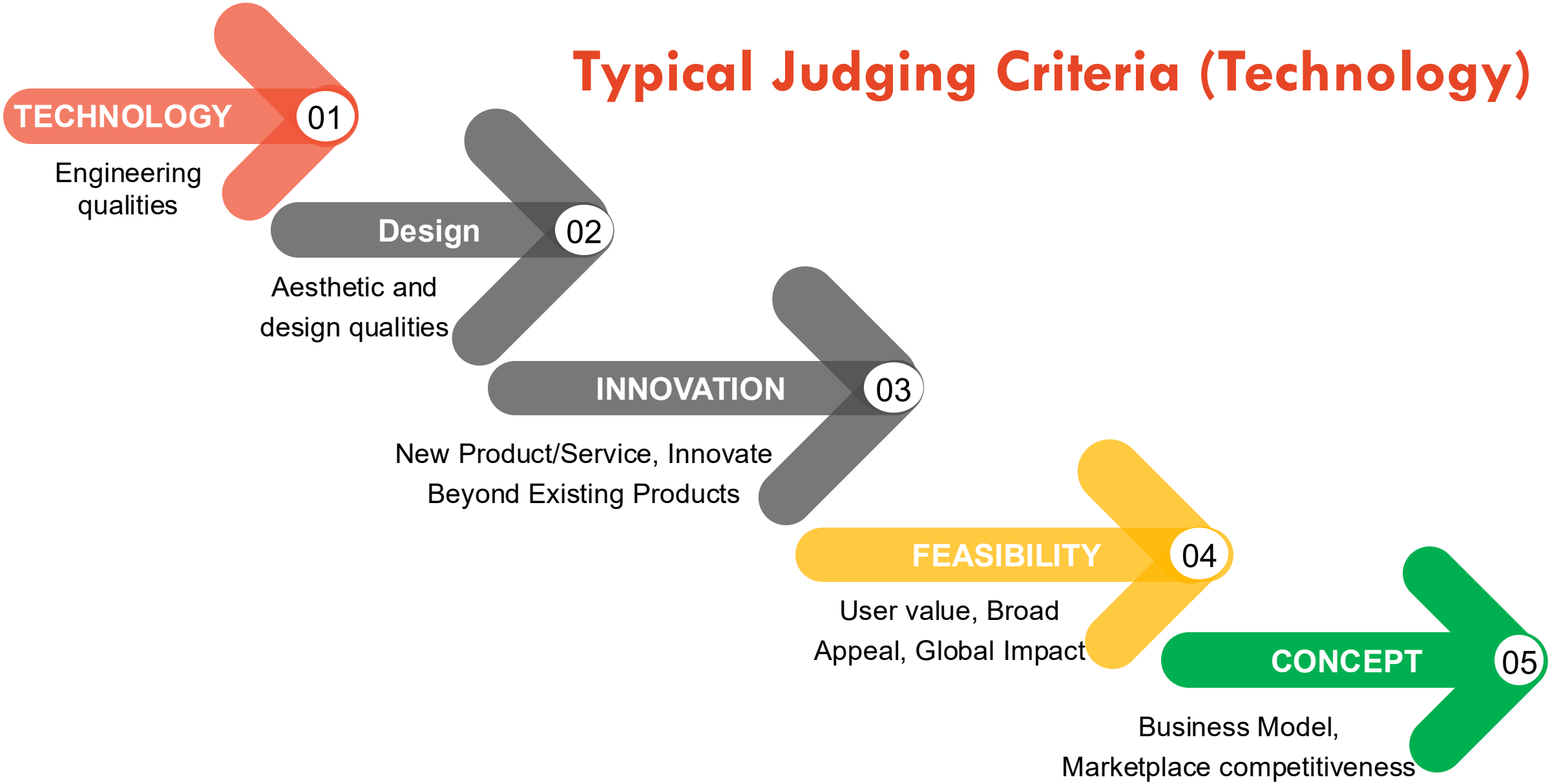
Judging IT Innovation

- Judging IT innovations with a selection Criteria. It is important to know the criteria as well as what the background of the competition and the Judges
- Judging Criteria can be designed to suit the need of the 'competition'

- **Many models e.g., CES, Microsoft, Harvard**
- **Berkley's model**
  - **Two stage judging criteria (Pre/Fu**
  - **Incentives for Judges**



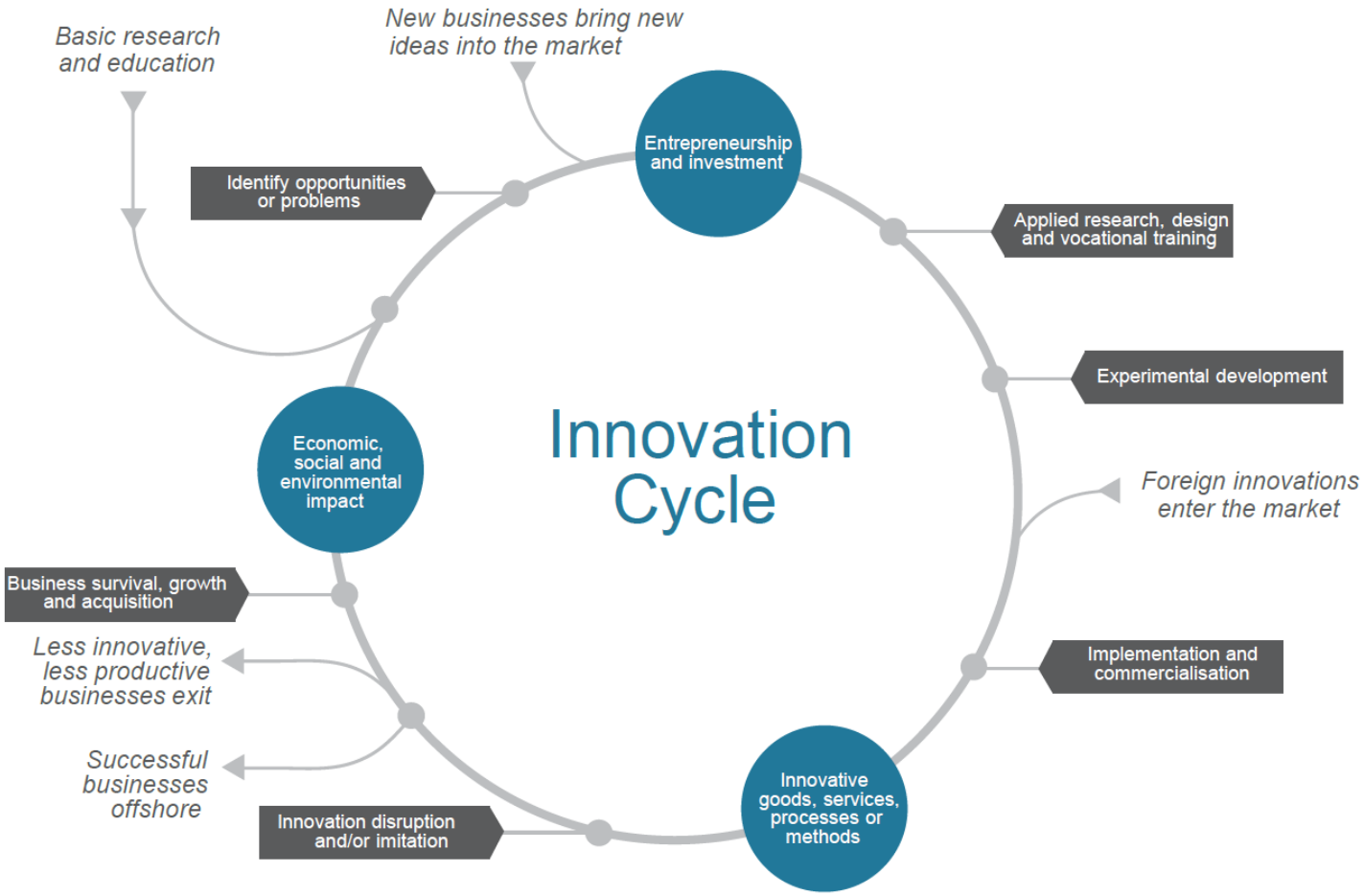
Typical Judging Criteria (Technology)



https://imaginecup.microsoft.com/en-us/support/faq (Oct'25)

Week 11 Innovation ecosystem: Silicon Valley and Australia

Innovation Cycle



*Source:*Department of Industry, Innovationand Science (2016)

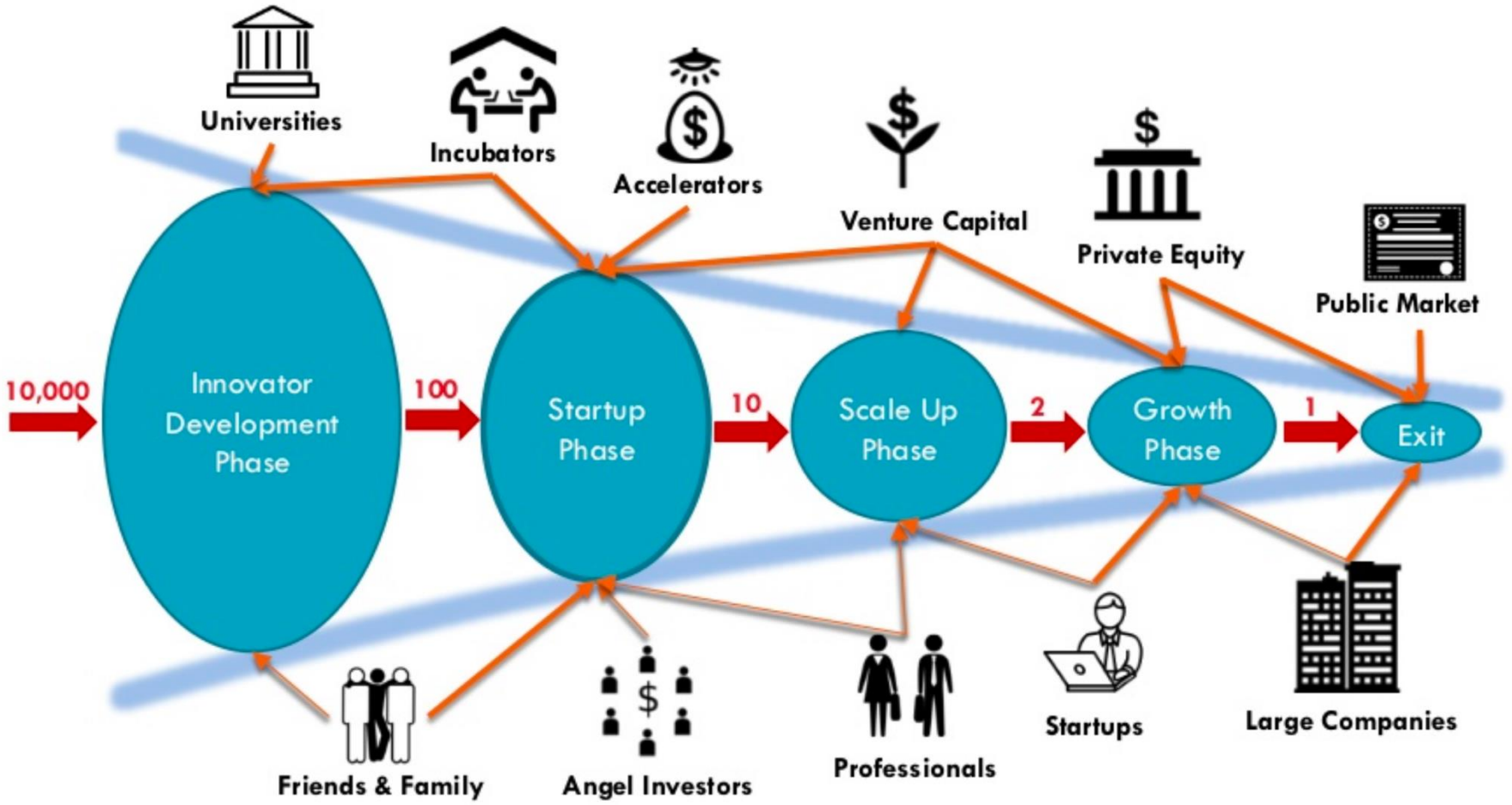
The innovation system – what is it?

- An innovation system is an open network of organisations that interact with each other and operate within framework conditions that regulate their activities and interactions.
- These three components of the innovation system —
  - innovation activities,
  - networks and
  - framework conditions

  collectively function to produce and diffuse innovations that have, in aggregate, economic, social and/or environmental value.

https://www.industry.gov.au/publications/australian-innovation-system-monitor (Oct'25)

The innovation ecosystem – An example representation



The process of developing, testing and scaling innovation for sustainable impact cannot be undertaken by any one actor working in isolation

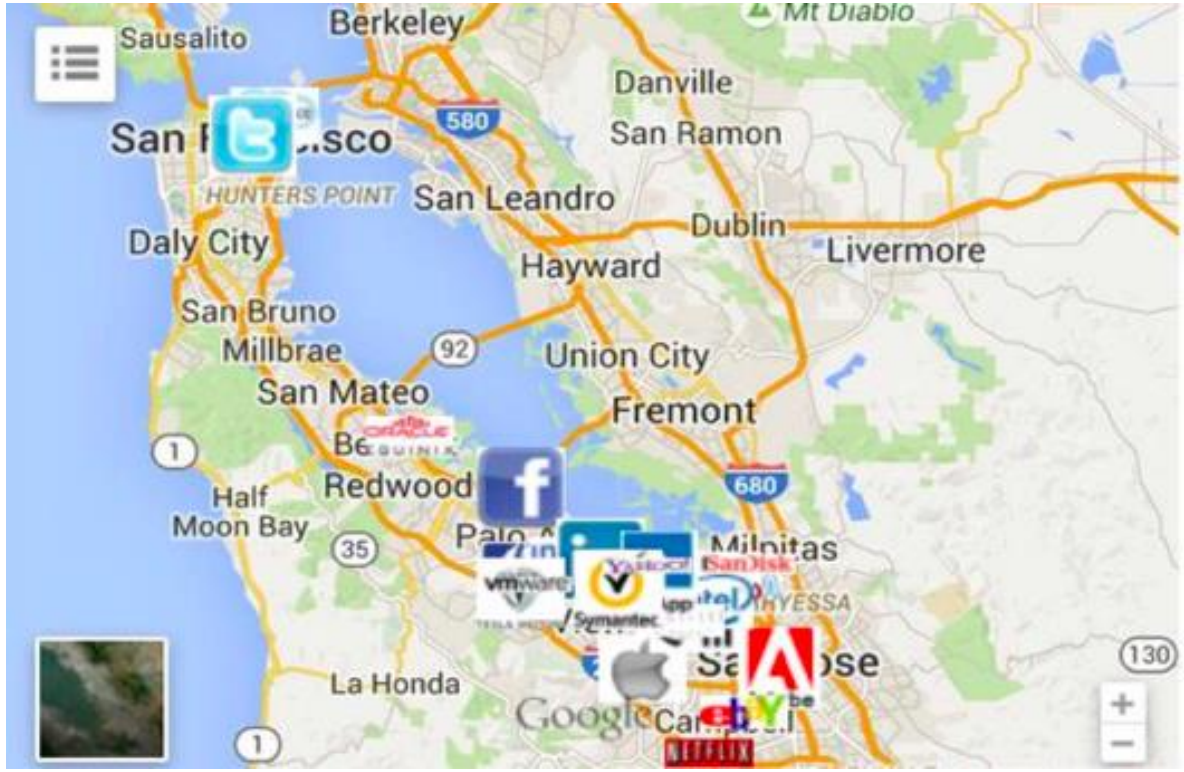
https://www.idiainnovation.org/ecosystem-actors (Oct'25)

Source: https://www.slideshare.net/MaherHakim/building-innovation-ecosystem (Oct'25)

Innovation ecosystems

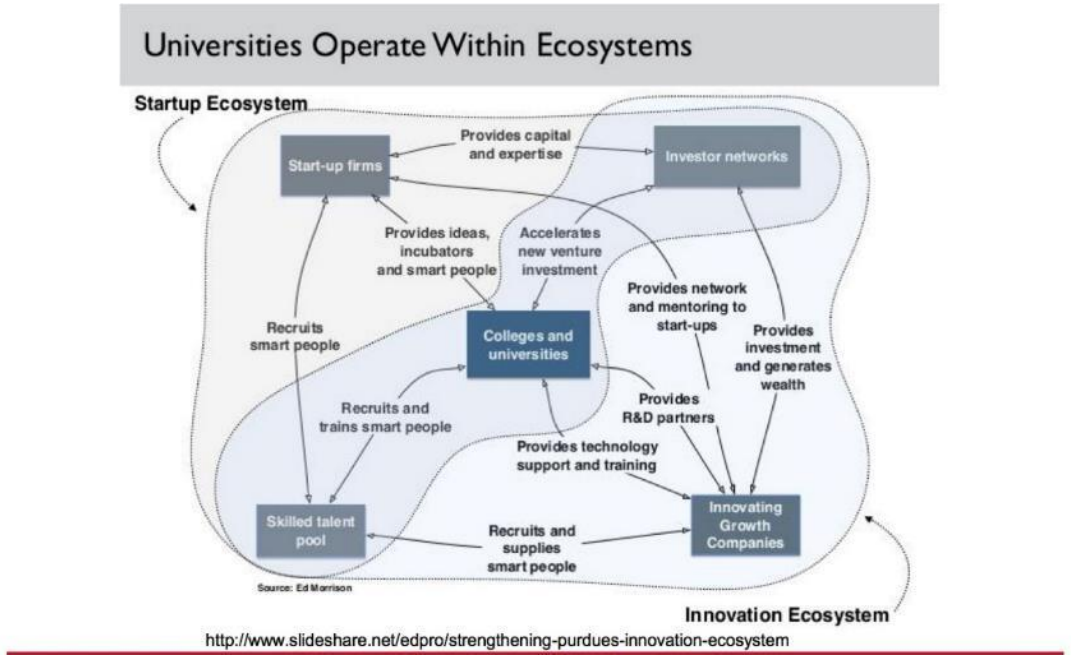
- Why Silicon Valley is so successful

- Network of organisations that interact with each other and operate within framework conditions that regulate their activities and interactions



Why is Silicon Valley a successful innovation ecosystem?

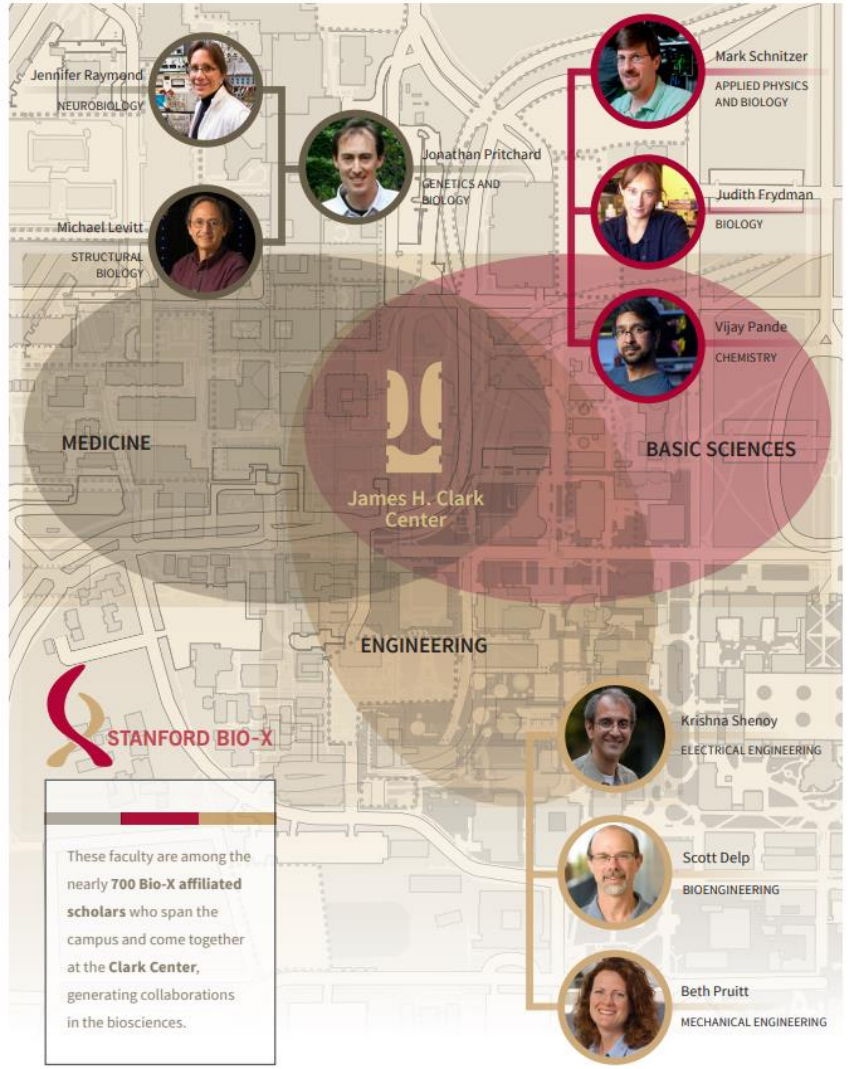
1. **Strong research-driven universities (with endowments)**
2. **Globally experienced repeat entrepreneurs**
3. Sophisticated risk capital
4. **Social capital**
5. Knowledge sharing
6. Tolerance for risk taking
7. **Creative destruction**
8. **Constructive failure**
9. Positive aggregate returns
10. Supportive government policy



From Adrian Turner: "Blue Sky Mining: Building Australia's next billion dollar industries"

Stanford Bio-X Interdisciplinary Initiatives Seed Grants Program (IIP) Seed Fund

- IIP *awards are given to teams of faculty with* ***early-stage, high-risk ideas*** *that couldn't be funded by traditional sources.*
- Stanford Bio-X awards approximately $4 million every other year in the form of two-year seed grants. **The current two-year grant level is $200,000 per project.**
- The first seven rounds of IIP awards (starting in 2000) **resulted in over $270 million** in external funding awarded to the university.
- **This tenfold return on investment by the IIP** awards has supported hundreds of graduate students and post-doctoral fellows, resulted in hundreds of publications and dozens of patents filed, and accelerated the pace of scientific discovery and innovation.



Seed Grants | Welcome to Bio-X (stanford.edu)

Replicating Silicon Valley

- Many cities around the world have tried to replicate the success of Silicon Valley, which includes a complex mix of factors.

- While different cities offer some of the key ingredients for replicating Silicon Valley's success, it's worth noting that each has its unique strengths and challenges.

1. **Strong research-driven universities**
2. **Repeat entrepreneurs**
3. Sophisticated risk capital
4. **Social capital**
5. Knowledge sharing
6. Tolerance for risk taking
7. **Creative destruction**
8. **Constructive failure**
9. Positive aggregate returns
10. Supportive government policy

Thank you!

Unit of Study Survey

THE UNIVERSITY OF SYDNEY