Innovation and Digital Government for Public Service Delivery

Day 2
Exploring Key Concepts and Conducting the Digital Transformation Assessment
Module 2.4
Systems Thinking and Situational Awareness
Interconnectedness

Systems thinking is . . . seeing wholes . . . seeing interrelationships rather than things, seeing patterns of change rather than static “snapshots.” . . .

. . . systems thinking is a sensibility — for the subtle interconnectedness that gives living systems their unique character.

- Peter Senge
A question for your consideration

Is there such a thing as a system?
The question:
Is there such a thing as a system?
An answer:
Depends on what you mean by a system.
The question:

Is there such a thing as a system?

An answer:

Depends on what you mean by a system.

So, what do you mean by a system?
A Definition

A system is a collection of elements or components that are organized and interact for a common purpose.

Scribd.com
Main Concepts of Systems Thinking

• **Collection**
  • Identifiable parts and boundaries, i.e., you can tell what’s part of the system and what’s not.

• **Organized**
  • Identifiable structure of the system that shows relationships among the components.

• **Interaction**
  • Identifiable processes that affect the components and other conditions.

• **Purpose**
  • One or more identifiable desired outcomes of the interactions.
What is Systems Thinking?

Goal seeking and feedback
Archetypes

- **Archetypes** are recurring patterns of behavior that give insights into the structures that drive **systems**.

- They offer a way of thinking about **systems dynamics** across a diversity of disciplines, scenarios, or contexts. They are defined as **archetypes**, which can be seen as the storylines of **systems** in the world.

https://medium.com/tools-for-system-thinkers
Socio-Technical Systems

- **Purpose**
  - Is combination of social and technical outcomes

- **Components**
  - Are a mix of social and technical entities

- **Dynamics**
  - Consist of interacting social and technical processes

- **Structures**
  - Consist of both social and technical relationships

- **Goals**
  - Are both social and technical outcomes
Some Socio-Technical Systems
Systems Thinking Concepts

• Process, process, process
• Holistic perspective: big picture view
• Input-process-output-feedback
• Links and loops, not linear chains
• Focus on dynamic complexity, not detail complexity
• Importance of mental models and process maps
• Looking for archetypes
Basic Ideas

You can't do just one thing!

“The world is filled with relationships, and anything we do is going to impact parts of the system that we may never have even thought of.”

(Richard Heinberg)
Real World Environment

- Customers
- Constituencies
- Legal Context
- Economic Conditions

Program, Policy & Economic Context
Organizations & People

Organizational Setting

- Structure
- Staffing
- Budget
- Linkages
The Work

- Info Flow
- Workflow
- Value-Added

Business Processes
Technology Solutions & Tools

- hardware
- software
- platforms
- infrastructure
Organizational Complexity

- Program, Policy & Economic Context
- Organizational Setting
- Technology Solution
- Business Processes

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Basic Ideas

- Looking for circles of causality, not linear chains
- Understanding feedback, delay, and noise
- Looking for consistent patterns of change
- Paying attention to the big picture
The Wicked Problems of Government
**THE ICEBERG MODEL: WAYS OF EXPLAINING REALITY**

- **Events**: Orientation looks for immediate cause and effect.
- **Patterns**: What Just Happened?
- **Trends**: What’s been Happening?
- **Structures**: What are the common forces at play? 5 Whys
- **Mental Models**: How do processes and organization impact? How does our thinking allow this to persist?

- **Systems Thinking**: Looks beneath the surface at the patterns, trends, structures and systems at play.
Spilled Oil
Recognizing Patterns System Archetypes

• Fixes that fail
• Limits to success
• Drifting Goals
• Escalation
• Growth and Underinvestment
• Shifting the burden/addition
• Success to the successful
• Tragedy of the commons
### TOOLBOX

**SYSTEMS ARCHETYPES AT A GLANCE**

<table>
<thead>
<tr>
<th>ARCHETYPE</th>
<th>DESCRIPTION</th>
<th>GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drifting Goals</strong></td>
<td>Is a “Drifting Goals” archetype, a gap between intended and current reality can be created by taking corrective action (B1) or lowering the goal (B2). The critical difference is lowering the goal immediately closes the gap, whereas corrective actions are usually late. (See The Systems Thinker, October 1990.)</td>
<td>- Drifting performance figures are usually indicative that the “Drifting Goals” archetype is at work and that new corrective actions are not being taken. - A critical aspect of creating a potential “Drifting Goals” scenario is to determine what drives the setting of the goals. Goals located outside the system will be less susceptible to drifting goals pressures.</td>
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<tr>
<td><strong>Escalation</strong></td>
<td>Is the “escalation” archetype, one party (A) takes actions that are perceived by the other as offensive. The other party (B) responds in a similar manner, increasing the conflict is A and escalating the more threatening actions by B. The escalating begins tapped out by following the outline of the figure-8 produced by the two balancing loops. (See The Systems Thinker, November 1993.)</td>
<td>To break an escalation structure, ask the following questions: - What is the relative measure that goes one party against the other and can you change it? - What are the significant delays in the system that may decelerate the true course of the threat? - What are the deep-rooted assumptions that reinforce the actions taken as a response to the threat?</td>
</tr>
<tr>
<td><strong>Fixes That Fail</strong></td>
<td>In a “Fixes That Fail” situation, a problem-symptom cure runs out of control. A solution is quickly implemented that alleviates the symptom (B1), but the unforeseen consequences of the “fix” exacerbate the problem (B2). Once the problem-symptom restores to its previous level or becomes worse. (See The Systems Thinker, November 1990.)</td>
<td>- Breaking “Fixes That Fail” cycle usually requires acknowledging the fix is merely alleviating the problem and making amends to remove the real problem cause. - Two-previously-acting of applying the fix and planning out the solution will help realize you don’t get everything in a perpetual cycle of solving yesterday’s “problems.”</td>
</tr>
<tr>
<td><strong>Growth and Underinvestment</strong></td>
<td>In a “Growth and Underinvestment” archetype, growth approaches a limit that can’t be eliminated or pushed into the future. Capacity investments are made. Instead, performance standards are lowered to justify underinvestment, leading to lower performance. There’s further justification for underinvestment. (See The Systems Thinker, June/July 1992.)</td>
<td>- Dig into assumptions which drives capacity investment decisions. If your performance lags low in comparison to those conjectures with strong look at demand and the factors that drive it growth. - There is potential growth, high capacity in anticipation of future demand.</td>
</tr>
</tbody>
</table>

### ARCHETYPE

#### Limits to Success

- **Others**
- **Influence**
- **Barrier**
- **Response**

#### Shifting the Burden/Addiction

In a “Shifting the Burden,” a problem is “solved” by applying a symptomatic solution (B3), which diverts attention away from more fundamental resolutions (B2). (See The Systems Thinker, September 1991.) In an “Addiction” structure, “Shifting the Burden” degrades into an addictive pattern in which the side-effect gets so entrenched that it overbalances the original problem-symptom. (See The Systems Thinker, April 1992.)

#### Success to the Successful

- **Others**
- **Influence**
- **Barrier**
- **Response**

#### Tragedy of the Commons

In a “Tragedy of the Commons” structure, each person pursues action which is individually beneficial (B1) and B2. If the amount of activity grows too large for the system to support, however, the “commons” becomes experienced diminishing benefits (B3 and B6). (See The Systems Thinker, August 1991.)

#### Guidelines

- The archetype is most helpful when it is used well in advance of any problems, to see how the cumulative effects of sustained success might lead to future problems.
- Use the archetype to explore questions such as: What kinds of pressures are building up in the organization as a result of the success? - Look for ways to release pressure or resource limits before an organizational golden thread.
- Problem symptoms are usually easier to recognize than the other elements of the structure.
- If the side-effect has become the problem, you may be dealing with an “Addiction” structure.
- Whether a solution is “symptomatic” or “fundamental” often depends on one’s perspective. Explore the problem from a different perspective in order to come to a more comprehensively understanding of what the fundamental solution may be.
- Look for reasons why the system was set up to create just one “winner.”
- Chop off one half of the archetype by focusing efforts and resources on one group. Rather than creating a “witness-taking” all organizations.
- Find ways to make teams collaborate rather than compete.
- Identity goals or objectives that define success at a level higher than the individual players A and B.

**Effective solutions for Tragedy of the Commons** remains narrow at the individual level.
- Ask questions such as: What are the incentives for individuals to persist in their actions? Can the long-term collective loss be made more real and immediate to the individual actors?
- Find ways to reconcile short-term competitive consequences. A governing body that is charted with the sustainability of the resources limit can help.
Stakeholder Analysis
Stakeholder Analysis

• What is it?
• What is it good for?
• Some Limitations
• How to get started
Stakeholder Analysis: What is it?

- A structured analysis of the main logic of a program or systems initiative

- Objects of analysis include
  - Customers
  - Resource suppliers
  - Expected results
  - Possible tools

- A programmatic assessment

- A business case
Stakeholder Analysis: What is it good for?

• Understanding the external environment of an agency or program
• Discriminating among stakeholder groups
• Specifying the possible results of an innovation
• Matching stakeholders with results
• Estimating impacts on stakeholders
• Making a rough assessment of data availability and data needed for a more complete evaluation
• Choosing a “good” problem
Stakeholder Analysis: Are there Limitations?

• Makes assumptions about causal relationships and processes

• Mixes qualitative and quantitative impacts

• Does not gather or generate enough hard data to draw solid conclusions
Strategic Framework
Strategic Thinking

“A strategic orientation, whether in government or business has five distinguishing features:

- Concerned with mission-critical activities
- Time dimension is long-range
- Looks outward, beyond organizational boundaries
- Seeks maximum ROI
- Places high value on technological, human and information resources”

(Anderson, Belardo & Dawes, 1994)
Strategic Framework: What is it?

An analysis of the internal and external factors that a public organization must consider to achieve a program or service objective.
Customers

A person or organization who makes use of the service you intend to provide.
Partners

A partner is a willing participant in a joint enterprise who **invests** staff time, equipment, money, or credibility in the creation and operation of the service. Partners **share** costs, risks, and benefits and engage in active, trustful working relationships with one another.
Innovation

Products and services that could be used to design, develop, or deliver a new service or to offer an existing service in a new way. In the example, the World Wide Web is an innovation that allows customers to be able to link to data sources 24 hours a day.
Resource

**Something of value** that is necessary to the success of the service. When using the Strategic Framework, it is usually useful to specify what resource(s) are associated with an organization, rather than just the organization’s name.
Strategic Framework: What is it good for?

• Identifying potential partners to help achieve those objectives
• Identifying information and other resources that will be needed
• Identifying innovative products and services that might be relevant
• Getting more specific about the customers of the service
Strategic Framework: Are there Limitations?

- Focuses on “enablers” but identify barriers
- Lacks the detail need to craft a project plan or design a system
2.4.1 Contextual Awareness

• Group Formation
  • We will form 3 groups
  • Count off by 6s
    • All #1s & #2s are Group 1
    • All #3s & #4s are Group 2
    • All #5s & #6s are Group 3
  • Move to your small Group location.

• Group Assignment
  • Each group will be assigned 2 dimensions
  • There three Exercise Instruction Sheets for this section. Each exercise builds on the next so please do them in order.
    • Exercise Instruction Sheet 2.4.1.a
    • Exercise Instruction Sheet 2.4.1.b.
    • Exercise Instruction Sheet 2.4.1.c.

• Group Process
  • Refer to the first Exercise Sheet 2.4.1.a.
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Thank You!