

Innovation and Technology Management

OENG1115

Lecture 5

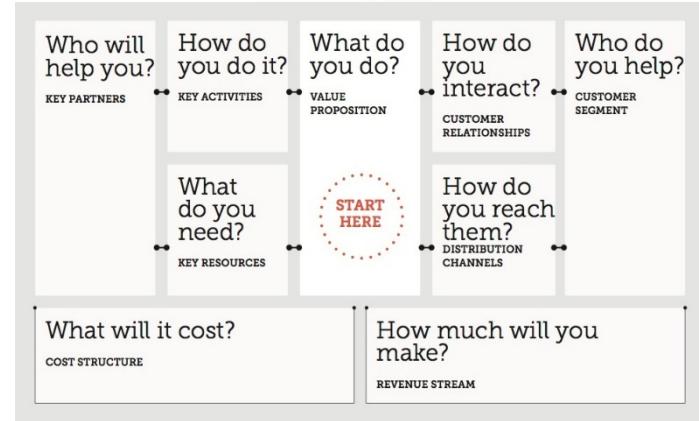
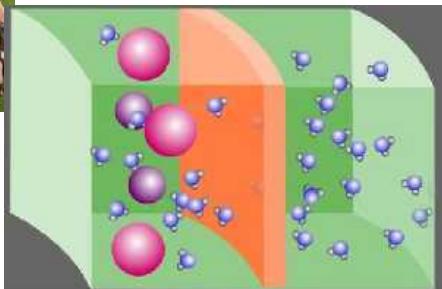
Today's Session Objectives

Time	Activity	Comment
5:30pm	Lecture	<ul style="list-style-type: none">• Welcome• Review of Module 4• Working with others<ul style="list-style-type: none">• Confidentiality & Non-compete• Ethics• Assessment 3<ul style="list-style-type: none">• Overview• Tips for making a pitch
7:30pm (approx)	Tutorial	<ul style="list-style-type: none">• Assessment 2 & Assessment 3 Deep Dive<ul style="list-style-type: none">• General Questions• Specific Assistance

Lets Briefly Revisit Last Session



Open and Closed Innovation



Lean Start-up and Business Canvas



Business Case

Lets Briefly Revisit Last Session



Question

A business case for a new technology/innovation should:

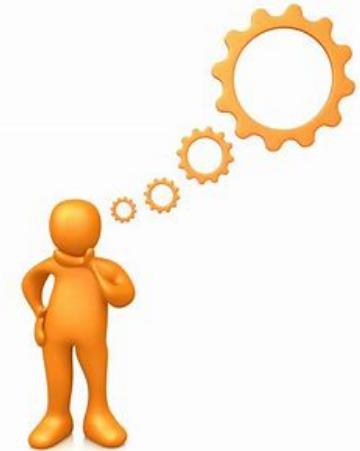
- a. Just focus on the engineering advantages
- b. Focus on deep technical detail to impress investors / manager
- c. In part outline how the technology/innovation supports organisational goals
- d. Not consider costs as these are difficult to calculate

Lets Briefly Revisit Last Session

Question

Heilmeier's Catechism represents:

- a. Ramblings from another era not relevant today
- b. Questions to help define scientific principles
- c. A cost structure theory for new technologies
- d. Key questions that help inform a business case



Lets Briefly Re-visit Module 4

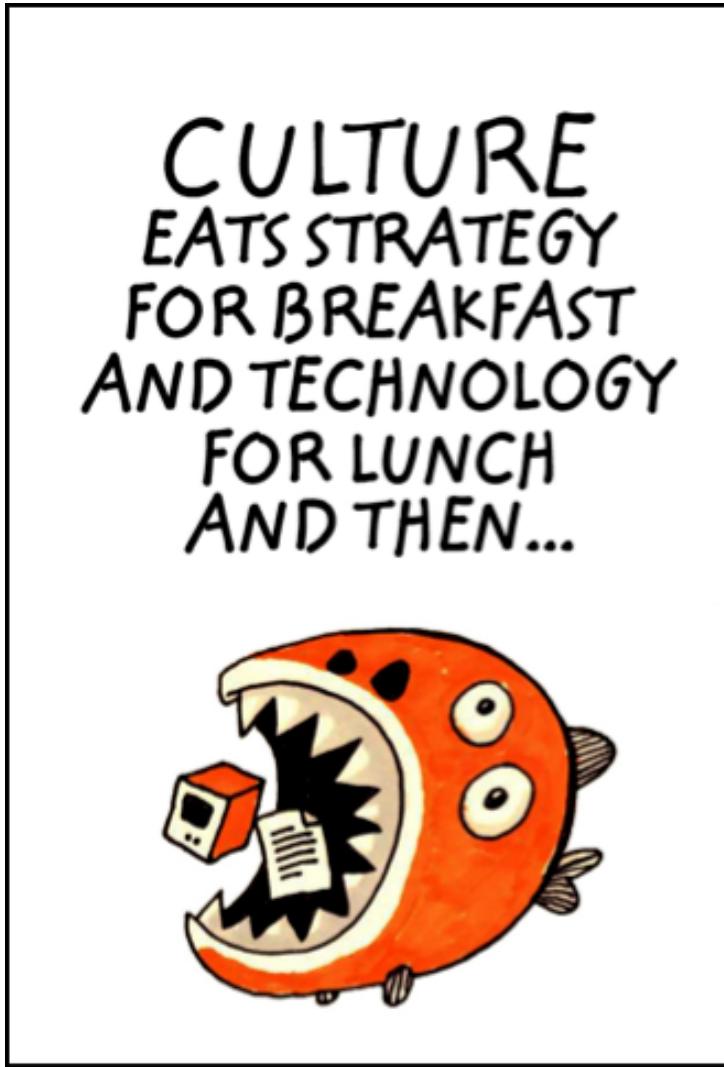
Question

It all boils down to money, the cheapest or most profitable technology/ innovation that fulfils the purpose will always win out:

- a. Agree
- b. Disagree
- c. It depends
- d. Unsure



Remember this Cartoon.....



Collaborating: Working with others



Working With Others.....

Formal or informal arrangements:

- Within the organisation
- With stakeholders (in or outside the organisation)

Considerations:

- Humanistic aspects
 - behaviours, feelings, thinking, believing, norms
- Geographical issues
 - distance, time-zone
- Processes
 - How are things done, approved & ratified, what systems and software are used etc etc

Remember:

- Motivations may be very different between individuals
- Trust = Time
- Win – Win (butWhat is in it for me?)



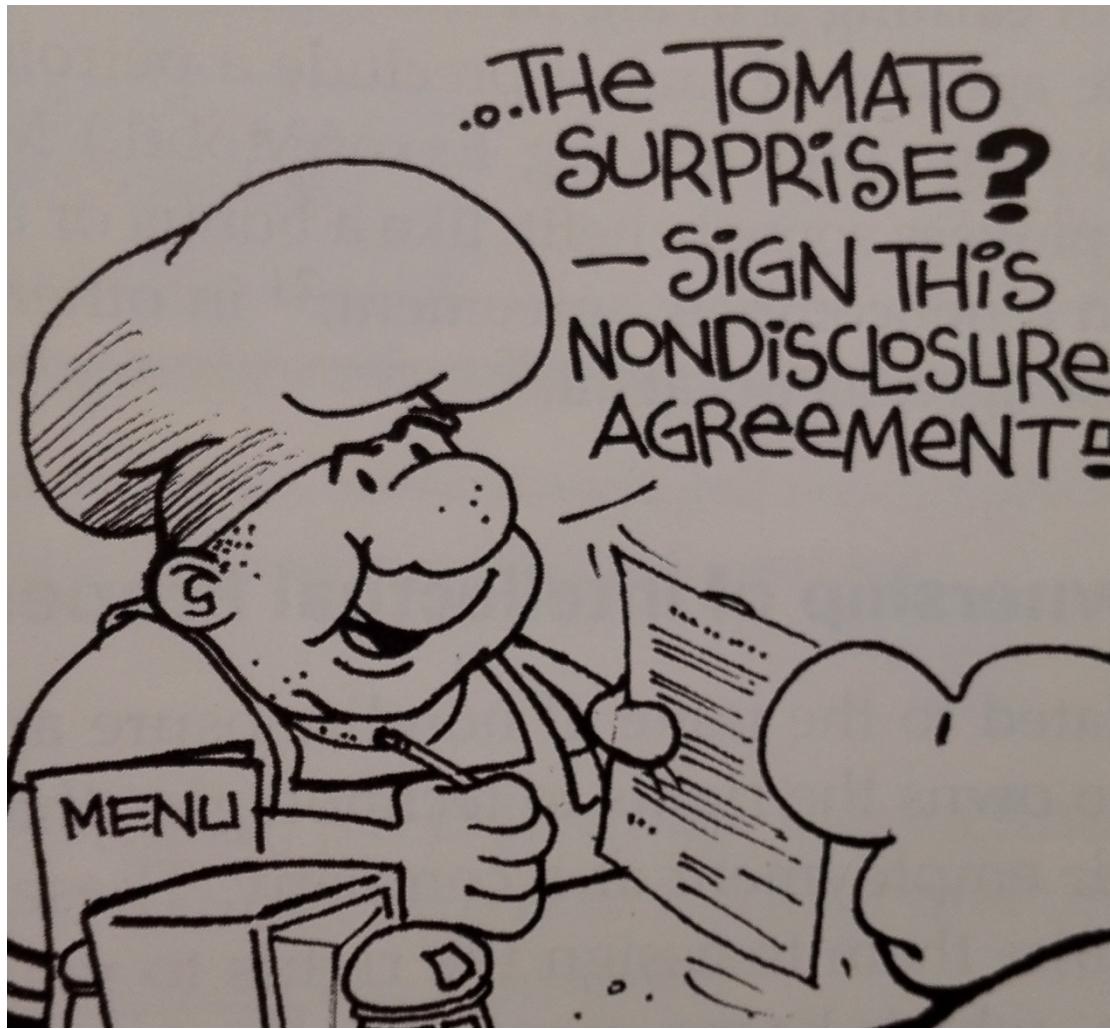
Working with Others (Partnering)

Organisations need to be careful when collaborating or deciding whether to collaborate

- How do we best protect our business's information ?
 - *Control what is released*
 - *Confidentiality agreement*
- How are the rules for collaborating decided?
 - *Commercial contract, Licence agreement, Confidentiality agreement etc*
- How might you get access to a technology or idea without formally partnering ?
 - *Crowd source*
 - *Market intelligence – conferences, forums*
 - *Head hunting talent*
- Lets consider some agreement types



Confidentiality



Confidentiality (i)

- Working with other often requires sharing of information
- Confidential information:
 - You can protect your Trade secrets through the use of a confidentiality agreement (CA) otherwise known as a non-disclosure agreement (NDA).
- Need to get legal advice - devil is in the detail
- Such agreements can be used with:
 - Employees (generally a condition of employment)
 - Partners, Collaborators, Investors
- Confidential information could be physical (written), digital or verbal communication:
 - A design, data, cost structure, strategy, clients, market knowledge, technical knowledge etc



Confidentiality (ii)

- Agreements are important when exchanging a deeper level of information
 - Well after the initial consultations
 - To make major decisions eg: partnerships, contracts
- The agreement should provide details over exactly what is to be kept secret and for how long.
- Need to keep accurate records
- Need to be prepared to take action against those who you believe have broken the confidentiality agreement



Confidentiality (iii) - Traps

Determine if you really need an agreement

- How good is your security & processes ?
 - Data files / physical storage
- Does everyone in your organisation have access, what barriers are in place ?
- Do staff know their obligations ?
- Do you work on multiple projects with multiple parties
 - Can you really keep each engagement separate and confidential
 - Will signing the agreement hinder you in some way ?
- How long will the agreement last ?

CONFIDENTIALITY DEED

between

ROYAL MELBOURNE INSTITUTE OF
TECHNOLOGY
ABN 49 781 030 034
("RMIT")

and

ABN ***
("SECOND PARTY")

File No: ****

Royal Melbourne Institute of Technology
Legal Services
GPO Box 2476, Melbourne, VIC 3001
Ph: 9925 3180
Fax: 9925 3047

Non-Compete Agreements



"Upset at you for breaching the non-compete? Of course not."

Non-Compete Agreements

- Concept is to restrict a person or organisation's ability to compete in the market place
- Typically used to prevent employees from working for competitors in the same industry and same field for a period of time:
 - Protect confidential information or competitive position
- Cannot be too broad eg: prevent staff from 'making a living'
- May need to be limited geographically (territory specific), time bound.
- Can also be related to partnerships between organisations
 - Example Plantic Technologies: Plastic from plants

Non-Compete Example



PLANTIC™

kuraray EVAL®

Dealer Login

Search



HOME

MARKETS ▾

PRODUCTS ▾

TECHNOLOGY ▾

SUSTAINABILITY ▾

COMPANY ▾

NEWS ▾

FAQS ▾

CONTACT

Technology

Innovation

The PLANTIC™ material has the following key properties:

- ✓ The raw material source is renewable and sustainable
- ✓ Ingredients are not genetically modified
- ✓ It is certified Biobased to European Standards
- ✓ It is certified Home Compostable to European Standards
- ✓ It is certified Biodegradable to European Standards
- ✓ It is certified for disposal in waste water to European Standards
- ✓ It is suitable for food contact applications
- ✓ It is inherently anti-static and oil resistant
- ✓ It is flexible, durable and impactable

Innovation

Starch Technologies

Formulations

Conversion Technologies

Quality Control

Manufacturing Process

Plantic Advantages

Research & Development

Case Studies

Ethics

“Ethics provides us with guides on what is the right thing to do in all aspects of life, while the law generally provides more specific rules so that societies and their institutions can be maintained. Ethics engages our thinking and also our feelings, including those of disgust and guilt”



Dr Eva Tsahuridu

Eva formerly managed CPA Australia's accounting policy team and looked after the ethics, professional standards and governance policy portfolio. She is currently an Industry Fellow at the School of Accounting at RMIT University.

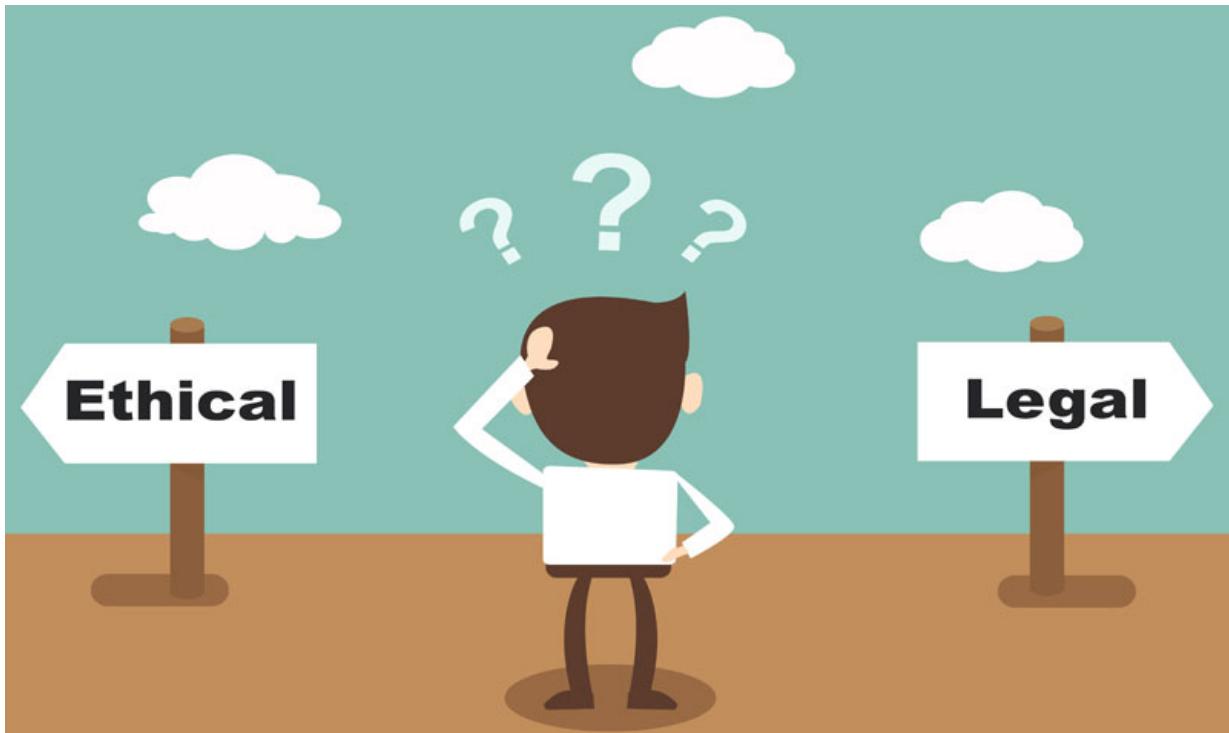


Responsibilities

- Professional Engineers have responsibilities and professional standards
- People and projects depend on the decisions and integrity of the work that has been and is being conducted.
- Decisions need to be backed up by evidence
- Ethical decision making is a corner stone
- We have seen the result of unethical behaviours in other industry segments.



Ethics

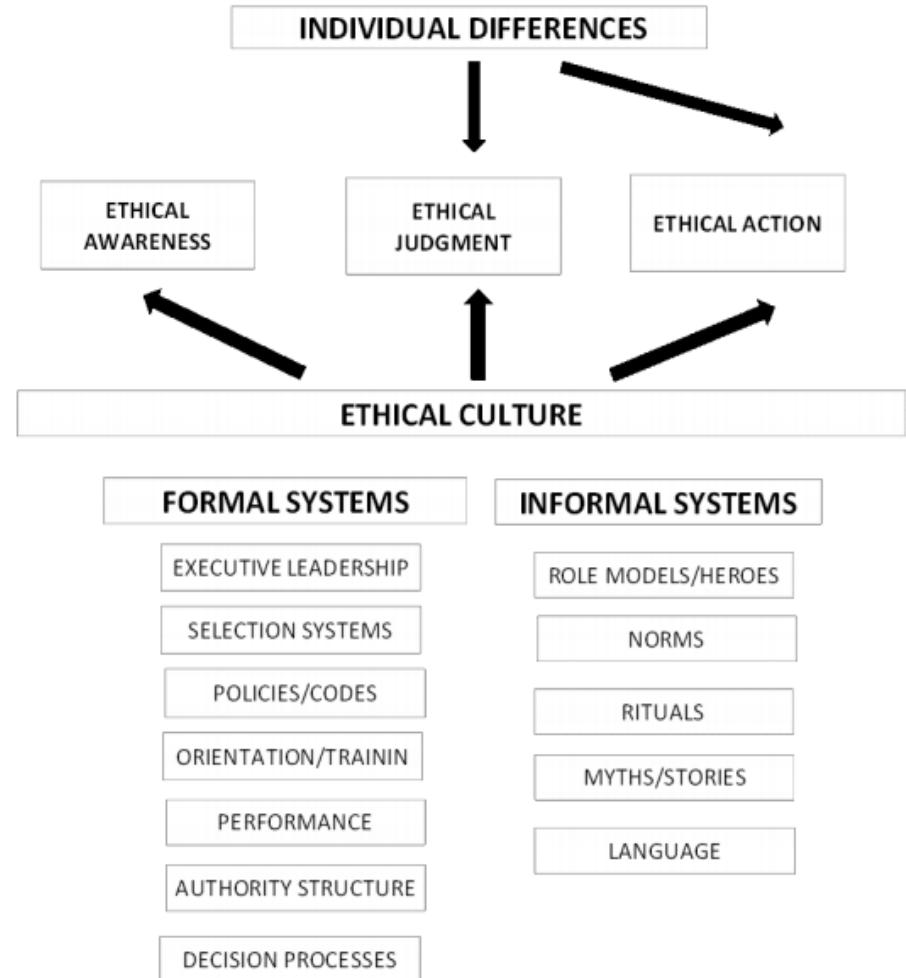


Something may be legal but we may consider it unacceptable.
We may consider something right but it may not be legal.

Typically, the law tells us what we are prohibited from doing and what we are allowed to do. It is said that the law sets minimum standards of behaviour while ethics sets maximum standards

Ethics

- Ethical decision making is a key consideration to the management of innovation and technology.
- It goes to values and principles
- Relates to the
 - Individual
 - impressionable, self interest, conscious/ unconscious bias, integrity, judgement
 - Situation
 - perception of, time frame for
 - Environment
 - societal / employment pressure



As Engineers



Our Code of Ethics

Our Code of Ethics defines the values and principles that shape the decisions we make in engineering practice.

Our Code of Ethics

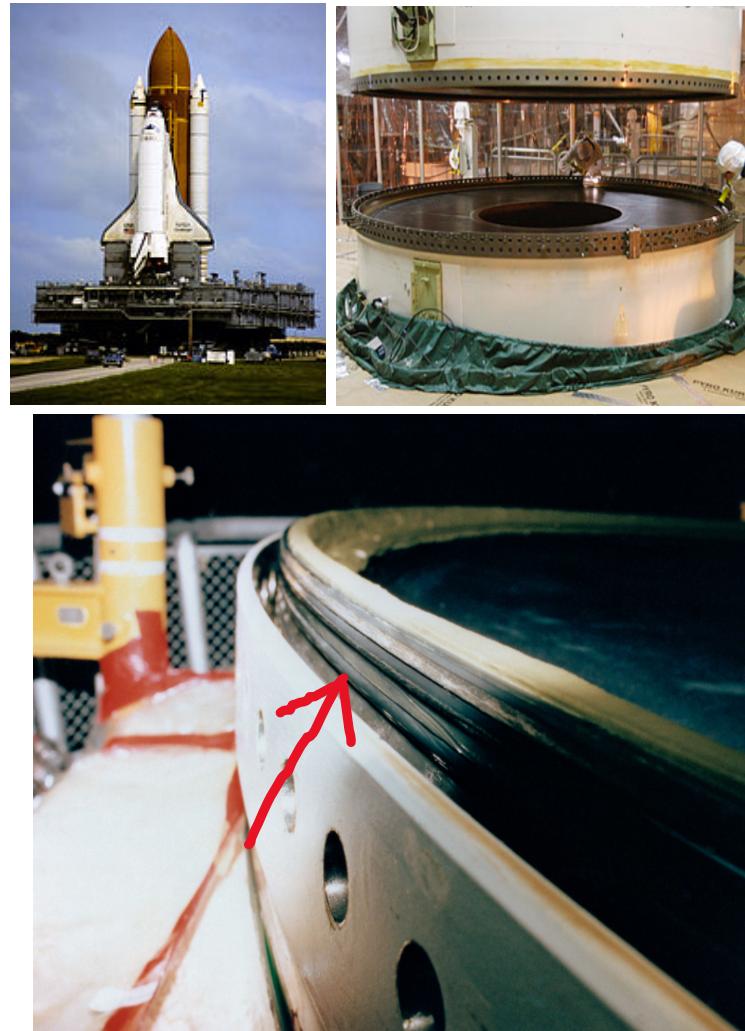
As engineering practitioners, we use our knowledge and skills for the benefit of the community to create engineering solutions for a sustainable future. In doing so, we strive to serve the community ahead of other personal or sectional interests.

In the course of engineering practice we will:

- ① Demonstrate integrity**
- ② Practise competently**
- ③ Exercise leadership**
- ④ Promote sustainability**

Case Study: Challenger Disaster 1986

- Environment:
 - Cold war: competition with Russia
 - Space station scheduling
 - Delays in a number of launches – added political pressure
- Temperature on launch was a key consideration for the 'o' rings on the solid rocket boosters.
 - 53 °F (~12 °C) 22°F (-6 °C)
- The VP of engineering was pressured to change his mind and *"Take off his engineering hat, and put on his management hat."*
- https://www.youtube.com/watch?v=QbtY_WI-hYI



Discussion

- What could NASA management have done differently ?
- How about the Thiokol team ?
- What do you see as your future engineering professional responsibilities in relation to both being loyal to company decisions /management and protecting the public welfare ?

ASSESSMENT 3.

Assessment 3 (i)

- **Weighting of final grade:** 20%
- **Related course learning outcomes:** 3
- **Presentation date:** in class Week 12
- **Groups:** Consistent with OENG1117 – note Canvas announcement
- **Assessment description:** You will work with your group members to develop and present a compelling presentation pitch which outlines and defends the integration of an innovation or new technology into an engineering project

NOTE: Note this “group assessment” follows the “individual assessment” as in previous years there was high similarity between students for the individual assessment task when it was reversed.

NOTE: Your Group’s first key task is to decide on which of the three Course projects you will pitch on

Assessment 3 (ii)

Assessment detail: Based on one of the Course projects your group will prepare a convincing, focused and polished 5 min presentation pitch for managing the integration and on-going management of a technology or innovation. Your group will be prepared to field 5 min approx. of questions (total time: presentation + questions = 10 min approx). It is critical that you work as an effective group to prepare for and defend the presentation.

- Your group will:
- Select and give a succinct overview of the technology or innovation
- Convincingly but succinctly outline a value proposition for its introduction into the project selected
- Describe how you will manage key stakeholders
- Outline your proposed process to mitigate risk and metrics to support value creation (successful integration) or to identify failure

Assessment 3 (iii)

Presentation style:

- The presentation will take strictly no more than 5 min. There will be a further 5 min (approx) of questions by the examiners
- Slide one will provide:
 - Presentation Title
 - Group members including student numbers
 - One sentence on each group member's contribution.
- Each presentation will have 3 slides (including Slide one above) and no more than 2 presenters (questions should be predominately fielded by team members that did not present)

Process

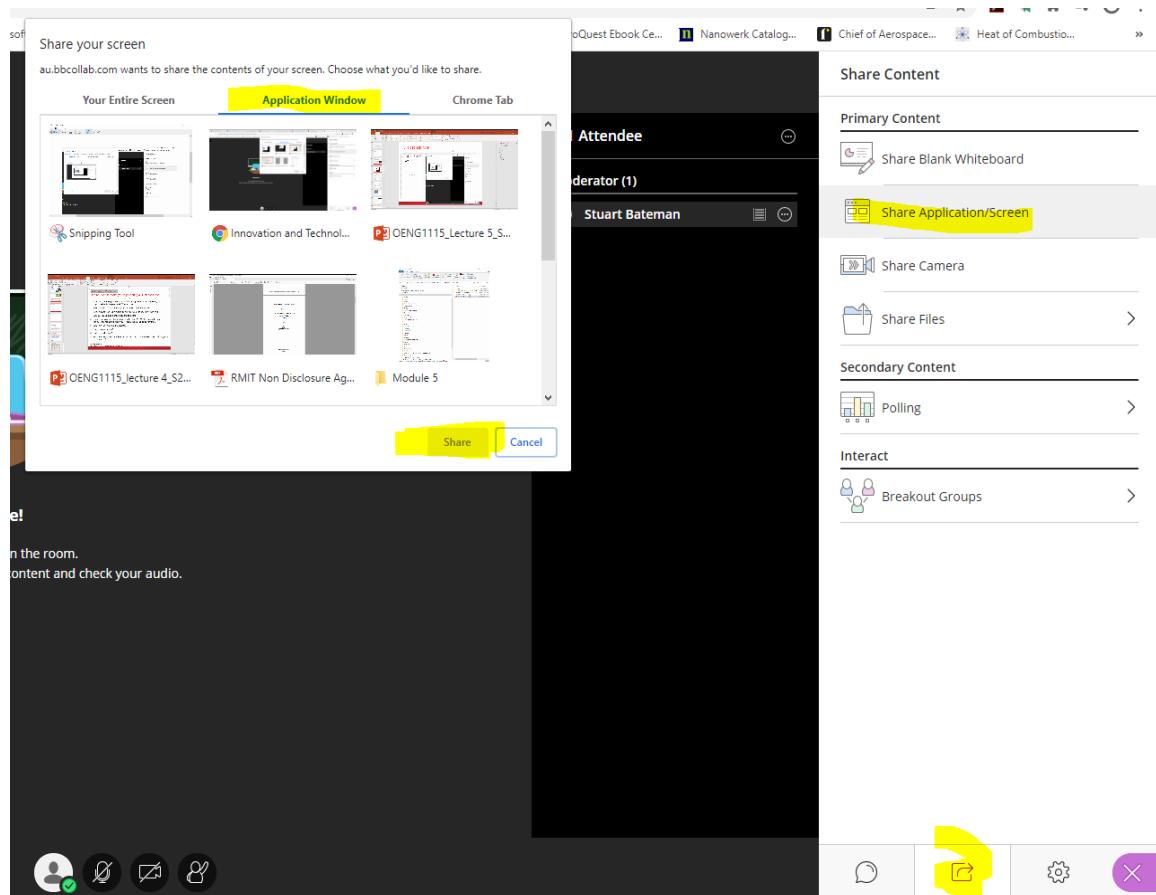
Different to previous years:

- I will provide Group time slots so that you have certainty on when you will present and the assessment process is efficient.
- The session will be recorded
- You will nominate one team member to share the presentation using Collaborate Ultra
- At your time slot your group will come off mute and onto video and I will make your nominated team member the “presenter” so that they can share the presentation - this need not be the actual “speaker” but it could be.
- Following the presentation the entire team will field some questions.

Team member controlling the slides

Process

- Have your presentation open
- After I make you a presenter
- In Collaborate Ultra:
 - Click: ‘share content’ icon
 - Click: share application
 - Click: application window
 - Click: your presentation in the open files
 - Click: ‘share’



Assessment 3 - Rubric (i)

Maximum Marks	Marks Awarded	Minimum Marks
<p>Format:</p> <p>The presentation was:</p> <ul style="list-style-type: none"> Followed the instructions provided. Was on-topic, logically set out, and provided clear relevant information. Aides (eg slides) were effective and interesting. Text, tables and figures were easy to read. 	<p>1 1 1 1</p> <p>3 Marks in total possible</p>	<p>The presentation was:</p> <ul style="list-style-type: none"> Off-topic Poor quality design, no logical format, confusing Presentation aides were non-existent or not effective. Not sufficient pictures/graphics, too many words—too small font
<p>Content:</p> <p>The presentation was:</p> <ul style="list-style-type: none"> On-topic clear, well-structured, justified, considered and argued relevant to the project selected and convincing Made reference to theory/models to support decisions made Considered limitations, constraints and benefits & provided innovative contributions Considered technological, practical and organisational, external factors Provided information at the appropriate level 	<p>1 1 1 1 1 1 1 1 1</p> <p>10 Marks in total possible</p>	<p>The presentation was:</p> <ul style="list-style-type: none"> Ill-considered, not well-justified, not convincing Off-topic Provided little or no consideration of the project constraints, external issues No reference to theory/models or deep thought process to support decisions made or entire proposal Did not answer all components of task

Assessment 3 - Rubric (ii)

Style & Performance:		
<ul style="list-style-type: none">→ Evidence-of-effective-group-work-and-acknowledgment-of-contributions→ Clear, interesting and effective presentation style→ On-time-and-no-hick-ups→ Convincing-and-polished	1 1 1 1	1 <ul style="list-style-type: none">→ Ineffective-team-work→ Off-topic, presentation was-read...→ Unprofessional-and/or-distracting-behaviour, not-interesting-/clear-/convincing-to-the-audience.→ Poor-time-keeping→ Technical-difficulties-(not-tested-first)
	3 Marks in total possible	
Questions:		
<ul style="list-style-type: none">→ Questions-were-answered-succinctly,- logically-and-effectively→ Evidence-of-deep-thinking-and-wide-reading-to-the-support-presentation→ Team-was-coordinated-and-organised—members-knew-who-would-answer-which-type-of-question, team-supported-each-other	1 1 1 1	1 <ul style="list-style-type: none">→ Questions-were-not-answered-or-poor-confusing-off-topic-and-distracting-answers-provided→ No-evidence-of-academic-insight-into-the-work-presented, questions-were-not-taken-seriously→ Team-was-uncoordinated-and-disorganised-in-responding
Overall score:		/20

COMMENTS:

Additional tutorial next week ?

- We recognise many are focusing on Assessment 2 at this time
- We propose to run an additional tutorial to focus on Assessment 3
- Opportunity to ask questions and seek advice specifically on this task
- Run for 60 to 90min, Thursday 8th October at 4pm
- Do you want this ?? Yes or No Poll



Making A Presentation Pitch



SOME HINTS

Introduction

- Ultimately we are always pitching ideas and concepts to convince others.
- A pitch is a conversation between you and your audience
- What makes you believable ?
- How do you best articulate your value proposition and convince others ?
- *Heilmeier Catechism* could assist you



Aspects To Consider Including

- Frame up the problem or opportunity
- What is your hook to get the audience interested
- Succinctly outline the compelling and differentiated solution
- How will you do it: your business model
- Why will you succeed
- What you want - what will you deliver in return & when.



Know your Audience.....

- What are they thinking, what matters to them ?
- How painful is the issue or how large is the opportunity ?
- What else is out there ?
- Is your concept easy to understand ?
- Does this make economic sense ?
- How long will this take ?
- Do I believe you / does this sound plausible ?
- Do I know enough to convince others / and/or make a decision?



Presentation tips

- Be interesting and visual - audience becomes bored easily
- Use clear and precise language
 - Its quite difficult to explain a concept in simple terms..... rehearse
 - Are you using language appropriate for the audience?
 - Don't talk too fast
- Careful of body language, look forward and do not read the slides or notes
- Think about the slides – not too much writing, font size appropriate, a picture tells a thousand words.
- Its okay to be nervous, use it to your advantage
- Review some brief TEDTalks for inspiration



Prepare for Question and Answer

- Group members not speaking should field questions
- Anticipate what you will be asked and be prepared to address the questions with your team
- Be clear and concise – no waffle
- Do you know the relevant statistics, support information?
- Can you plant seeds in your presentation pitch for follow up by the audience
- If you really don't know, be careful about making up an answer.



2020 Semester 2 Course Experience Survey (CES)

We value your feedback

Your feedback is valuable

- Every semester, we ask students to give us feedback on what works well and what needs to be improved
- It's called the Course Experience Survey (CES) and it helps us improve teaching, course design and content for you
- It takes about 10 minutes to complete online



For those cynics out there...

- The CES matters – it's part of making sure we're doing a good job
- The CES works – it has delivered a lot of improvements to what we do
- It helps you and those who come after you
- It helps us



Your feedback has an impact

Examples of changes made from student feedback:

- Reduced group sizes
- Updated and more relevant content and examples
- Improved class format
- Improved lab tasks
- Changes in assessment



When is it happening?

- The CES is run each semester
- Semester 2, 2020 CES dates:

Start: 21st September

End: 18th October



There are 3 options to access the survey

1. Find the survey link in your student inbox

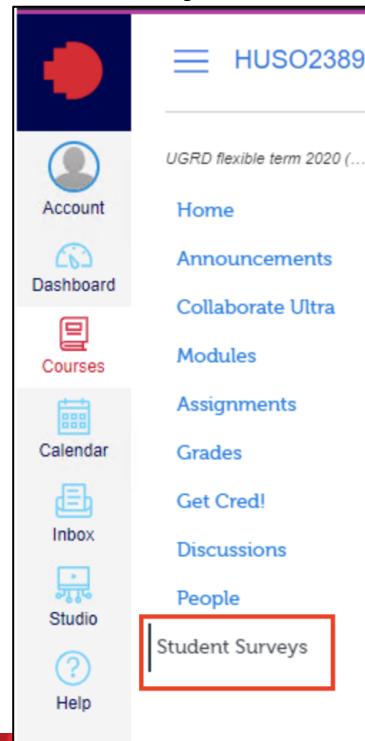
Sender: RMIT Student Feedback Team <surveys@rmit.edu.au>

Subject: Course Experience Survey – tell us about your course

Click link in email

2. Access via Canvas

- Select **Student Surveys**

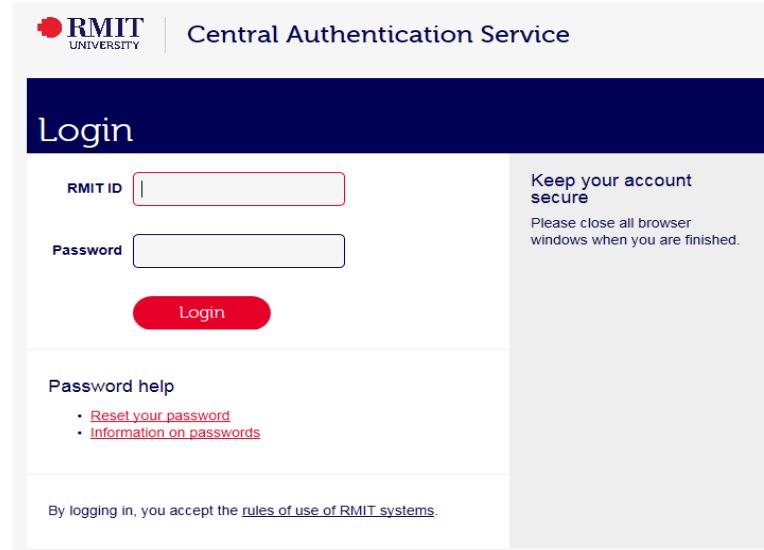


There are 3 options to access the survey (Canvas)

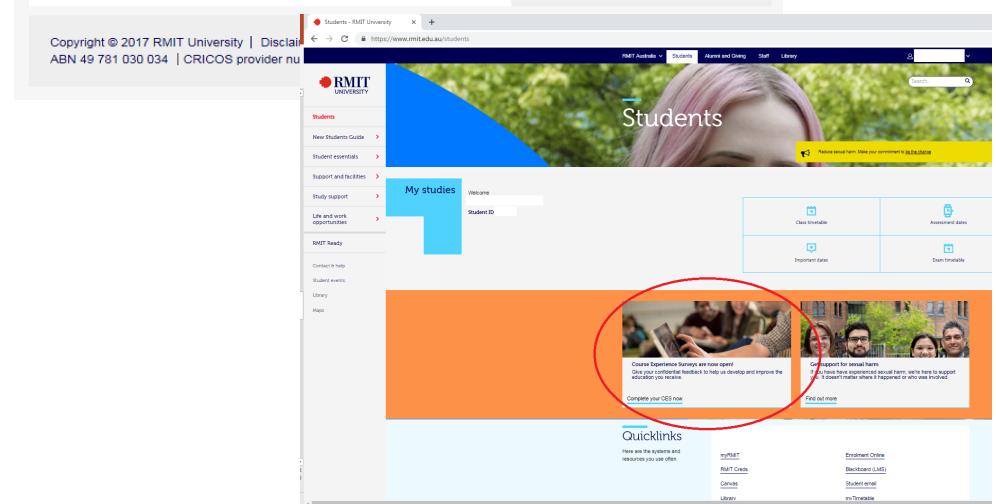
3. Access via

<https://surveys.rmit.edu.au/Blue/>

Student login is required



The image shows the RMIT Central Authentication Service login page. At the top left is the RMIT logo and the text "Central Authentication Service". Below that is a dark blue header with the word "Login" in white. The main form has two input fields: "RMIT ID" and "Password", both with placeholder text. To the right of the password field is a sidebar with the heading "Keep your account secure" and the instruction "Please close all browser windows when you are finished." Below the input fields is a red "Login" button. Underneath the button is a "Password help" section with links to "Reset your password" and "Information on passwords". At the bottom of the page is a note: "By logging in, you accept the [rules of use of RMIT systems](#)".



The image shows a screenshot of the RMIT University Students website. The URL in the address bar is https://www.rmit.edu.au/students. The page features a navigation menu on the left with sections like "Students", "Support and facilities", "Study support", "Life and work opportunities", "RMIT Ready", "Contact & help", "Student events", "Library", and "Maps". The main content area has a large image of a student and several call-to-action boxes. One box is circled in red and contains the text: "Course Experience Surveys are now open! Give us your feedback to help us develop and improve the education you receive. Complete your CES now". Another box below it says "Get support for sexual harm" and "Here are the systems and resources you use often". At the bottom, there's a "Quicklinks" section with links to myRMIT, RMIT Credits, Concourse, Library, Enrollment Online, Blackboard (LMS), Student email, and mTimetable.

Course In Summary



Course in Summary

- **Module 1:**
 - Course introduction
 - 101: key concepts: tech push/pull, tech S-curves, tech roadmaps, value proposition, SWOT analysis, risk/reward
- **Module 2:**
 - [Richard Taube](#) (FORD), Light Vehicle Emissions Project
 - [Christopher Wong](#) (Dept. of Transport), Rolling Stock Project
 - [Marcos Anastassiou](#) (RMIT), Road – Rail Separation Project
 - Work Place Culture
- **Module 3:**
 - Intellectual property ([Dr Hishani Prabaharan](#): CSIRO)
 - Deep Dive into innovation and technology strategy across its lifecycle
- **Module 4:**
 - Organisational approaches to innovation and technology management
 - Business planning, lean start up and mounting a business case
- **Module 5:**
 - Working with Others : Confidentiality and Non-Compete
 - Ethics
 - Presentation Pitch

Why Manage Technology and Innovation....

- Strategy to add value or to create wealth
- Competitive advantage (triple bottom line - \$, social, environmental)
 - new products and services to meet a need
 - more efficient production of products and services
- Mechanism to deal with uncertainty
 - both internal (overcome problems, market failure/entry) and
 - external dynamics (what are competitors or new entrants doing)
- Consider unintended negative outcomes.....change, social issues
- Doing new things is difficult and risky.
 - management is required to realise benefit whilst minimizing risks– strategies to mitigate risk are a key.

Organisations

Larger organisations tend to

- have sophisticated processes
- manage innovation & technology carefully
- develop and introduce new technologies systematically
- mitigate risk & brand damage

Start-ups and smaller organisations tend to

- be more agile – less process driven
- shorter innovation cycle time
- move rapidly to capture opportunity – first to market
- have a greater risk tolerance
- Test the market, pivot or iterate

Work place culture

Its about patterns of workplace norms:

- Behaviour
- Feelings
- Thinking
- Believing



CULTURE
EATS STRATEGY
FOR BREAKFAST
AND TECHNOLOGY
FOR LUNCH
AND THEN...



Work place culture impacts innovation potential:

- Do the workplace leaders and staff embrace innovation ?
- How does it deal with failure ?
- How does it deal with success ?
- How does it make choices?Ethics is a key consideration

Level of innovation

High Risk

System



New model
Car

Low Risk

Component



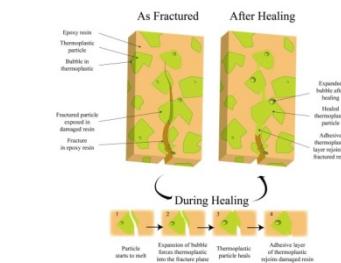
Improved
Components

Incremental

Low Risk



Digital
Camera

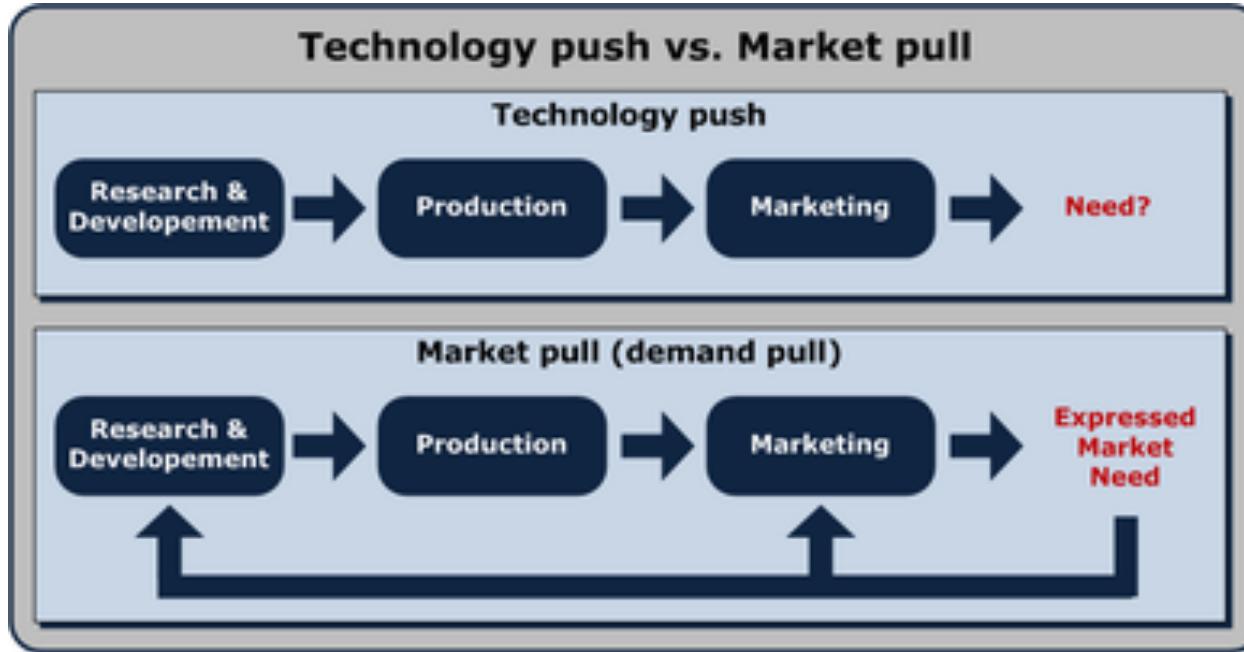


Functional
Material

Radical

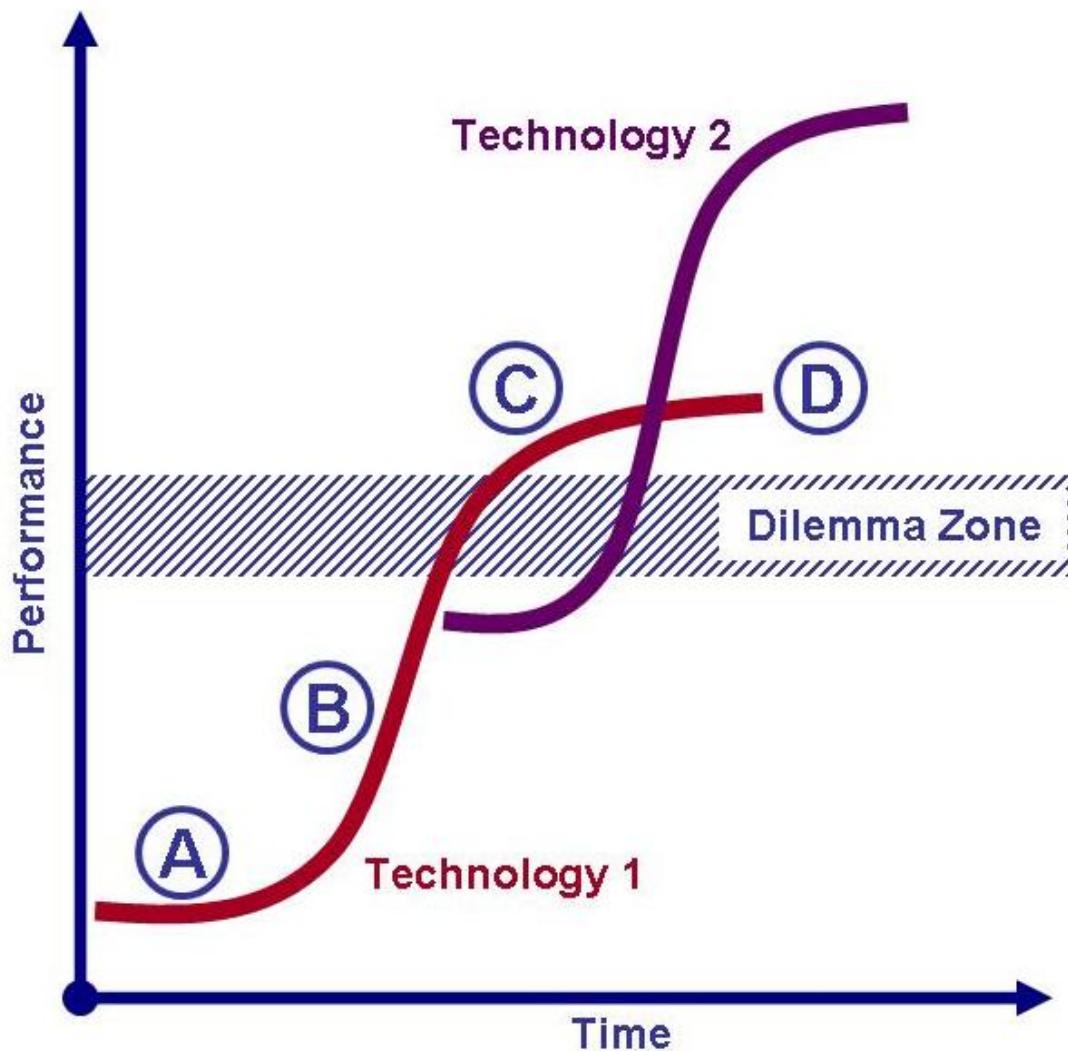
High Risk

Technology Push or Market Pull Drivers



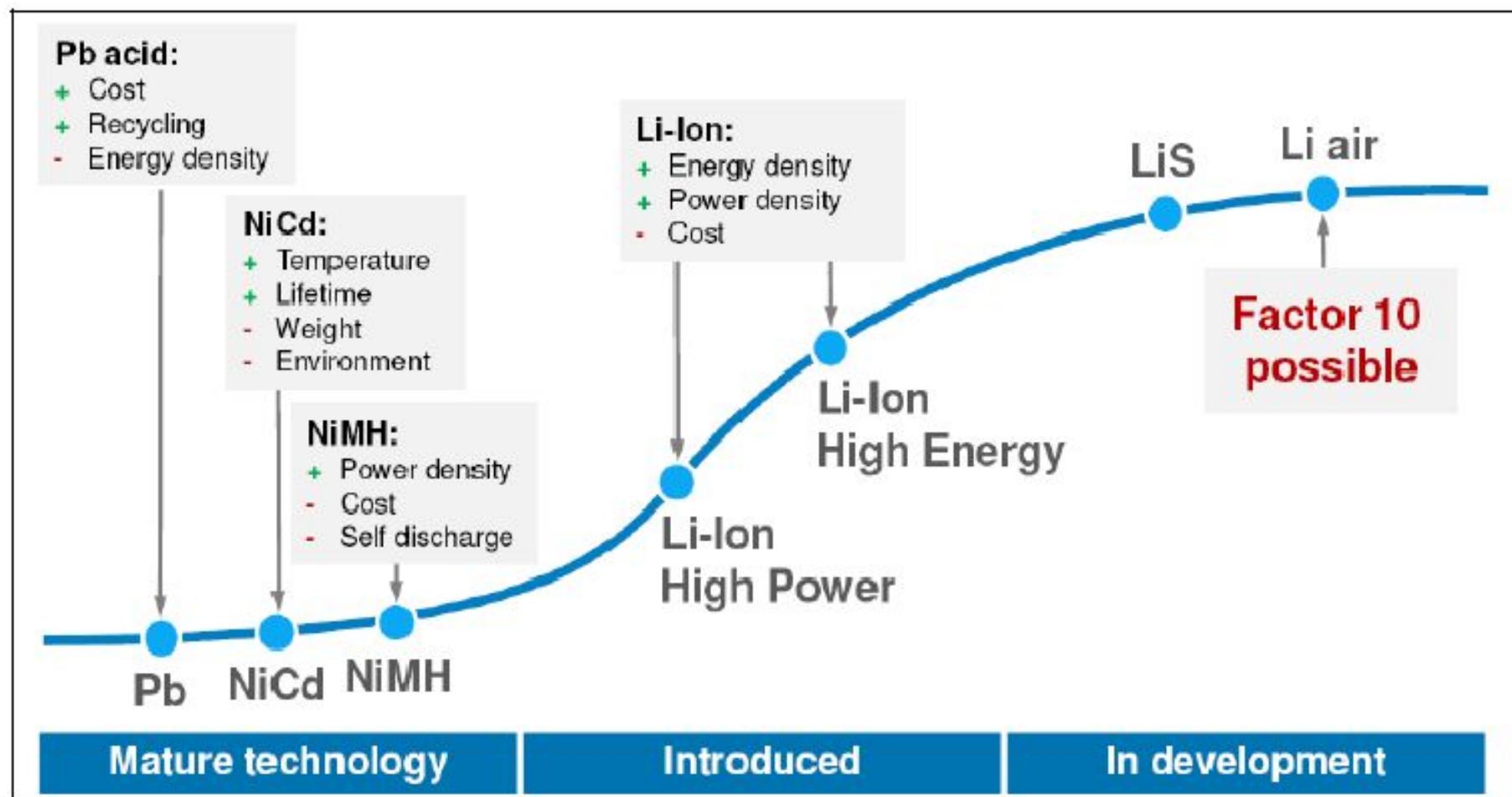
- Often organisations will test the market prior, during and/or following the development of technologies
- “Voice of Customer” – could be internal customer as well as external

Technology Life Cycles: Recall The Kodak Example



Technology Roadmap – Eg: Battery Technology

Battery technology roadmap



Long Term Technology Strategy

- Goal is to achieve:
 - An enduring competitive advantage (triple bottom line)
 - Long term business viability and ‘success’.

According to Rieck and Dickson: there are six key elements:

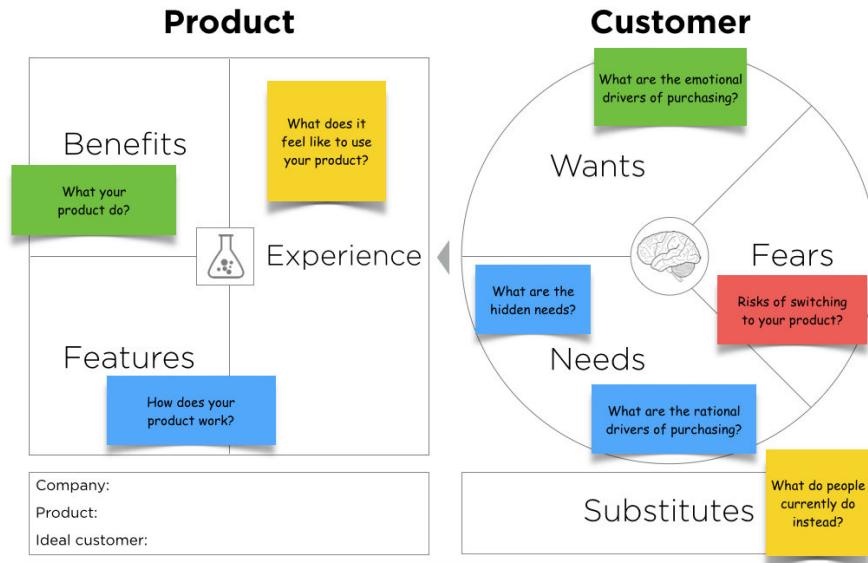
1. Setting horizons (*what industry do we want to be in into the future*)
2. Industry forecasting (*where is that industry segment heading*)
3. Technology positioning (*what technology {capability} will we need to reach our goals*)
4. Technology availability (*where will we source it:- ‘make’ or ‘buy’*)
5. Appropriating technology (*how will we best integrate the technology*)
6. Managing technology (*how will we manage our technology {portfolio} within our business, comply to standards now and future*)

Value Proposition

In a nutshell, value proposition is a clear statement that

- explains how your offering solves problems or improves the situation (relevancy),
- delivers specific benefits (quantified value),
- tells the stakeholder why they should take this action from you and not (another approach) from the competition (your differentiation).

Value Proposition Canvas



SWOT Analysis

A SWOT analysis could be one element of a value proposition (or a business case)

Strengths

- Capabilities
- Competitive advantages
- Resources, assets and people
- Experience, knowledge and data
- Financial reserves, returns
- Marketing, reach
- Innovative aspects
- Location, geographical
- Price, value and quality
- Processes, systems, it, communications
- Advantages of proposition

Weaknesses

- Lack of capabilities
- Gap in competitive strengths
- Reputation, presence and reach
- Timescales, deadlines and pressures
- Financials
- Cash flow, cash drain
- Continuity, supply chain
- Effects on core activities
- Reliability of data, plan and project
- Management cover & succession

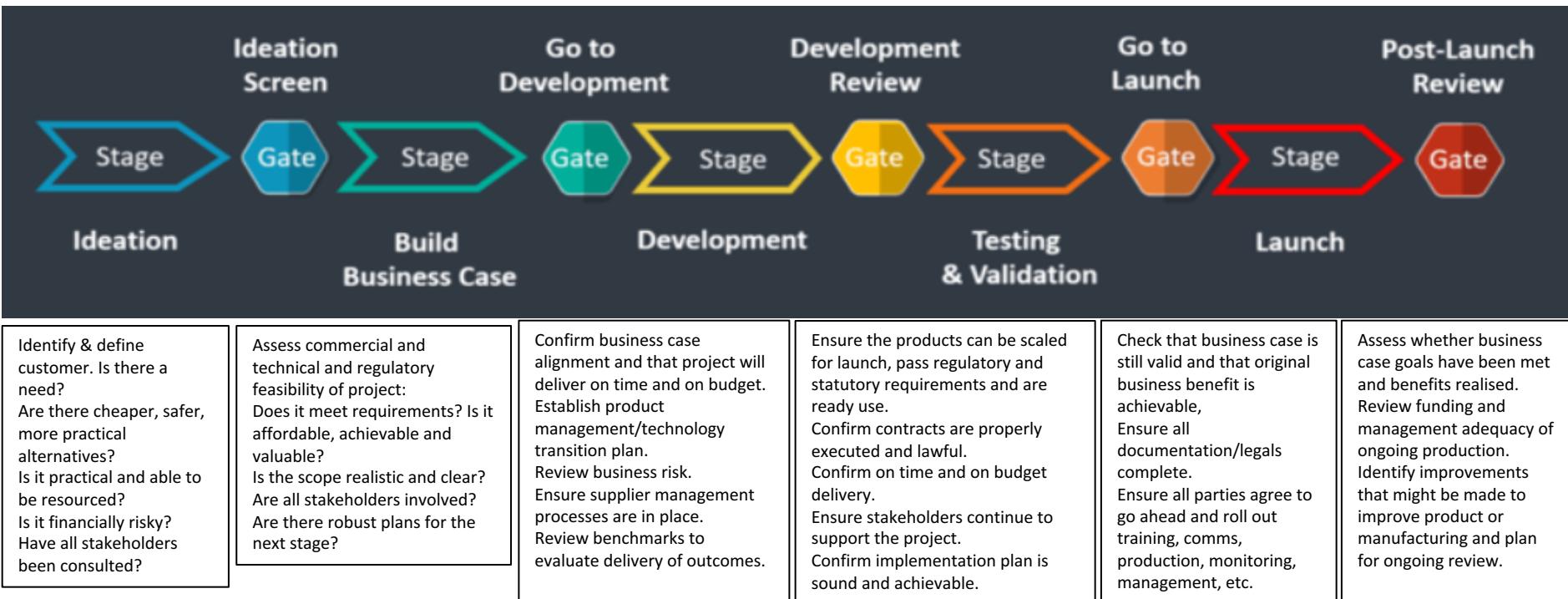
Opportunities

- Market developments
- Industry or life style trends
- Innovation and technology development
- Global influences
- Market dimensions, horizontal, vertical
- Target markets
- Geographical import, export
- Major contracts, tactics and surprises
- Business/product development

Threats

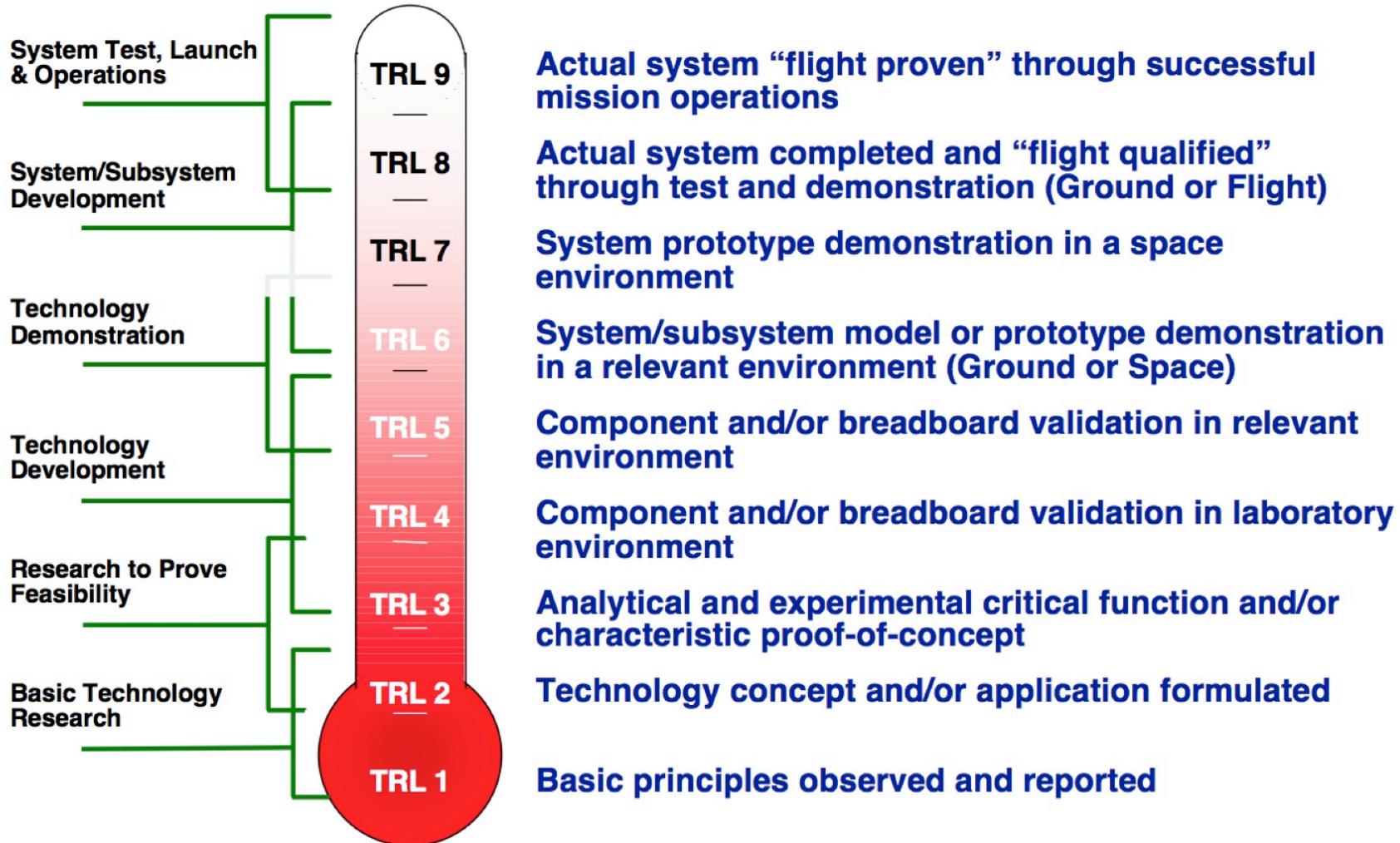
- Political and economical effects
- legislative effects
- environmental effects
- Competitive intentions
- Market demand
- Innovation in technologies, services and ideas
- New contracts and partners
- Loss of resources
- Obstacles to be faced
- Poor management strategies
- Economic condition home, abroad

Project: Gated Process Decisions – Go/No Go.....Decision Gates Reduce Risk.....





NASA/DOD Technology Readiness Level



George Heilmeier's Catechism

DARPA (USA Defence Advanced Research Projects Agency)

- What are you trying to do? Articulate your objectives using absolutely no jargon. What is the problem? Why is it hard?
- How is it done today, and what are the limits of current practice?
- What's new in your approach and why do you think it will be successful?
- Who cares?
- If you're successful, what difference will it make? What impact will success have? How will it be measured?
- What are the risks and the payoffs?
- How much will it cost?
- How long will it take?
- What are the midterm and final "exams" to check for success? How will progress be measured?

Management of Intellectual Property

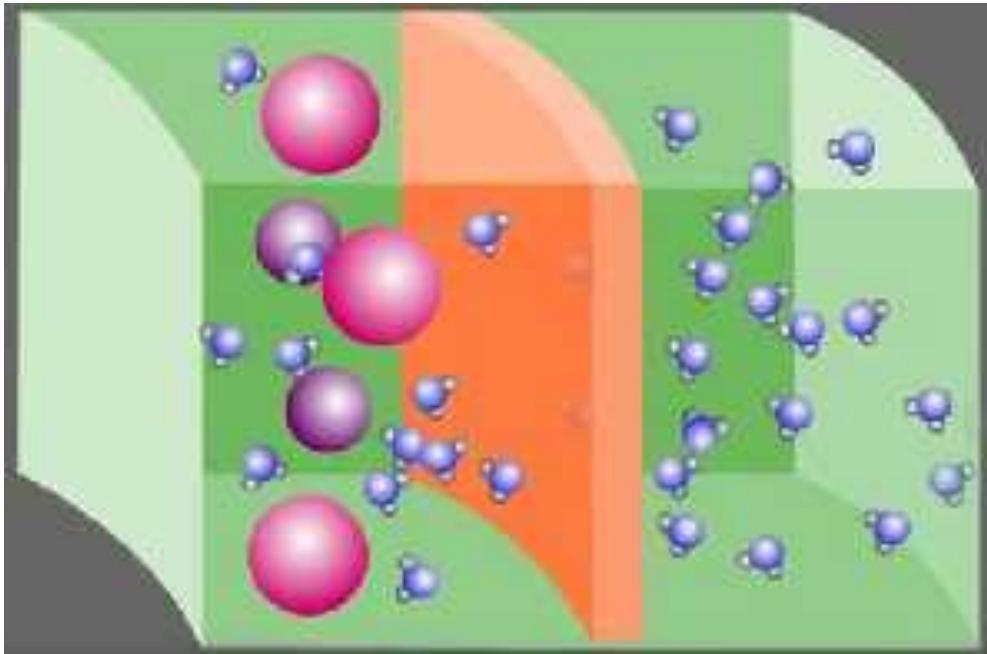
- Patents - need to identify what is:
 - Novel (new)
 - Inventive (non-obvious)
 - Useful (has a purpose)
- Patents are granted ***in return for disclosure*** of the invention
- Patent costs can be significant over the life of the patent and are ultimately disclosed
 - Trade secret may be a better approach
 - Requires confidentiality maybe non-compete
- Patents are a part of the company assets
 - Revenue can be earnt from patents for example through licensing agreements
 - Patents can provide you with a competitive advantage and a key consideration for investors

Closed Approach To Innovation



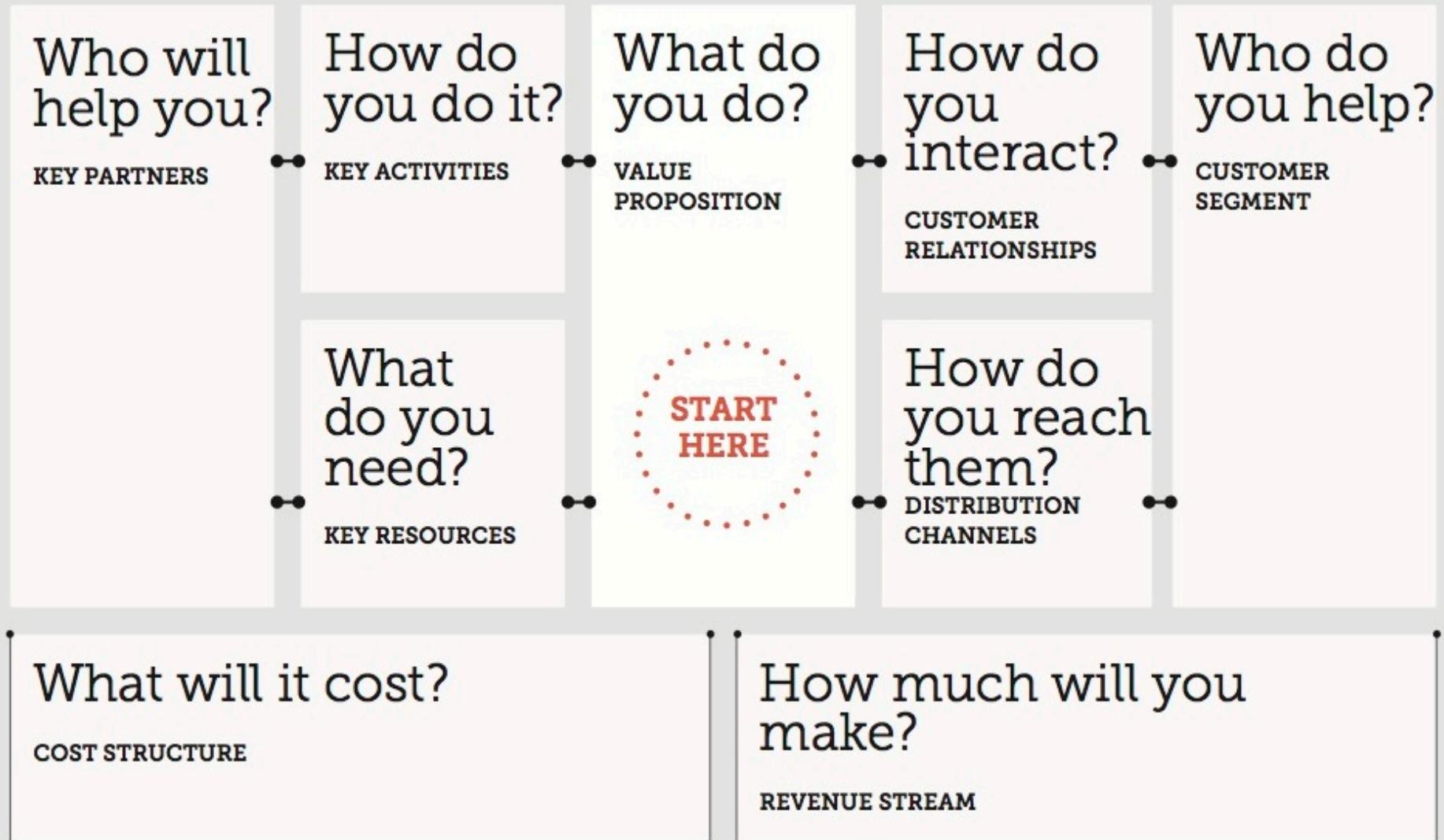
- Focus innovation internally
- Have the majority of capabilities and facilities located internally
- Trade secrets

Open Approach To Innovation



- Recognition that:
 - Competitive advantage may require technologies and skills outside of their organisation
 - In-house technologies may have application outside their primary markets
- Requires more sophisticated organisations and systems

Business Canvas: Planning all on one page

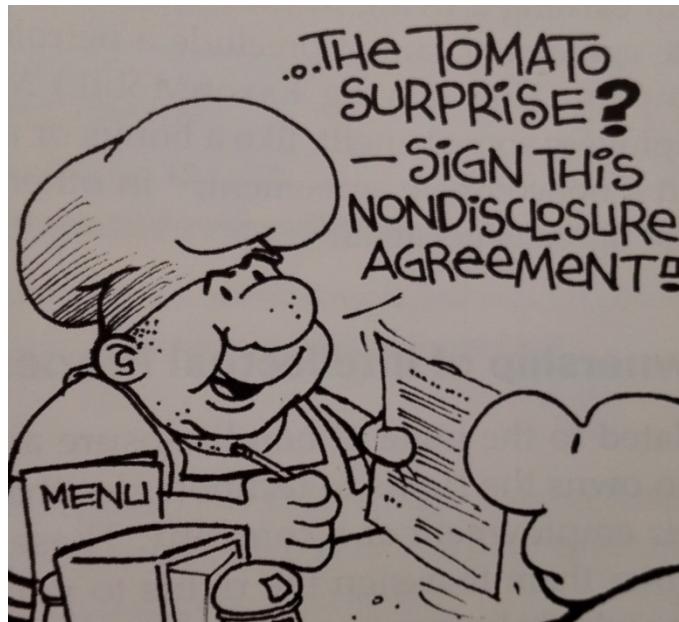


Mounting a Business Case

- A business case is an extension of developing a value proposition.
- Comprehensive case for why change is warranted
- Articulates what is being proposed with reference to alternative options (including do nothing) – its value proposition
- Demonstrates how the proposal supports the overall business goals and is cost effective, safe sustainable and achievable
- Identifies who is responsible and stakeholders interested (both internal and external)
- Documents when eg: a timeline and what is next as a technology roadmap



Confidentiality & Non-Compete Agreements



"Upset at you for breaching the non-compete? Of course not."

Ethics and Professionalism



Our Code of Ethics

Our Code of Ethics defines the values and principles that shape the decisions we make in engineering practice.



In the course of engineering practice we will:

- ① Demonstrate integrity
- ② Practise competently
- ③ Exercise leadership
- ④ Promote sustainability

