From Blue Skies to Wicked Problems: Using Foresight to Design Your Use Case For Real-World Implementation

June 26, 2025. 8:00pm to 10:00pm

By Clarissa Ai Ling Lee

Clara Yun Fontaine

Day 1 Recap: Embedding responsibility in the use-cases and the ecosystem

- We care about responsibility because of massive global investments, potentially transformative use-cases, and the risks of perpetuating existing harms
- The time is now – early-stage development means more control over impacts
- The SEA of responsibility: Safeguarding, Engaging, Advancing
- ASEAN needs to take ownership – what do we want quantum to be for us, and how will we do it with our own hands?
- Actions towards responsibility will need to push back against the global forces of irresponsibility

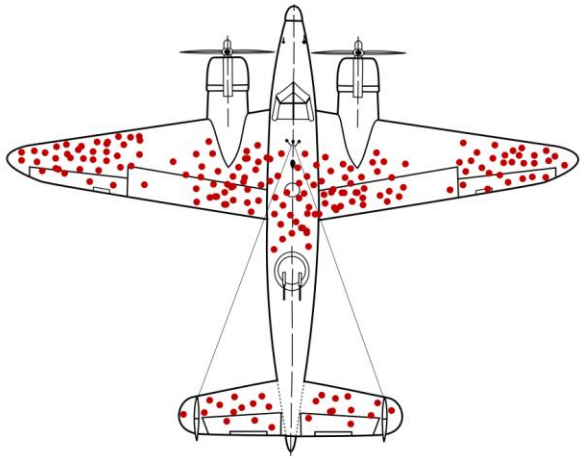
Design Thinking

Desirability
Feasibility
Viablility

Start with a Problem

Brain Teaser: Statistician Abraham Wald (1902-1950) was tasked with working on World War II Problems. One of the tasks he was handed was to find out where to add extra armour to the war planes. He plotted the locations on the outline of the plane. As data accumulated, the outlines filled up. Wald finally had his answer. What did you think was the answer?

Wald said: Put the armor in the few spots with no bullet holes as that where the bullets hit the planes that never made it back.



THE POWER OF DIVERGENT THINKING

The Power of Design

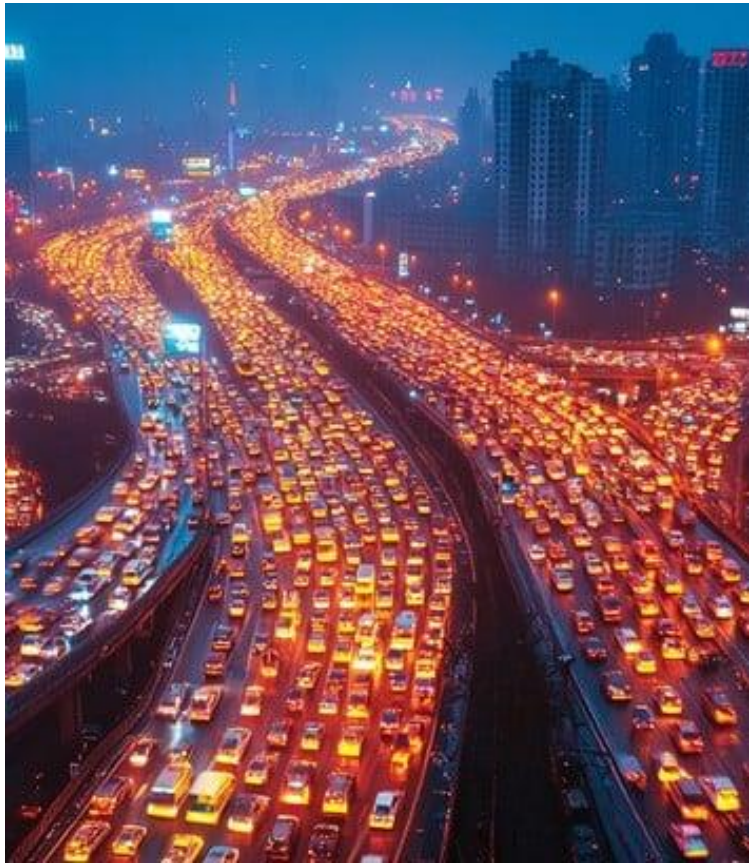
Credit to : Larry C Price and OpenArt

Ideal Problems for Design Thinking

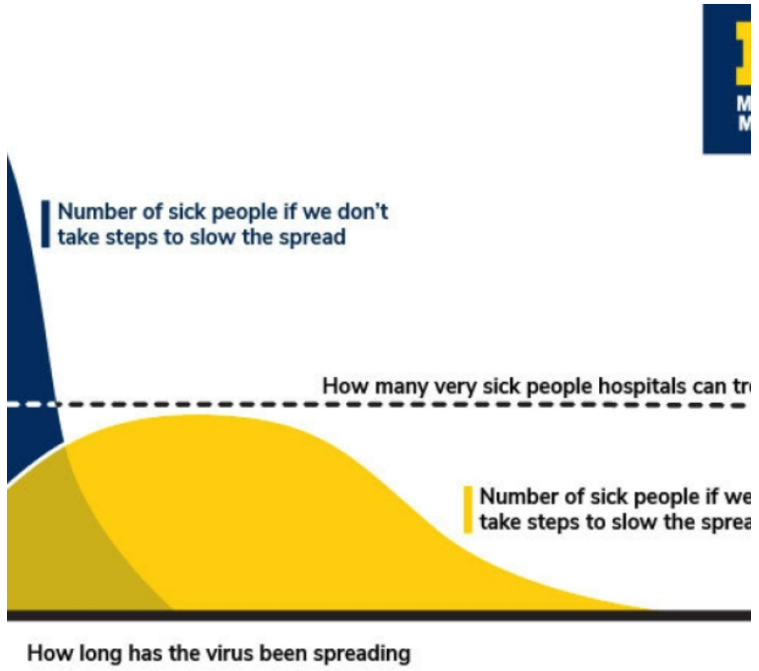
- Novel
- Multidisciplinary and multisectoral
- Disruptive
- Human-Centered
- Ill-Defined
- Complex

ALL WICKED PROBLEMS

Flood



Traffic



Covid-19

Wicked Problems

Not every solution is found in Design! Nor could design solve every problem

If the problem is just about patching over a temporary abnormality.

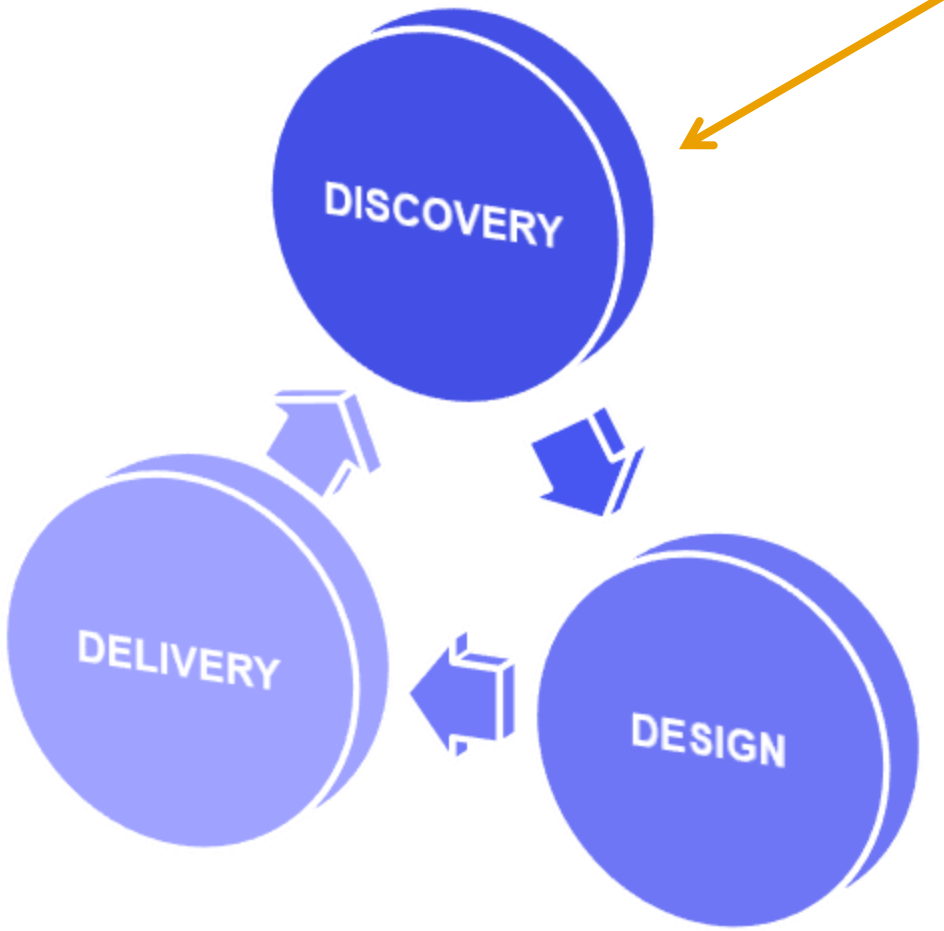
If the problem involves human behaviour.

Future problems and black swan situations.

Cannot solve a problem completely or prevent a problem from recurring.

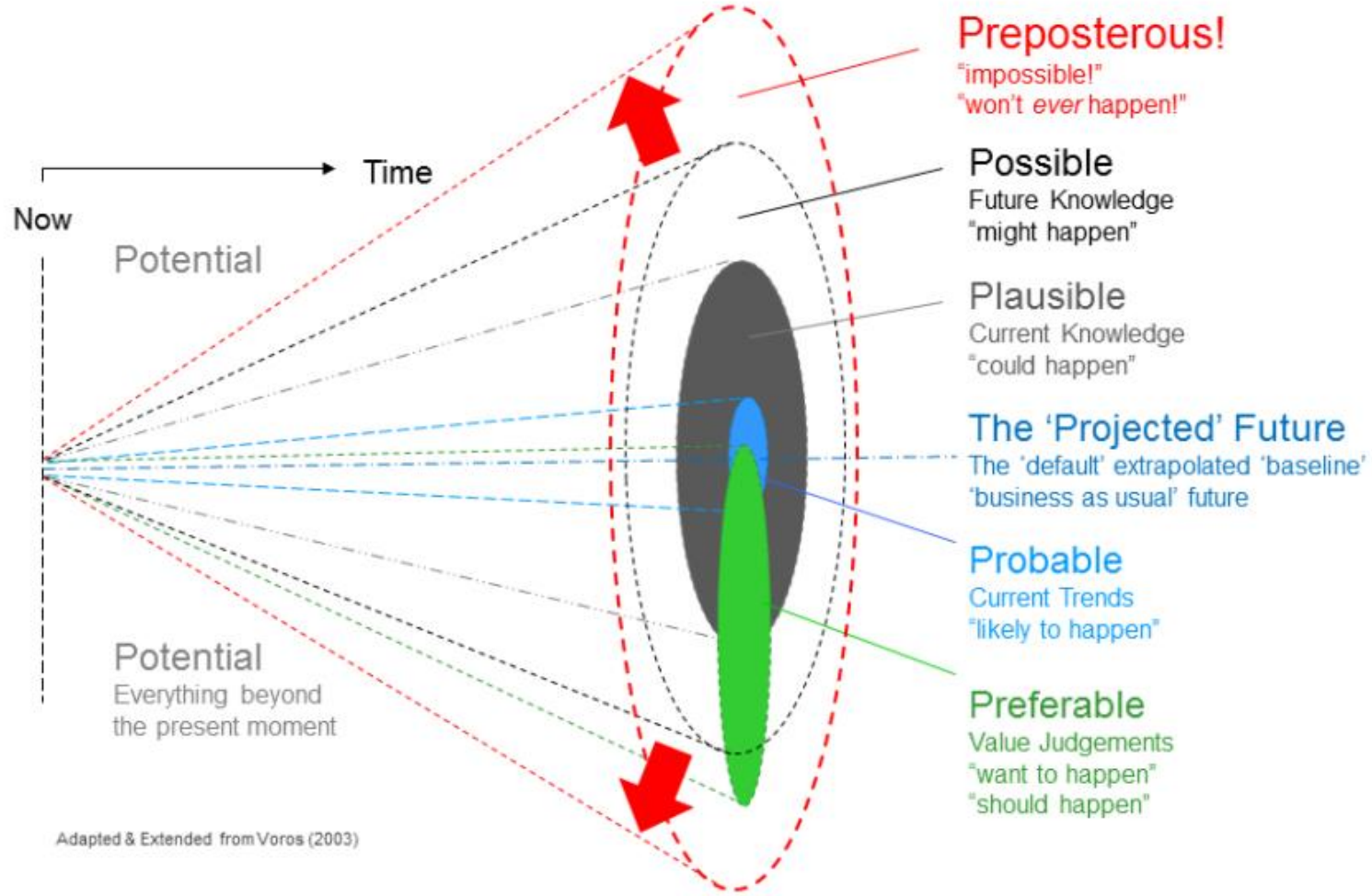
Phases of Design Thinking

Our Focus Today



Reinventing the Wheel

Voros's Future Cone (2017)



SUSTAINABLE DEVELOPMENT GOALS

Scan the QR code to access Day 2 folder for today's activities.

Activity 1

- Go back to the slides you created yesterday as you will be porting what you have done there over to today's activity.
- Go to the folder for Day 2 and create fresh slides using your group's name. You can title your slides "The Future of Quantum Tech" and include your breakout room number in the byline.
- Using what you have done yesterday, create a slide that you would divide into four quadrants. On each quadrant, write "possible", "plausible", "preferable" and "probable". Based on what was done yesterday, which ones do you think should go into which? The idea could appear more than once. **Work with no more than a maximum of two ideas.**
- **Examples on how you do this:**
  - **For use case A, under circumstance B, will be plausible because of conditions X. At the same time, it is a preferable outcome if we want to achieve SDG 10.**
  - **For use case A, under circumstances C, it will be probable because of Y. However, this probability does not lead to a preferability because of Z.**

- Spend only 8 minutes doing this – so do this as fast as you can!

Scaling blue-sky projects

Diminish the negative and augment the positive

Scalability of impact (what does it mean for the world to have this outcome)

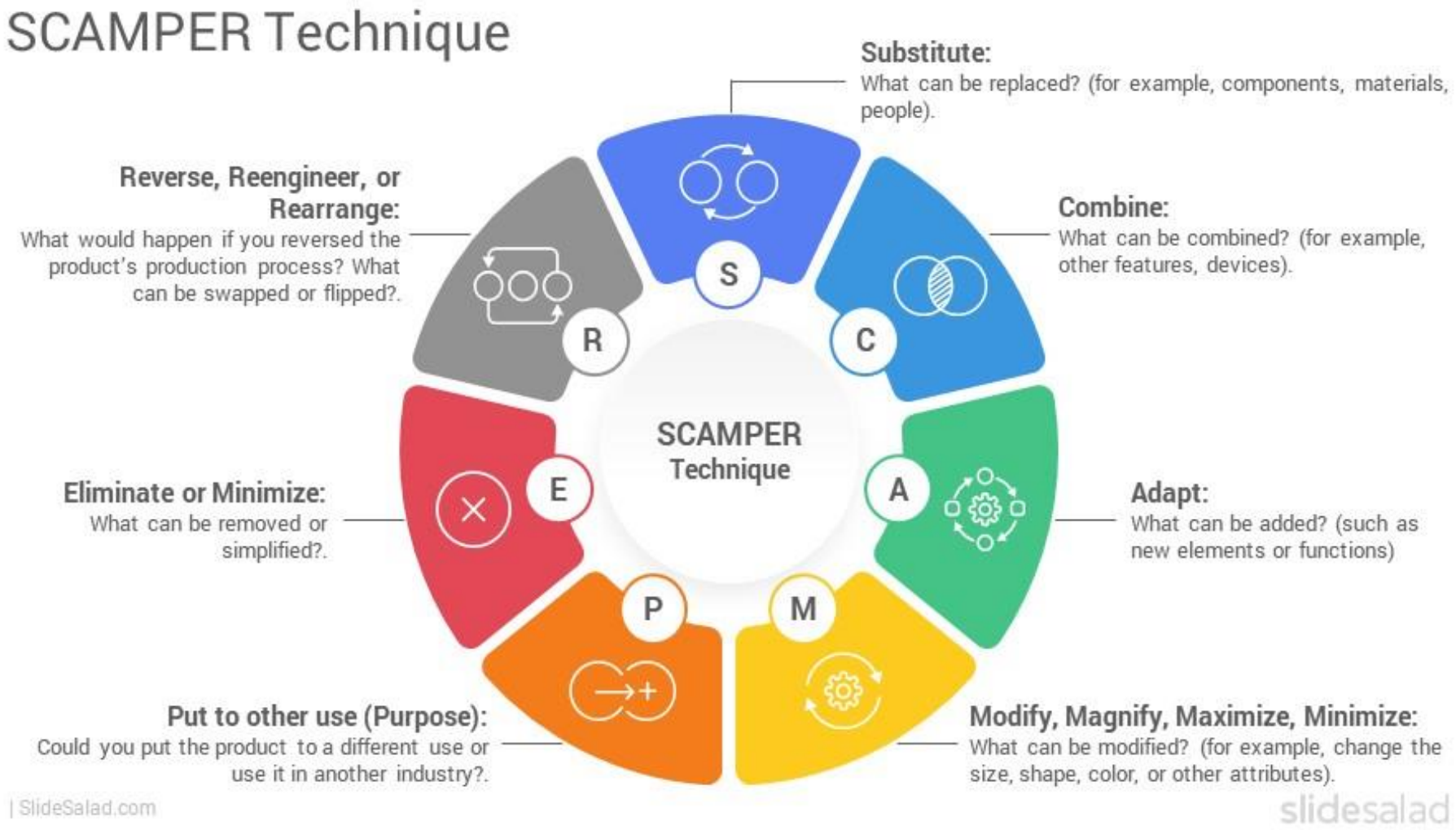
Overall desirability (how preferable is it)

Changeability (how flexible or resilient is the project to challenges and uncertainties).

Mary Sue/Gary STU ‘Problem’ Statement

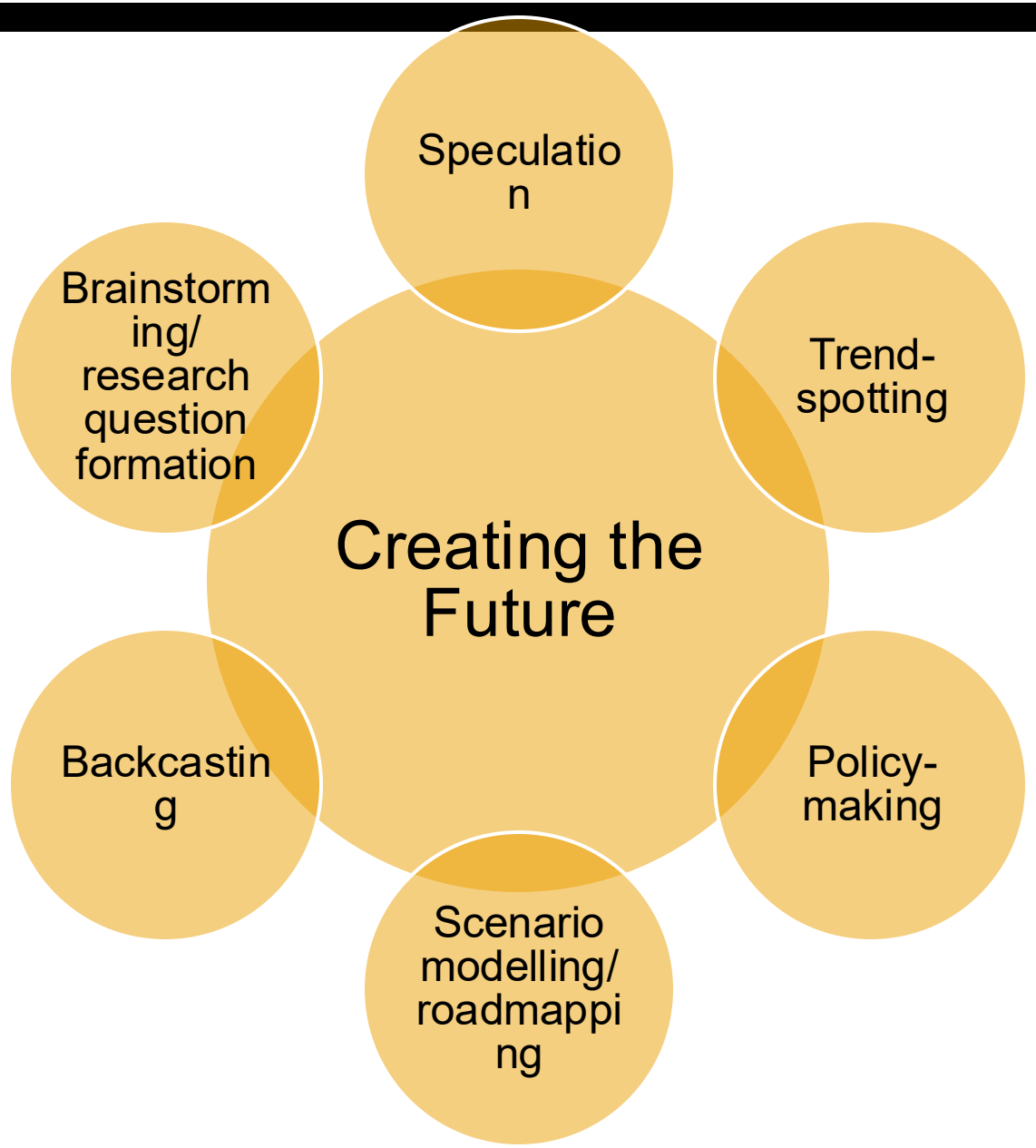
- The protagonist of the problem statement for the use case is unclear.
- The creator is more focused on advancing their personal preference to the exclusion of contextualizing the solution proposed.
- There is no measurable goal, and no clear justification as to why the project should be approach as is.
- The techniques become more important than the outcome.

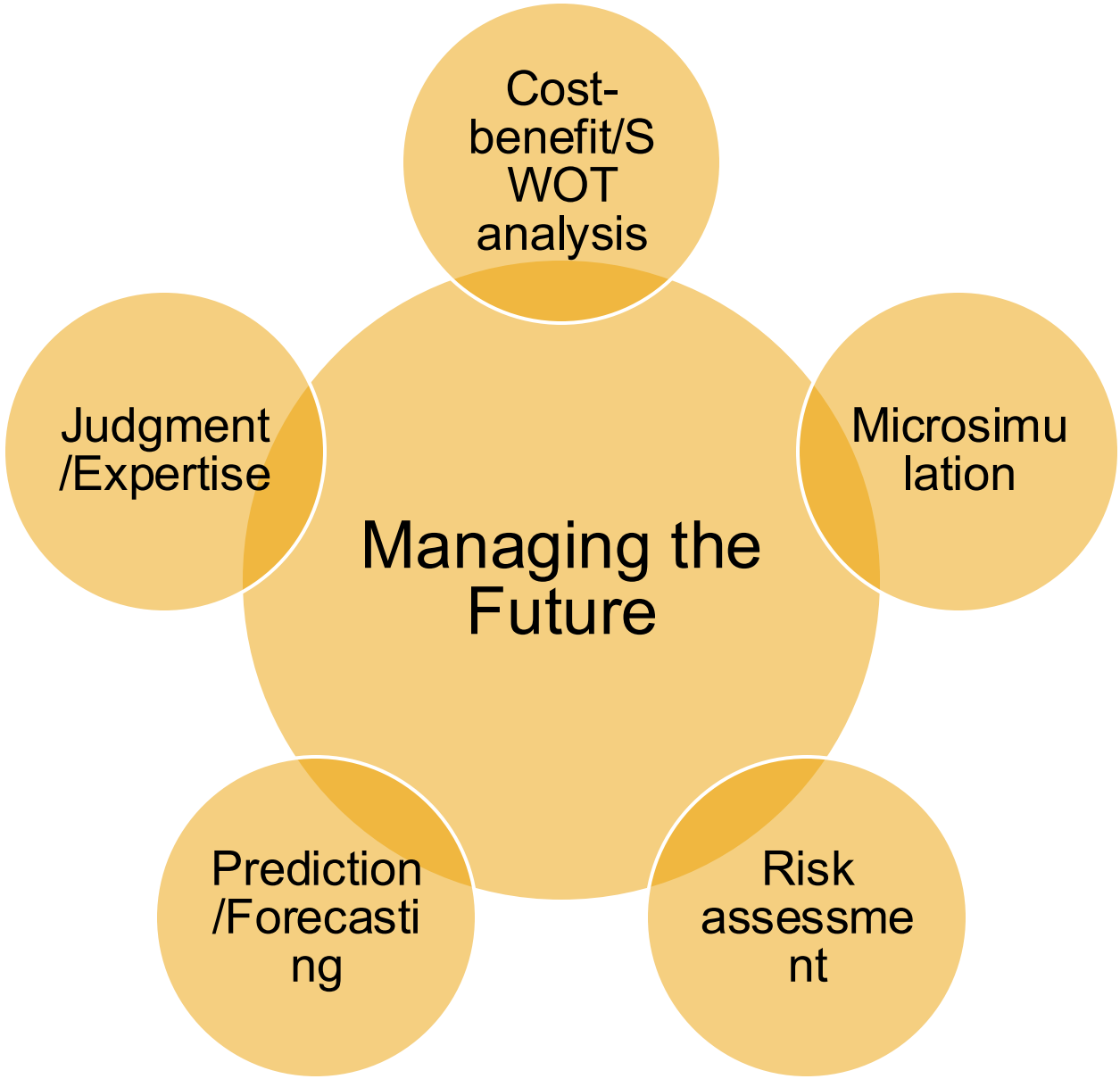
Select, Eliminate, Implement



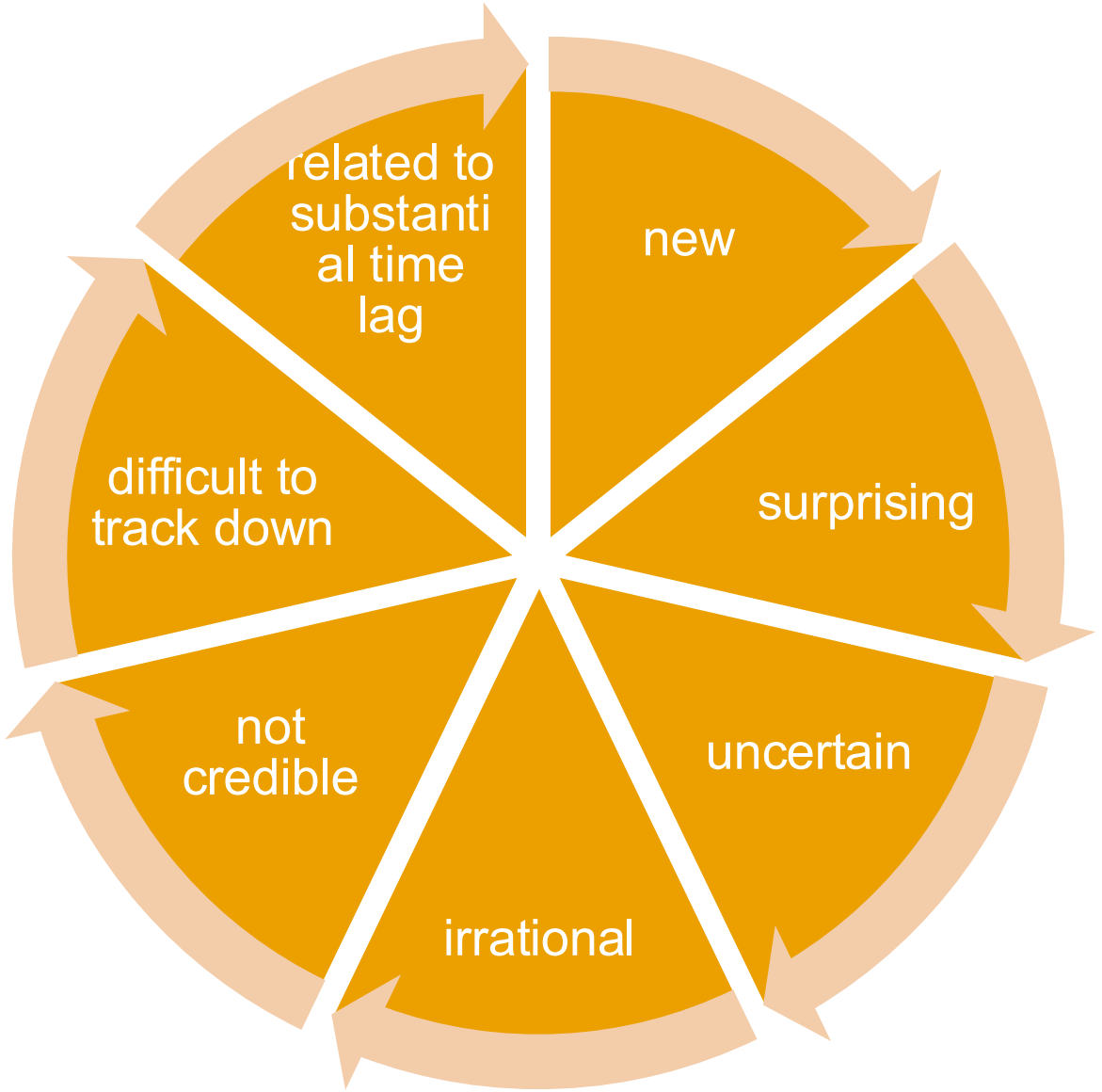
Activity 2

- On the second slide, create a story taken from your first slide that could represent each of the four criteria.
- You could also use the SCAMPER technique to create the story that could flow into the four criteria.
- You have 15 minutes to do this.


Speculation
Brainstorming/ research question formation
Trend-spotting
Creating the Future
Backcasting
Policy-making
Scenario modelling/ roadmapping


Cost-benefit/SWOT analysis
Judgment /Expertise
Microsimulation
Managing the Future
Prediction /Forecasting
Risk assessment

SIGNALS


related to substanti al time lag
new
surprising
uncertain
irrational
not credible
difficult to track down

Future Visions

Back-casting

- How does the future translate from the present?
- How does one create scenarios in the present that will establish a preferred future?
- How does present design-thinking translate into future design thinking?

Future-casting

- How does a problem change over time; can present problems project future problems?
- How do the present sets of expertise translate into future sets of expertise?
- What are stable vis-à-vis ephemeral trends?

Speculative Design

Expanding the scope: Responsibility in the ecosystem of quantum development

ACTIVITY 3: CREATE YOUR PROBLEM ANALYSES WORKSHEET

Put this worksheet into another blank slide. You have 18 minutes to do this (https://docs.google.com/presentation/d/1UUlTtx8bq76Bw6trnkN7r26iLgeglW7c8nfEvnrfNE0/edit?usp=sharing)

Problem Statement:	
Background	
Risks	
Ethical Consideration	
Backward Casting	
Future Casting	

US Air Force offers funding for quantum in SEA

Scenario: The US Air Force (USAF) offers funding for foundational quantum science all over the world, without requiring transfer of IP. They fund projects that are likely to be useful to different branches of the USAF.

Questions:

- Why is the US AF trying to fund foundational quantum science in SEA?
- Why doesn't SEA generally fund fundamental research?
- Who benefits? Who suffers?
- What if there are no other sources of funding? What kind of dependencies are created or reinforced?

Entrepreneurial spinoffs from public academic research

Scenario: An academic research project spins off to become a for-profit quantum startup. As they scale, there is increasing interest in acquisition by Big Tech companies.

Questions:

- What happens when one Big Tech company dominates the whole market?
- How are the paths of technology development different between academia, start-up, and Big Tech?
- Who are the stakeholders in each that shape the possible use-cases?
- What alternative paths could the academic research have gone to impact the broader public?
- What are the main goals of the technology within each of the environments, and why?