SUCCESS STORY

FROM CONCEPT TO COMMERCIALIZATION

CONTACT INFORMATION

- **Hector J Barea**

- **Senior R&D Engineer and Product R&D Manager**

- **Tupperware Brands Corporation**

- **www.linkedin.com/in/hector-barea/**

- **FIRST Robotics Competition Mentor**

  - **www.firstinspires.org/**

TUPPERWARE BRANDS CORPORATION

- Public traded company

- Headquarters in Orlando Florida

- Tupperware brand products made their debut in 1946

- 3.0 million independent sales force at year-end 2018

- $2.07 billion in 2018 Sales

- 92% of 2018 sales outside the United States

- Tupperware, sells products for food preparation, storage and serving solutions for the home

- Five brands of beauty and personal care products including Avroy Shlain, Fuller, NaturCare, Nutrimetics, and Nuvo.

TODAY'S EXAMPLES

MicroPro® Grill
Grill in the microwave oven

———————————————

Microwave-grill meat, fish and vegetables in under 20 minutes!

https://www.tupperware.com/micropro-grill.html

Nano Nature Water Filtration System
Clean water from your tap.

———————————————

With Nano Nature Water Filtration System, you can be 100% sure that 99.9% of the water filtered is clean, quality water.
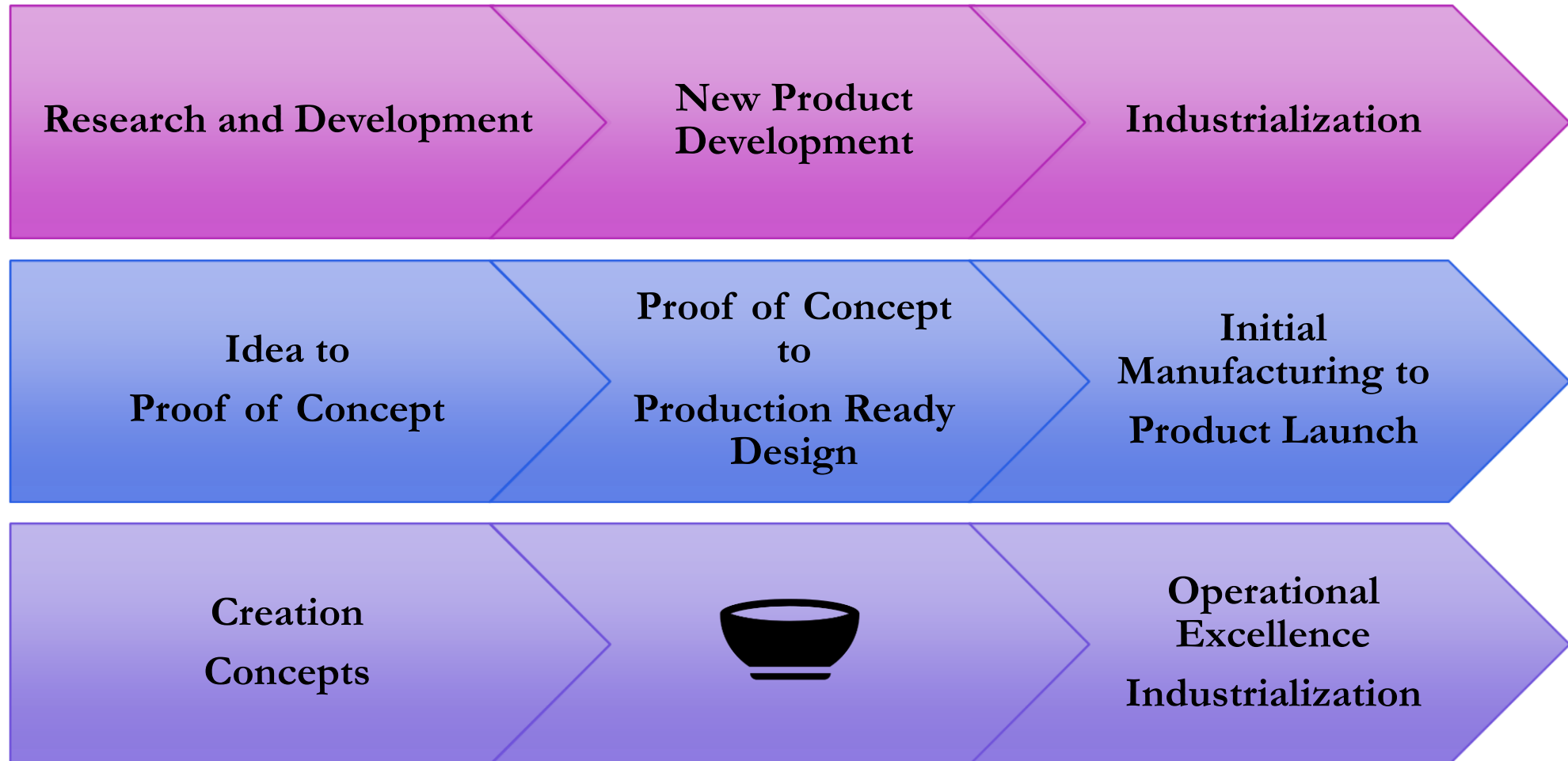
https://www.tupperwarebrands.com.my/nnwfs_malaysia2.php

NASA PONDS
Passive Orbital Nutrient Delivery System

———————————————

A collaboration between NASA, Techshot, Inc., and the Tupperware Brands Corporation introduced a plant growth unit called PONDS..
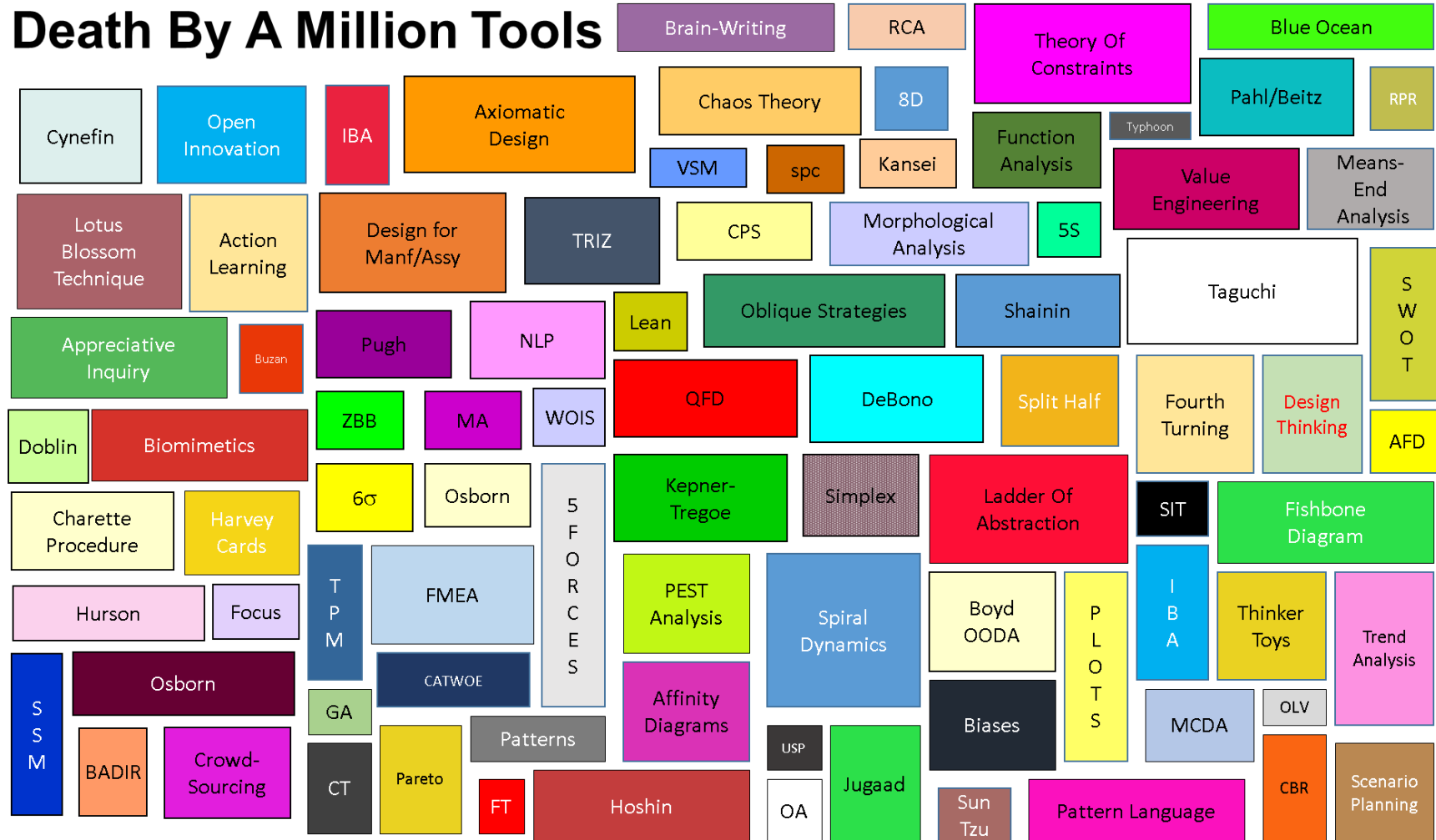
https://www.nasa.gov/feature/the-shape-of-watering-plants-in-space

CONCEPT TO INDUSTRIALIZATION PROCESS

Research and Development — **New Product Development** — **Industrialization**

Idea to Proof of Concept — **Proof of Concept to Production Ready Design** — **Initial Manufacturing to Product Launch**

Creation Concepts — **Operational Excellence Industrialization**

Death By A Million Tools

FRAMEWORK FROM CONCEPT TO INDUSTRIALIZATION

Death By A Million Tools

TRIZ

Lean

6σ
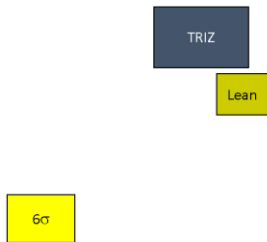
Design Thinking

- **Philosophy, Method and Tool**

- **Concept**
  - **Design Thinking**
    - **Make sure you are solving the right problem**
  - **TRIZ**
    - **Innovation and Problem solving, strong for ideation**
- **Commercialization**
  - **Six Sigma**
    - **Eliminate Variation**
  - **Lean**
    - **Eliminate Waste**

BRAINSTORMING
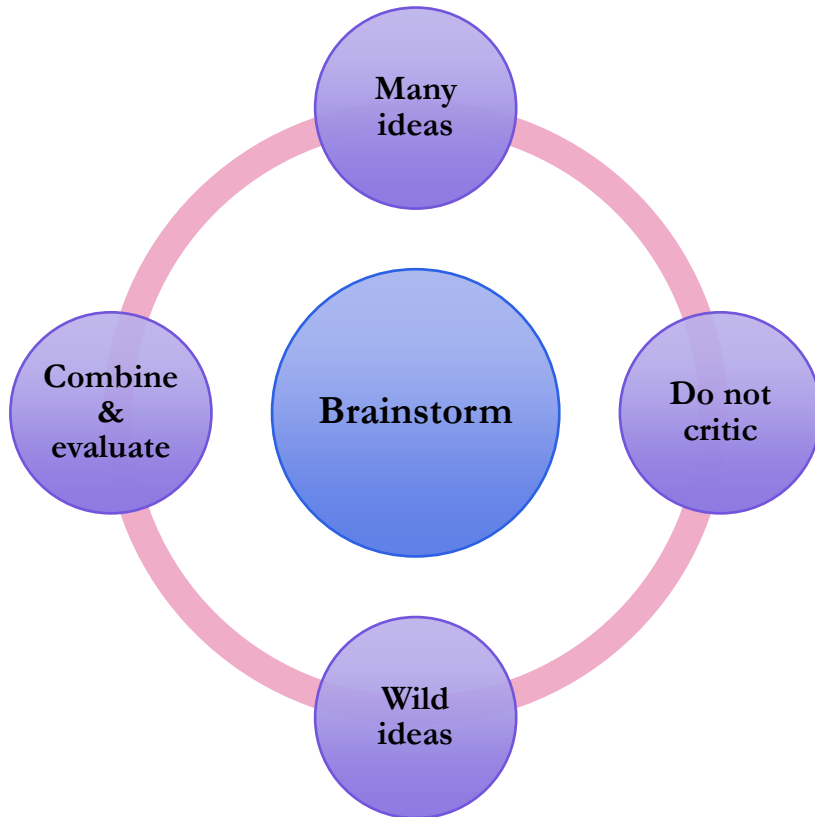
- **Alex Faickney Osborn, Applied Imagination, 1967**
  - **Generate as many ideas as possible**
  - **Do not critic**
  - **Go for wild ideas**
  - **Combine, improve, evaluate**
- **Multiple variations and improvements**
  - **Random word**
  - **Cards**
  - **Dice**

IMPROVE BRAINSTORMING WITH TRIZ
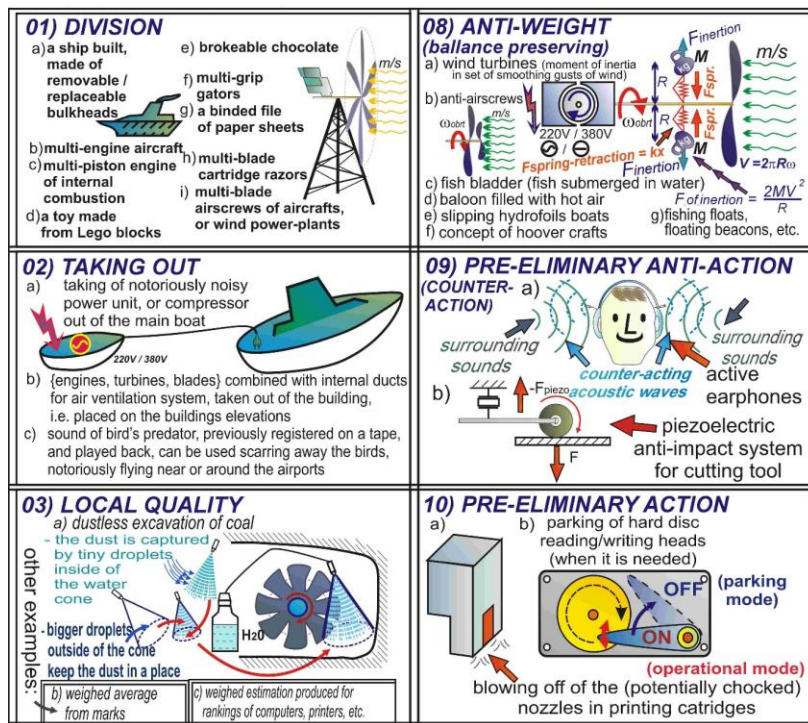
By FotoSceptyk - Own work, CC BY-SA 4.0,
https://commons.wikimedia.org/w/index.php?curid=45719323

- **TRIZ 40 Inventive Principles**

- **Genrich Altshuller analyzed a larger number of patents and identified a group of 40 techniques that inventors used successfully to solve problems**

- **6 ideas (individual), 29 ideas (individual with TRIZ, 10 principles), 53 ideas (team with TRIZ, 10 principles)**

EXAMPLE: PRINCIPLE 26. COPYING (TECHNICAL)

- http://www.ipface.org/pdfs/reading/TRIZ_Principles.pdf (technical)

- http://innomationcorp.com/wp-content/uploads/2017/08/40-Inventive-Principles-for-Computing.pdf?6b2ee5 (computing)

- http://innomationcorp.com/Files/40%20Inventive%20Principles_Business_InnomationLLC_Rev2.pdf (business)

Concept design; TRIZ (Teoriya Resheniya Izobreatatelskikh Zadatch)

University of Southampton

Principle 26. Copying

A - Instead of an unavailable, expensive, fragile object, use simpler and inexpensive copies
- Imitation jewellery.
- Astroturf
- Crash test dummy
- UAV excludes pilot

B - Replace an object, or process with optical copies
- Do surveying from space photographs instead of on the ground.
- Measure an object by scaling measurements from a photograph.
- Laser anemometry
- Virtual reality
- Virtual mock-ups/electronic pre-assembly modelling

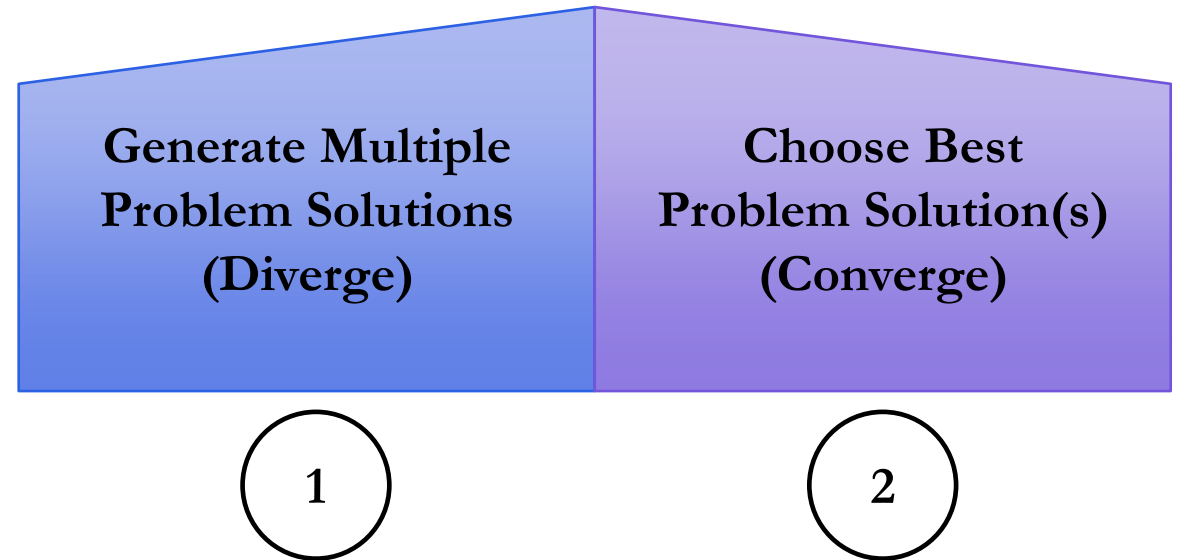**C - If visible optical copies are already used, move to infrared or ultraviolet copies**
- Make images in infrared to detect heat sources, such as diseases in crops, or intruders in a security system.
- Use UV as a non-destructive crack detection method
- UV light used to attract flying insects into trap

Module SESA3002a; Aerospace Design
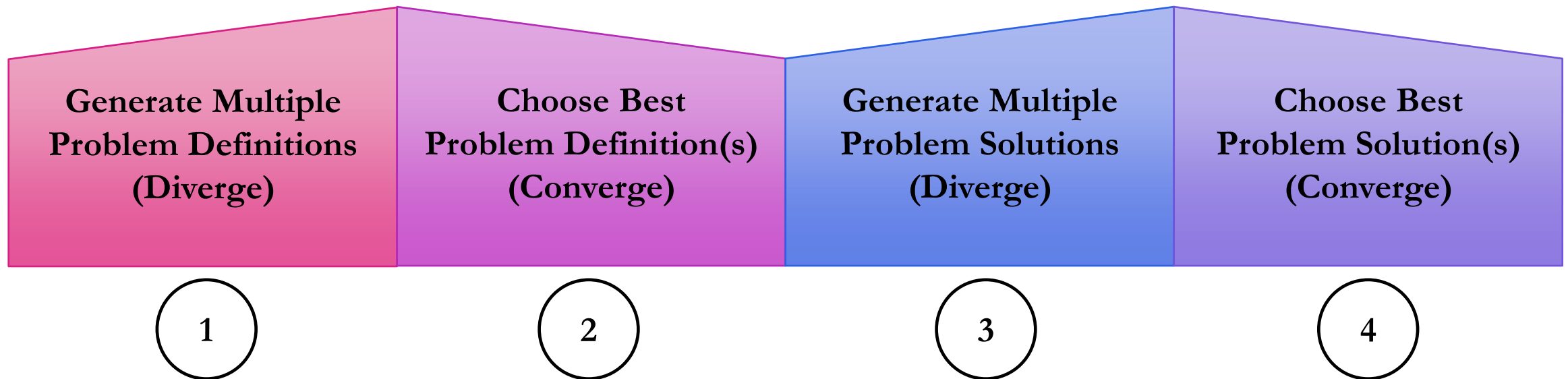James Scanlan; School of Engineering Sciences

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http://www.ipface.org/pdfs/reading/TRIZ_Principles.pdf (technical)

REDEFINE YOUR PROBLEM

Generate Multiple Problem Solutions (Diverge) — 1

Choose Best Problem Solution(s) (Converge) — 2

STAY IN PROBLEM DEFINITION LONGER

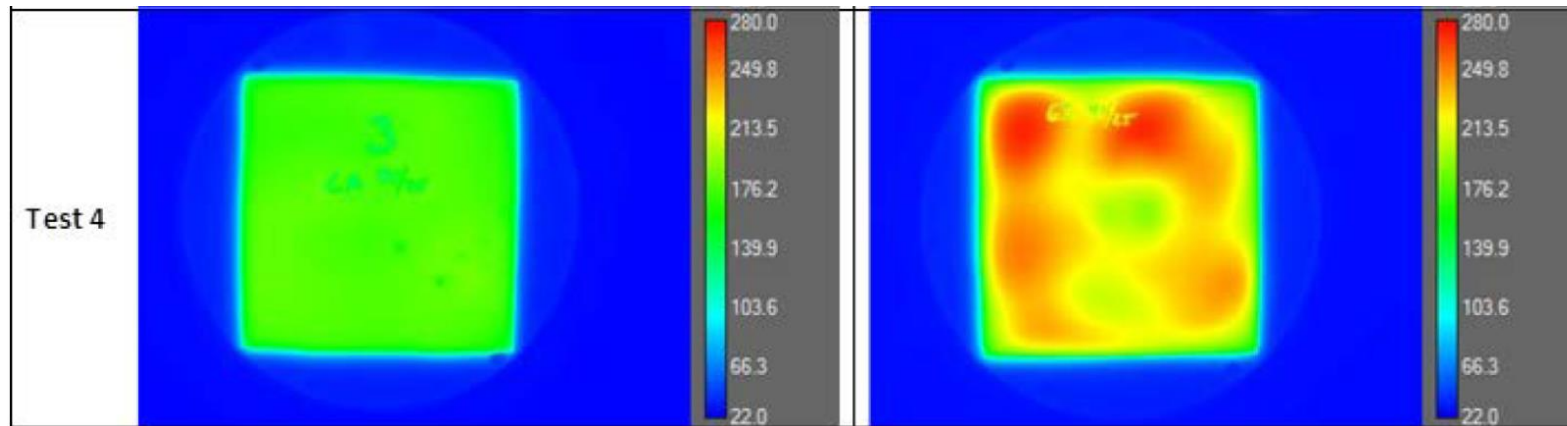| Generate Multiple Problem Definitions (Diverge)	Choose Best Problem Definition(s) (Converge)	Generate Multiple Problem Solutions (Diverge)	Choose Best Problem Solution(s) (Converge)
1	2	3	4

ENJOY NATURE INDOORS

COMMUNICATING WITH INTERNATIONAL TEAMS

- **Have a low bandwidth back up for video meeting (Zoom, Skype, Teams, etc.)**

- **Publish an agenda ahead of time (align expectations)**

- **If a decision needs to be made in the meeting, have the decision makers on the meeting**
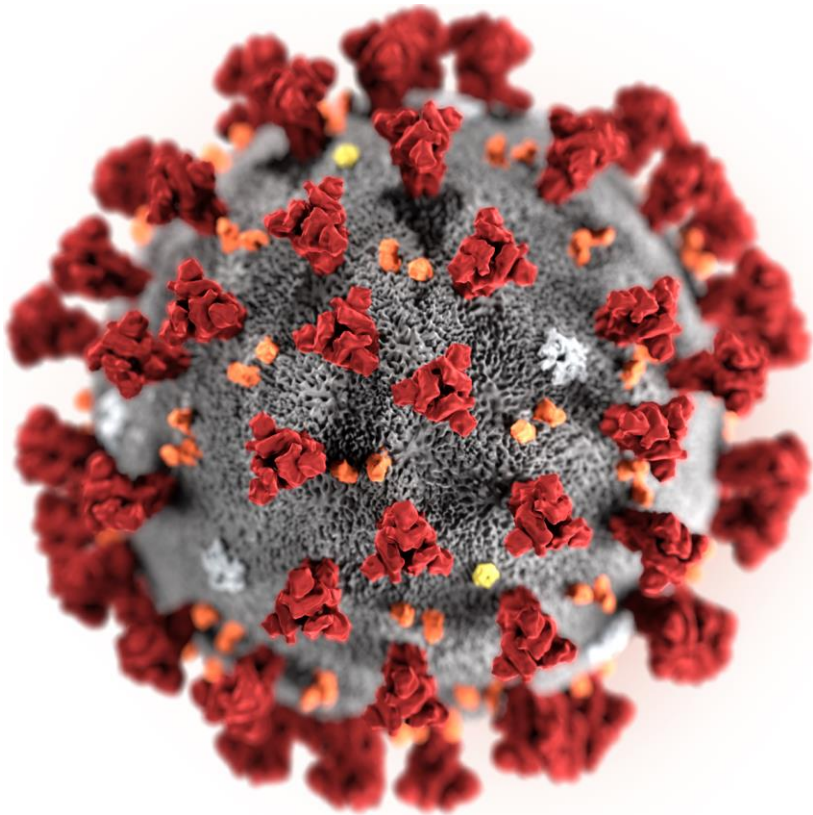
- **Prepare for the meeting with the right visual aids**

COMMUNICATING WITH INTERNATIONAL TEAMS

- **Lay the ground rules for good communication**
  - **Roles and responsibilities**
  - **Conflict resolution**
- **Effective Questions for Verbal Communication**
  - **Base on this information, what our team plan to do next?**
  - **What are the next steps?**

COVID 19 - KEEP THE BUSINESS GOING

This Photo by Unknown Author is licensed under CC BY-SA

- **Evolve and adapt processes**
  - **Replace manual signatures with digital signatures**
- **Complement unavailable internal services with available external services**
  - **Shipping**
- **Stay connected**
  - **Separate important information from noise**