



Tackling Wicked Problems

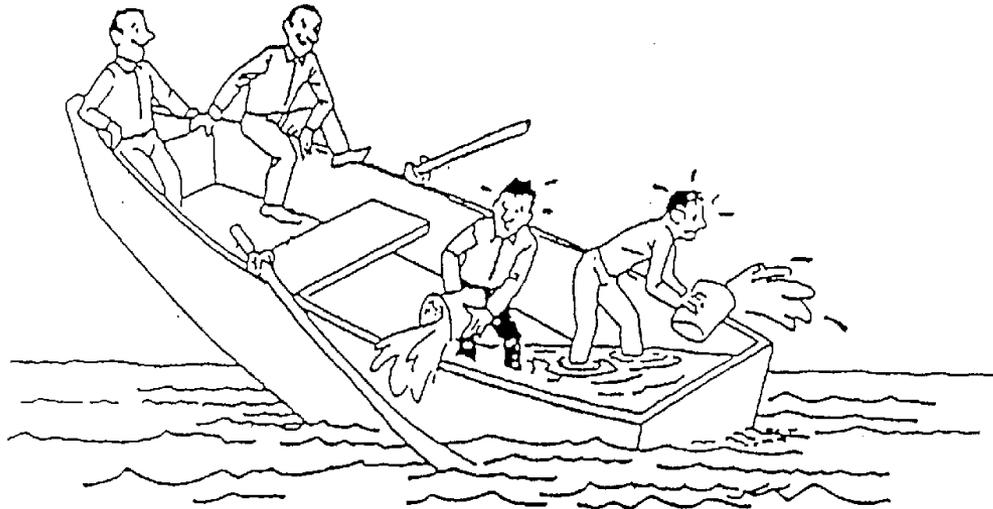
**SYSTEMS THINKING:
THINKING AND ACTING
DIFFERENTLY**

Michael Goodman

January 13, 2015

Systems Thinking

*I'm sure glad
the hole isn't in
our end...*



Objectives

- Understand what systems thinking is and why it is important
- Introduce basic systems thinking framework, principles and tools
- Explore mental models and the impacts they have
- Hands on experience actually applying systems thinking to your own work
- Engage in a structured community dialog

Topic Agenda

- Introduction to Organizational Learning and Change
- Systems Thinking
 - Distinguishing Traditional from Systems Thinking
 - The Iceberg and Exercise
 - Basic Language of Systems Thinking
 - Applying systems thinking in communities
- Mental Models
 - Sherlock Holmes exercise
 - Ladder of inference
 - Effective conversation tools
 - Belief-Action-Results Maps Exercise
 - Mental models exercise
- Café Dialogue – A tool for collective thinking and action

Two Types of Thinking

Conventional

appropriate for
simple problems

Systems

appropriate for chronic,
complex/messy
problems

Conventional vs Systems Thinking

Conventional

The connection between problems and their causes is obvious and easy to trace

Systems Thinking

The relationship between problems and their causes is indirect and not obvious

Conventional vs Systems Thinking

Conventional

Others, either within or outside our organization, are to blame for our problems and must be the ones to change

Systems Thinking

We contribute to our own problems

Everyone is acting reasonably and responsibly and no one is to blame

Conventional vs Systems Thinking

Conventional

What we do short-term
will also assure long-
term success

Systems Thinking

Most quick fixes either make
no long-term difference or
actually make matters worse
in the long run

Conventional vs Systems Thinking

Conventional

In order to optimize the whole, we must optimize the parts

Systems Thinking

In order to optimize the whole, we must improve relationships among the parts

Conventional vs Systems Thinking

Conventional

The best way to implement change is to aggressively tackle many independent initiatives simultaneously.

Systems Thinking

Only a few high leverage interventions are required for large systems change

“A Learning Organization or Community is...

... a group of people who are continually enhancing their capacity to create the results they want.

If you think about this statement, it has two parts to it:

*One, you have to know **what you want to create**, so you're continually reflecting on your sense of purpose, vision.*

*And secondly, you have to be continually **developing the capability** to move in that direction.”*

- Peter Senge, Author

1990, *The Fifth Discipline - The Art and Practice of the Learning Organization*

1994, *The Fifth Discipline Fieldbook*

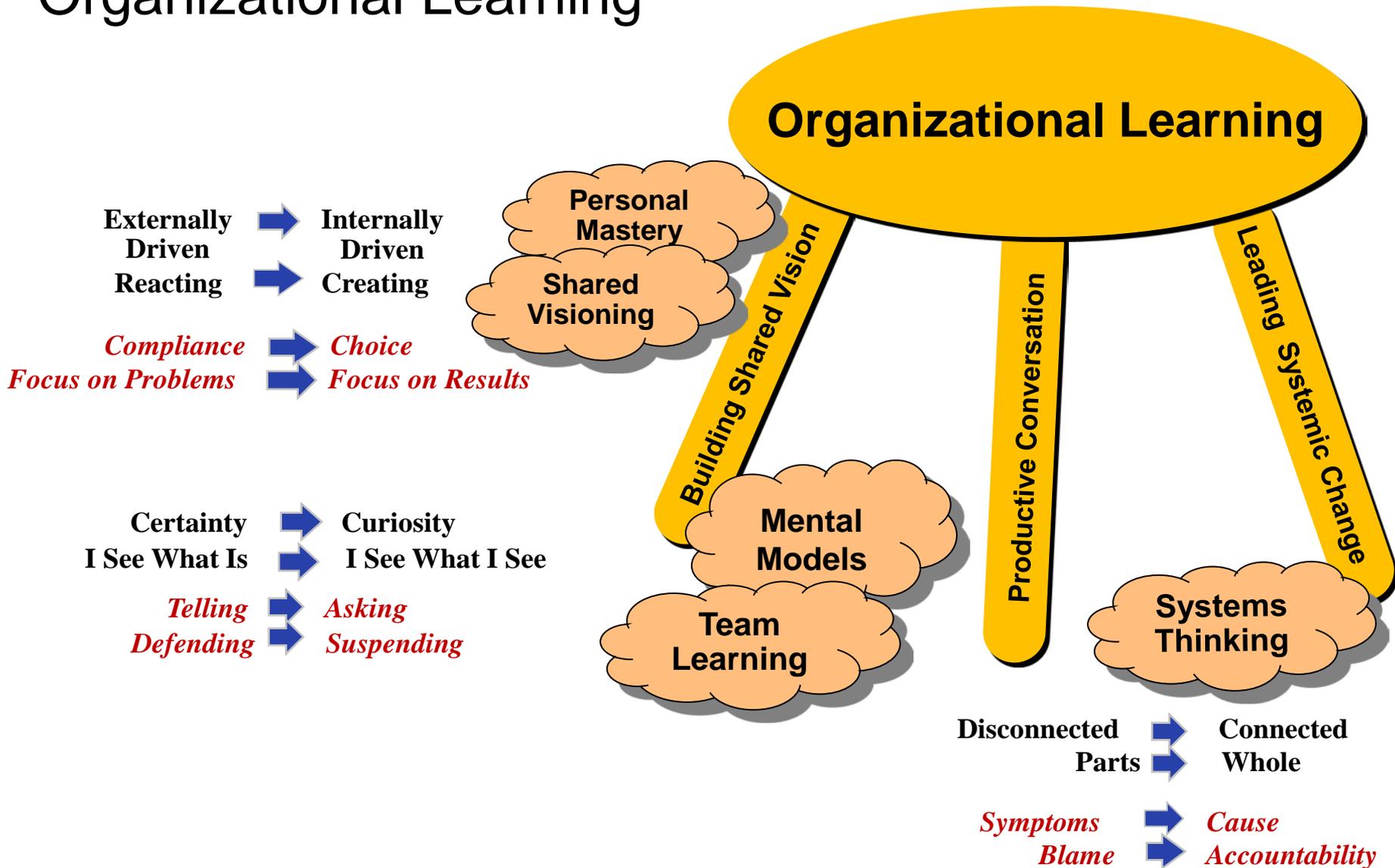
1999, *The Dance of Change*

2000, *Schools that Learn*

2005, *Presence: An Exploration of Profound Change in People, Organizations, and Society*

2008, *The Necessary Revolution: How Individuals and Organizations Are Working Together to Create a Sustainable World*

The Disciplines of Organizational Learning



The Five Disciplines of Organizational Learning

Building Shared Vision



Personal Mastery: Developing capacity to clarify what is most important to us, and to achieve it.

Shared Visioning: Building a sense of commitment in a group based on what people want to create.

Productive Conversation



Mental Modeling: Developing capacity to reflect on our internal pictures of the world to see how they shape our actions.

Team Learning: Developing capacity for collective intelligence.

Leading Systemic Change

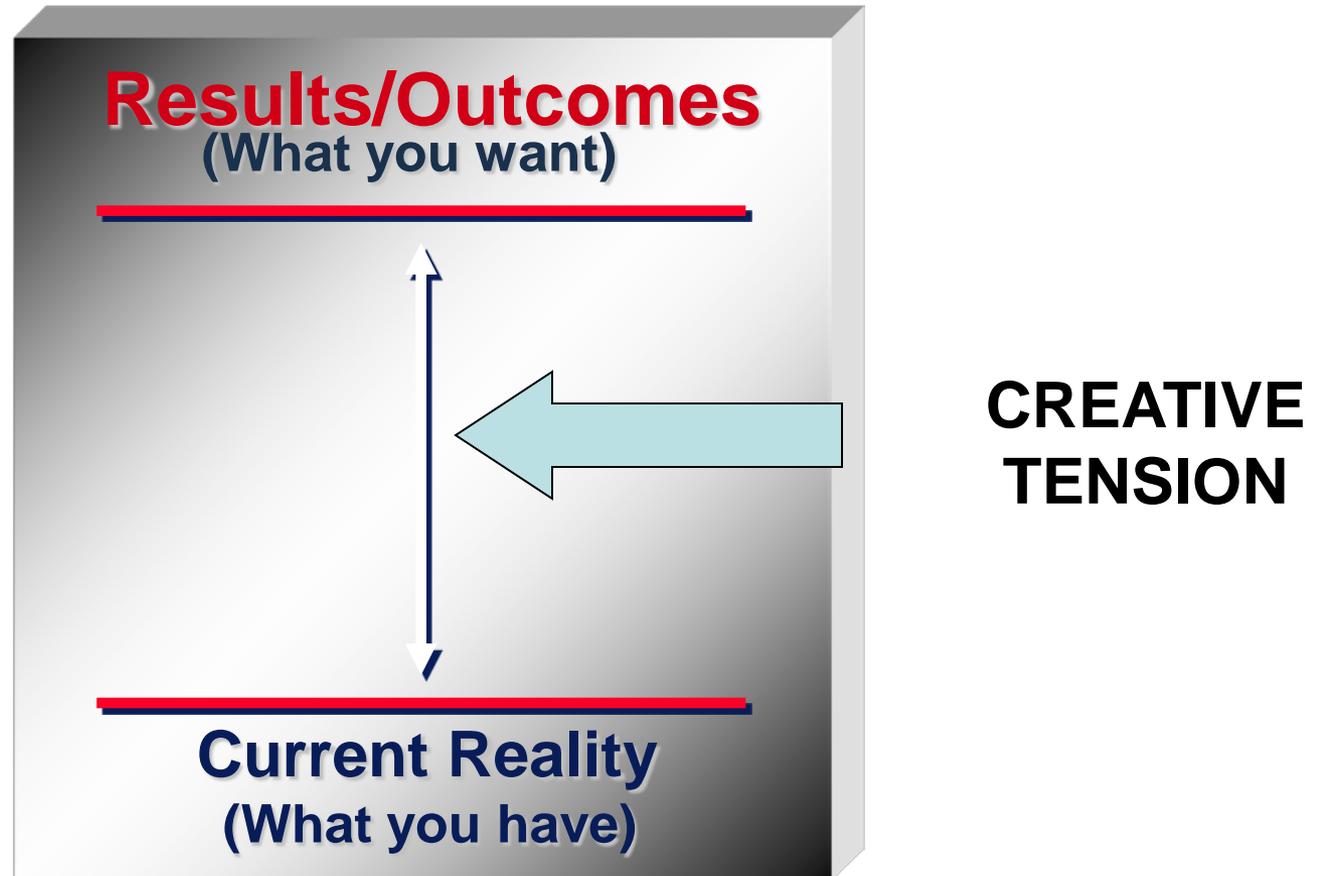


Systems Thinking: Developing capacity for putting pieces together and seeing wholes.

Systems Thinking... why?

- Helps us to recognize **hidden & unintended consequences**
- Enables us to **think deeper and wider** about effective strategies in complex systems
- Can be helpful when thinking about strategy & change - **the short term as well as the long term**
- **Expands the choices** available to us & enables us to focus on higher leverage strategic interventions

Basics of Strategy & Change: Establishing Creative Tension



Basics of Strategy & Change: Establishing Creative Tension

Results/Outcomes
(What you want)



Current Reality
(What you have)

Systems Thinking:

- Establish a **shared** picture of current reality that both honors different perspectives and explains their limitations
- Develop clarity about not only what is happening, but also **why**
- Identify **root causes** of complex, chronic problems
- Anticipate **unintended consequences** of proposed solutions
- Clarify **leverage points** for sustainable improvement in system-wide performance
- **Anticipate and prevent** difficulties from becoming major problems

Using Systems Thinking to Understand Current Reality

1. Why do we have the current reality we have? (*Diagnosis*)

Why do we have this gap (between desired results & current reality)?

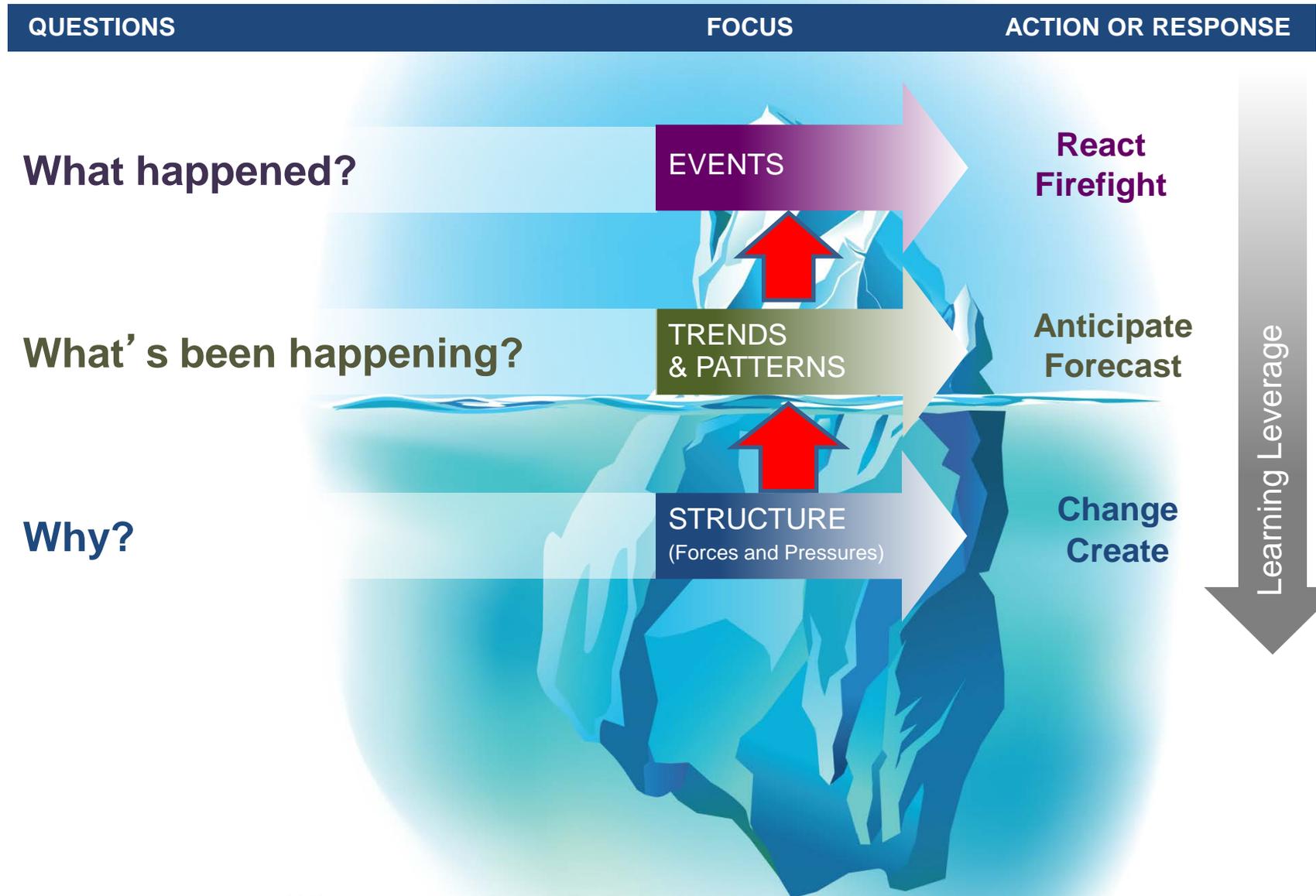
Why has it persisted?

What will prevent or impede change?

What are the barriers to improvement?

2. **What would be our strategic recommendations for making the most progress on closing the gap based on a systemic view of the current system.** (*Treatment*)

Deepening Our Understanding of Problems: The Iceberg



An Iceberg Exercise - Example 1

1. Tell the Story

What happened?

What are some key events or crises?

Why is this a problem for us?

Share stories & info

Listen for key variables & trends

Example

Focusing question: Why, despite our best efforts, have we been unable to introduce new technology into the organization?

- **We've really only had one successful implementation**
- **We always encounter resistance when we approach different departments**
- **Our mission is to bring new technology into our plants but we are struggling with how to do this**

An Iceberg Exercise - Example 1

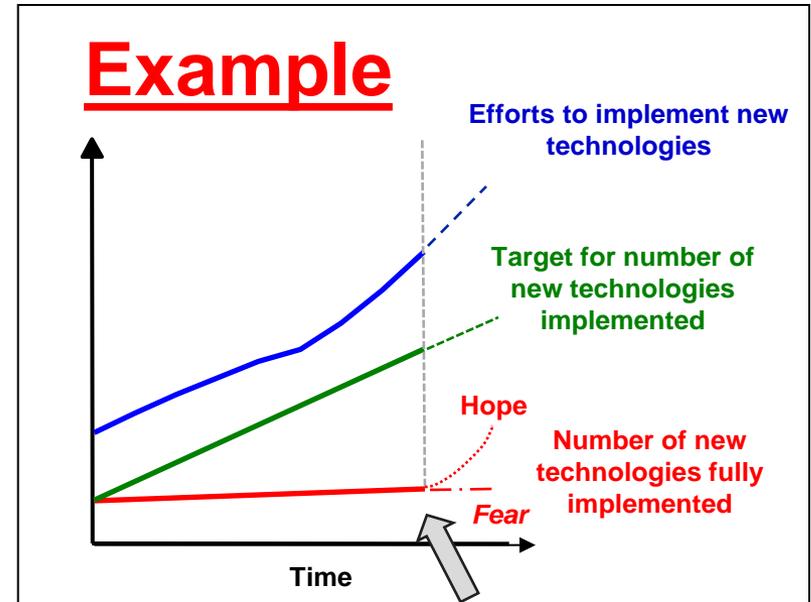
2. Draw the Graphs

Historically what has been happening over time?

What are the trends & patterns we see?

Where is this headed (hopes & fears)?

Draw 3-5 key historic trends of the key variables important to the issue



An Iceberg Exercise – Example 1

3. Identify the Structure

Why did this happen?

What are the forces & pressures at work?

What is perpetuating or exacerbating the problem?

- **Develop a list of important drivers or factors contributing to or perpetuating the problem**

(Suggestion: Use sources of pressures or forces list on next pages)

- **Use Brainstorming**
- **Avoid solutions or fixes**

Example

We keep pushing but don't see much "pulling" from the dept managers.

We're seen as outsiders with an agenda to push & not as real partners.

The financial structure makes the dept managers very risk averse. They see the costs but not the benefits.

Senior management does not seem to have a deep commitment to new technology advances.

The depts don't seem to have the resources to support the new technologies.

An Iceberg Exercise – Example 2

1. Tell the Story

What happened?

What are some key events or crises?

Why is this a problem for us?

Share stories & info

Listen for key variables & trends

Example

Focusing Question

Why, despite our best efforts, have we been unable to end homelessness in Calhoun County?

Calhoun County, MI: estimated 250-500 people homelessness among population of 100,000

Homeless Coalition meetings again fail to deal with the problem: disagreements, competition, and lack of knowledge cited

Opportunity to receive funding to develop ten-year plan to end homelessness

An Iceberg Exercise – Example 2

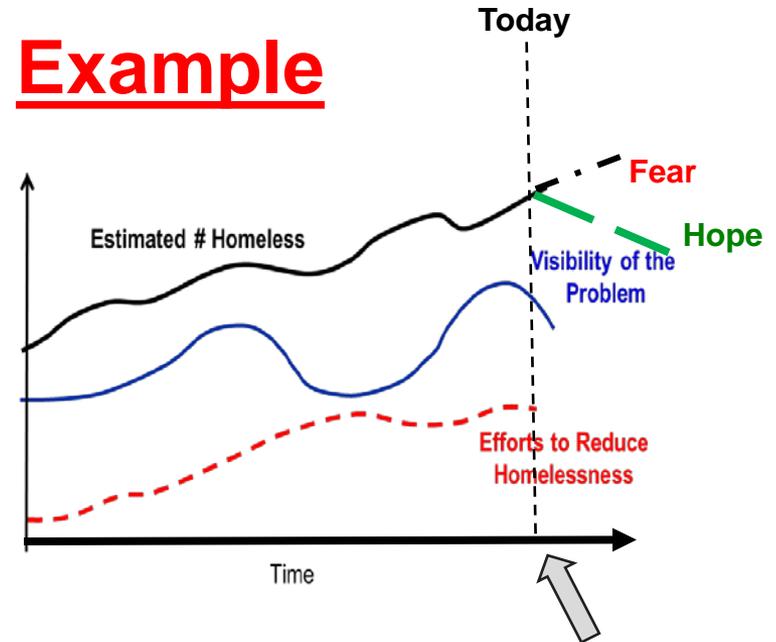
2. Draw the Graphs

Historically what has been happening over time?

What are the trends & patterns we see?

Where is this headed (hopes & fears)?

Draw 3-5 key historic trends of the key variables important to the issue



An Iceberg Exercise – Example 2

3. Identify the Structure

Why did this happen?

What are the forces & pressures at work?

What is perpetuating or exacerbating the problem?

- **Develop a list of important drivers or factors contributing to or perpetuating the problem**

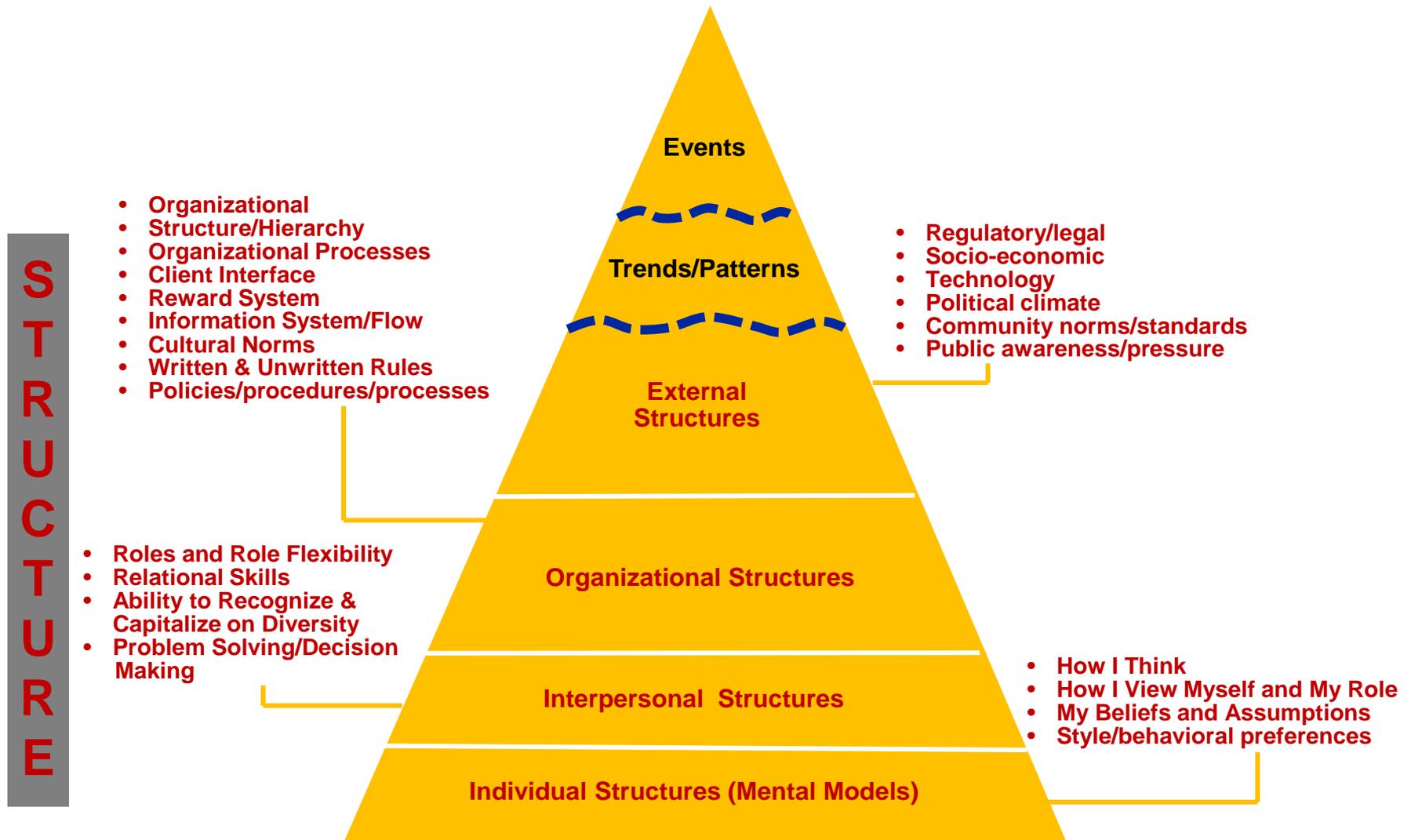
(Suggestion: Use sources of pressures or forces list on next pages)

- **Use Brainstorming**
- **Avoid solutions or fixes**

Example

- Factors That Create Risk
 - Individual and family risk factors, e.g. poverty, discrimination, and lack of education; substance abuse, mental illness, DV; lack of support for minors; absence of life management skills, underlying self-esteem
 - Limited permanent, accessible, living wage jobs
 - Financial problems stemming from above, e.g. difficulty paying for medical emergencies and child support – not just rent and food
 - Limited permanent, safe, affordable, supportive housing
 - Social risk factors, e.g. aging, meth lab immigration
- Dynamics That Increase Risk
 - Renting to people who are at risk reduces housing affordability *for landlords*, which increases vacant housing or gentrification and decreases quality of the remaining stock
 - Vulnerability to scams, e.g. slum lords, quick cash

Sources of Pressures or Forces



Sample Elements of Structure that Generate Forces & Pressures

- State/local regulations & laws
- General economy
- Local economy
- Financial resources/capital (e.g. access to funding)
- Technology (e.g. access & availability)
- Political climate
- Human capital (e.g. skill level, education)
- Demographics (including migration patterns)
- Availability & access to services (health, education, etc)
- Level of collaboration among service providers & agencies
- State/local leadership (private/public)
- Housing availability & quality
- Built (infrastructure) capital
- Quality of life factors
- Natural capital
- Social capital (e.g. connections within community, among businesses and to resources outside the community)
- Cultural capital (mindsets, attitudes, level of public trust) (Mental models)

What makes for good systems thinking issues?

The problem/issue is chronic

- There is a known history – we have data and are knowledgeable about the issue
- Prior attempts to solve the problem have failed
- Multiple perspectives exist on why we have the problem & what should be done
- We believe there is more to be learned about the issue
- We have some control or influence over the situation including access to the key stakeholders

Potential Issues

Try formulating your issue as a focusing question that starts with the words Why or How Come but not **How To**.

Examples:

Why despite our best efforts have we been unable to end homelessness in Calhoun County?

How come despite all the past initiatives have we been unable to create a vibrant, attractive and safe downtown in Trenton?

Using Systems Thinking to Understand Current Reality

Be prepared to present your iceberg analysis & answer the following questions from your diagnosis:

Focusing Question: _____

1. *What are the results you'd like to see created? What would it look like if the problem was fixed? (Capture on flip chart)*
2. *What is the current reality now? Events (symptoms) & key trends (Draw 3-5 & include hopes & fears)*
3. **Why** *do we have the current reality we have? Structure* (Brainstorm list of factors or drivers found on next pages)

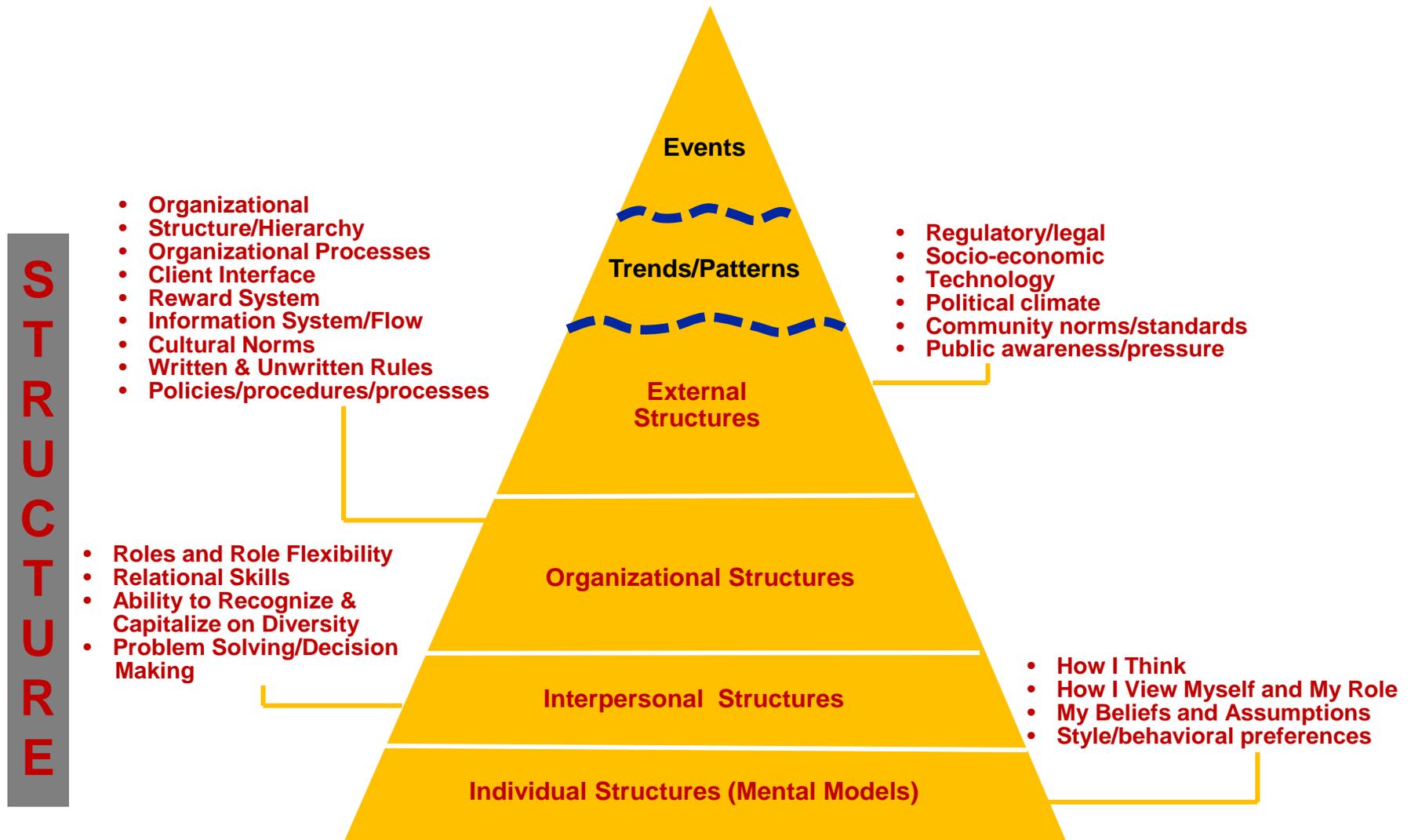
Why has it persisted?

What is perpetuating or exacerbating it?

What are the barriers to improvement?

NOT WHAT TO DO ABOUT IT OR HOW TO FIX IT YET

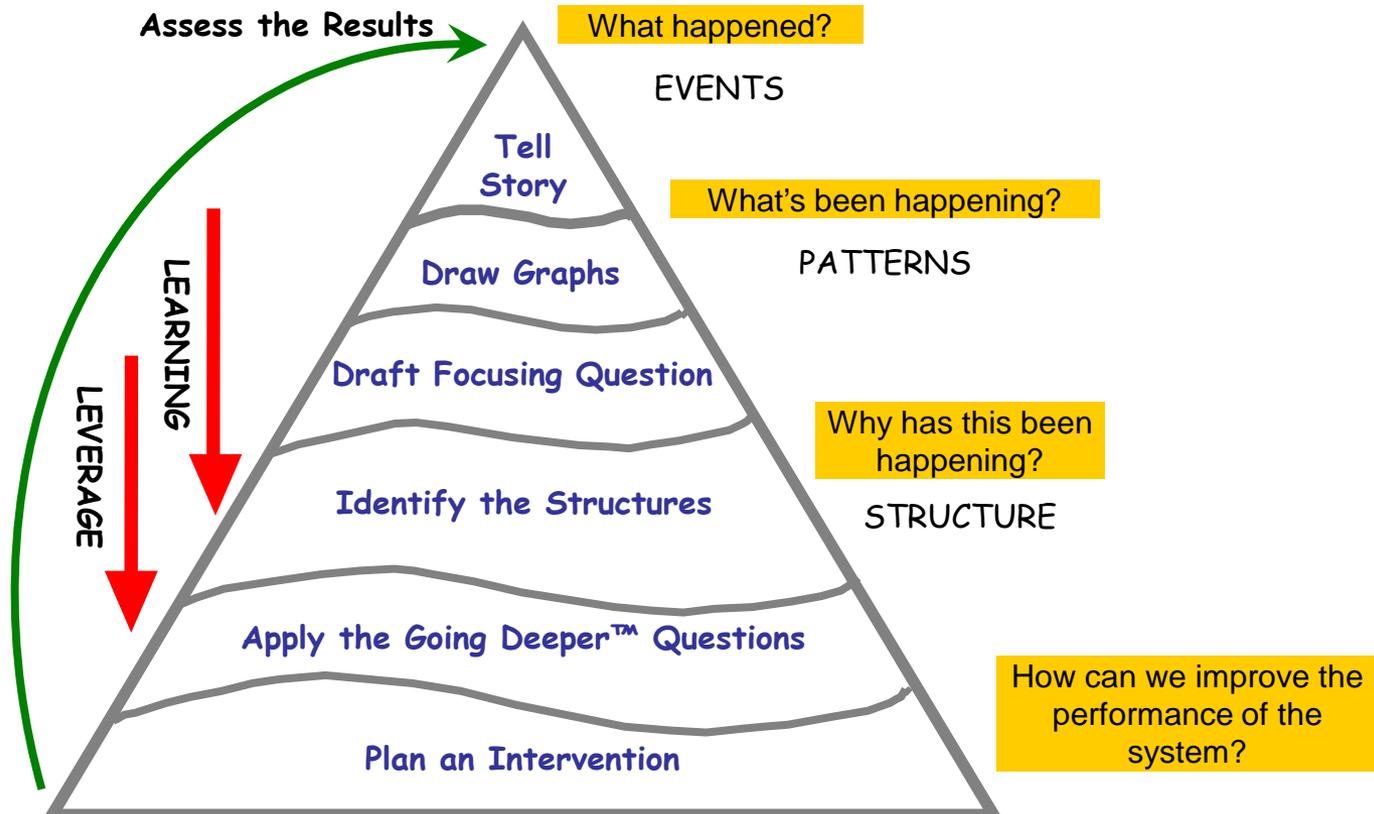
Sources of Pressures or Forces



Sample Elements of Structure that Generate Forces & Pressures

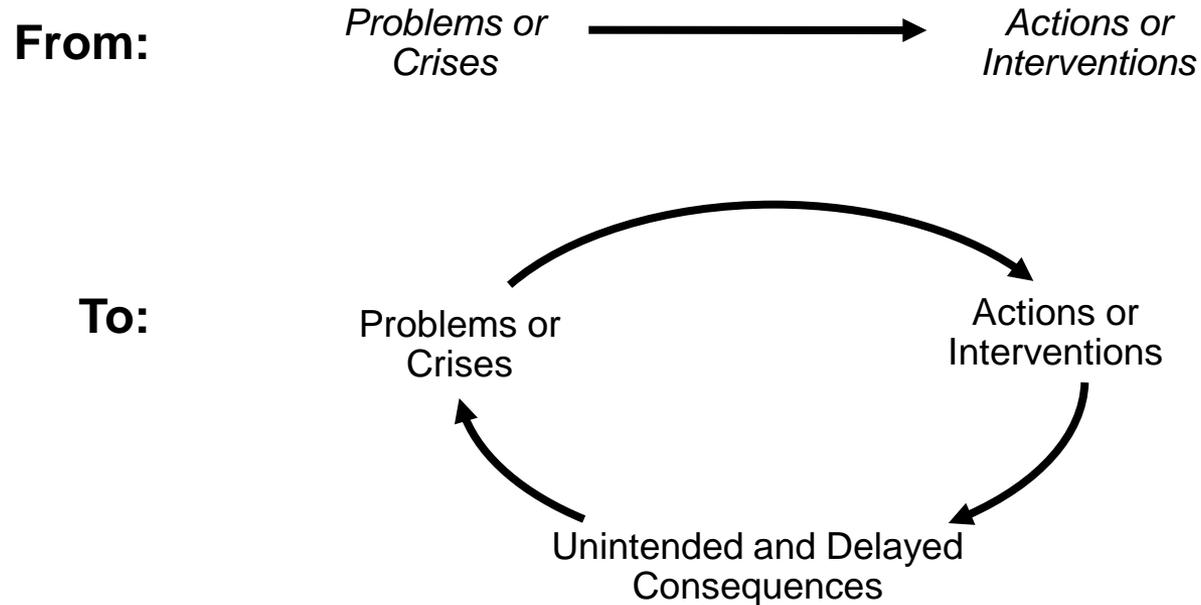
- State/local regulations & laws
- General economy
- Local economy
- Financial resources/capital (e.g. access to funding)
- Technology (e.g. access & availability)
- Political climate
- Human capital (e.g. skill level, education)
- Demographics (including migration patterns)
- Availability & access to services (health, education, etc)
- Level of collaboration among service providers & agencies
- State/local leadership (private/public)
- Housing availability & quality
- Built (infrastructure) capital
- Quality of life factors
- Natural capital
- Social capital (e.g. connections within community, among businesses and to resources outside the community)
- Cultural capital (mindsets, attitudes, level of public trust) (Mental models)

Steps in Systems Thinking



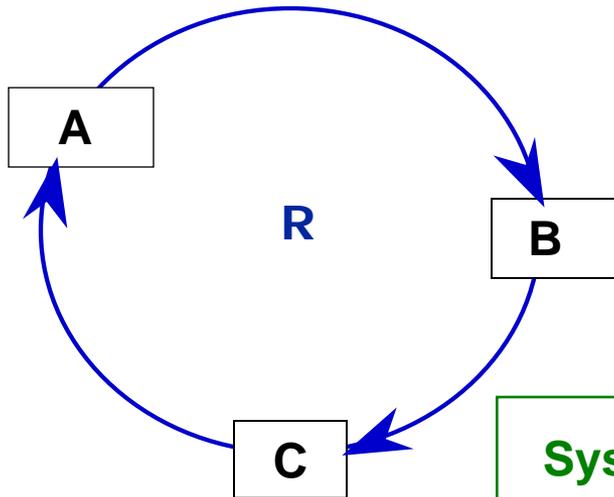
The Language of Systems Thinking

The world is circular– not linear



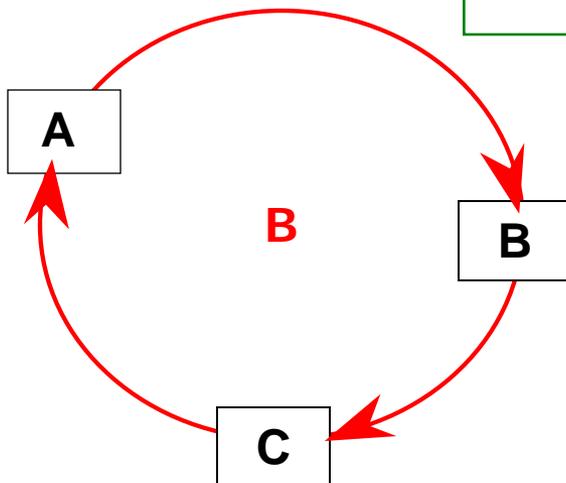
The Language of Systems Thinking

Two Kinds of Loops



R= Reinforcing

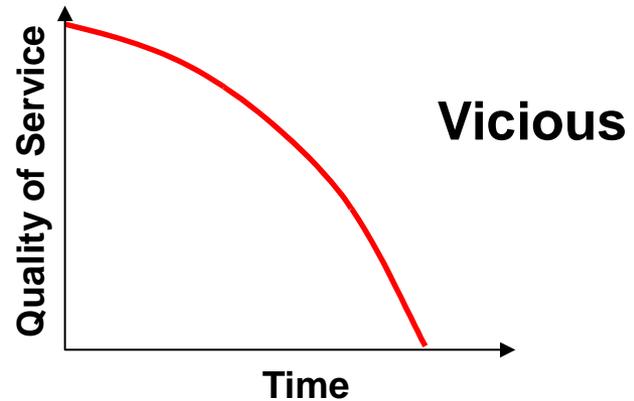
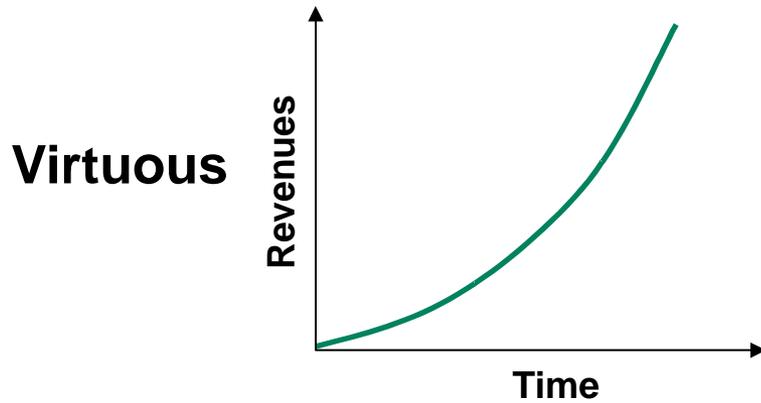
Systems are complex webs of interconnected Reinforcing and Balancing processes.



B= Balancing

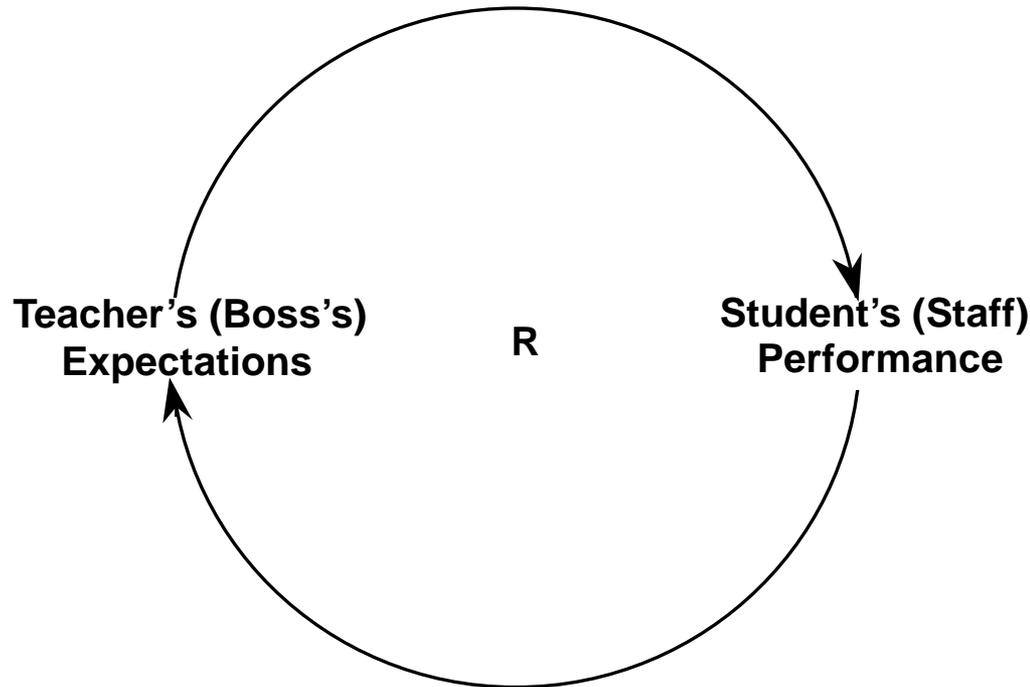
Systems Language

- Reinforcing process
 - Virtuous cycles that generate growth
 - Vicious treadmills that create disaster



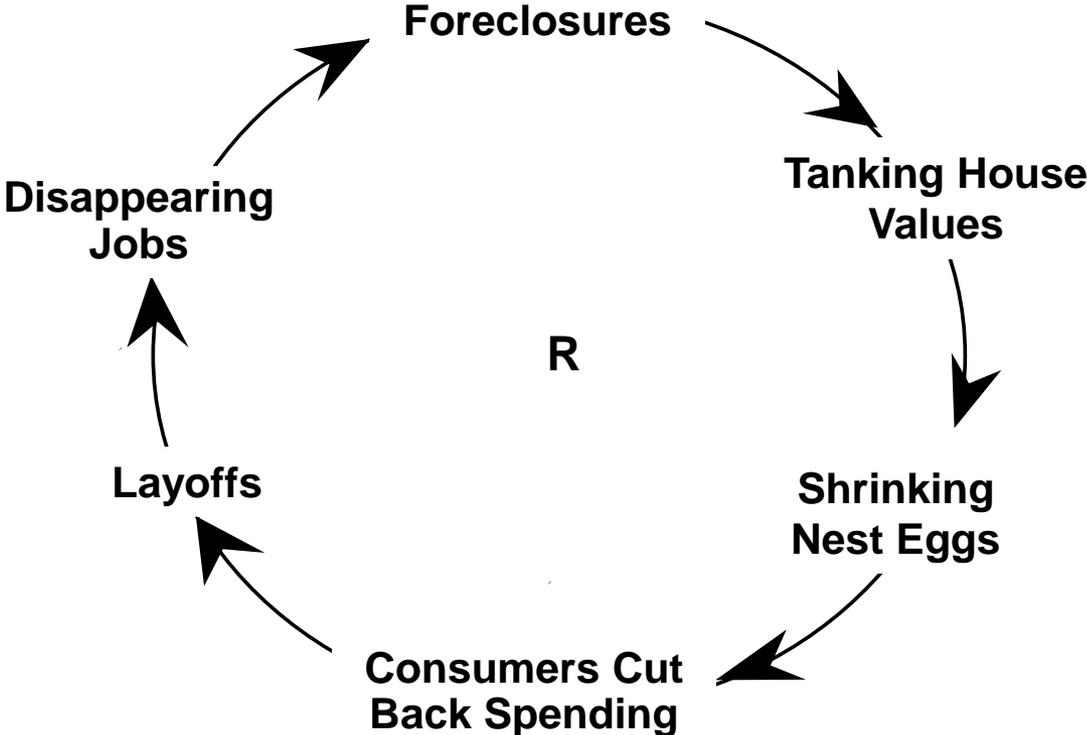
The Self-Fulfilling Prophecy

Reinforcing loops can be virtuous or vicious.

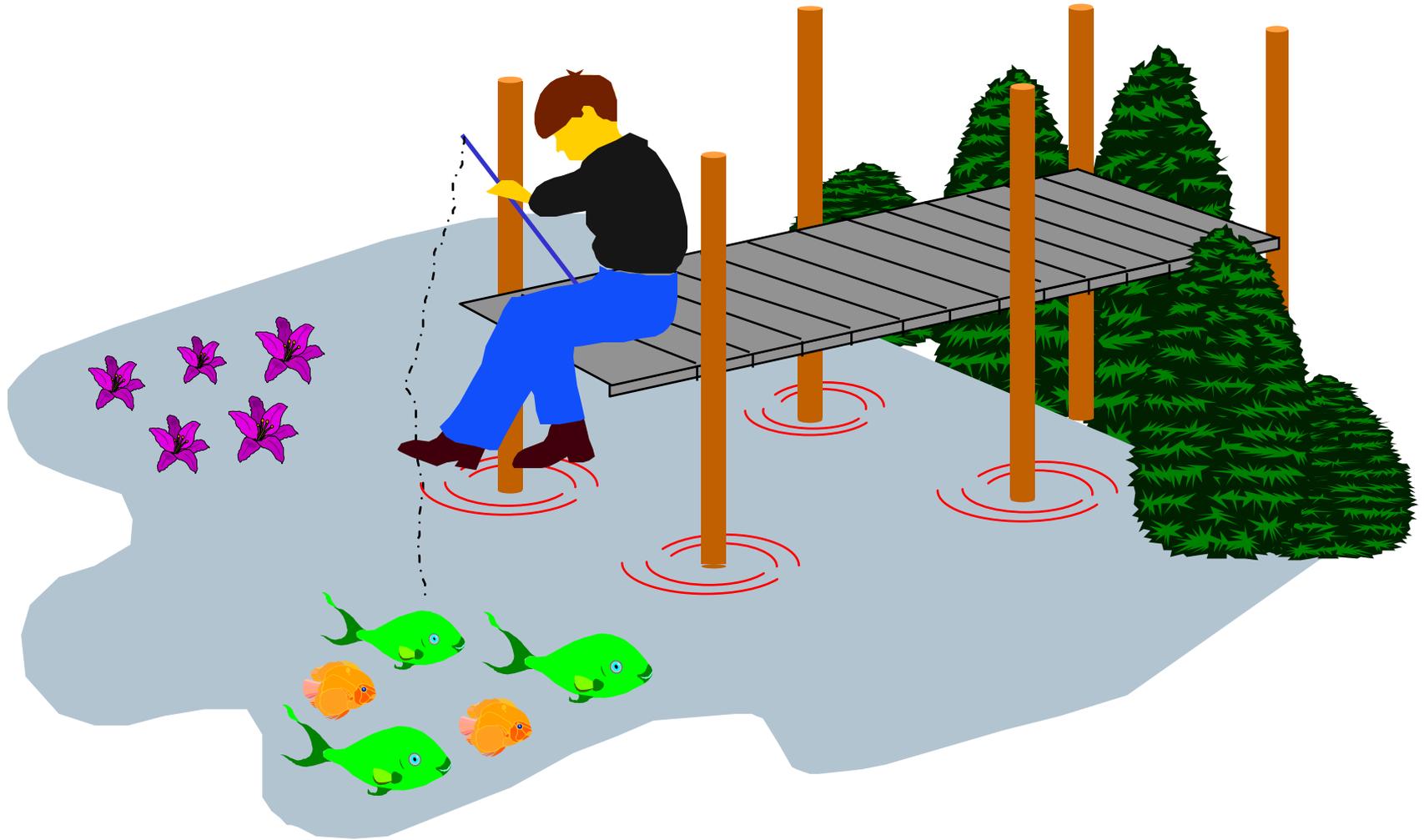


To what extent have you experienced the same dynamic with people who work for you, your colleagues or partners, your children?

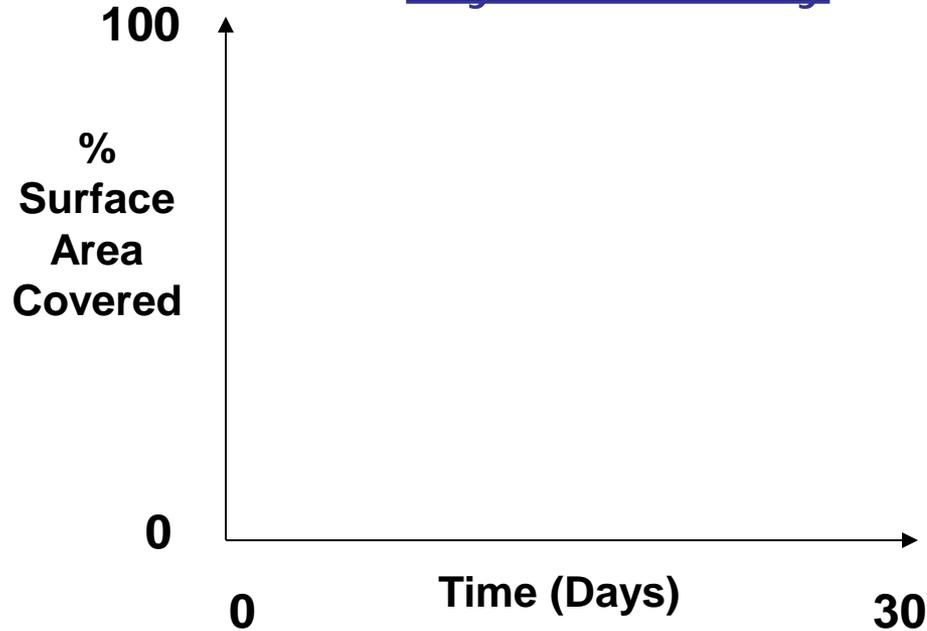
Reinforcing Process: Vicious Cycle



Managing the Lily Pond



Lily Pond Story



Known Facts:

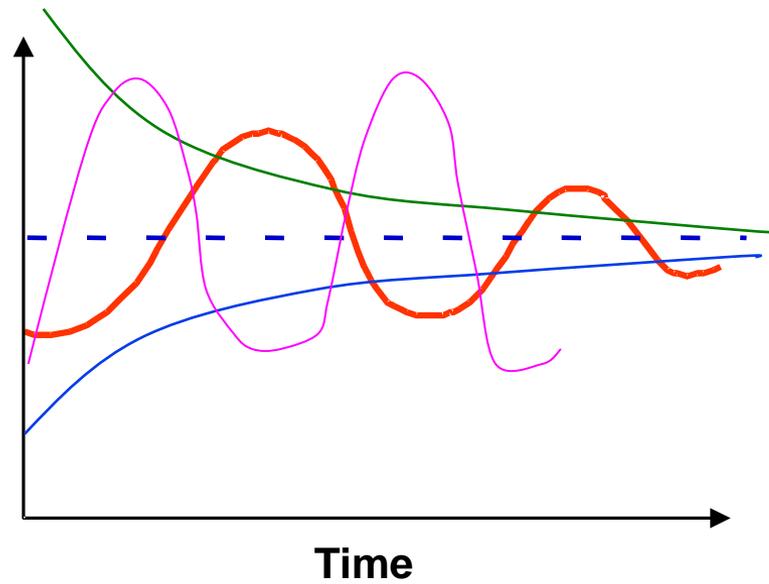
- 1. 100% of surface area is covered in 30 days***
- 2. Surface area covered by lily pads doubles every day***

Questions:

- 1. When is the pond half covered?**
- 2. How much of the pond is covered by day 15?**

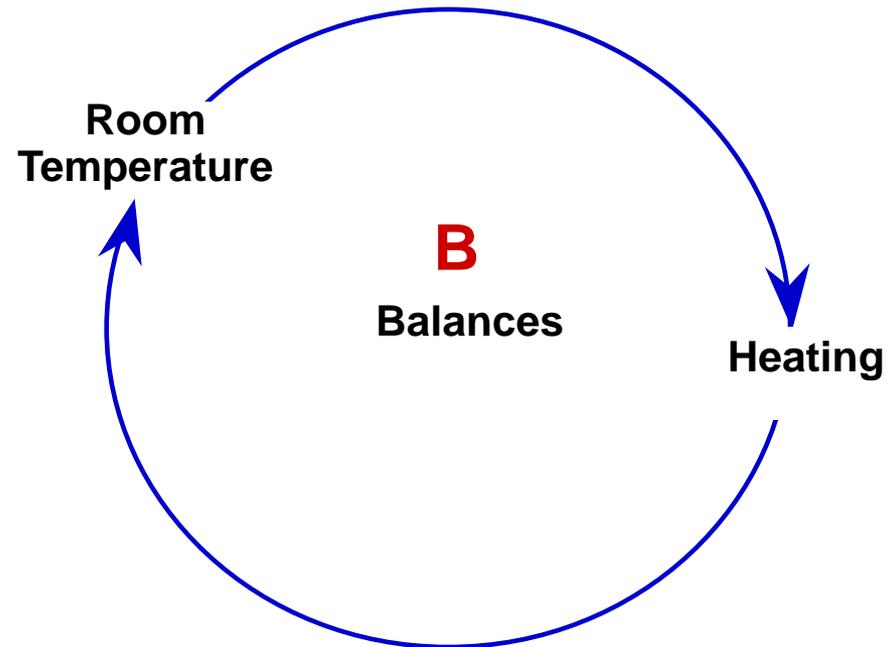
Systems Language

- Balancing processes
 - The corrective mechanisms that sustain us
 - The primary source of resistance to change



Balancing Process

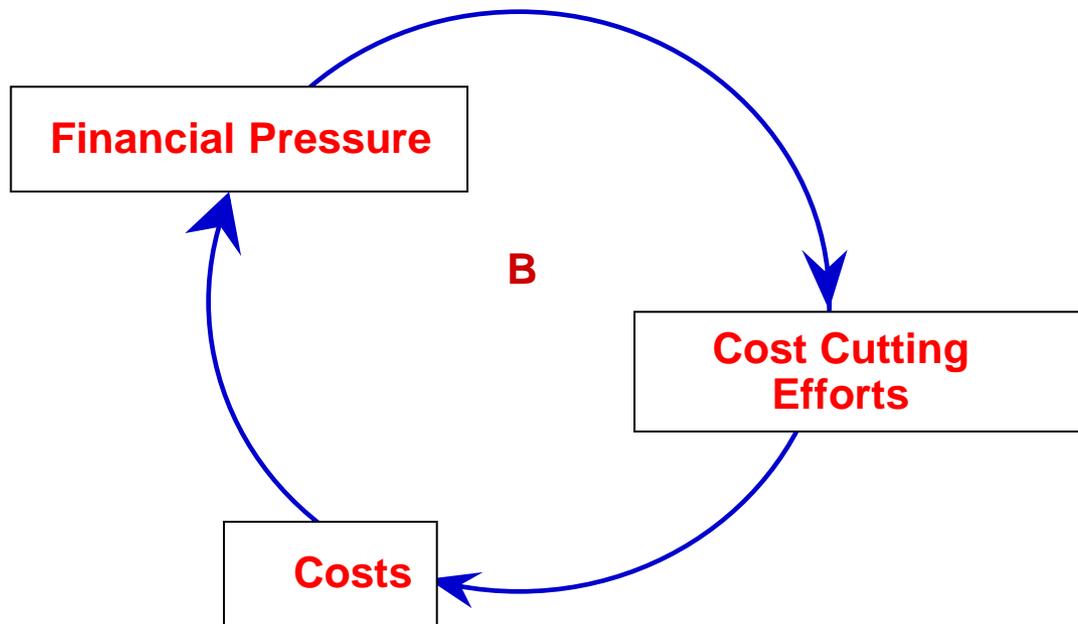
Maintaining Room Temperature



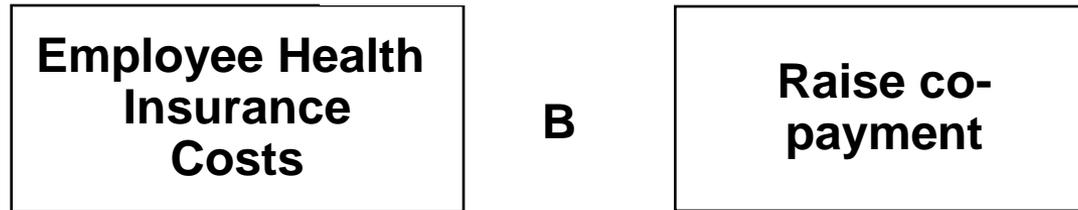
Balancing Process

Cutting Costs To Help Finances

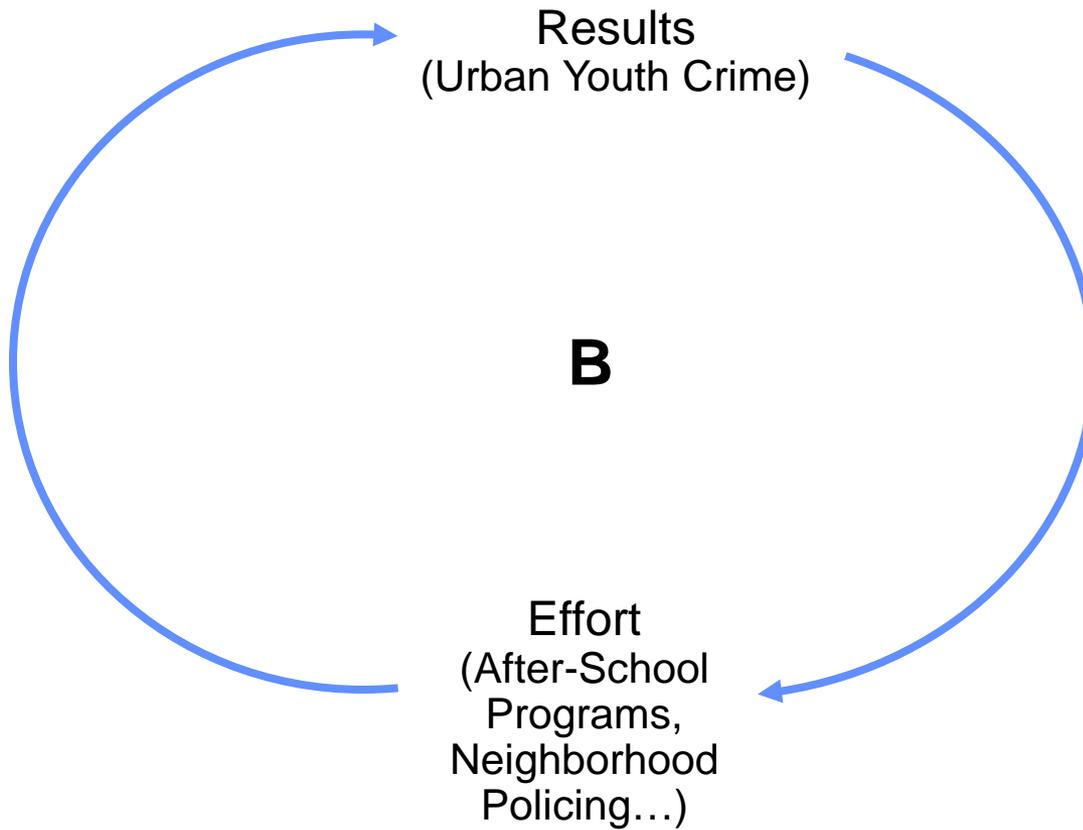
Facing **financial pressure**, we cut back on costs (e.g. travel, training, etc.) **Cost cutting efforts** lower **costs**. Reductions in cost reduce **financial pressure**.



Spiraling Health Insurance

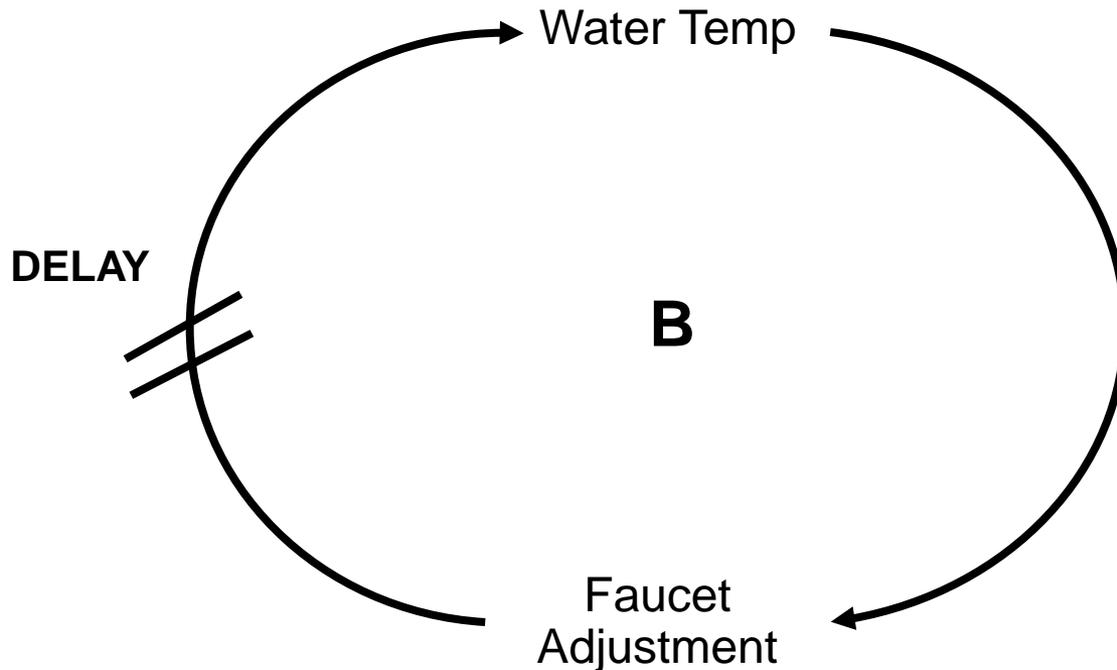


Balancing Loops are Reactive



Balancing Loops

The Challenge of Managing Time Delays



- Delays are a significant and often hidden part of system structure.
- Delays can occur in awareness, decision-making, implementation, and/or correction.
- The tendency is to be impatient and over-respond or to give up prematurely.

The Power of Systems Archetypes

Systems archetypes are recurring structures that appear in many different types of situations.

They often serve as initial guides to making sense of a complex system.

- Make systems thinking visible
- Well understood--recur frequently
- Easily transferable
- Naturally promote systems thinking and acting in a team
- Shift focus from blaming to inquiry

System Archetypes

Virtuous/Vicious Cycles

Amplification and Reinforcement: a reinforcing process producing success or disaster.

Balancing Process

Corrections: we try to reduce the gap.

Fixes that Backfire

Unintended Consequences: the long-term negative consequences of a quick fix.

Shifting the Burden

Unintended Dependency: the quick fix that we become addicted to.

Limits to Growth/Success

Unanticipated Constraints: the limiting mechanism on spiraling growth.

Accidental Adversaries

Partners Who Become Enemies: two parties want to cooperate, but each sees the other undermining their success.

Escalation

Unintended Proliferation: the harder you push, the harder the competitor pushes back.

Drifting Goals

Inadvertent Poor Performance: actual and desired performance levels gradually falling.

Success to the Successful

Winner Takes All: your success produces my failure.

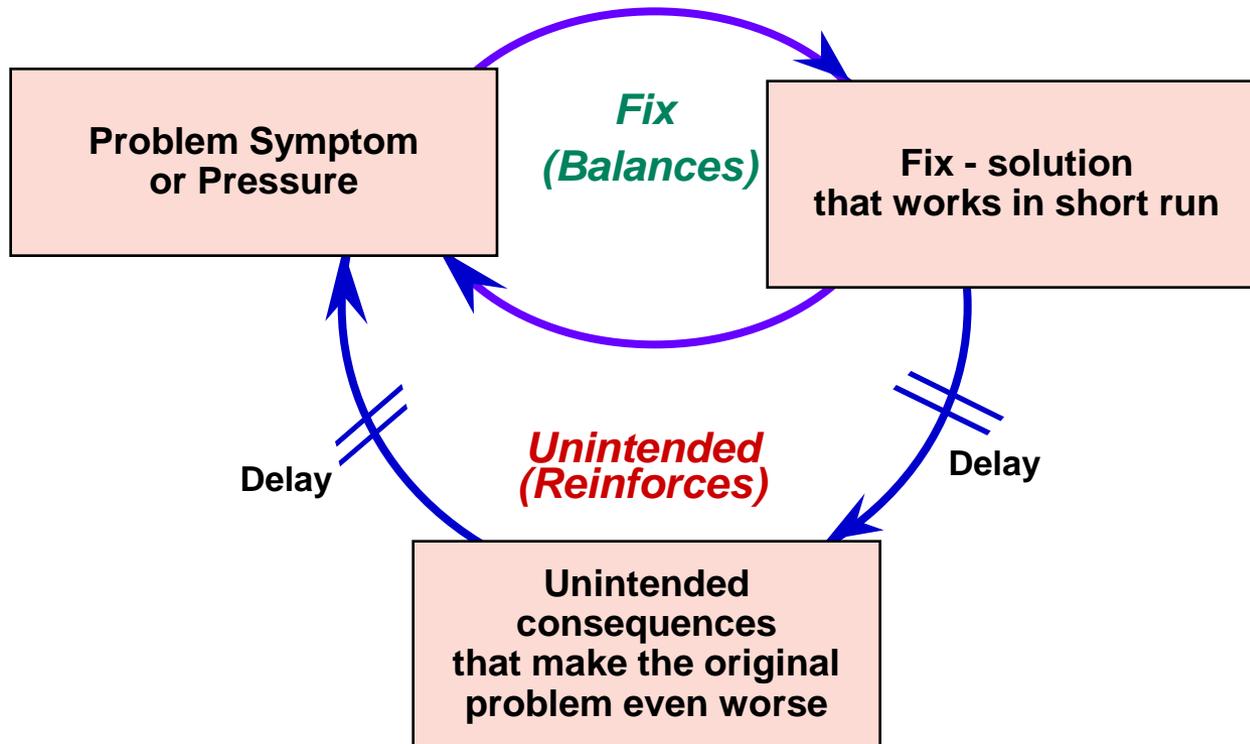
Tragedy of the Commons

Optimizing Each Part Destroys the Whole: everyone takes advantage of a resource that doesn't belong to anybody.

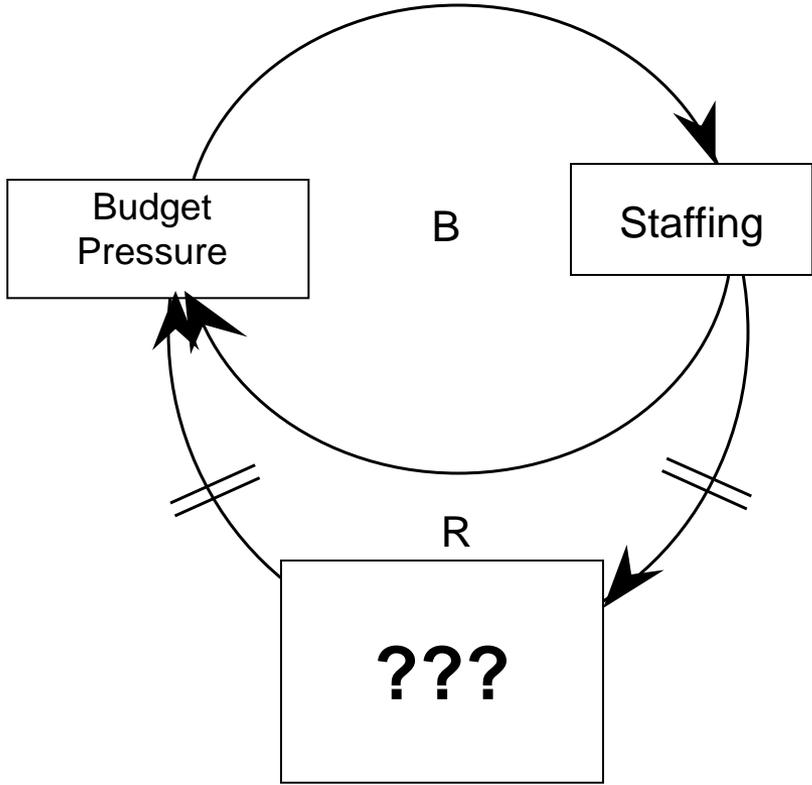
Multiple Goals

Conflicting or Competing Commitments: trying to do too much or satisfy conflicting goals can lead to accomplishing none.

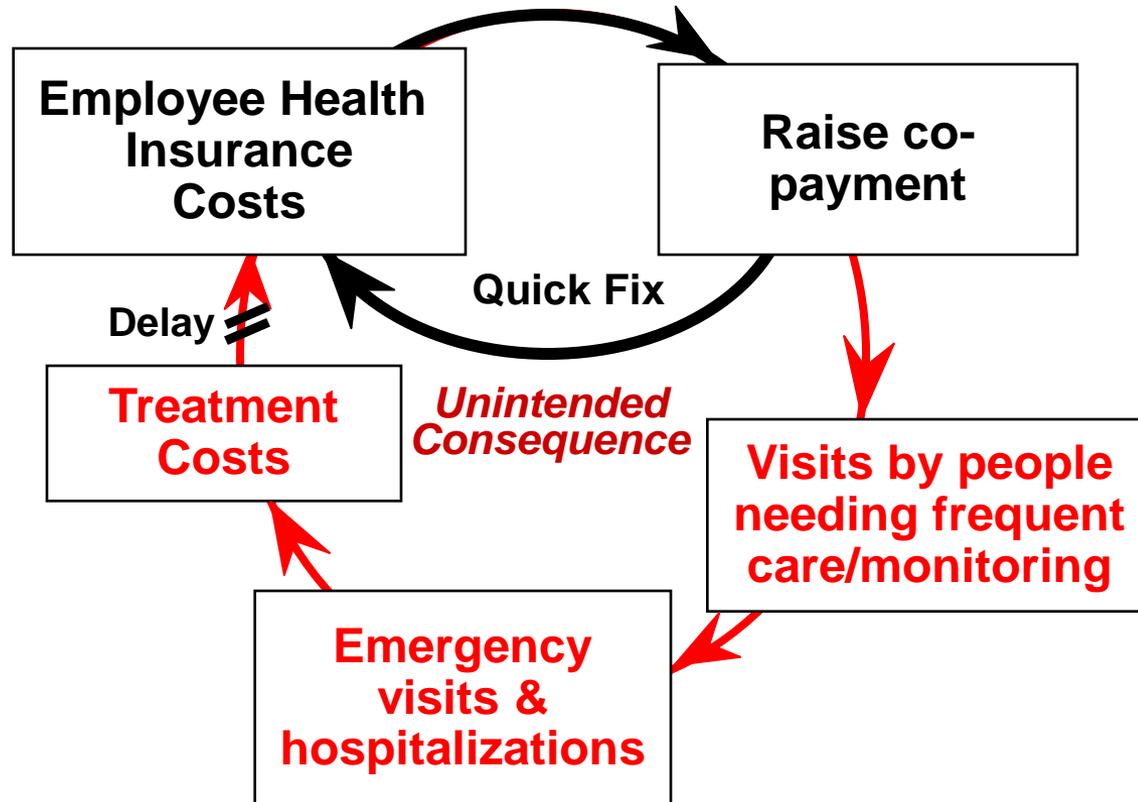
Fixes that Backfire Template



The Perils of Downsizing



Health Insurance



Fixes that Backfire Exercise

Purpose:

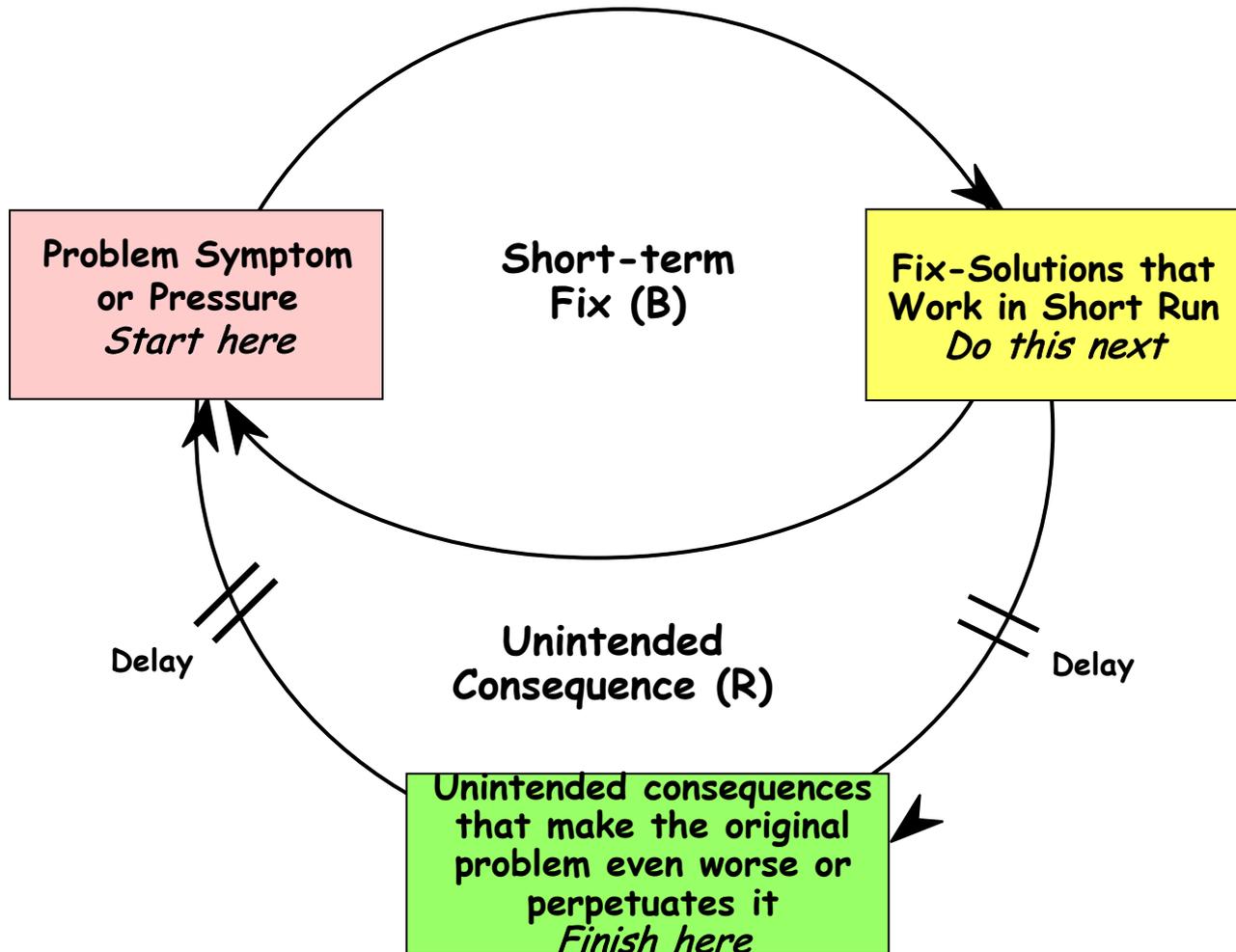
To practice applying the “Fixes That Backfire” template.

Time: 5 minutes

Instructions:

- Identify a story from your own experience that fits this template (related to your issue or organization)
- Share your story with your table

Fixes that Backfire Template



Fixes that Backfire: Summary

- **The fix addresses the symptom, not the problem.**
- **The reinforcing loop is longer term, usually not obvious, and dominates behavior.**

What you can do:

- Increase awareness of the unintended consequences**
- Identify and address the root problem**
- Implement a different fix**
- Implement the same fix without the negative consequences**

Mental Models

What are our Mental Models?

The beliefs, assumptions, and models we have are about every aspect of ourselves, others, our organizations, and how the world works.

- They are critical to our effectiveness.
- They affect how we think and how we act.
- They may be conscious, or unconscious; they can get us into trouble.
- It's easier to see others' mental models and harder to see our own.
- They are always incomplete and often flawed.
- They are high leverage.

Sherlock Holmes Exercise

You have just arrived at the ABC Company for a job interview. This job sounds like just what you have been looking for; your title would be Director. You would be working directly for the V.P. of Sales & Marketing, who has now requested a private interview with you. You arrived on time and were met by the V.P.'s secretary, who apologized and said there would be a delay. The V.P. was called unexpectedly into an important conference and will be there for at least 15 minutes more. In the meantime, the secretary has informed you that you are welcome to wait in the V.P.'s private office.

You enter the private office. You know that you will be alone here for at least 15 minutes. You look around the room, naturally curious about the person you may be working for . . .

The office has hardwood floors. You sit in one of the two emerald green club chairs to the left of the doorway. Between the chairs is a low glass table on which there is an empty gold glass ashtray. Next to the ashtray are two books of matches; one is from a popular nightclub and the other is from a local restaurant. On the wall behind you is a picture of an old sailing ship in blues and browns. A rubber plant set in a brown and green woven basket sits against the side wall next to the other chair.

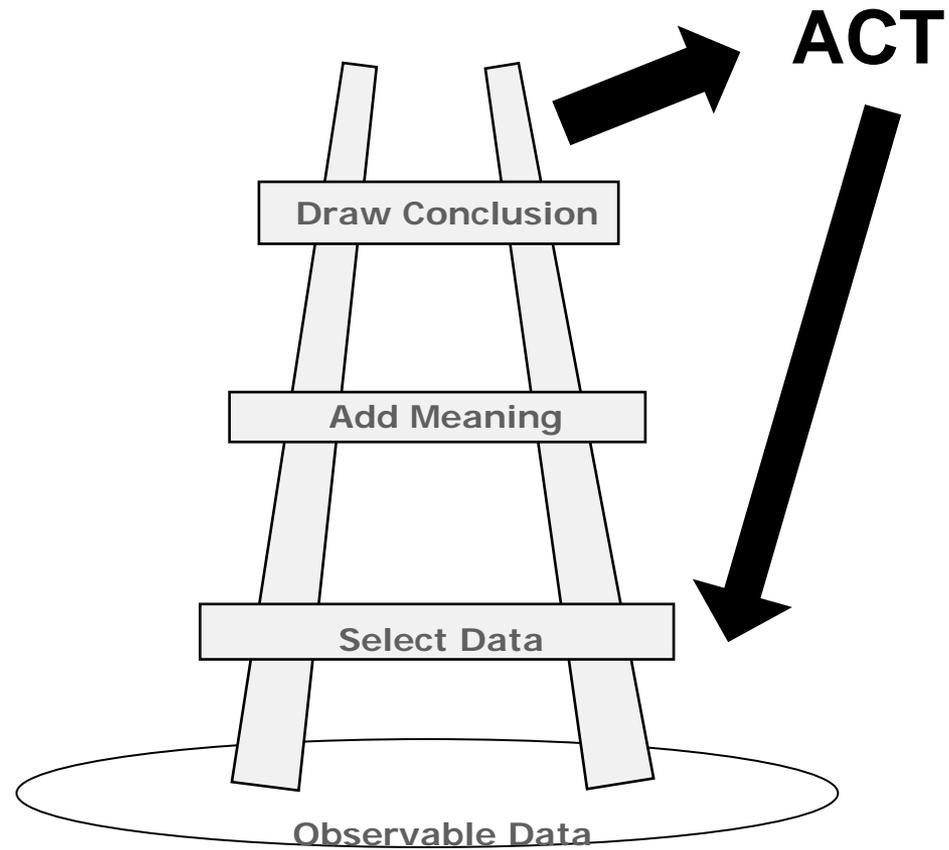
There is a window on the far wall, and you get up and go over to look out. Directly in front of the window is a sofa covered in emerald green and beige print. Two woven throw pillows in beige cotton lie against the arms of the sofa. The draperies at the window behind the sofa are a cream white woven material with a beige stripe. The view from the window is pleasant—a few small shops bordering a small park.

Your gaze turns to the square dark wooden table next to the sofa. Magazines and newspapers are scattered in front of a black ceramic lamp with a cream white shade. They include a copy each of The Economist, Paris Match, Vogue, and The Financial Times. There is also a souvenir program from the Football World Cup Finals.

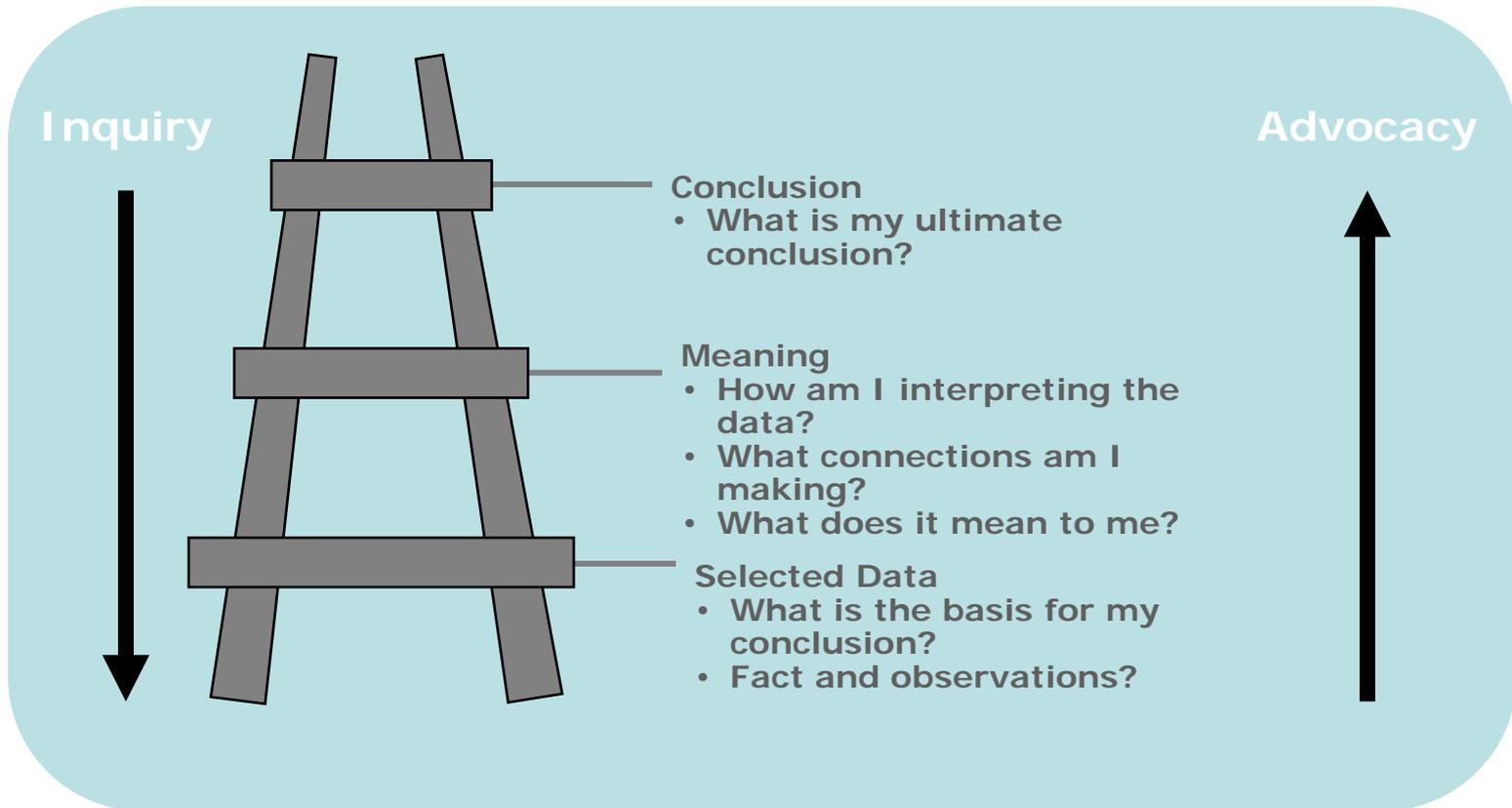
As you turn to walk back to your chair, you notice that the papers on the desk in front of the chair are your resume and that the statement of your sex has been marked with a felt-tipped pen. Since the V.P. may return any moment, you sit in the emerald green club chair to wait.



Ladder of Inference



Ladder of Inference



Mental Models Examples

“Who would ever want a computer in their home.”

“The only way anything changes around here is when our senior leaders change it.”

“Learning is what we do outside of work.”

“Home prices will always rise.”

Mental Models Question

As you think about your issue:

What mental models are at play that could be barriers to change or improvement related to your issue? What are the mindsets that have perpetuated the current situation?

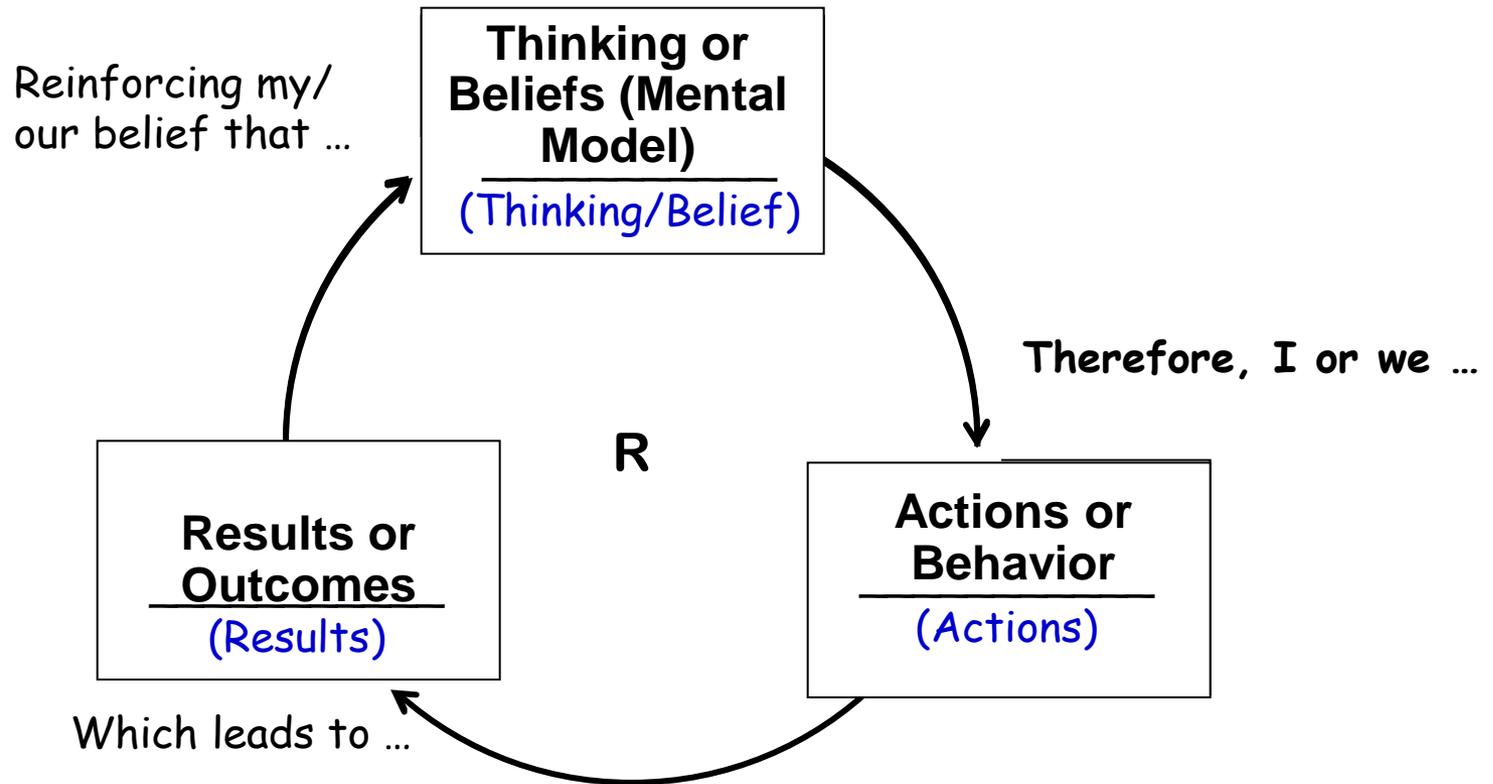
Write them as if they were statements of fact:

“The only way anything changes around here is when our senior leaders change it.”

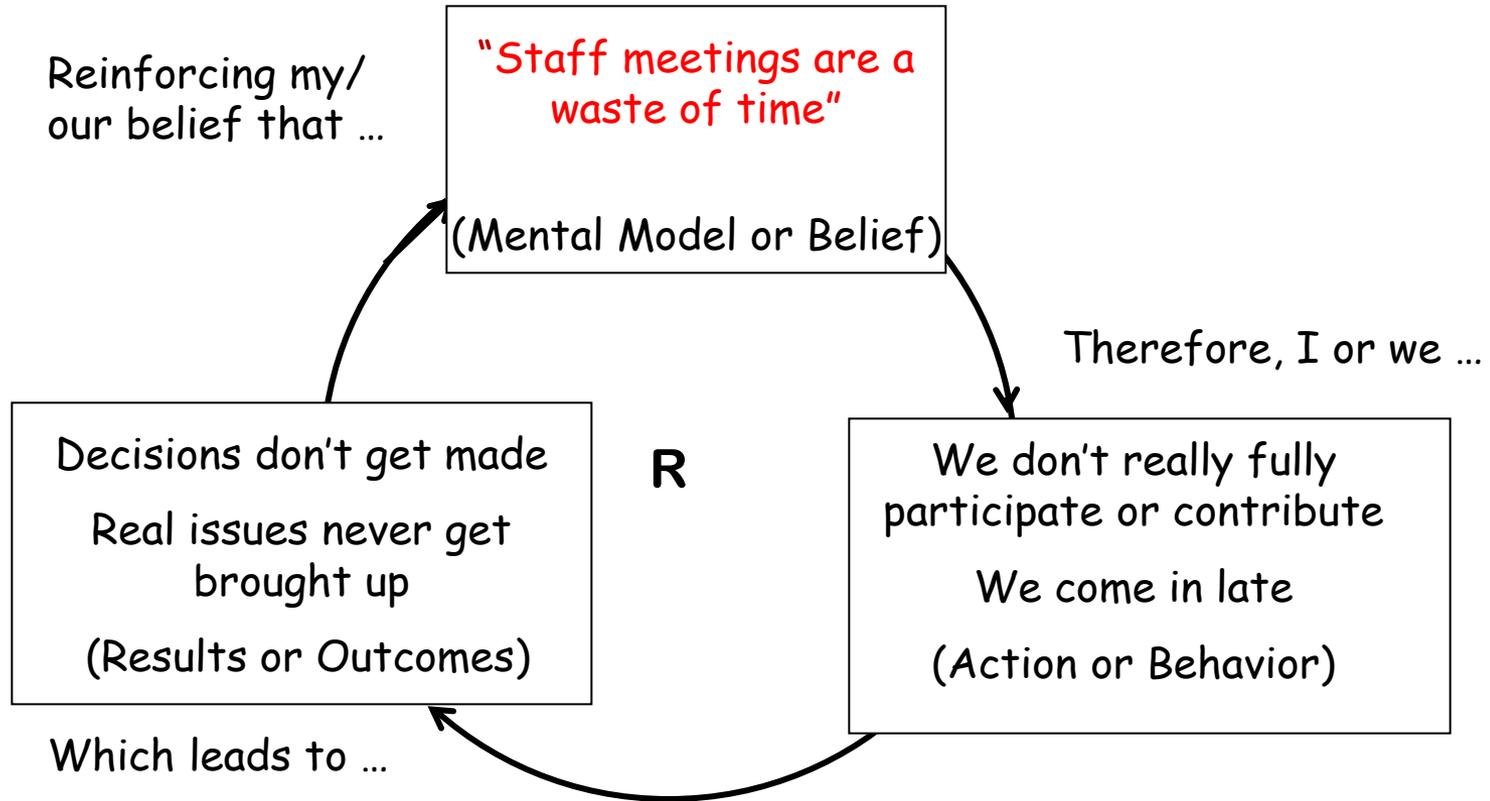
“Things only get done when we have a major crisis.”

“Meetings are a waste of time.”

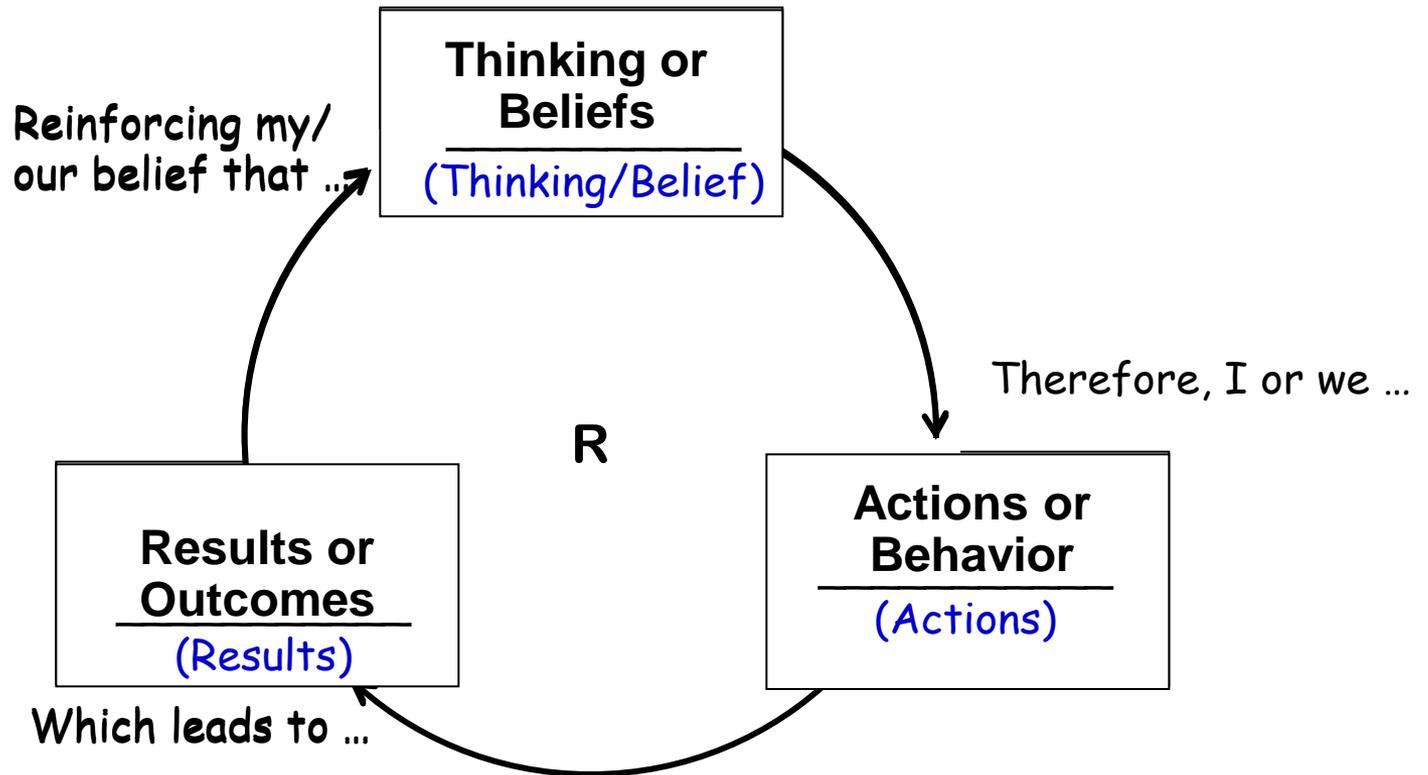
Belief-Action-Results Maps



Beliefs – Actions – Results Loop: Example



Develop a BAR map using one of the mental models you just identified



Effective Conversation Tools

Advocacy-Inquiry-Summarizing



- **Inquiry:** Asking questions that are designed to solicit the other person's point of view and opinion.
- **Advocacy:** Sharing your expertise, viewpoint, and assessments.
- **Summarizing (Acknowledging):** Sorting out the central aspects of their message and paraphrasing it back.

Three Tools to Explore Each Other's Reasoning (Ladder of Inference)

Inquiry : Asking good questions.

- What Is their Story?
- Use the ladder to understand how they arrived at their conclusions

Measure: *To understand their story or to advocate yours?*

Summarizing/Acknowledgement : Let the other person know that you understand them.

- Acknowledgement doesn't mean agreement
- Perfunctory acknowledgement doesn't satisfy

Measure: *The other person feels acknowledged*

Advocacy : Tell your side of the story in a way that they can hear.

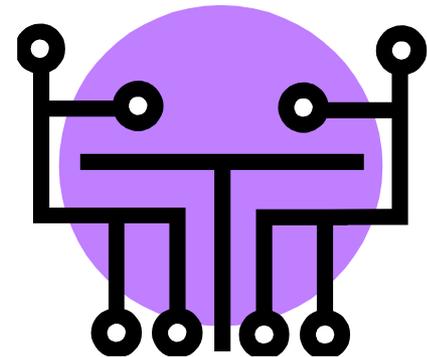
- Put your own point of view out as a theory to be tested
- Offer your ladder

Measure: *Are you advocating in a way they can hear?*

Café Dialog

Purpose

- Build the collective intelligence of this community of people by sharing ideas and experiences horizontally
- Learn how this community of colleagues is thinking about important issues
- Learn a process we can apply back at work
- Practice skills e.g. like inquiry



"Café" is a Process

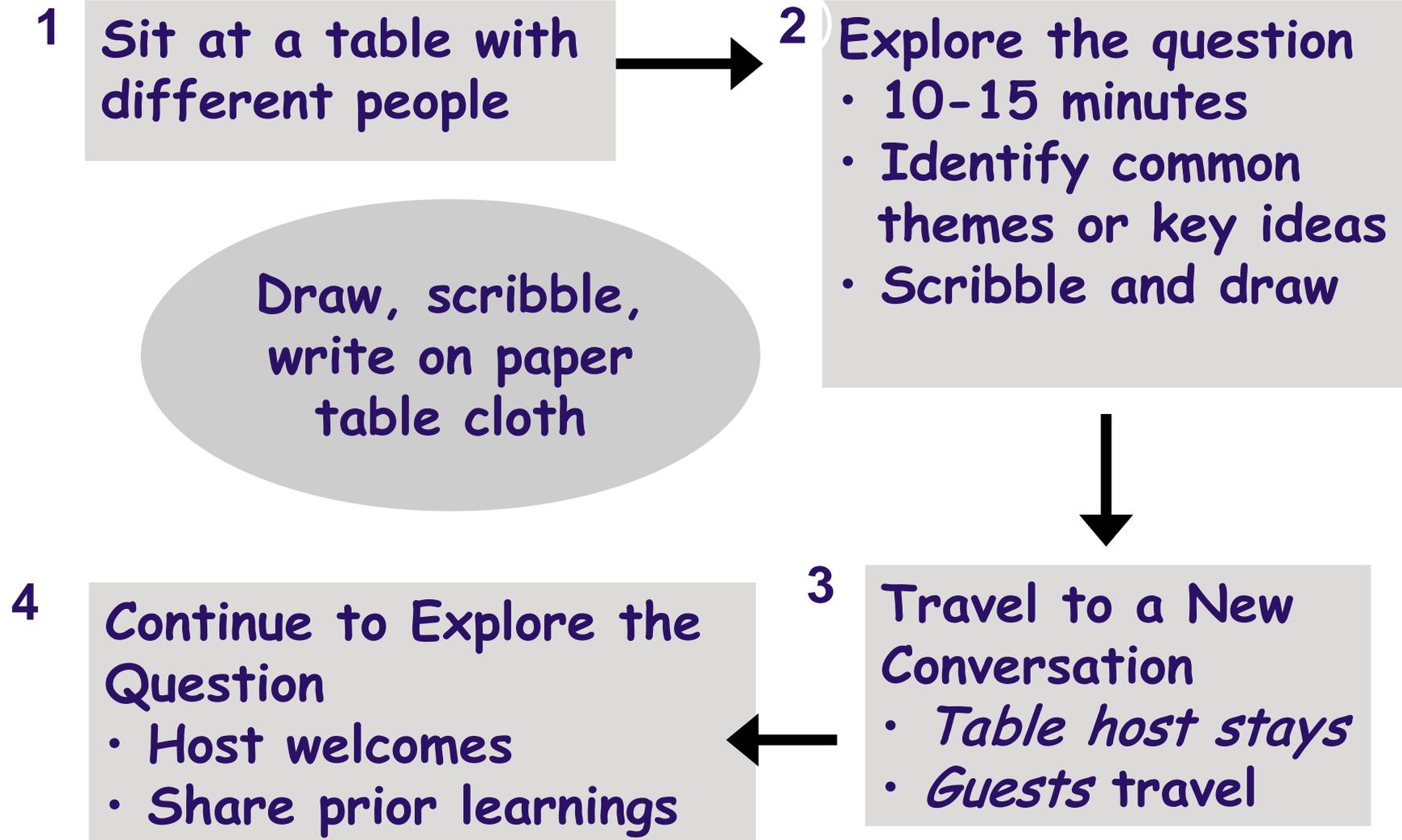


Table Host Job

- Remind people at your table to jot down key connections, ideas, discoveries and deeper questions
- Remain at table when others leave and welcome travelers from other tables
- Briefly share key insights from the prior conversation so others can link & build using ideas from other tables

Café Etiquette

- Focus on what matters
- Contribute your thinking
- Speak your mind & heart
- Listen to understand
- Link and connect ideas
- Listen together **for insights and deeper questions**
- Play, doodle, draw... **writing on the tablecloths is encouraged**
- Have fun

Café Question

- **What are the deeper systemic forces that impede our ability to collaborate across our organizations in order to deal more effectively with wicked problems?**
- **What would be required for us to shift from the reactive to the longer-term systemic approach to poverty prevention and alleviation in our community?**

Café Debrief

What are common themes that emerged from your conversations?

On what themes/issues was there a lot of energy?

Resource List

Books

- Peter Senge, The Fifth Discipline
- Peter Senge et al, The Fifth Discipline Fieldbook

Websites

- Applied Systems Thinking: www.appliedsystemsthinking.com
- Society for Organizational Learning: www.solonline.org

Online Systems Thinking Course

- www.iseesystems.com