Systems thinking and Systems maps

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My ‘recent’ journey

- Public Administration
- Innovation Consulting
- Culture Change
- Leadership Development
- Network Analysis
- Systems Change

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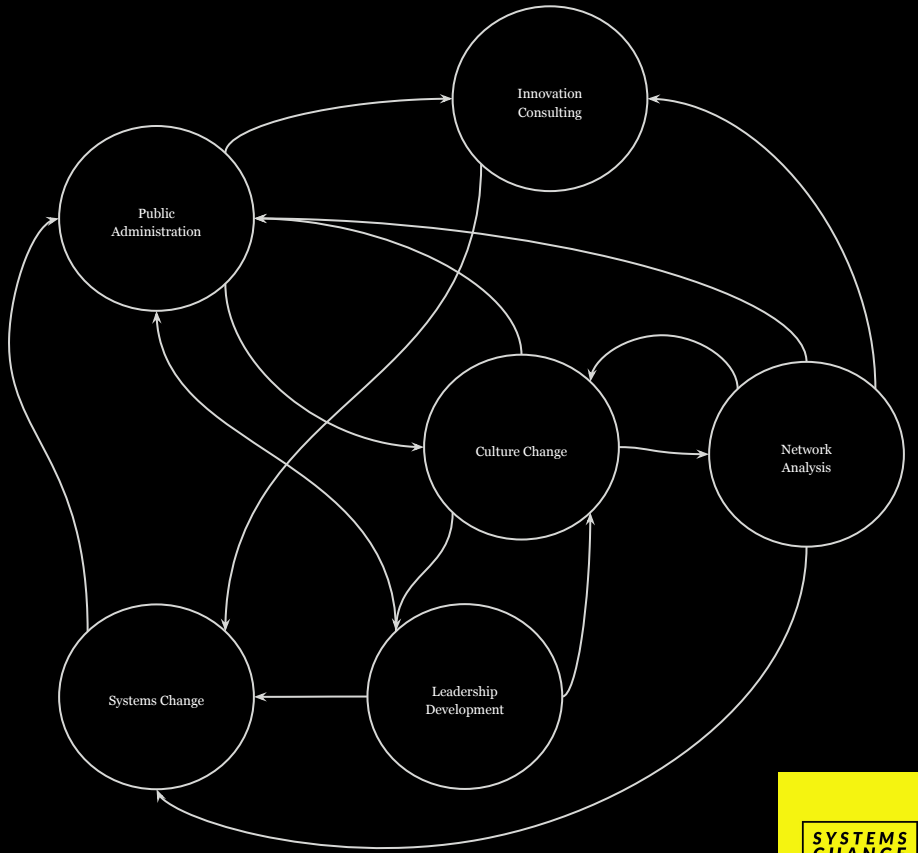

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My goals today

- Encourage you to think and see differently
- Signpost some systems concepts that can be useful in your work
- Help you understand how government ‘thinks’
- Give you some weapons to ‘see’ systems so you can understand them so that you can shift them
- Confuse you (a bit)

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“**Embrace** the state of **confusion**, it is a **necessary** precondition **for breakthrough** thinking”

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Part 1 - Meta Context and Mindsets

Part 2 - Systems Thinking Concepts

Part 3 - System Maps & Mapping

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Part 1 - Meta Context and Mindsets

- Human Eras - understanding large scale shifts
- The Industrial Age VS The Connected Age
- How government thinks
- Acted vs Stated Values
- Structure of Government

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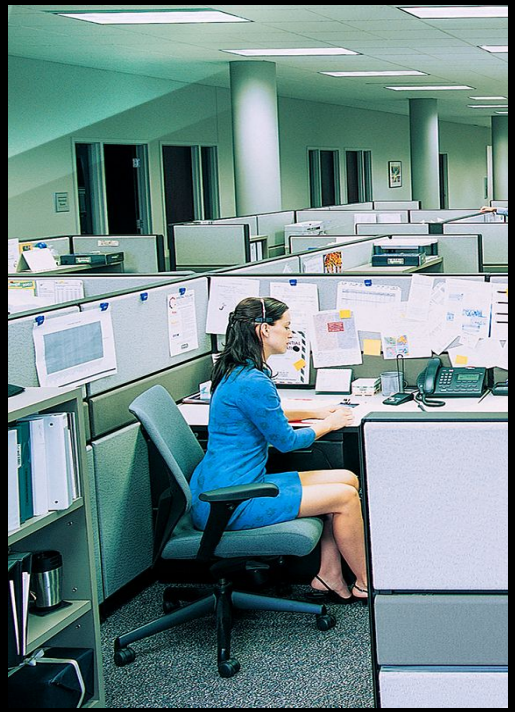
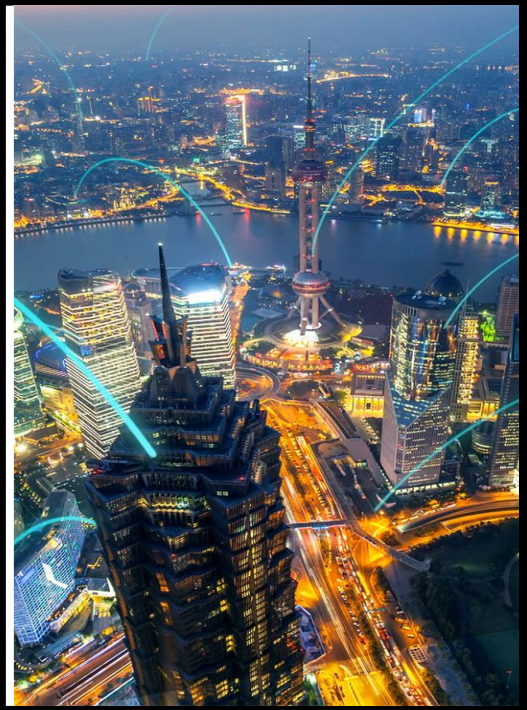
Industrial Age



Information Age



Connected Age

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Credit: Images from The Responsive Organisation http://www.responsive.org/

Era Shifts - technology drivers

From	Technology	To
Hunter & Gatherer	Plough	Agrarian age
Agrarian	Steam Engine	Industrial age
Industrial	Silicon Chip	Information age
Information	Internet	Connected age*
Connected	Artificial Intelligence	???

The new technologies drive progress that create a new realities.

Later the social, economic, political, environmental and legal consequences of the new reality need to be adjusted for.

Our track record in these transitions is really bad.

*sometimes referred to as the 4th Industrial Revolution, The Complexity Age, The Internet Age, The age of Participation, etc...

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Era Shifts - time and rate of change

From	Technology	To	Timescale
Hunter & Gatherer	Plough	Agrarian age	100,000s years
Agrarian	Steam Engine	Industrial age	10,000 years
Industrial	Silicon Chip	Information age	100s years*
Information	Internet	Connected age*	10s years
Connected	Artificial Intelligence	???	very fast**

* the mindset legacy from here says we should design new solutions that are more relevant to the current time and circumstances, which we assume will be static for a while
**this tells us we should rather be designing solutions that are adaptable to a constantly shifting environment

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The ingredients available when modern government and public administration ideas were baked are cooked into the foundations of how governments think and behave.

- Newtonian Science
- Linear thinking
- Scientific Management
- Taylorism

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Industrial Age

When you are working with government you are trying to solve challenges that emerge from **here** with a system that thinks like **this**.

Connected Age

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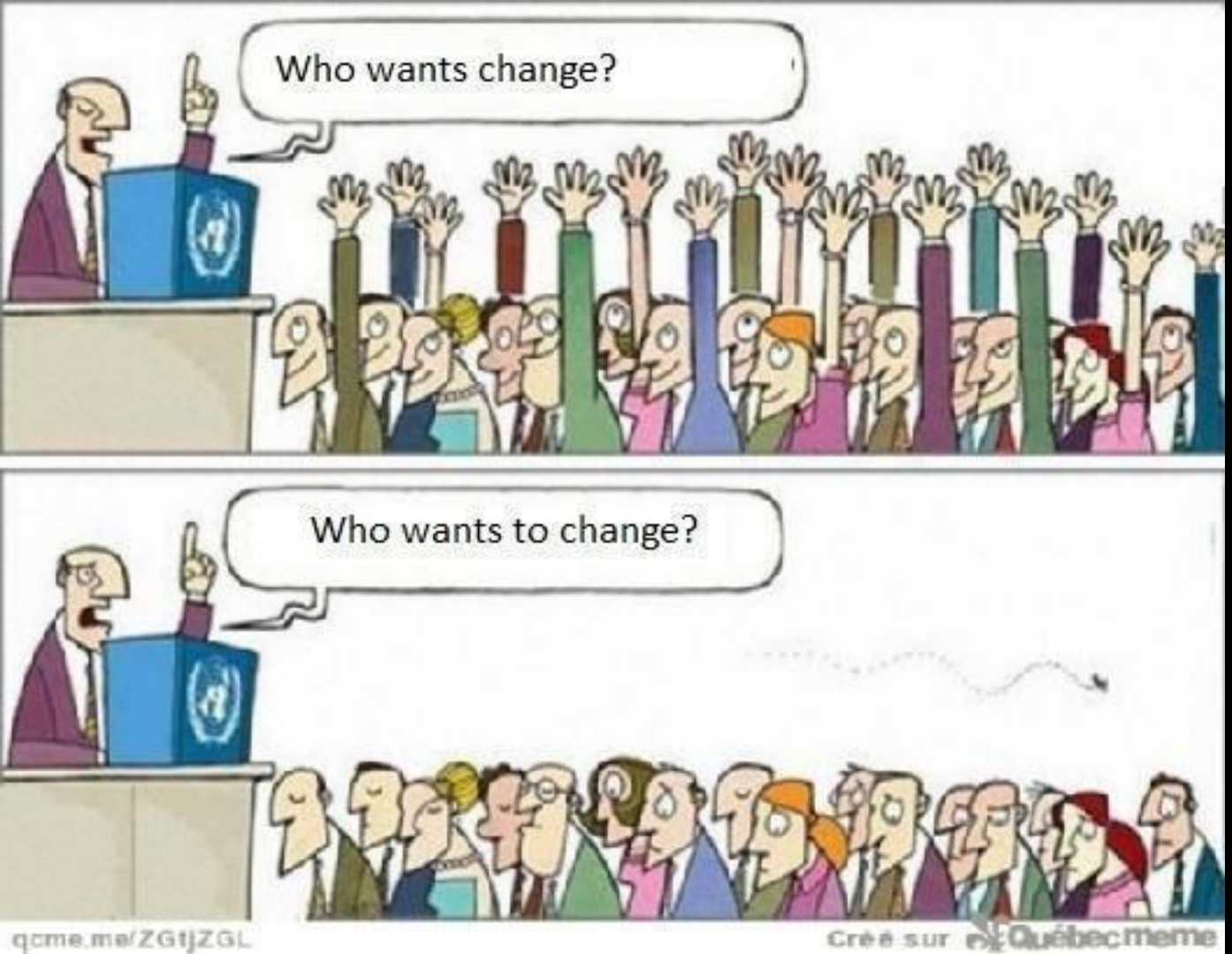
Credit: Images from The Responsive Organisation http://www.responsive.org/



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Acted values vs stated values

Stated values are what we say we will behave like. It's the poster on the wall that says this organisation is 'Innovative' or 'Embraces diversity'.

Acted values is how we actually behave, and this behaviour is observable and describable.

The wider the gap between Stated and Acted values, the higher the frictions (particularly cultural frictions) there will be in the system.

Search for Espoused theories vs theories in use
Argyris, C., Putman, R. and Smith, D.M., 1985. Action science (Vol. 13). Jossey-Bass.

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Industrial Era vs Connected Era Mental Models

Industrial	Connected
Linear	Non linear
Newtonian	Quantum
Analysis	Synthesis
Reductionism	Holism
Sum of the parts	Emergence
Object Focus	Relationship Focus
Machine metaphor	Organism metaphor
Centralised	Distributed
Owned & Closed	Shared & Open
Hyper-competition	Hyper-collaboration
Monolithic	Networked

Industrial	Connected
Proprietary	Interoperable
Waiting & Blaming	Co-responsibility
Hiding mistakes	Embracing Learning
Obligation	Passion & commitment
Ego-centric	Eco-centric
Waiting & Blaming	Co-responsibility
Hiding mistakes	Embracing Learning
Obligation	Passion & commitment
Us vs Them	Trust & Partnership
Quick Fixes	Sustainable solutions

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Structure of Government

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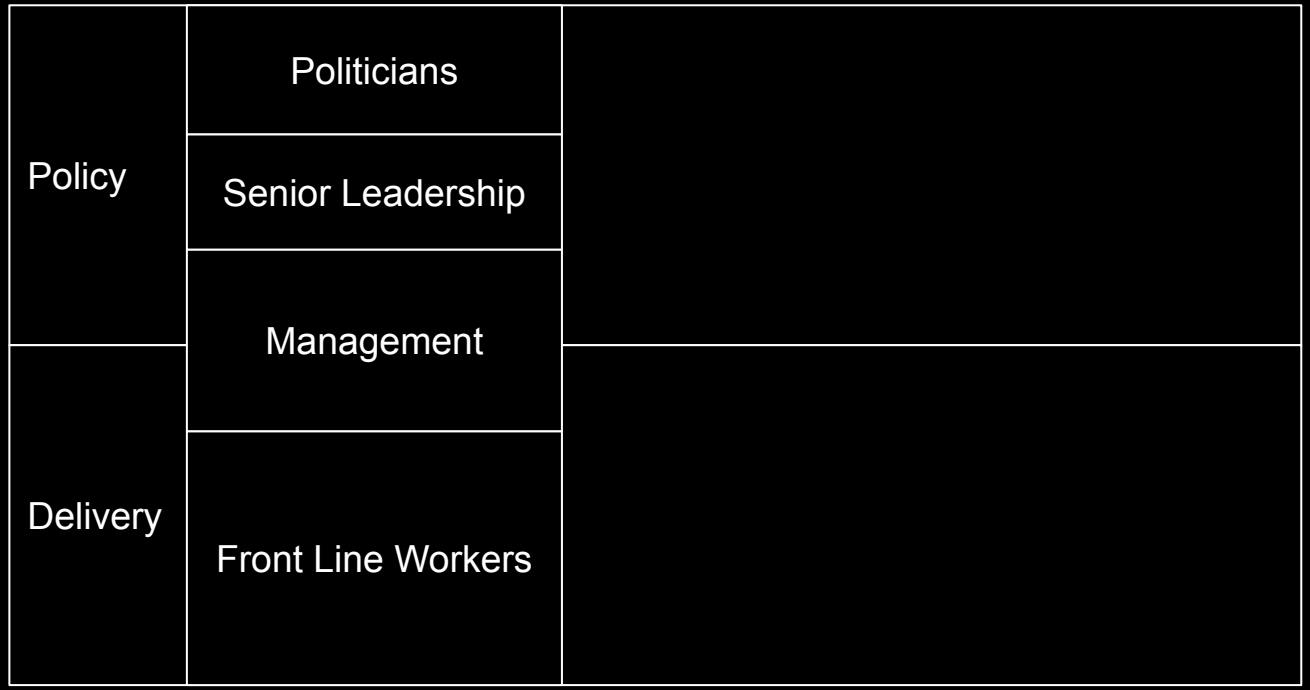

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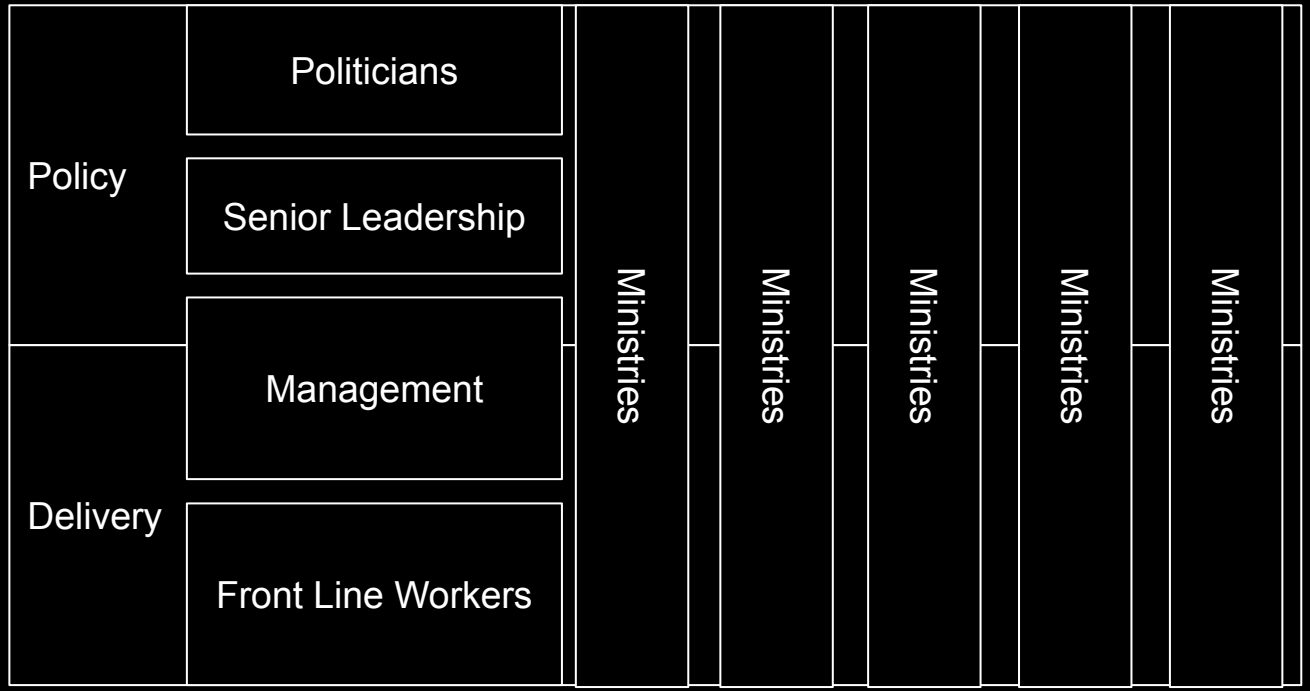
Structure of Government



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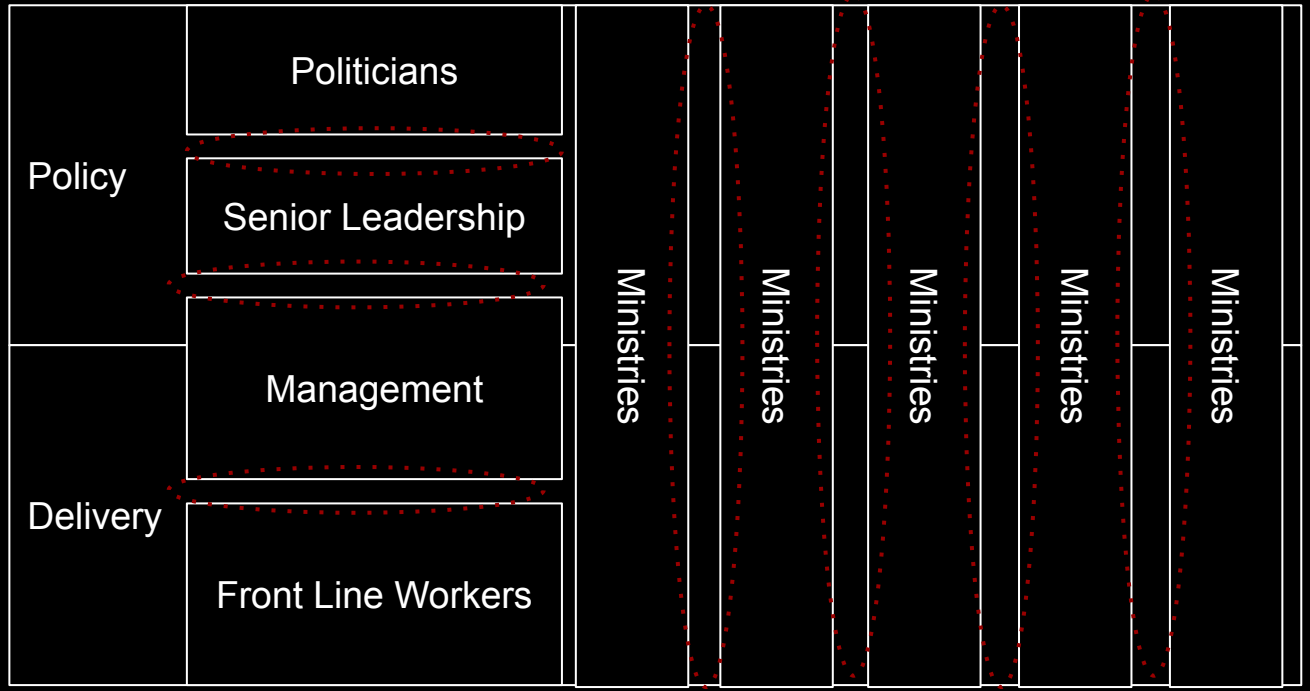
Structure of Government



Cultural Air gaps

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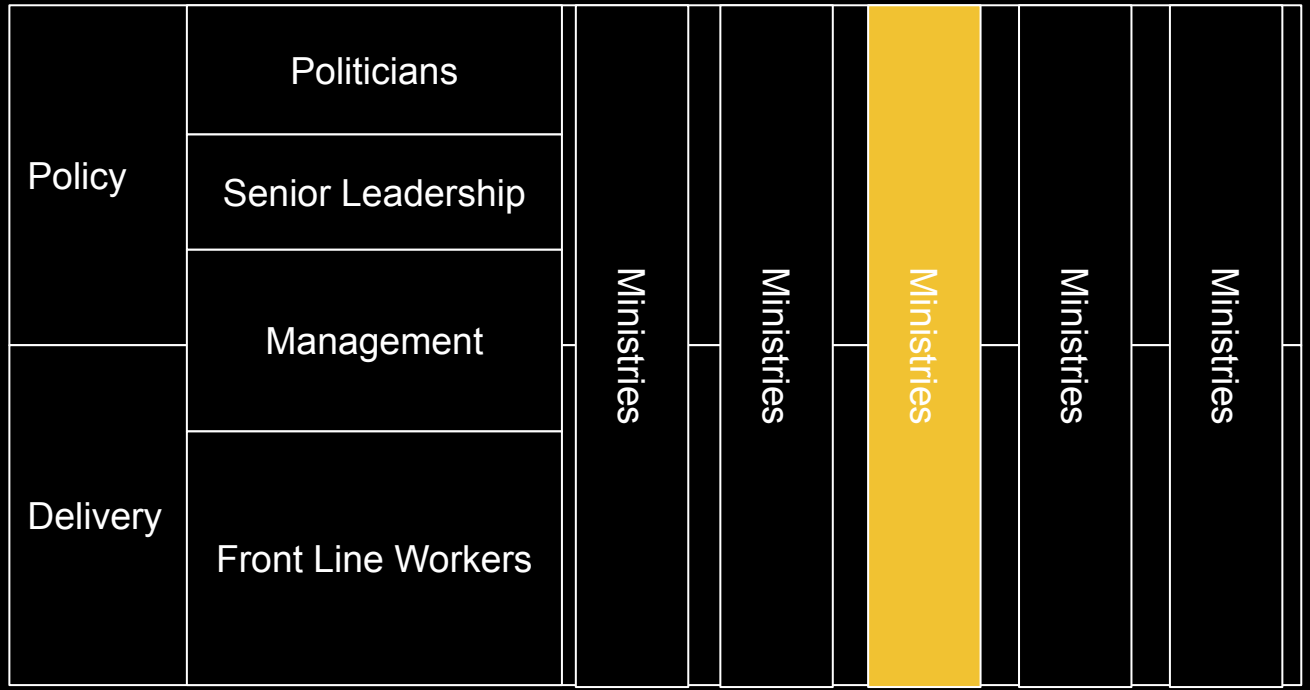
Structure of Government



Single silo area:
e.g “Education”

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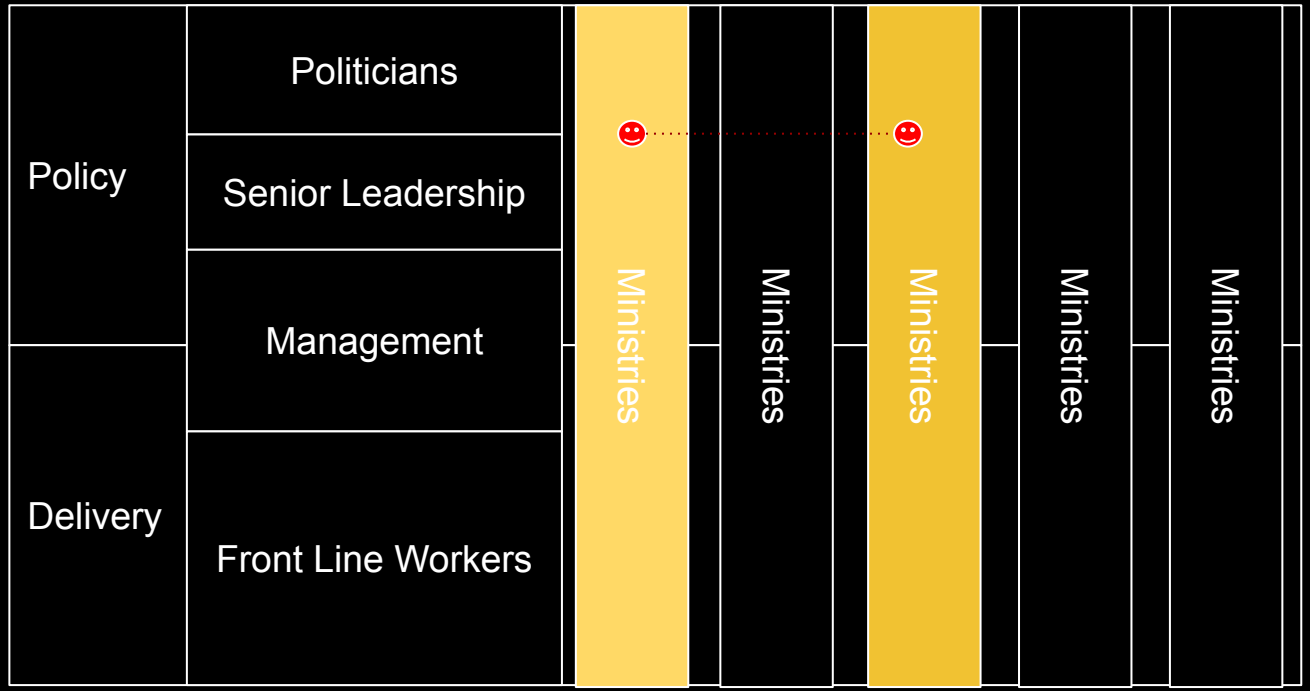
Structure of Government



Phenomenon based:
e.g SOTE
Social & Health

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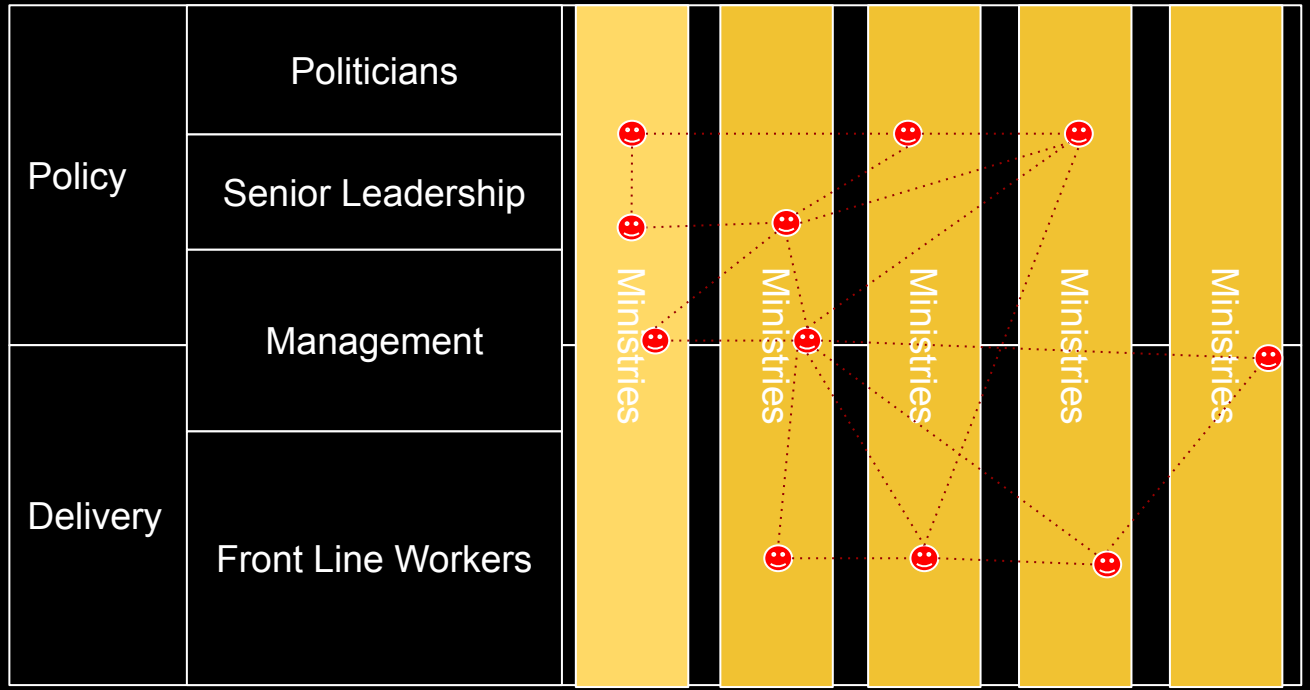
Structure of Government



Complex system based:
e.g The dream

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Part 2 - Systems Thinking Concepts

- What is a system?
- What type of system? - Cynefin model
- Feedback Loops
- Emergence
- System Elements & Attributes
- Unintended Externalities
- Pace Layering
- Leverage points
- 4 Keys

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What is a system?

“A defined collection of things that are connected by relationships that together as a whole have some kind of purpose.”

THINGS - LINKS - PURPOSE

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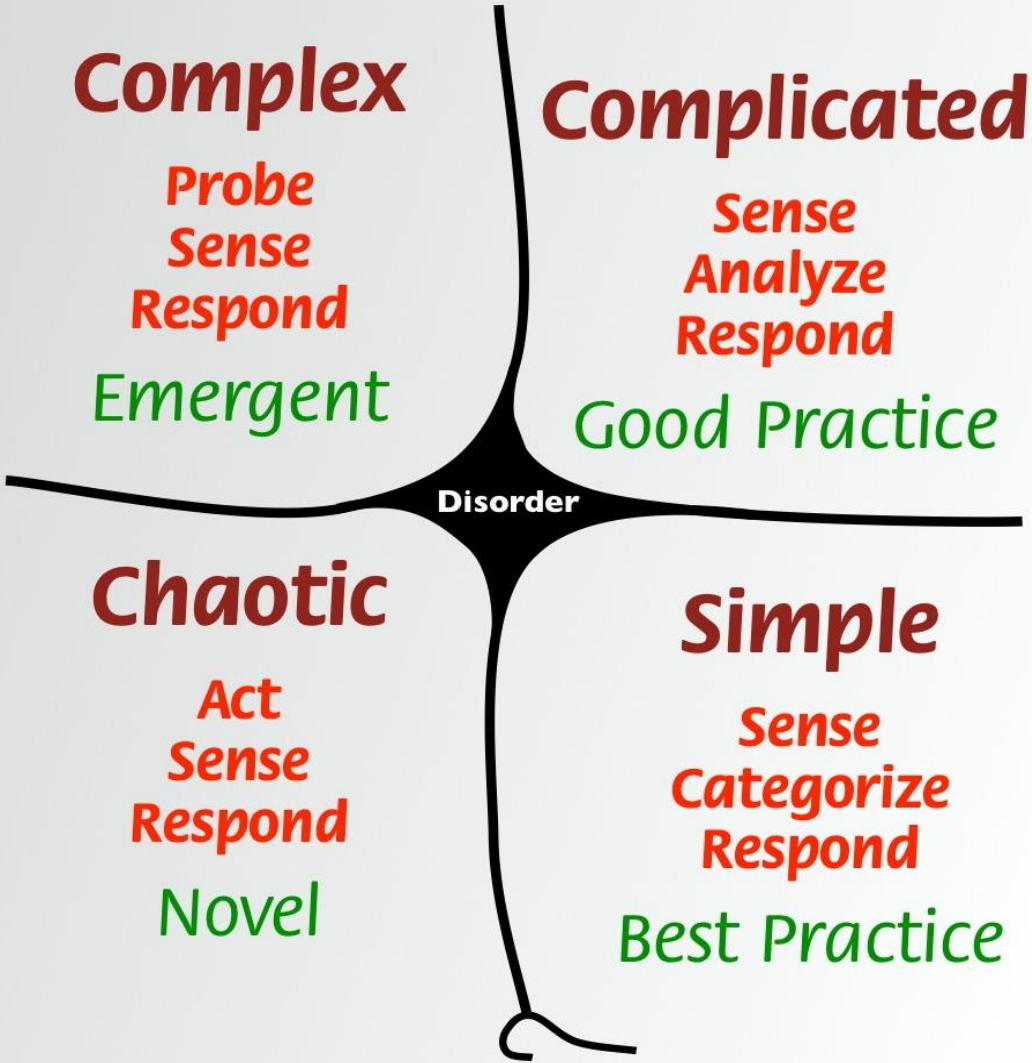
Cynefin Framework

Dave Snowden

A leaders framework for decision making - HBR

https://hbr.org/2007/11/a-leaders-framework-for-decision-making



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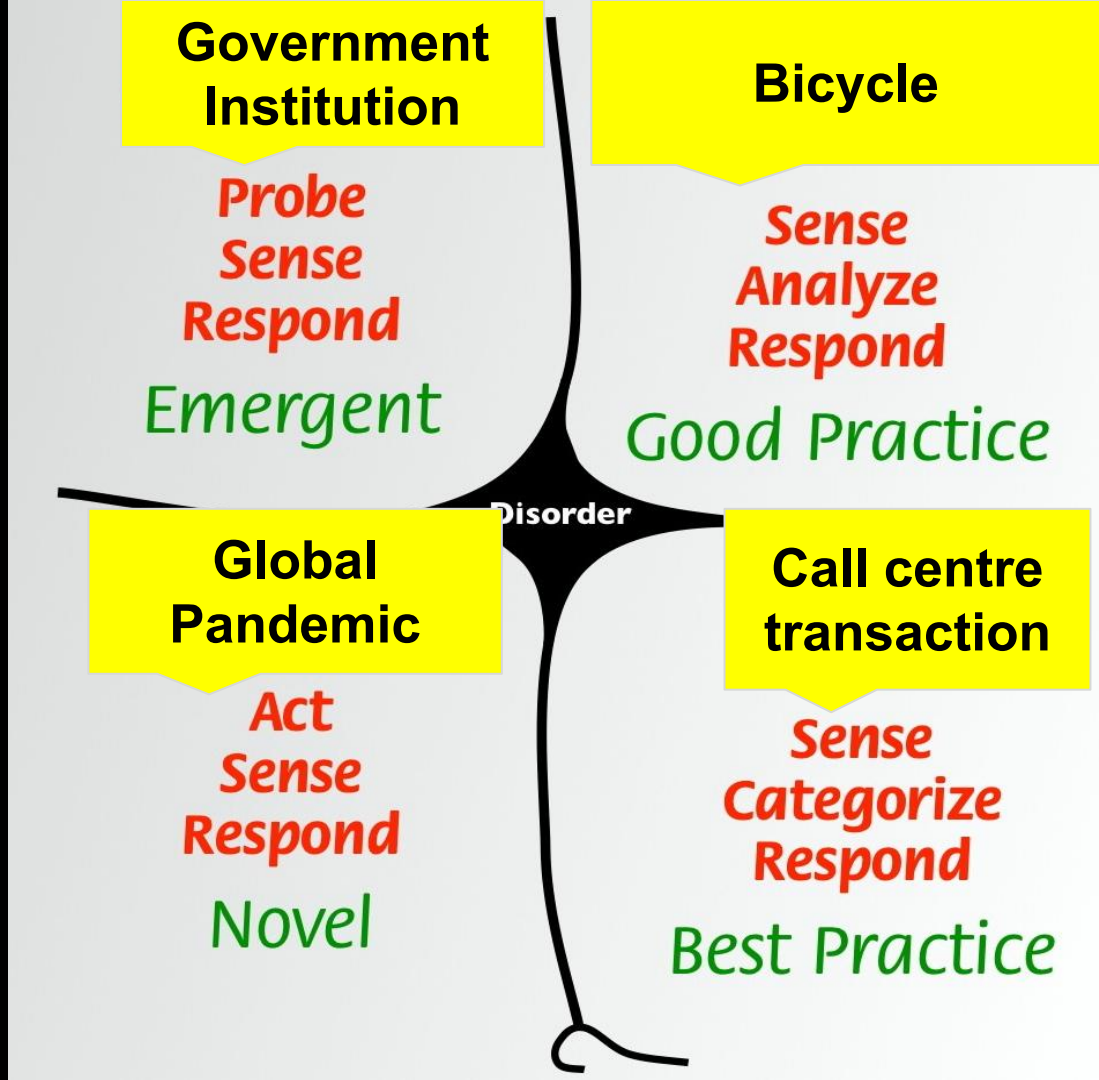
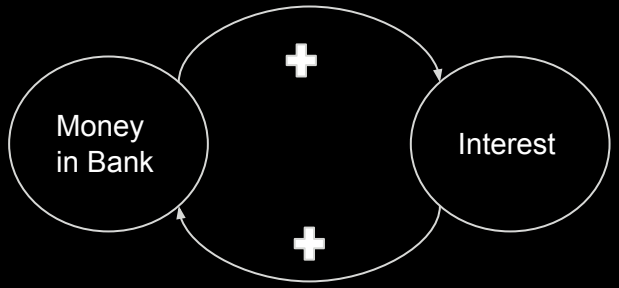
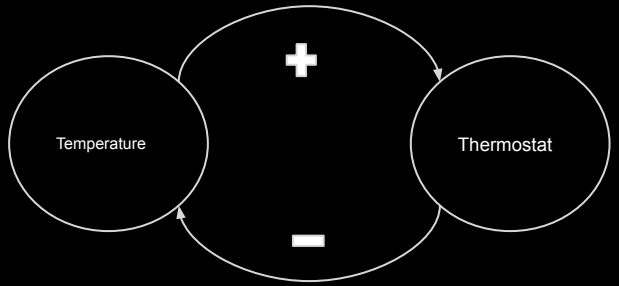


Feedback Loops

Reinforcing - positive feedback loop - more gets more



Balancing - negative feedback loop - opposite direction



Balancing feedback loops always have a stated goal, for example ‘Maintain a specific temperature’. It’s worth remembering this when you get to looking at leverage points. Changing the goal of a system is very high impact. Changing the goal of a balancing feedback loop is much lower impact but a far more commonly applied strategy.

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Emergence

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Emergence

“emergence occurs when an entity is observed to have properties its parts do not have on their own, properties or behaviors which emerge only when the parts interact in a wider whole”

SELECTION

Positive feedback loops

Balancing feedback loops

VARIATION

Dense network of connections

Chaos

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Emergence

SELECTION

Positive feedback loops

Balancing feedback loops

VARIATION

Dense network of connections

Chaos

Government is almost entirely made up of this stuff

The silo structure of government reduces the density of network connections and clusters them

There are few words that freak government people out more than this one!

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System elements & Attributes

Nodes

- People
- Organisations
- Documents
- Associations
- Other Networks
- Transport Assets
- etc

Links

- Relationships
- Physical
- Contracts
- Decision flows
- Communication
- Knowledge Transfer
- etc

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System elements & attributes

Alice

- Gender
- Age
- Current Location
- Team
- KPI performance score
- Time Served
- Skills
- Income
- Time to retirement

Links

- Works for <manager>
- Communicates with <nodes 1,2,4,7,9>
- Approves decisions of <nodes 2,4,7>
- Provides technical support to <nodes 2,7>
- Socialises with <people>
- Accountable for <metric>
- Gave COVID-19 to <nodes 3,5,7>

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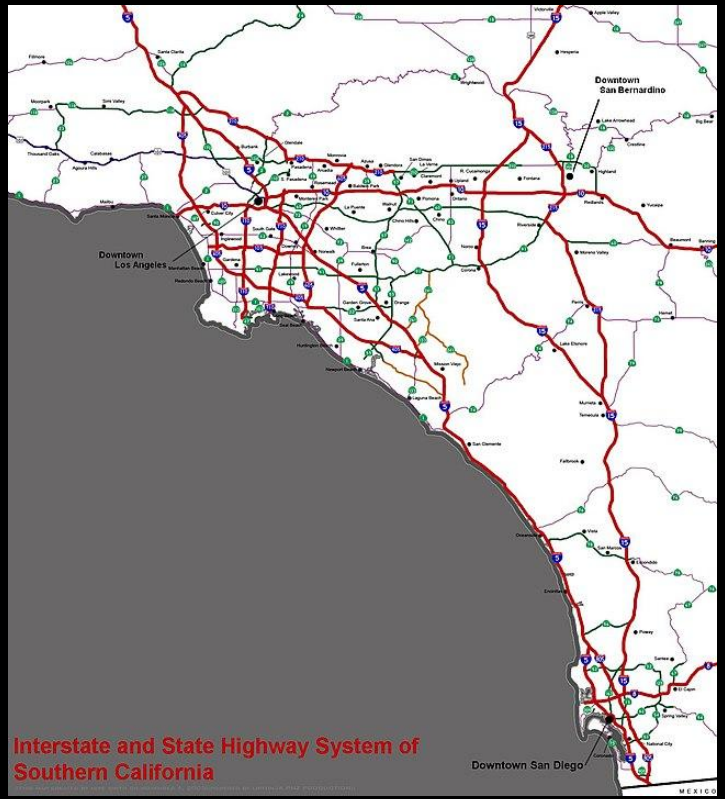
Unintended Externalities



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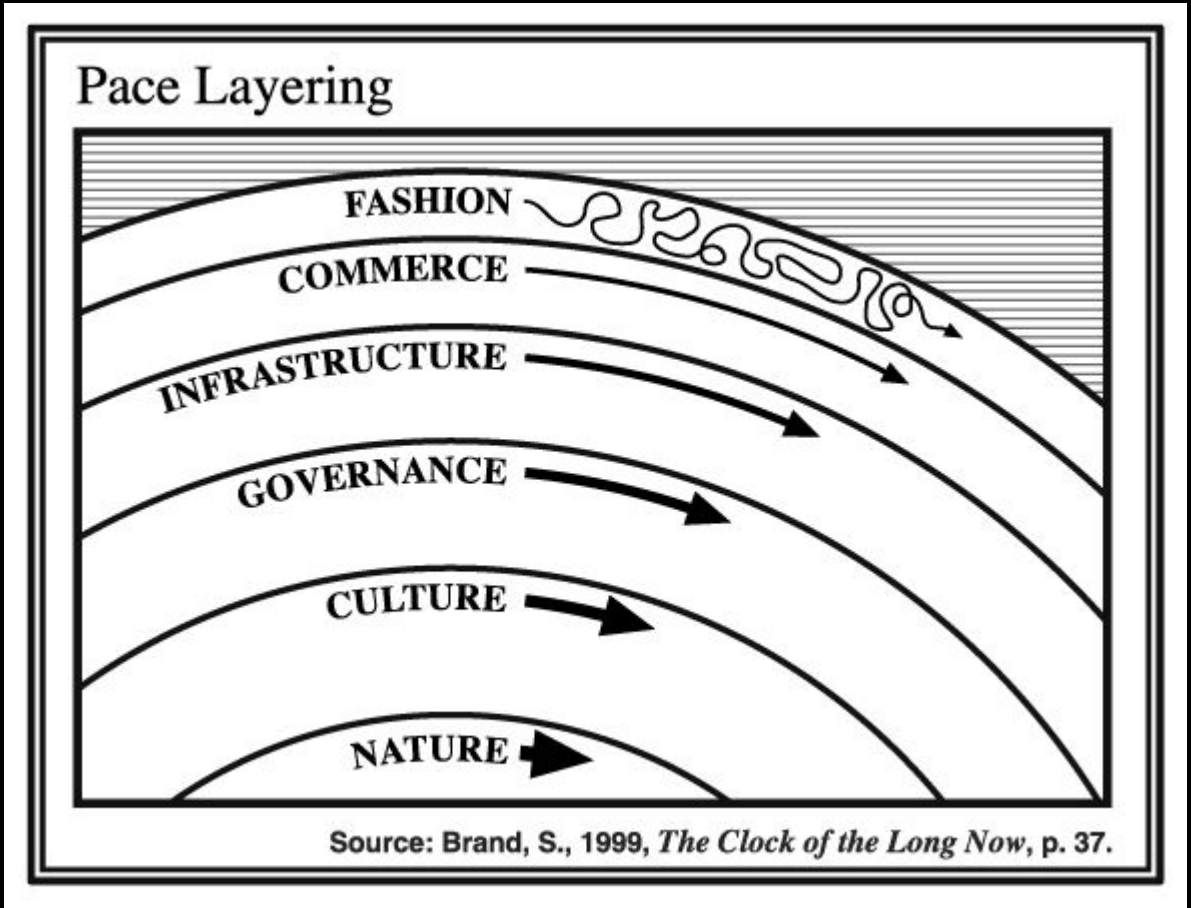

Pace Layering

https://blog.longnow.org/02015/01/27/stewart-brand-pace-layers-thinking-at-the-interval/

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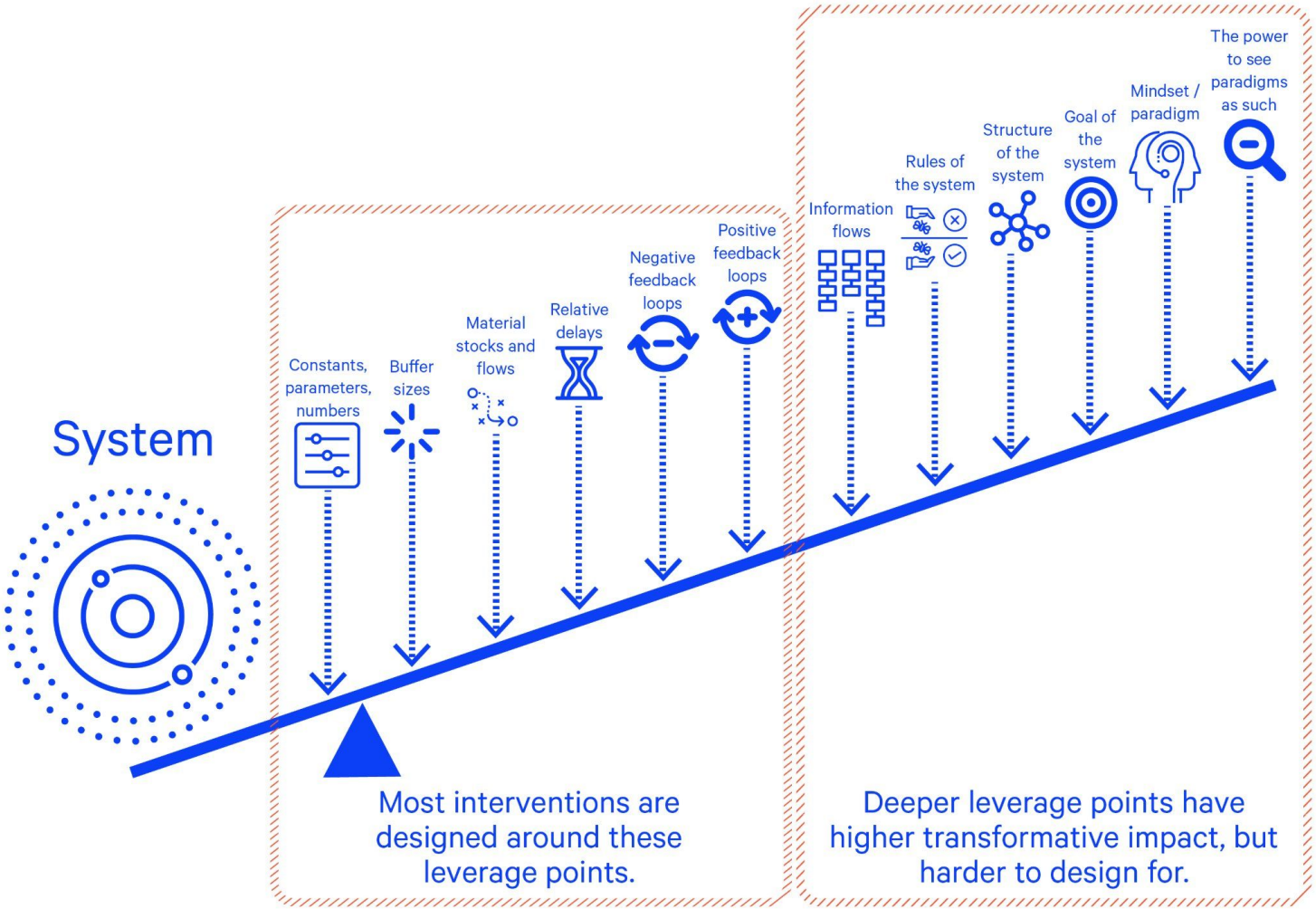
Leverage points



Adapted from Meadows (1977): Leverage Points: Places to Intervene in a System

The 4 Keys

Purpose

Power

Resource flows

Relationships

Charlie Leadbeater & Jennie Winhall - Building Better Systems - https://www.systeminnovation.org/green-paper

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Part 3 - System Maps & Mapping

- Types of system maps
- What are system maps for?
- System Boundaries
- Multimodal Maps
- Complex representations
- Storytelling
- Interventions Strategies

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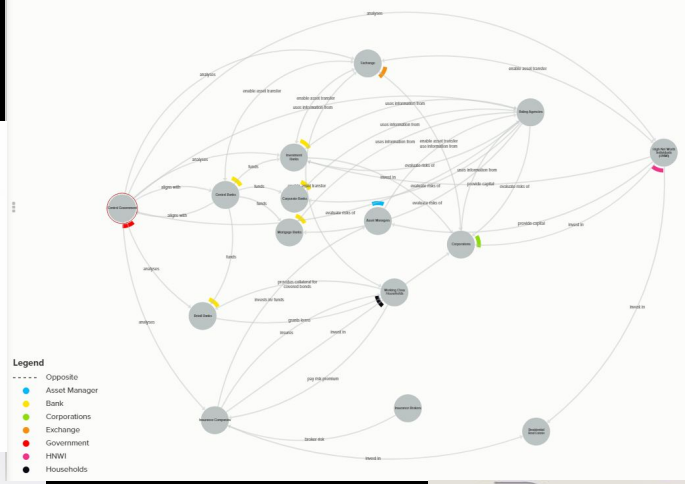
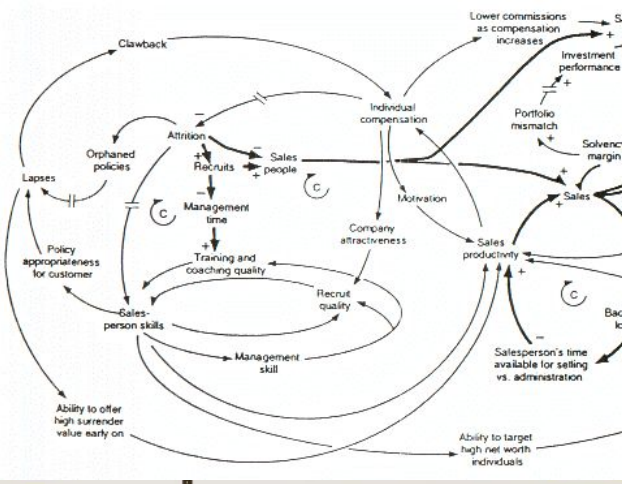
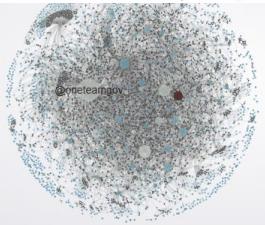
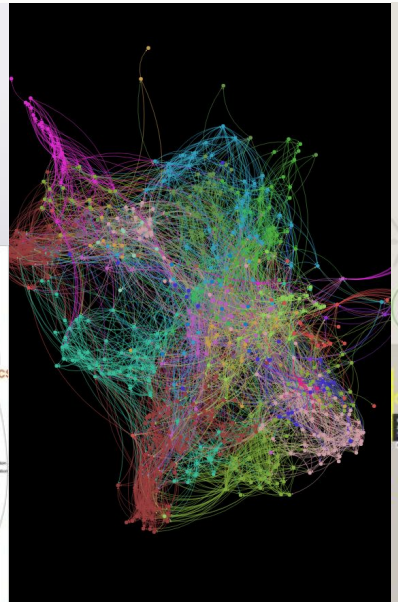
System Maps

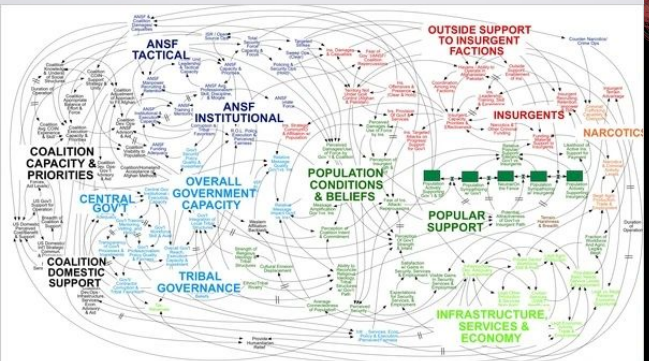

Can't attend the lecture
support studying parents
Why not take turns writing? $$$
Internet
Help to establish contact
provide info around the clock
have to stay at home with kids
public Kindergarten closed!
University: equal possibilities for all students
Support projects
What options are there??
Statistics show: parents study 3 years longer!
Look for alternatives

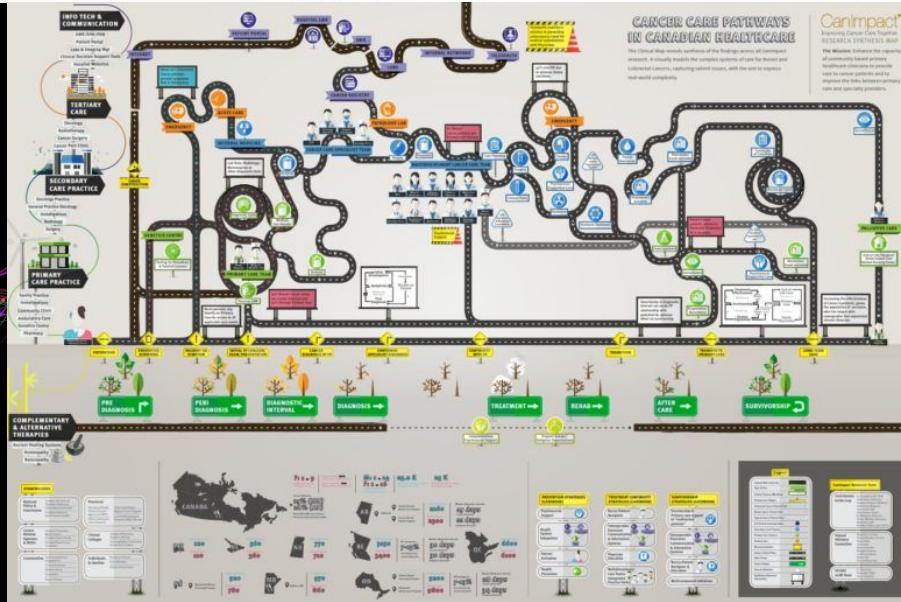

Legend
Opposite
Asset Manager
Bank
Corporations
Exchange
Government
HNWI
Households


Clawback
Lower commissions as compensation increases
Investment performance
Individual compensation
Portfolio mismatch
Attrition
Orphaned policies
Recruits
Sales people
Lapses
Management time
Motivation
Sales
Company attractiveness
Policy appropriateness for customer
Training and coaching quality
Sales productivity
Recruit quality
Sales-person skills
Management skill
Salesperson's time available for selling vs. administration
Ability to offer high surrender value early on
Ability to target high net worth individuals


@onetearngov




ANSF TACTICAL
OUTSIDE SUPPORT TO INSURGENT FACTIONS
ANSF INSTITUTIONAL
INSURGENTS
NARCOTICS
COALITION CAPACITY & PRIORITIES
OVERALL GOVERNMENT CAPACITY
POPULATION CONDITIONS & BELIEFS
CENTRAL GOVT
POPULAR SUPPORT
COALITION DOMESTIC SUPPORT
TRIBAL GOVERNANCE
INFRASTRUCTURE, SERVICES & ECONOMY


INFO TECH & COMMUNICATION
CANCER CARE PATHWAYS IN CANADIAN HEALTHCARE
CanImpact
TERTIARY CARE
SECONDARY CARE PRACTICE
PRIMARY CARE PRACTICE
COMPLEMENTARY & ALTERNATIVE THERAPIES
PRE DIAGNOSIS
PERI DIAGNOSIS
DIAGNOSTIC INTERVAL
DIAGNOSIS
TREATMENT
REHAB
AFTER CARE
SURVIVORSHIP
CANADA

Types of Systems Maps

- **Generic System Map** - any visual representation of things and their relationships
- **Rich Picture** - easy to get started, good for preliminary sketches
- **Causal Loop Diagrams** - good for predictive modelling
- **Giga Maps** - good for showing interactions between multiple subsystems of different types
- **Network map** - good for showing dynamic system change over time, allows use of powerful graph theory analytical tools

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What are systems maps for?

- Understanding
- Sensemaking
- Intervention design
- Storytelling

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System Boundaries

A system is defined by where you choose to place the boundary around it. This is a very impactful decision and will influence how you think about the system.

The system you are studying exists within other systems you have chosen to exclude.

That doesn't mean that systems outside your boundary will stop influencing your system, or that your system will not influence them.

It's better to think in terms of HIGH and LOW resolution, within your defined boundary you want high resolution information, while maintaining a low resolution awareness of the systems outside your boundary.

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Service Design and Resistance

fiddling with the aqueducts while Rome is burning...

Esko Reinikainen

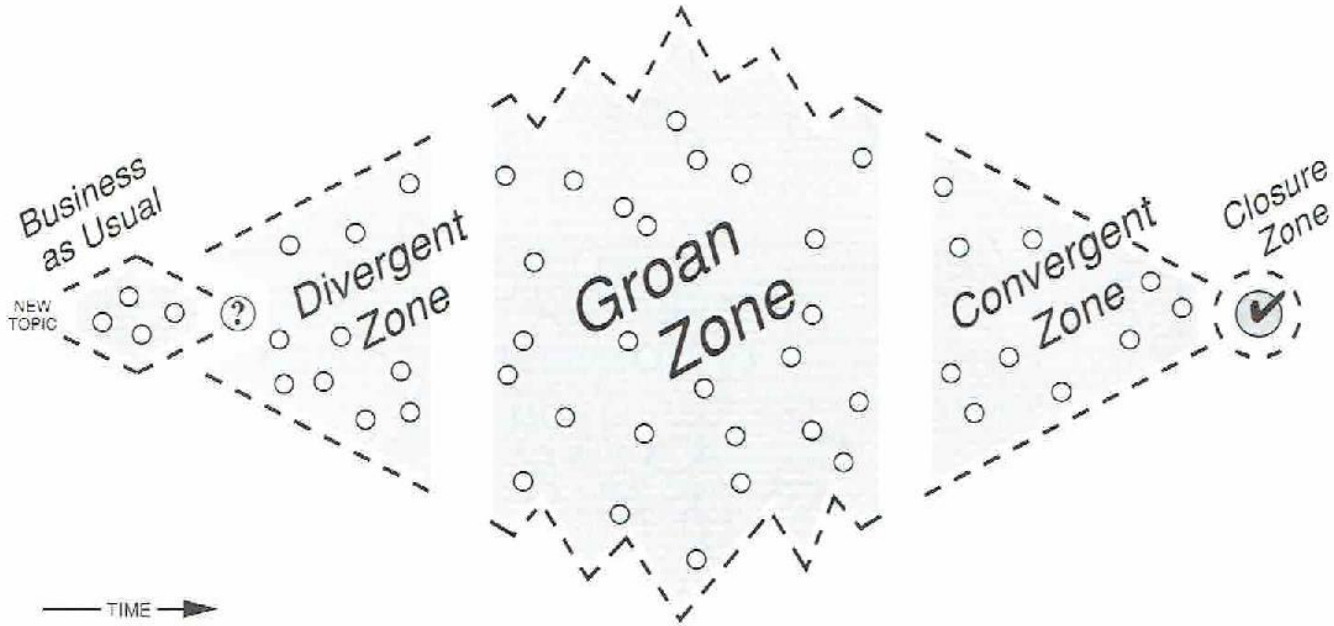
bit.ly/SDinGovResistance

satori lab
culture hackers

@reinikainen @TheSatoriLab

DYNAMICS OF GROUP DECISION-MAKING

THE DIAMOND OF PARTICIPATORY DECISION-MAKING



Extract from Facilitator's Guide to Participatory Decision-Making

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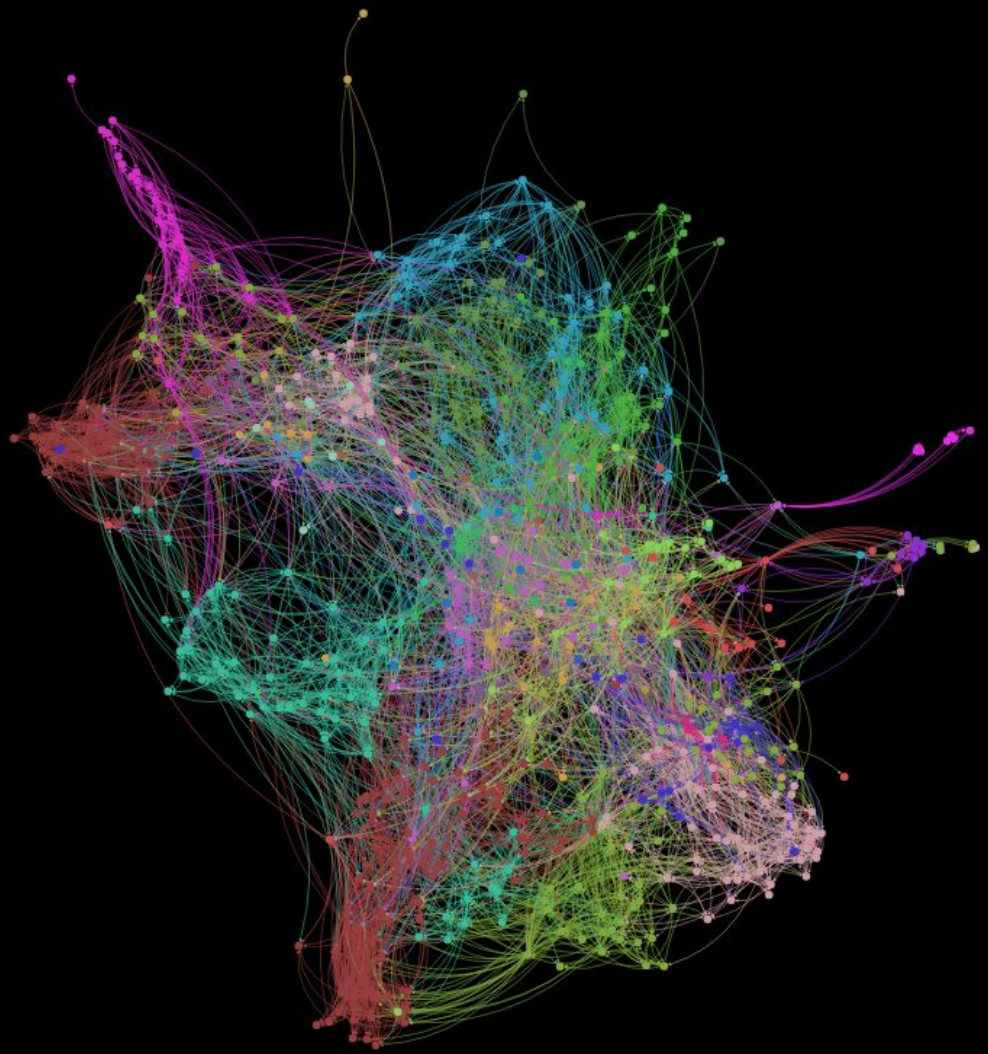

This is a real government organisation.

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Complex representations

Communications
Decision making
Technical Support
Resource flows
Social support
Management structure (Organisation Chart)

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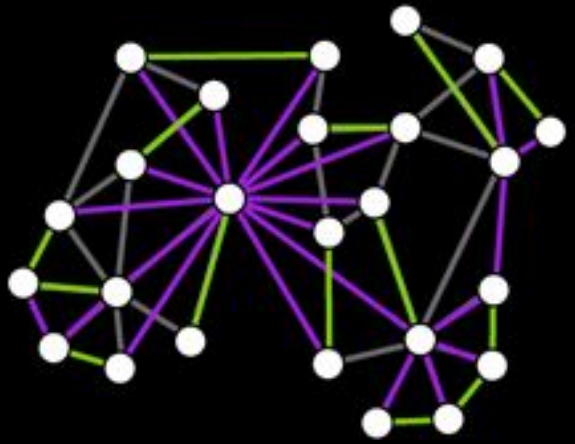

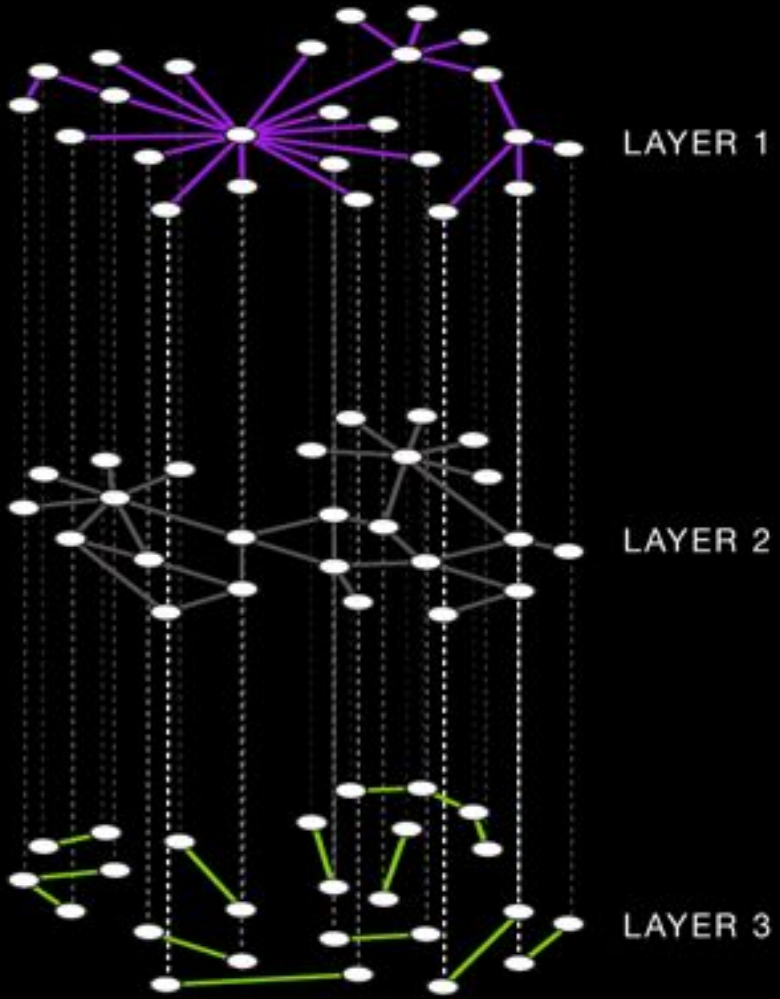

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Storytelling

3 Perspectives

Topography - the story of structure

Individual - the story of a node and how it experiences the network

Journey - the story of travelling connections between nodes

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Intervention Strategies

- Engineering at the relationship level
- Create links that are missing
- Remove links that are unhelpful
- Designate specialist roles to nodes
- Change the purpose of a node

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Interval

Thank you to our external viewers for tuning in, the rest of the session after the break is a practical session for the students only.

If you would like to contact me to talk further about these topics or opportunities you can find me on twitter @reinikainen or via email esko@systemschange.fi

Keep an eye out for CONVERGE & EMERGE: the great Open Space gathering for systems changers, online, May 14th 2021

Systemschange.fi

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Exercise

In your groups you will re read your government project design brief and populate two tables. The first table is a list of elements with attributes. The second table is a list of relationships or links with attributes. This will result in the raw elements you will need to start a system map.

(This is also coincidentally the basic data model needed to make a network map.)

While you are doing this you will be thinking about the kinds of attributes that should or should not be included and asking questions that are relevant to the 4 keys.

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Exercise

For elements (or things):

What kind of power does this element have? Financial, decision making, mandate, etc...

What is the purpose of this element?

Does this element receive or transmit any resources? What kind? Money, Information, etc...

For relationships (or links):

Is this relationship one way or two way?

Are there resources flowing through this link? What kind? How much? Under what circumstances?

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Exercise - Table 1 Elements

Element Name	Type	Purpose	Power	Resource TX	Resource RX	Attribute X	Attribute Y

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Exercise - Table 2 Relationships

From	To	Type	Direction	Resource Flow	Attribute X	Attribute Y

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