

Yavapai County Economic Prosperity Network

Systems Thinking for Workforce and Economic Development

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Prepared by Dr. Megan E. Hanna

1. Welcome and Purpose of This Primer

Welcome, and thank you for taking a few minutes before our gathering to read this short primer. You do not need to read it cover to cover or memorize anything in it. Think of it the way you might think of reading a brief orientation guide before visiting a new place: it gives you just enough familiarity with the landscape so that when you arrive, you can spend your time exploring rather than getting your bearings.

Session 3 of the current Yavapai County Economic Prosperity Network (YC-EPN) series invites us to look at workforce and economic challenges in Yavapai County through a **systems thinking** lens. This primer introduces several foundational concepts. The goal is not to teach them fully, but to give you a working vocabulary so that our workshop time can be spent applying the ideas rather than defining them.

The people in the room (local government leaders, business owners, educators, nonprofit partners, workforce professionals, and community members) bring a remarkable range of knowledge and lived experience. That is not incidental to the work. As you will see, systems thinking depends on it.

2. Why Systems Thinking Matters for Workforce and Economic Development

Workforce and economic development are not simple puzzles with single, clean solutions. They are closer to what Russell Ackoff called **messes**: dynamic situations made up of interacting problems rather than independent problems that can be solved one at a time (Ackoff, 1979, as cited in Meadows, 2008, p. 1; Ackoff, 1999, Chapter 9). Ackoff's point was that leaders often do not simply solve isolated problems; they manage interrelated problem situations. Pulling one problem out of a mess for isolated treatment can miss the wider dynamics that keep the situation in place.

Think for a moment about the workforce challenges in Yavapai County. A shortage of qualified workers in a key industry might look, on the surface, like a training problem. But dig a little deeper and you may find that it is also a housing problem, a transportation problem, a childcare problem,

a wage problem, and a perception problem. Solving only one part of that picture in isolation rarely produces lasting results.

Systems thinking is a set of habits, tools, and ways of seeing that help us understand complexity. The goal is not to eliminate complexity, but to work with it more wisely. Donella Meadows described a system as a collection of things connected in ways that, over time, cause the whole to generate its own behavioral patterns (Meadows, 2008, p. 2). The most important word in that description is **interconnected**. Systems thinking asks us to pay attention to connections and relationships, not just individual parts.

Peter Senge described systems thinking as “a discipline for seeing wholes” — a way of perceiving interrelationships among things rather than isolated things, and patterns of change instead of just focusing on fixed snapshots (Senge, 2006, p. 98). In the context of economic and workforce development in our region, this way of seeing the system we’re operating within is not just useful; it is essential. The goal is not to find a single lever to pull, but to understand how the parts of a regional ecosystem (e.g., employers, schools, housing, transportation, wages, culture) shape one another over time.

3. Complex vs. Complicated Systems

One of the most useful distinctions in systems thinking is the difference between systems that are **complicated** and systems that are **complex**. These words are often used interchangeably in everyday conversation, but in systems thinking they mean different things. That difference has real implications for how we approach problems.

Complicated systems have many parts, but those parts can be understood, mapped, and reliably predicted with enough expertise. An aircraft engine is complicated. So is a hospital billing system or a tax code. These systems reward expertise. If you understand all the parts and how they connect, you can predict what will happen and fix what goes wrong. The relationship between cause and effect is visible, at least to someone with the right knowledge.

Complex systems are different. They involve many interacting agents (people, organizations, markets, policies, norms) whose relationships constantly shift. You cannot take the system apart and fully understand its behavior by studying the parts alone; in systems thinking, a system’s behavior depends heavily on the interactions among its parts and on the larger whole of which it is a part (Ackoff, 1999). In complex systems, cause and effect are often separated in time and space. An action taken today may not produce visible consequences for months or years. Moreover, those consequences may appear in an entirely different part of the system than where the action was taken.

A simple analogy from Sholom Glouberman and Brenda Zimmerman helps make this concrete: following a recipe to cook something is **simple** because a tested recipe can usually produce a predictable result; sending a rocket to the moon is **complicated** because it requires high levels of

specialized expertise but can become more reliable through experience; and raising a child is **complex** because every situation is unique and expertise does not guarantee certainty (Glouberman & Zimmerman, 2002, pp. 1–2).

Workforce and economic development in a region like Yavapai County are firmly in the complex category. They involve human behavior, policy decisions, market forces, and cultural values. All of these factors interact with each other simultaneously. That is not a reason for us to worry; it is a reason to use different tools and a different mindset than we would bring to a complicated problem.

4. The Importance of Multiple Perspectives

Here is something worth sitting with before our session: no one in the room has the full picture of the workforce and economic system in Yavapai County — not the policymaker, not the business owner, not the educator, not the workforce developer. Each of us sees a portion of the system through the lens of our own role, experience, and position.

Meadows emphasized that the models we use to understand reality are necessarily partial. She advised systems thinkers to remember that what any person knows is a model, to make our mental models visible, and to invite others to challenge our assumptions and build on them (Meadows, 2008, p. 171). This is not false modesty. Rather, it is practical insight. Our maps of reality are always partial. The purpose of bringing diverse stakeholders together is precisely to assemble a more complete picture than any one of us could build alone.

Senge introduced this concept of **mental models**, which are the deeply held views, assumptions, and generalizations that affect the way we see the world and the resulting actions we take (Senge, 2006, p. 18). These mental models are not flaws; they are necessary shortcuts. Even so, in complex systems, unexamined mental models can blind us to important dynamics. The solution is not to pretend we have no assumptions, but to surface them, share them, and test them against the perspectives of others.

In our workshop, diverse perspectives are not just welcomed; they are necessary. An employer and faculty member may see the same workforce gap through completely different lenses. Both lenses are needed to understand the full system.

5. Boundary Critique: What's Inside and Outside the System?

Every time we try to understand a system, we draw a boundary around it. When we do so, we decide what is "in" and what is "out." That decision is rarely as neutral as it seems.

Meadows noted that the world is continuous rather than neatly divided into separate systems, and that where we choose to draw a system boundary depends on the purpose, discussion, or problem

we are working to solve (Meadows, 2008, pp. 97-98). Every boundary we draw shapes what we can see, what we can measure, and ultimately what actions seem available to us.

The practice of questioning these choices (asking *who* and *what* we have included, who and what we have left out, and what difference that makes) is known in the systems thinking literature as **boundary critique**. Werner Ulrich developed boundary critique as the methodological core of critical systems heuristics, arguing that claims about facts, values, and solutions depend on boundary judgments about what is treated as relevant and what is left out (Ulrich & Reynolds, 2020).

In the context of Yavapai County's workforce system, boundary questions might look like these:

- Are we defining "the workforce" as only current workers, or do we include people who have left the labor market? Those who are incarcerated? Young people still in school?
- When we talk about "the economy," are we including the informal economy? The care economy?
- Whose knowledge are we treating as expertise? Who is not in the room, and what are we missing as a result?

Boundary critique does not tell us there is a single correct answer to these questions. Rather, it asks us to make our choices **visible** and **deliberate**, so that we are aware of what we may be missing and can choose whether to expand the boundary of our analysis.

6. A Brief Introduction to the DSRP Framework

Over the past few decades, systems thinkers have developed many frameworks and tools to help make the practice of systems thinking more accessible and teachable. One such framework is **DSRP**, developed and advanced by Derek Cabrera and Laura Cabrera (2022).

DSRP is an acronym for four patterns that Cabrera and Cabrera (2022) identify as Distinctions, Systems, Relationships, and Perspectives. In "DSRP Theory: A Primer," the authors describe these four patterns and their underlying elements as a basis for systems thinking and for organizing information in complex settings (Cabrera & Cabrera, 2022). The four patterns can be introduced this way (Cabrera & Cabrera, 2022; Cabrera et al., 2015):

Letter	Pattern	The Core Question It Asks	In Plain English
D	Distinctions	What is this thing, and what is it not?	Every time we label or define something, we draw a boundary: we say what it is and implicitly what it is not. Being conscious of those distinctions matters.

S	Systems	What are the parts, and what is the whole they belong to?	Everything is both a whole made of parts and a part of something larger. How we organize things into wholes and parts changes what we see and understand.
R	Relationships	How do things affect one another?	Parts of a system are connected by relationships: causal, correlated, direct, indirect. Identifying those relationships is often where the most important insight lives.
P	Perspectives	From whose point of view?	Every observation is made from a perspective. Changing the vantage point (who is looking, and from where) changes what is visible in the system.

What makes DSRP practical is that these are not just abstract categories; they are active habits of thought. In our workshop, you may find yourself naturally asking "What's the relationship between these two things?" (R), or "Who isn't represented in this conversation?" (P), or "Are we lumping things together that should be distinguished?" (D). Those instincts are systems thinking in practice.

You can also think of DSRP as a complement to boundary critique: the D (Distinctions) and P (Perspectives) patterns are particularly closely connected to the boundary questions we explored in the previous section.

7. A Preview: Feedback Loops

One of the most powerful (and counterintuitive) insights of systems thinking is that causes and effects often loop back on each other. Rather than a straight line from action to outcome, complex systems are full of circular chains of cause and effect. Senge made this point vividly, noting that reality is structured in circles, even though we habitually perceive it in straight lines of cause and effect (Senge, 2006, pp. 105-106).

These circular chains are called **feedback loops** (Senge, 2006, pp. 108). Meadows described **reinforcing feedback loops**, which amplify change, and **balancing feedback loops**, which seek stability or correction toward a goal or condition (Meadows, 2008, pp. 26–34).

Reinforcing loops amplify change in a given direction, for better or worse. A positive example: as a community college builds a reputation for quality workforce training, more employers hire its graduates, which brings in more resources, which improves the program, which strengthens the reputation further. This virtuous cycle reinforces itself over time. A troubling example: if young people leave a rural region for opportunities elsewhere, the remaining talent pool shrinks, making it harder for local employers to grow, which leads to fewer opportunities, which encourages more young people to leave. That is a reinforcing loop running in the wrong direction.

Balancing loops resist change and push a system back toward a desired state. A thermostat is the classic example: when the temperature falls below a target, the system heats the room; when it rises above target, it cools. Balancing loops can be stabilizing and helpful. But they can also be frustrating when they resist changes we are trying to make, like the way raising wages in one sector can trigger workforce movement that partially offsets the intended benefit, or the way a new housing development absorbs demand and then triggers new demand.

We will spend meaningful time in session four mapping and exploring feedback loops that operate within Yavapai County's workforce and economic system. This section is your preview: by the time you arrive, you will already have these ideas sitting in the back of your mind, ready to activate.

8. What to Expect During the Workshop

During the workshop, you will not be asked to solve Yavapai County's workforce and economic development challenges on the spot. Instead, you will be invited to slow down, look at the system from multiple perspectives, surface assumptions, notice boundaries, and begin identifying relationships that may not be obvious from any single role or sector. The work is exploratory by design. The value comes from learning together before moving too quickly toward solutions.

9. Systems Thinking Mindsets

The most important preparation for systems thinking work is not conceptual; it is attitudinal. The following mindsets will serve you well not just in the workshop but in any context where you are navigating complexity. They are adapted from themes found across the work of Meadows, Senge, Ackoff, and the Cabrerias.

♦ **Stay curious longer.** The instinct to jump to solutions is understandable, especially for people in leadership roles who are used to being expected to have answers. But complex systems rarely yield quick solutions. Meadows encouraged systems thinkers to observe how a system behaves before trying to change it and to listen for what the system itself is showing (Meadows, 2008, pp. 170–171).

In our workshop, the goal of the early phases is to understand before we prescribe. Give yourself permission to not know the answer yet.

◆ **Hold your model lightly.** Your knowledge of the local economy, the workforce system, or your sector is valuable. It is also a model: a simplification of a much more complex reality. Senge used the term "mental models" to describe deeply held views, assumptions, and generalizations that shape how people see the world and the actions they take (Senge, 2006, p. 18). Effective systems thinkers bring their mental models to the table, but remain genuinely open to having them revised.

◆ **Look for relationships, not just actors.** When we try to explain why something is going wrong, we often identify a person, an organization, or a policy to blame. Systems thinkers such as Ackoff and Senge emphasized that system behavior emerges from relationships, structure, and patterns of interaction, not only from the traits of individual actors (Ackoff, 1999; Senge, 2006). This is not a call to excuse poor leadership; it is a call to look more deeply at the conditions that produce outcomes, good and bad.

◆ **Embrace not knowing — and invite others in.** In complex systems, the person with the most credentials does not always have the most relevant knowledge. The insight that unlocks a new way of seeing might come from someone with direct experience at the front lines: a job seeker, a front-line worker, or a small business owner. Meadows encouraged people to make their models visible and invite others to challenge and improve them (Meadows, 2008, p. 171). In the workshop, be as interested in learning from others as in sharing your own perspective.

◆ **Think in time.** Complex systems play out over months and years, not hours and days. The decisions that shaped Yavapai County's workforce situation today were made years ago. The actions we take today will take time to ripple through the system. Senge observed that in complex systems, cause and effect are often separated in both time and space — a key reason why well-intentioned interventions can produce unintended consequences (Senge, 2006, pp. 90-91). Try to hold both short-term and long-term lenses simultaneously.

◆ **Learning is the work.** Systems thinking is not a technique you master and then deploy. It is an ongoing practice of paying attention, questioning assumptions, and updating your understanding. Senge described learning organizations as organizations where people continually expand their capacity to create desired results and learn together (Senge, 2006). We hope our sessions together are a small step in building that capacity for Yavapai County.

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