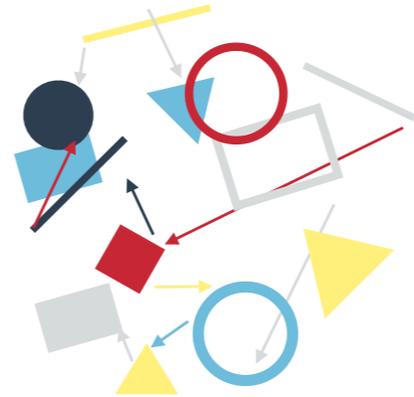


Applied Systems Thinking



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Prelude

- **Land acknowledgement**

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Thanks for welcoming me to the territory of the Wolastoqiyik and Mi'kmaq people

Prelude

- Land acknowledgement
- Just checking: no one was here last time?

How many designers does it take to change a light bulb?



How many designers does it take to change a light bulb?



...Why a lightbulb?

Prelude

- **A few disclaimers:**

- Minimal Newfie accent, but I can still talk fast
- Systems are confusing—trust yourself
- References are easily shared
- You have to do the work (but we're in it together)

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(In the form of by background)

I.e., I was a youth advocate for years and did a lot of youth leadership development
I know enough about both subjects to know that you can't trust yourself nor your technology

By definition, systems are counterintuitive and of unbounded complexity. Stop and ask questions at any point

About me

- **Geekery:**

- BSc. Psych/Computer Science (Software Engineering)
- Master of Design (Strategic Foresight & Innovation)
- Student: PhD in Management (Information Systems)

- **Practicing systems for ~10 years**

- Engineers Without Borders — Canada
- Radhoc Youth Leadership

- **I've worked with:**

- McConnell Family Foundation
- NouLAB
- OCAD U
- Global Steering Group for Impact Investment

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What about you?

- **Think/pair/share:**

- What are your assumptions, expectations, and past experiences with systems?
- What are your fears?
- If today was extraordinarily successful, what happened? What are you leaving with?

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- The most important thing is not the model, nor the methodology, but the conversation that it sparks
- My fear is not getting you focused, such that modelling takes too long and we can't digitalize the results
- Can't be a prophet in your own town: would love to do this work more in NL, but people in other provinces are the only ones that call me!

Overview

- Intro & Overview (10:30am-ish)
- The case for (and of) systems (10:50am-ish)
- Problem finding (11:45am-ish)
- Lunch! 🍷 (12:15pm-ish)
- Focusing questions (1:00pm-ish)
- **Four systems approaches (1:30pm-ish)**
- Break (3:00pm-ish)
- Technology for systems modelling (3:15pm-ish)
- Building systems models & coaching (3:30pm-ish)
- Day-end reflection, sharing, and discussion (3:30pm-ish)

The case for (and of) systems

- **Reviewing case studies**
- **Review independently (5 mins)**
- **Discuss in pairs (5 mins)**
- **Discuss as a table (5 mins)**

The case for (and of) systems

- **Reviewing case studies**
- **Review independently (5 mins)**
- **Discuss in pairs (5 mins)**
- **Discuss as a table (5 mins)**
- **Prep presentation: what was the system? what is the key takeaway? (5 mins)**
- **Presentations and discussions (20 mins)**

The case for (and of) systems

Takeaways?

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- Malawi: Understanding the system is an important way to find leverage, to gain a lot of traction with only a little effort
- Conference organizing: The same system has different impacts on different stakeholders; you may not be able to see the most important phenomena to someone else
- Budworm: Good intentions aren't good enough. In fact, poorly placed interventions can make matters worse. Also, delays are important.
- Recidivism: The participation of all actors is crucial; as is their full engagement and willingness to take responsibility and change

Wait: systems???

- **Interconnected elements that act together, leading to emergent behaviour**
 - “Purposeful”
 - Adaptive
 - Goal-seeking
 - Self-preserving
 - Dynamic
 - Evolutionary

Wait: systems???

- **Systems are always doing exactly what they were “designed” to do**
 - So you can't blame the system...
 - ...but you can't blame the actors, who are doing what the system makes them do
- **Who to blame? What to do?**

Overview

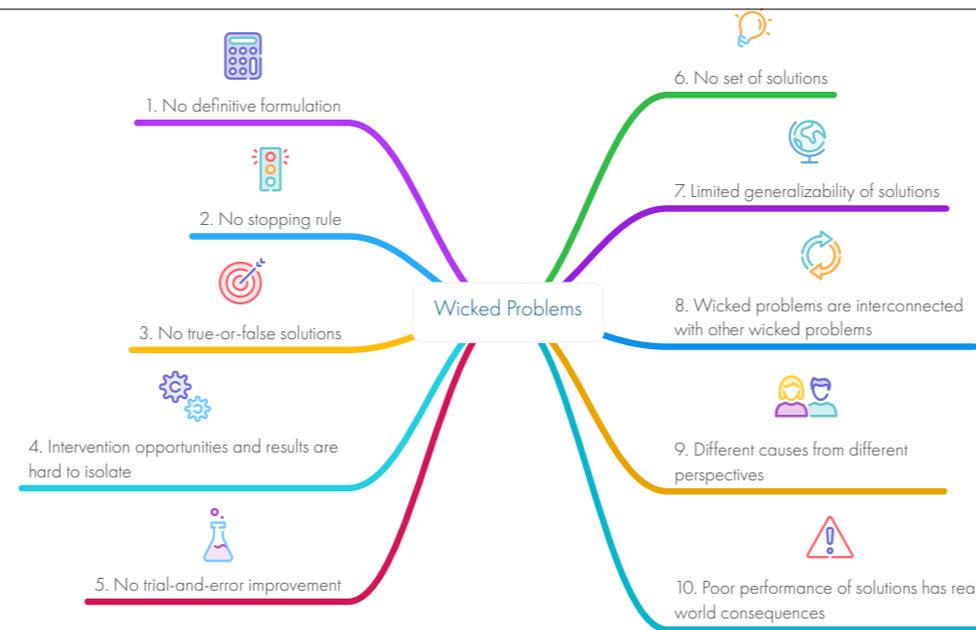
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Problem finding

- **Goal: form clusters around similar topic areas for shared systems exploration**

Focusing systems work

- **Why do we undertake systems work?**
 - The problems we're facing are *wicked*



Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155–169. Retrieved from <http://link.springer.com/article/10.1007/BF01405730>

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Focusing systems work

- **Why do we undertake systems work?**
 - The problems we're facing are *wicked*
- **Why do problems persist?**
- **What unforeseen forces might halt our innovations?**

Focusing systems work

- What *is* a focusing question?
 - “Why does [x] continue to happen?”
 - “Why, despite our best efforts, intentions, and resources, does [y] persist?”
- Converting HMWs to focusing questions:
 - “How might we *verb* for *noun*?”
 - Why does *noun* not *verb* already?
 - What state should *noun* be in?
Why isn’t it there already?
 - Why don’t we *verb* all the time?”
- **Working independently, identify several focusing questions**
- **On cue, discuss with people working on similar topics**
- **Cluster the questions you’ve come up with**
 - **Which of these questions cannot be answered by the others?**
 - **Create a hierarchy**
 - *Challenge mapping*

Focusing systems work

- **Decide on the questions you will strive to answer with modelling today.**
 - It's okay if there's more than one
 - However: stay aligned with others in the group!
 - (If you want to go fast, go alone. If you want to go far, go together.)

Systems Approaches

- **Soft Systems Methodology (Checkland)**
- **Actor mapping (Gharajedaghi)**
- **Causal Loop diagrams (Senge)**
- **Stock and Flow diagrams (Forrester)**

Systems Modelling Approaches

- **Rich pictures**

- Checkland's Soft Systems Methodology

- Sketchy infographics!

- CATWOE:

- Customer: who benefits?

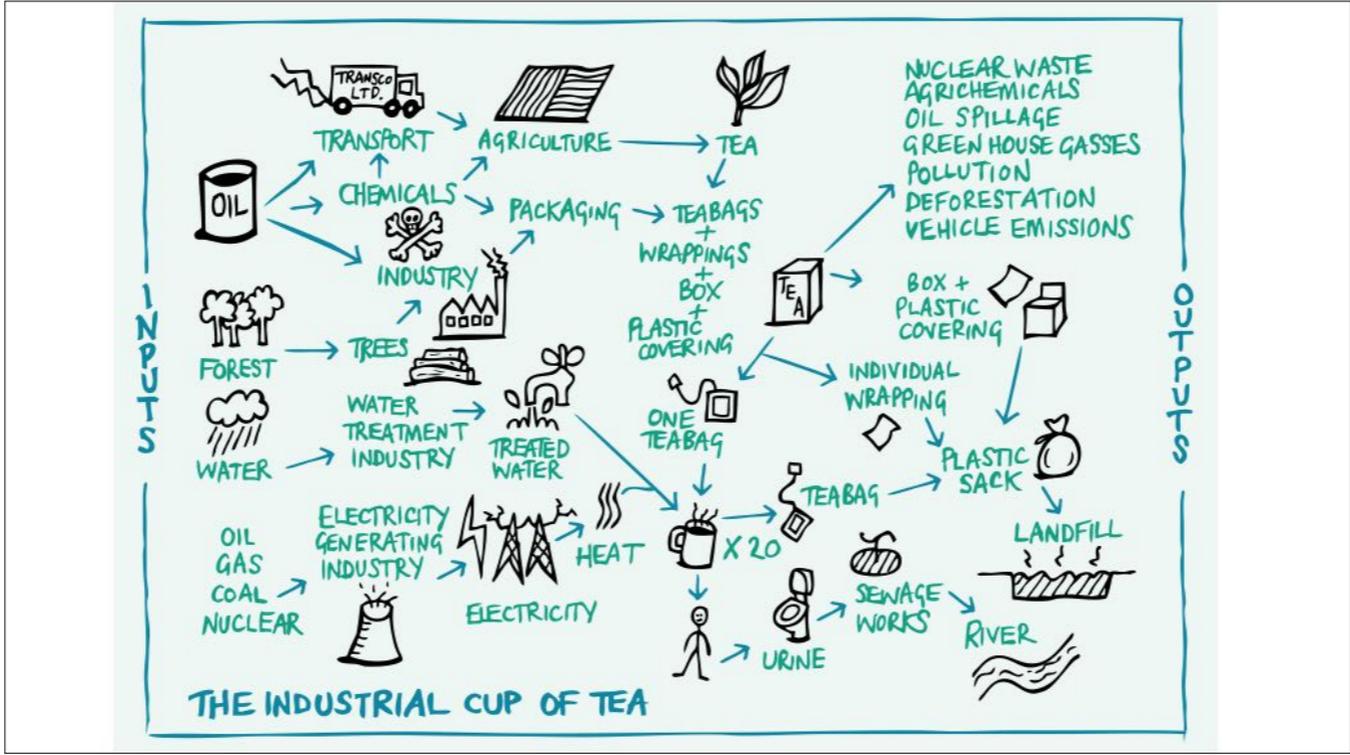
- Actors: who influences?

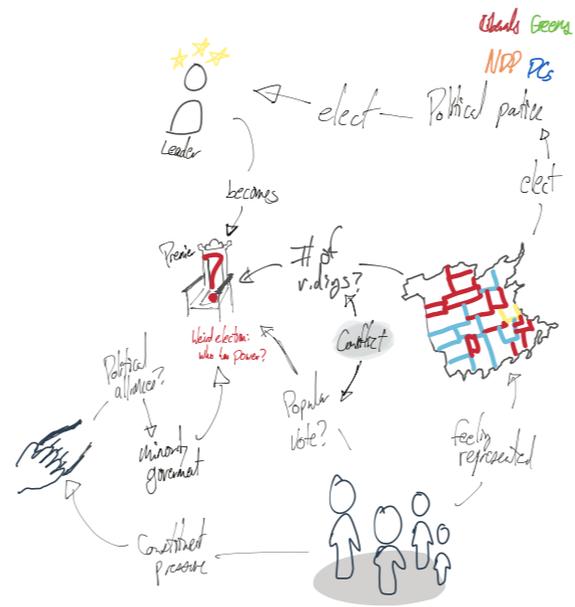
- Transformation: what changes?

- Worldview: according to whom?

- Owners: who has stopping power over the transforming process?

- Environment: what constraints are taken as given?





Systems Modelling Approaches

- **Rich pictures**

- Checkland's Soft Systems Methodology

- Sketchy infographics!

- Practice:

- Independently: take 5 minutes to sketch a systemic answer to the focusing questions

- On cue, share with your group & get feedback

Systems Modelling Approaches

- **Actor mapping**

- Who are the stakeholders? Who's involved? How are they involved?
- Key organizations? Key individuals?
- How can these actors be categorized or organized?
- What gaps exist? Why are they unfilled?

Table 4.1 Obstructions to Development

Obstruction to development				
	First order			Second order
Dimensions of Social Systems	Scarcity	Mal-distribution	Insecurity	
WEALTH Economics	Poverty	Disparity	Deprivation	ALIENATION
KNOWLEDGE Scientific	Ignorance	Elitism Illiteracy	Obsolescence	POLARIZATION
POWER Politics	Impotency	Autocracy	Illegitimacy	CORRUPTION
VALUES Ethics	Norm less	Discrimination	Fanaticism	TERRORISM
BEAUTY Aesthetics	Hopeless	Hatred	Fear to lose Identity	

Gharajedaghi, J. (2011). *Systems thinking: managing chaos and complexity: a platform for designing business architecture* (3rd ed). Burlington, MA: Morgan Kaufmann.

Systems Modelling Approaches

- **Actor mapping**

- Practice:

- Independently: take 5 minutes to sketch a systemic answer to the focusing questions
 - On cue, share with your group & get feedback

Systems Modelling Approaches

- **Causal Loop Diagrams**

- Also known as influence maps
- What phenomena contribute to the purposes and persistence of the system?

Systems Modelling Approaches

- **Causal Loop Diagrams**

- **Steps:**

1. Identify variables (nouns) that represent quantities over time
 - Use positive nouns instead of negatives
 - Distinguish between actual and perceived states where this might be important
 2. Draw connections between variables such that when the former variable changes, the latter responds
 - Use +/- symbols to indicate whether an increase in the former variable causes a increase or decrease in the latter
 3. Identify delays in cause-effect relationships with | | or a label
 4. Identify loops.
 - Are they balancing or reinforcing?
 - *(Is there an odd number of negative connections?)*
 - Try to make the “goals” of the loop explicit
 5. Iterate, breaking up the map into more detail and expanding its boundary
- 

Systems Modelling Approaches

- **Causal Loop Diagrams**

- Practice:

- Independently: take 5 minutes to sketch a systemic answer to the focusing questions
 - On cue, share with your group & get feedback

