

# Systematic Problem Solving with A3 and System Modelling

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Results are Not the Point

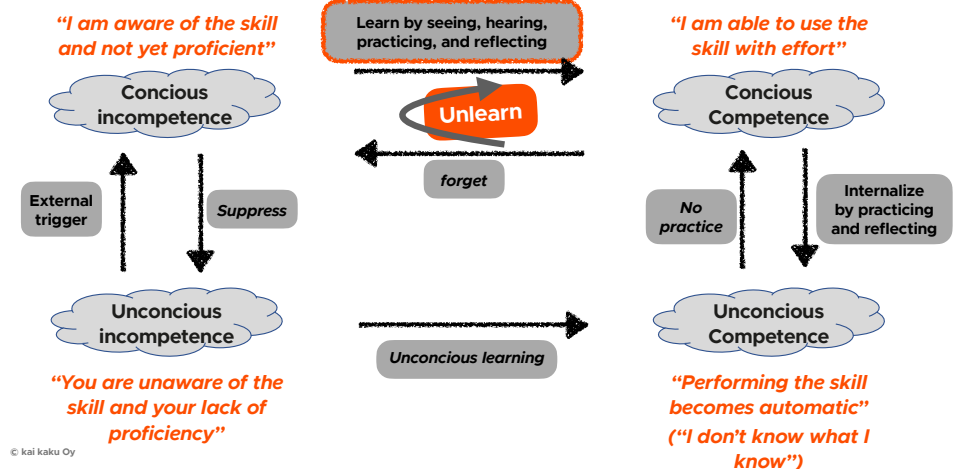
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Developing people so  
that they can  
achieve successful  
results is the point.

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## How we learn...



# The Deming Cycle (Plan – Do – Check – Act)

Data based problem solving



## Typical PDCA Application

- Plan quickly
- Do immediately
- Check roughly
- Act pretty much the way you did before



## High Velocity Organization PDCA

- Plan deeply
  - Really understand the problem and root causes
  - Devise experiments to check understanding
- Do many experiments
- Check carefully
- Act systematically
  - Update standards, processes, working agreements

# Systems Thinking



## Exercise 1/2



Imagine that you face the following pair of concurrent decisions.  
First examine both decisions, then make your choices.

Decision (i): Choose between

A. sure gain of \$240

B. 25% chance to gain \$1,000 and 75% chance to gain nothing

&

Decision (ii): Choose between

C. sure loss of \$750

D. 75% chance to lose \$1,000 and 25% chance to lose nothing

Choose:

AC

AD

BC

BD

## Exercise 2/2



Which of the following choices do you choose:

AD: 25% chance to win \$240 and 75% chance to lose \$760

BC: 25% chance to win \$250 and 75% chance to lose \$750

Choose:

AD

BC

# Side by side

Decision (i): Choose between

A. sure gain of \$240

B. 25% chance to gain \$1,000 and 75% chance to gain nothing

Decision (ii): Choose between

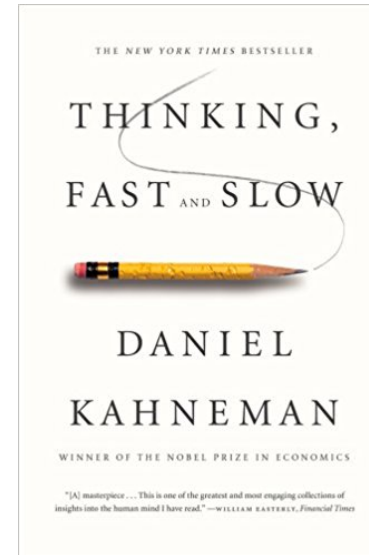
C. sure loss of \$750

D. 75% chance to lose \$1,000 and 25% chance to lose nothing

Versus

AD: 25% chance to win \$240 and 75% chance to lose \$760

BC: 25% chance to win \$250 and 75% chance to lose \$750



Theme: Is there a clear theme for the report that reflects the contents?

## Background

1. Is the topic relevant to the organization's objectives?
2. Is there any other reason for working on this topic (e.g., learning)?

P

## Current Condition

1. Is the current condition clear and logically depicted in a visual manner?
2. How could the current condition be made more clear for the audience?
3. Is the current condition depiction framing a problem or situation to be resolved?
4. What is the actual problem in the current condition?
5. Are the facts of the situation clear, or are there just observations and opinions?
6. Is the problem quantified in some manner or is it too qualitative?

L

## Goal / Target Condition

1. Is there a clear goal or target?
2. What, specifically, is to be accomplished?
3. How will this goal be measured or evaluated?
4. What will improve, by how much, and when?

A

## Root Cause Analysis

1. Is the analysis comprehensive at a broad level?
2. Is the analysis detailed enough and did it probe deeply enough on the right issues?
3. Is there evidence of proper five-whys thinking about the true cause?
4. Has cause and effect been demonstrated or linked in some manner?
5. Are all the relevant factors considered (human, machine, material, method, environment, measurement, and so on)?

N

Owner

Mentor

Date

## Countermeasures (Experiments)

1. Is the analysis comprehensive at a broad level?
2. Is the analysis detailed enough and did it probe deeply enough on the right issues?
3. Is there evidence of proper five-whys thinking about the true cause?
4. Has cause and effect been demonstrated or linked in some manner?
5. Are all the relevant factors considered (human, machine, material, method, environment, measurement, and so on)?

Do

## Confirmation (Results)

1. How will you measure the effectiveness of the countermeasures?
2. Does the check item align with the previous goal statement?
3. Has actual performance moved line with the goal statement?
4. If performance has not improved, then why? What was missed?

Check

## Follow-up (Actions)

1. What is necessary to prevent recurrence of the problem?
2. What remains to be accomplished?
3. What other parts of the organization need to be informed of this result?
4. How will this be standardized and communicated?

Act

Problem: Improve Physical Health Name(s): Joel Gross Date: 29 Dec 2013

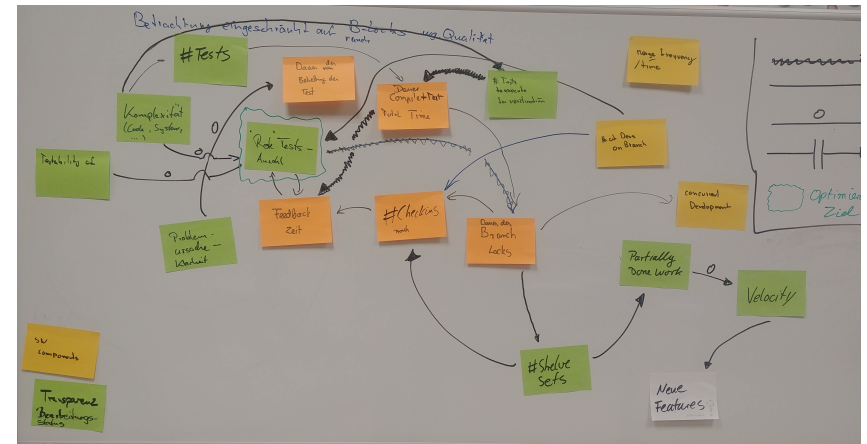
Current Condition / Problem	Cause Analysis
<p><u>Before Photo</u></p> <p>Facts as of 29 Dec 2013...</p> <ul style="list-style-type: none"> <li>Weight → 204.3</li> <li>% Body Fat → 31%</li> <li>Blood Pressure → 141/86</li> <li>Bench Press → 135 lbs.</li> <li>Life Expectancy = 78.75 years</li> </ul>	<p>Why am I in poor health?</p> <ul style="list-style-type: none"> <li>Exercise &lt; 1 hr per week</li> <li>I choose not to exercise</li> </ul> <p>When I eat, I eat too much</p> <ul style="list-style-type: none"> <li>when I eat, I make poor food choices</li> <li>relieves stress temporarily</li> <li>new baby</li> <li>long commute</li> </ul> <p>Root Cause:</p> <ul style="list-style-type: none"> <li>- when tired/stressed, I make poor food choices and choose not to exercise to seek temporary relief. (willpower?)</li> </ul>
Target Condition / Goal	Countermeasures / Actions
<p><u>After Photo</u></p> <p>Strategy</p> <ul style="list-style-type: none"> <li>1.) Lose Weight</li> <li>2.) Build Strength</li> <li>3.) Protect Heart</li> </ul> <p>Target for 31 Dec 2014</p> <ul style="list-style-type: none"> <li>Weight → 171 lbs.</li> <li>Body Fat % → 15%</li> <li>Blood Pressure → 120/80</li> <li>Bench Press → 185 lbs.</li> </ul>	<p>How do I better manage my stress?</p> <p>How do I improve decision making when eating or exercising?</p> <ul style="list-style-type: none"> <li>make better decisions</li> <li>don't make a decision!</li> <li>pre-commit to exercise (no choice req.)</li> <li>create eating plan (no choice req.)</li> </ul>
Verify / Standardize	
<p>Status as of 31 Mar 2014</p> <ul style="list-style-type: none"> <li>Weight: 187 lbs. → -22 lbs fat loss</li> <li>Body Fat: 22% → +5 lbs muscle gained</li> <li>Blood Pressure: 116/78</li> <li>Bench Press: 203 lbs.</li> </ul> <p>Current Life Expectancy: 86.24 years</p>	

## 6 Steps to Systematic Problem Solving

1. Create common understanding of the goal
2. Create common understanding of the problem
3. Create common understanding of the root causes
4. Identify potential solution (formulate experiments)
5. Do those experiments and measure 2 things: do you do the experiments and do they bring you closer to the goal?
6. Manifest successful experiments into your processes

## Systems Model

## Systems modelling



# Systems Thinking Climate Change



## Practise Systems Thinking



**Puzzle: I want to understand the “climate change”?**

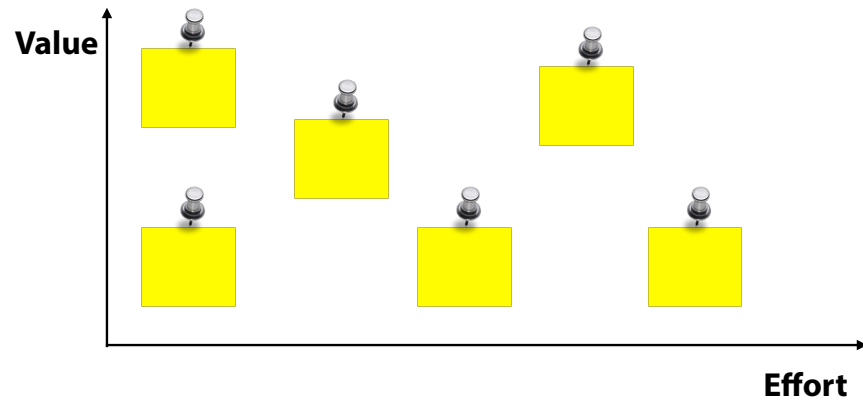
**We start with:**

1. **Amount of greenhouse gases** (CO<sub>2</sub>, Methan)
2. **Capability of atmosphere to trap heat** (Infrared reflection)
3. **Global surface temperature**
4. **Greenhouse gas emission meat & dairy**
5. **Percentage of areas with permafrost** (areas with a lot of methan stored)

**Find at least 5 more variables of your own choice and enhance your model!**



## Map the experiments



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with your colleagues, in  
Social Media  
LinkedIn, Xing, etc.



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Thank  
you!



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