Tackling Wicked Problems

SYSTEMS THINKING: THINKING AND ACTING DIFFERENTLY

Michael Goodman

January 13, 2015
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

<table>
<thead>
<tr>
<th>Conventional</th>
<th>Systems Thinking</th>
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</table>
| Others, either within or outside our organization, are to blame for our problems and must be the ones to change | We contribute to our own problems  
Everyone is acting reasonably and responsibly and no one is to blame |
**Conventional vs Systems Thinking**

<table>
<thead>
<tr>
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<th>Systems Thinking</th>
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<tbody>
<tr>
<td>What we do short-term will also assure long-term success</td>
<td>Most quick fixes either make no long-term difference or actually make matters worse in the long run</td>
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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

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

- Externally Driven
  - Reacting
- Internally Driven
  - Creating

- Compliance
  - Focus on Problems
- Choice
  - Focus on Results

- Certainty
  - I See What Is
- Curiosity
  - I See What I See

- Telling
  - Defending
- Asking
  - Suspending

Organizational Learning

- Personal Mastery
- Shared Visioning
- Mental Models
- Team Learning
- Systems Thinking

- Building Shared Vision
- Productive Conversation
- Leading Systemic Change

- Disconnected
  - Parts
- Connected
  - Whole

- Symptoms
  - Blame
- Cause
  - Accountability
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

Current Reality
(What you have)

Results/Outcomes
(What you want)

CREATIVE TENSION
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

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>FOCUS</th>
<th>ACTION OR RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>What happened?</td>
<td>EVENTS</td>
<td>React Firefight</td>
</tr>
<tr>
<td>What’s been happening?</td>
<td>TRENDS &amp; PATTERNS</td>
<td>Anticipate Forecast</td>
</tr>
<tr>
<td>Why?</td>
<td>STRUCTURE (Forces and Pressures)</td>
<td>Change Create</td>
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</tbody>
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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
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**

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### Example

- **Time**
- **Efforts to implement new technologies**
- **Target for number of new technologies implemented**
- **Hope**
- **Fear**
- **Number of new technologies fully implemented**
3. **Identify the Structure**

Why did this happen?
What are the forces & pressures at work?
What is perpetuating or exacerbating the problem?

**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.

*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*
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
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

Example

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)?
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

- External Structures
  - Regulatory/legal
  - Socio-economic
  - Technology
  - Political climate
  - Community norms/standards
  - Public awareness/pressure

- Interpersonal Structures
  - Roles and Role Flexibility
  - Relational Skills
  - Ability to Recognize & Capitalize on Diversity
  - Problem Solving/Decision Making

- Organizational Structures
  - How I Think
  - How I View Myself and My Role
  - My Beliefs and Assumptions
  - Style/behavioral preferences

- Individual Structures (Mental Models)

- Events

- Trends/Patterns
  - written & Unwritten Rules
  - Policies/procedures/processes
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

- Organizational
- Structure/Hierarchy
- Organizational Processes
- Client Interface
- Reward System
- Information System/Flow
- Cultural Norms
- Written & Unwritten Rules
- Policies/procedures/processes

- Regulatory/legal
- Socio-economic
- Technology
- Political climate
- Community norms/standards
- Public awareness/pressure

- Roles and Role Flexibility
- Relational Skills
- Ability to Recognize & Capitalize on Diversity
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Sample Elements of Structure that Generate Forces & Pressures

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Steps in Systems Thinking

- Tell Story
- Draw Graphs
- Draft Focusing Question
- Identify the Structures
- Apply the Going Deeper™ Questions
- Plan an Intervention
- Assess the Results

EVENTS

- What happened?

PATTERNS

- What's been happening?

STRUCTURE

- Why has this been happening?

LEVERAGE

- How can we improve the performance of the system?
The world is circular–not linear

The Language of Systems Thinking

From: Problems or Crises \rightarrow Actions or Interventions

To: Problems or Crises \rightarrow Actions or Interventions

Unintended and Delayed Consequences
The Language of Systems Thinking

Two Kinds of Loops

R = Reinforcing

B = Balancing

Systems are complex webs of interconnected Reinforcing and Balancing processes.
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

Disappearing Jobs → Layoffs → Consumers Cut Back Spending → Shrinking Nest Eggs → Tanking House Values → Foreclosures → Reinforcing Process: Vicious Cycle
Managing the Lily Pond
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

Room Temperature

B
Balances

Heating
Balancing Process

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

Employee Health Insurance Costs

Raise co-payment
Balancing Loops are Reactive

Results
(Urban Youth Crime)

Effort
(After-School Programs, Neighborhood Policing…)

B
• 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
<table>
<thead>
<tr>
<th>System Archetypes</th>
<th></th>
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<tbody>
<tr>
<td><strong>Virtuous/Vicious Cycles</strong></td>
<td><strong>Amplification and Reinforcement</strong>: a reinforcing process producing success or disaster.</td>
</tr>
<tr>
<td><strong>Balancing Process</strong></td>
<td><strong>Corrections</strong>: we try to reduce the gap.</td>
</tr>
<tr>
<td><strong>Fixes that Backfire</strong></td>
<td><strong>Unintended Consequences</strong>: the long-term negative consequences of a quick fix.</td>
</tr>
<tr>
<td><strong>Shifting the Burden</strong></td>
<td><strong>Unintended Dependency</strong>: the quick fix that we become addicted to.</td>
</tr>
<tr>
<td><strong>Limits to Growth/Success</strong></td>
<td><strong>Unanticipated Constraints</strong>: the limiting mechanism on spiraling growth.</td>
</tr>
<tr>
<td><strong>Accidental Adversaries</strong></td>
<td><strong>Partners Who Become Enemies</strong>: two parties want to cooperate, but each sees the other undermining their success.</td>
</tr>
<tr>
<td><strong>Escalation</strong></td>
<td><strong>Unintended Proliferation</strong>: the harder you push, the harder the competitor pushes back.</td>
</tr>
<tr>
<td><strong>Drifting Goals</strong></td>
<td><strong>Inadvertent Poor Performance</strong>: actual and desired performance levels gradually falling.</td>
</tr>
<tr>
<td><strong>Success to the Successful</strong></td>
<td><strong>Winner Takes All</strong>: your success produces my failure.</td>
</tr>
<tr>
<td><strong>Tragedy of the Commons</strong></td>
<td><strong>Optimizing Each Part Destroys the Whole</strong>: everyone takes advantage of a resource that doesn’t belong to anybody.</td>
</tr>
<tr>
<td><strong>Multiple Goals</strong></td>
<td><strong>Conflicting or Competing Commitments</strong>: trying to do too much or satisfy conflicting goals can lead to accomplishing none.</td>
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Fixes that Backfire Template

- **Problem Symptom or Pressure**
- **Fix (Balances)**
- **Fix - solution that works in short run**
- **Unintended consequences that make the original problem even worse**

*Delay (Reinforces) Delay*
The Perils of Downsizing

Budget Pressure

Staffing

???

B

R
Health Insurance

Employee Health Insurance Costs → Raise co-payment

Quick Fix

Emergency visits & hospitalizations → Visits by people needing frequent care/monitoring

Treatment Costs → Unintended Consequence

Delay ≠

50
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

Problem Symptom or Pressure
Start here

Short-term Fix (B)

Fix-Solutions that Work in Short Run
Do this next

Unintended Consequence (R)

Unintended consequences that make the original problem even worse or perpetuates it
Finish here

Delay
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.
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

- Observable Data
- Select Data
- Add Meaning
- Draw Conclusion
- ACT
Ladder of Inference

Inquiry

Conclusion
• What is my ultimate conclusion?

Meaning
• How am I interpreting the data?
• What connections am I making?
• What does it mean to me?

Selected Data
• What is the basis for my conclusion?
• Fact and observations?

Advocacy
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

Which leads to …

Thinking or Beliefs (Mental Model)
(Thinking/Belief)

Reinforcing my/our belief that …

Results or Outcomes
(Results)

Therefore, I or we …

Actions or Behavior
(Actions)

Which leads to …
Beliefs – Actions – Results Loop: Example

Reinforcing my/our belief that …

“Staff meetings are a waste of time”

(Mental Model or Belief)

Decisions don’t get made
Real issues never get brought up
(Results or Outcomes)

Which leads to …

We don’t really fully participate or contribute
We come in late
(Action or Behavior)

Therefore, I or we …
Develop a BAR map using one of the mental models you just identified

- **Thinking or Beliefs**
  - Reinforcing my/our belief that ...
  - Which leads to ...

- **Actions or Behavior**
  - Therefore, I or we ...

- **Results or Outcomes**
  - Which leads to ...

- **Results**

**BAR Model**

- **R**

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63
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

1. Sit at a table with different people
   - Draw, scribble, write on paper, table cloth

2. Explore the question
   - 10–15 minutes
   - Identify common themes or key ideas
   - Scribble and draw

3. Travel to a New Conversation
   - Table host stays
   - Guests travel

4. Continue to Explore the Question
   - Host welcomes
   - Share prior learnings
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