Problem Solving Methods

Proven tools for Radical Open Innovation

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Radical Open innovation

A modern innovation processes requires:

- An enormous diversity of knowledge and skills
- Use of knowledge partners
- Openness

Radical Open innovation is all about collaboration

We define Radical Open Innovation (ROI) as a method in which exchange of ideas and knowledge is possible in an open structure using openness principles by default.

ROI requires the use of problem solving methods with a foundation in systems thinking.
Accelerating changes

Changes in:

- Technology: Machine Learning (AI), biohacking (crissp), Internet use, etc
- Post covid-19 economy
- Environmental shifts (water becomes the new gold)
Solving problems is never easy

Well intentioned efforts to solve pressing problems lead to:

RESISTANCE

Many times your best efforts to solve a problem actually:

MAKE IT WORSE
Systems thinking will help

Move from generalizations to tools and processes:

- that help to solve complexity
- design better operating policies, and
- Guide change in systems (organisations and technology systems)

System Dynamics is a method to enhance learning in complex systems
Systems thinking is critical for ROI

- Changes in our environment are driving us to think differently about governance.

- Information explosion: More accessible knowledge (fads, facts and opinions)

- Digital connected world (Machine Learning / AI, IoT, Internet) -> Everything is connected.

- Communication is more complex: E.g. complex collaboration networks
What is a system

- A combination of interacting elements organized to achieve one or more stated purposes.

- An integrated set of elements, subsystems, or assemblies that accomplish a defined objective. These elements include products (hardware, software, firmware), processes, people, information, techniques, facilities, services, and other support elements.

- A set of things, connected in such a way that they produce their own pattern of behavior over time. (Donella Meadows)
Systems thinking

- Systems thinking is a unique perspective on reality a perspective that sharpens our awareness of wholes and how the parts within those wholes interrelate.

- A systems thinker knows how systems fit into the larger context of day-to-day life, how they behave, and how to manage them.

- Systems thinking recognizes circular causation, where a variable is both the cause and the effect of another and recognizes the primacy of interrelationships and nonlinear thinking. A way of thinking where the primacy of the whole is acknowledged.
Emergence

- System-level properties exist only at the system level as the system functions.
- System properties are not observable by looking at a subsystem only.
- Emergence behaviour cannot be understood, explained, or inferred from the structure or behavior of constituent elements or their local properties.
- Cause and effect relationships can only be established through retrospection.
- Traditional reductionist analytic techniques are incapable of useful predictions of emergent, system-level behavior.
Systems Science overview

Source: DOI: https://doi.org/10.1017/dsj.2018.16 (cc-by)
Systems Science overview (2)

Source: DOI: https://doi.org/10.1017/dsj.2018.16 (cc-by)
Skills

Source: Canadian Chamber of Commerce, 2013
System Dynamics

Known and Unknown behaviour makes IT innovation comparable with rocket launching:

- Programming (mistakes)
- Knowledge
- Floating specs
- Budget
- Scope creep
- Software errors
- Hardware errors (CPU, Storage, etc)
- Communication errors (network and humans)
- Human behaviour
- Factor time
System Dynamics

System dynamics is fundamentally interdisciplinary:

- Behaviour of complex systems
  - Theory of nonlinear dynamics and feedback control

- Behaviour of humans
  - Cognitive and social psychology, economics and other social sciences.
System Dynamics

Events

Increasing Leverage

Behavior Patterns, Change over time

Systemic Structure

Mental Models
Factors that make innovation complex

Only a few factors make problems complex and hard to solve:

- Humans (mostly behaviour)
- Time (and delays in time)

Time delays between taking a decision and its effects on the state of the system are common and particularly troublesome.
Feedback

- Much of the art of system dynamics modeling is discovering and representing the feedback processes.

- The most complex behaviors usually arise from the interactions (feedbacks) among the components of the system, not from the complexity of the components themselves.

Positive Feedback → Self-Reinforcing

Negative Feedback → Self-Correcting
Time: Exponential behaviour

- Exponential growth
- Linear growth
Time: Scale

- Strategic
- Tactical
- Operations

Length of simulation run:
- From Days
- Hours/Days/Weeks/Months
- 1 - 2 years Horizon
- 2 - 5 or 10 years Horizon

To Years
Core tool: mental models

Share perceptions
Core tool: Causal Loop Diagrams

Direct causal relations are never there.

Use it for discovering of:
- Digital Innovation
- Organizational
- Changes
- Business cases
And to solve problems!

Use the most simple (and FREE!) tool available: https://nocomplexity.com/causalloopdiagram/
Core tool: Stock and flow models

Use the FOSS tool Insight Maker to create fast simulations to validate if changes are sustainable. Its free to use! Check: https://insightmaker.com/
Core tool: Archetypes to predict behaviour

- Feedback loops are linked to specific kinds of behaviour patterns.
- Finding archetypes (feedback loops) in nonlinear systems (so real world systems!) is very hard!
Requirements for successful ROI

- Use systems thinking and the key tools.
- Simulation is essential.

Your innovation problem

Create diagrams, rich pictures and causal loop diagrams

Create an architecture view with the current (baseline) and the target situation to define the gap

Select a PSM to approach the problem (and iterate!)

Define the implementation steps needed for change

Implement and learn (with all stakeholders!)

Real world

System thinking about the real world (virtual worlds)
Join!

Joining the Open Company Directory network of the BM-Support.org Foundation enables more opportunities for your open collaboration project.

- Joining this open network is free. No strings attached!
- It is a decentralized network by design. You decide if, how, when and with whom you want to collaborate.

https://www.bm-support.org/join/
Contact Information

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BM-Support.org is a foundation for sharing and creating knowledge. Everyone can join the bm-support.org network!

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