United Nations | Department of Economic and Social Affairs

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***.

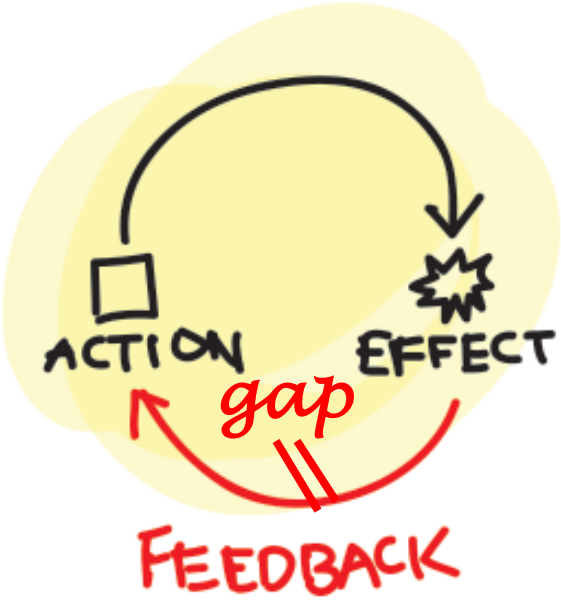
Scribd.com

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.

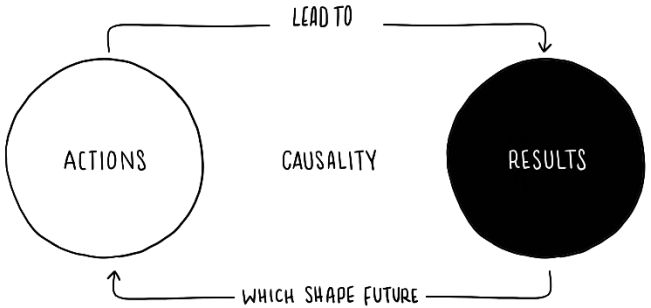
What is Systems Thinking?

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

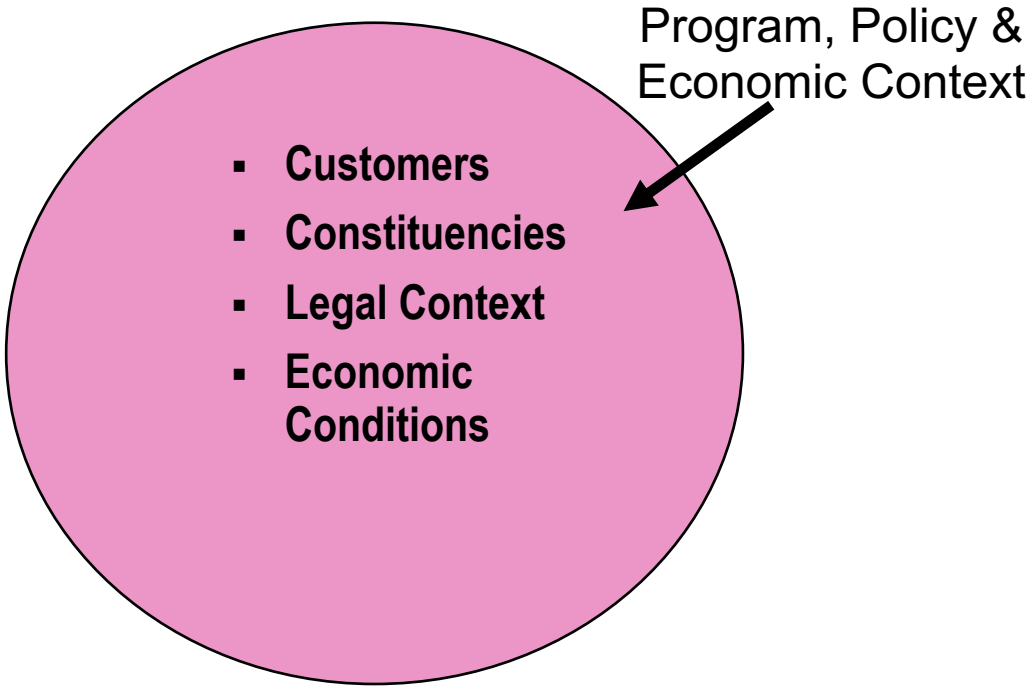
Basic Ideas

You can't do just one thing!

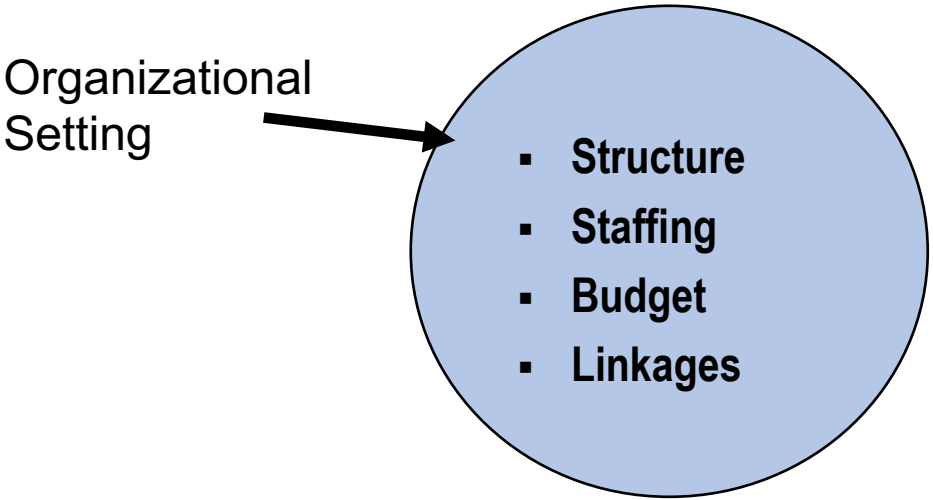
“The world is filled with relationships, and anything we do is going to impact parts of the system that we may never have even thought of.”

(Richard Heinberg)

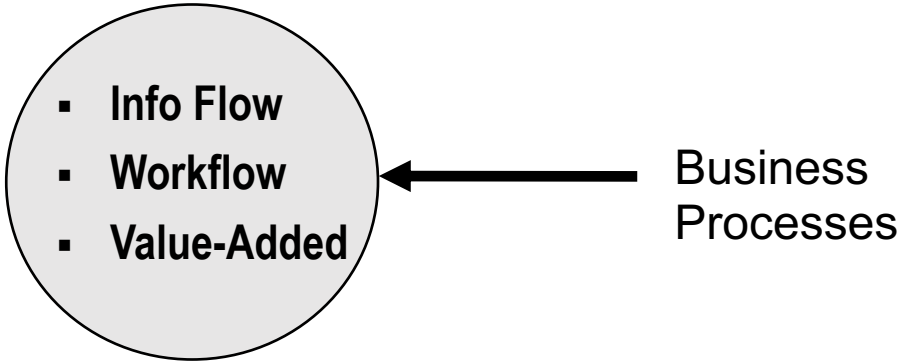
Real World Environment



Organizations & People

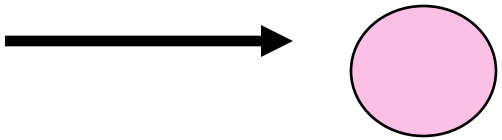


The Work



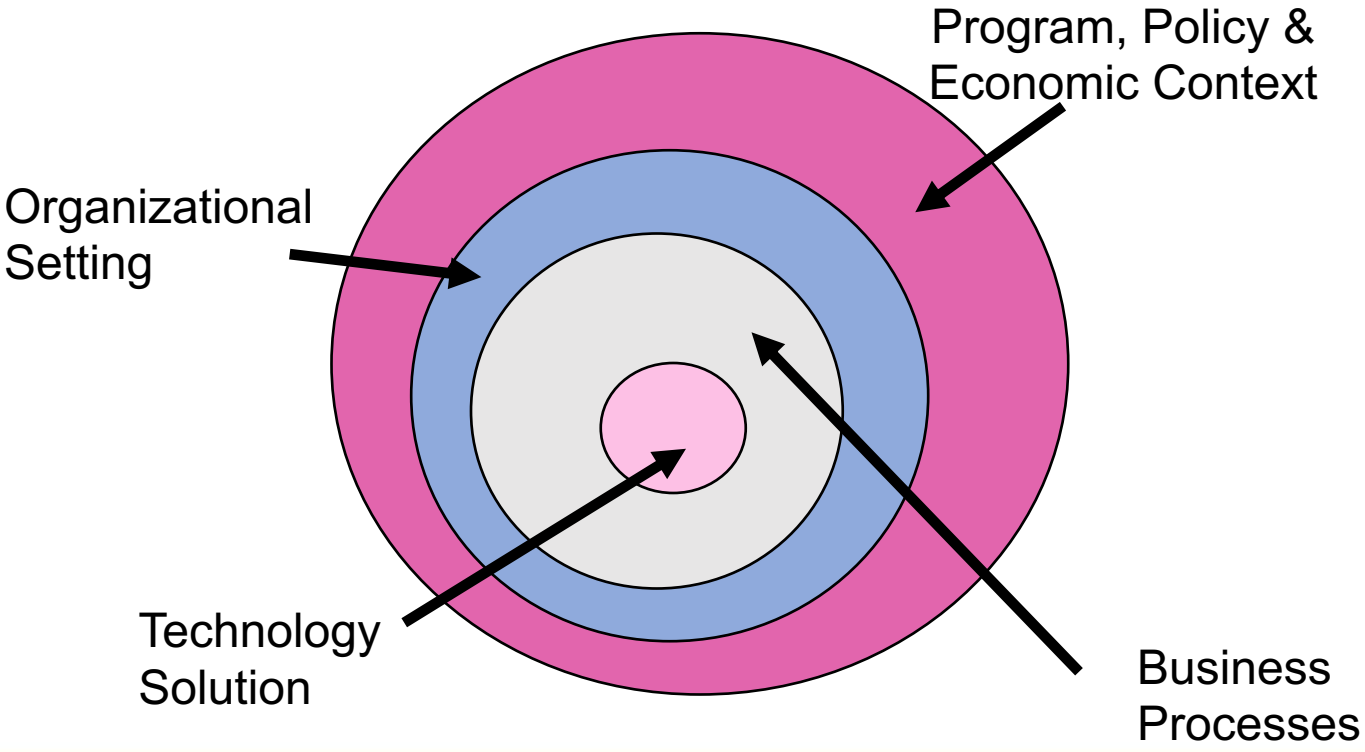
Technology Solutions & Tools

Technology Solution



- **hardware**
- **software**
- **platforms**
- **infrastructure**

Organizational Complexity

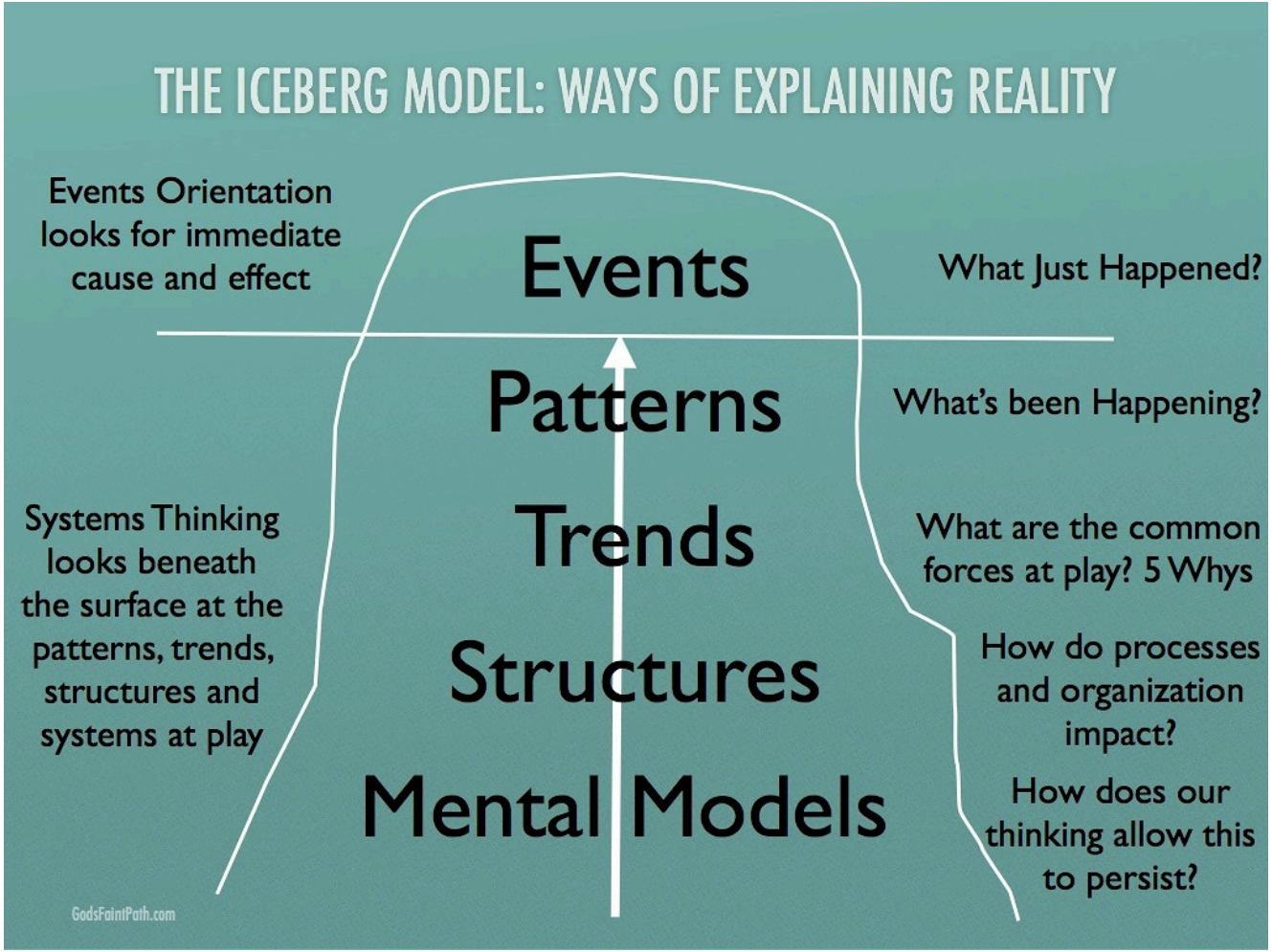


Basic Ideas

- 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

United Nations



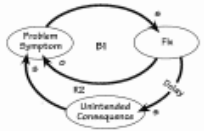
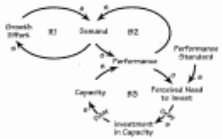
DESA

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

SYSTEMS ARCHETYPES AT A GLANCE

ARCHETYPE	DESCRIPTION	GUIDELINES
Drifting Goals 	In a "Drifting Goals" archetype, a gap between the goal and current reality can be resolved by taking corrective action (B1) or lowering the goal (B2). The critical difference is that lowering the goal immediately closes the gap, whereas corrective actions usually take time. (See *The Systems Thinker*, October 1990.)	• Drifting performance figures are usually indicators that the "Drifting Goals" archetype is at work and that real corrective actions are not being taken. • A critical aspect of avoiding 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.
Escalation 	In the "Escalation" archetype, one party (A) takes actions that are perceived by the other as a threat. The other party (B) responds in a similar manner, increasing the threat to A and resulting in more threatening actions by A. The reinforcing loop is traced out by following the outline of the figure-8 produced by the two balancing loops. (See *The Systems Thinker*, November 1991.)	To break an escalation structure, ask the following questions: • What is the relative measure that pits one party against the other and can you change it? • What are the significant delays in the system that may distort the true nature of the threat? • What are the deep-rooted assumptions that lie beneath the actions taken in response to the threat?
Fixes That Fail 	In a "Fixes That Fail" situation, a problem symptom cries out for resolution. A solution is quickly implemented that alleviates the symptom (B1), but the unintended consequences of the "fix" exacerbate the problem (R2). Over time, the problem symptom returns to its previous level or becomes worse. (See *The Systems Thinker*, November 1990.)	• Breaking a "Fixes that Fail" cycle usually requires acknowledging that the fix is merely alleviating a symptom, and making a commitment to solve the real problem now. • A two-pronged attack of applying the fix and planning out the solution will help ensure that you don't get caught in a perpetual cycle of solving yesterdays "solutions."
Growth and Underinvestment 	In a "Growth and Underinvestment" archetype, growth approaches a limit that can be eliminated or pushed into the future if capacity investments are made. Instead, performance standards are lowered to justify underinvestment, leading to lower performance which further justifies underinvestment. (See *The Systems Thinker*, June/July 1992.)	• Dig into the assumptions which drive capacity investment decisions. If past performance dominates as a consideration, try to balance that perspective with a fresh look at demand and the factors that drive its growth. • If there is potential for growth, build capacity in anticipation of future demand.

ARCHETYPE	DESCRIPTION	GUIDELINES
Limits to Success 	In a "Limits of Success" scenario, continued efforts initially lead to improved performance. Over time, however, the system encounters a limit which causes the performance to slow down or even decline (B2), even as efforts continue to rise. (See *The Systems Thinker*, December 1990/January 1991.)	• The archetype is most helpful when it is used well in advance of any problems, to see how the cumulative effects of continued 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 growth? • Look for ways to relieve pressures or remove limits *before* an organizational gasket blows.
Shifting the Burden/Addiction 	In a "Shifting the Burden," a problem is "solved" by applying a symptomatic solution (B1), which diverts attention away from more fundamental solutions (B3). (See *The Systems Thinker*, September 1990.) In an "Addiction" structure, a "Shifting the Burden" degrades into an addictive pattern in which the side-effect gets so entrenched that it overwhelms the original problem symptom. (See *The Systems Thinker*, April 1992.)	• 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 differing perspective in order to come to a more comprehensive understanding of what the fundamental solution may be.
Success to the Successful 	In a "Success to the Successful" archetype, if one person or group (A) is given more resources, it has a higher likelihood of succeeding than B (assuming they are equally capable). The initial success justifies devoting more resources to A, and B's success diminishes, further justifying more resource allocations to A (R2). (See *The Systems Thinker*, March 1992.)	• 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 "winner-take-all" competition. • Find ways to make teams collaborators rather than competitors. • Identify goals or objectives that define success at a level higher than the individual players A and B.
Tragedy of the Commons 	In a "Tragedy of the Commons" structure, each person pursues actions which are individually beneficial (R1 and R2). If the amount of activity grows too large for the system to support, however, the "commons" becomes experiences diminishing benefits (B5 and B6). (See *The Systems Thinker*, August 1991.)	• Effective solutions for "Tragedy of the Commons" scenario never lie 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 cumulative consequences. A governing body that is chartered with the sustainability of the resources limit can help.

DESA

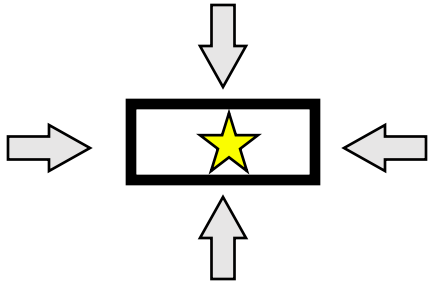
Stakeholder Analysis

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:

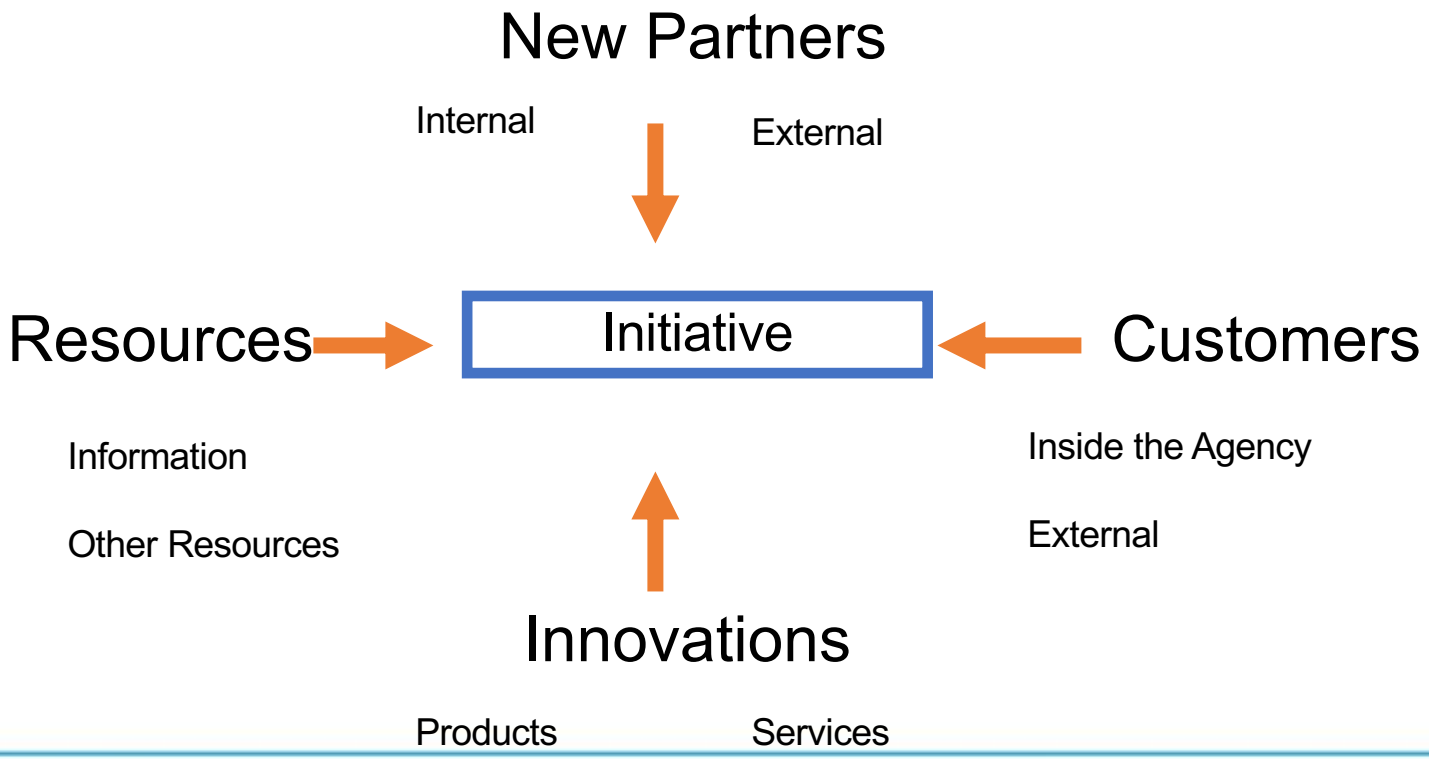
- Concerned with mission-critical activities
- Time dimension is long-range
- Looks outward, beyond organizational boundaries
- Seeks maximum ROI
- Places high value on technological, human and information resources"

(Anderson, Belardo & Dawes, 1994)

Strategic Framework: What is it?

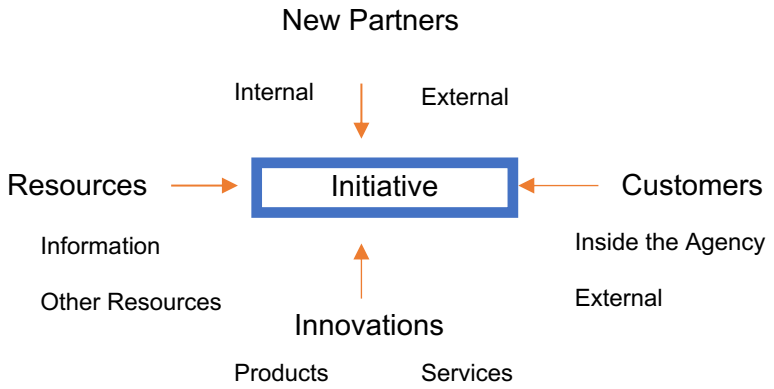
An analysis of the internal and external factors that a public organization must consider to achieve a program or service objective.

Strategic Framework



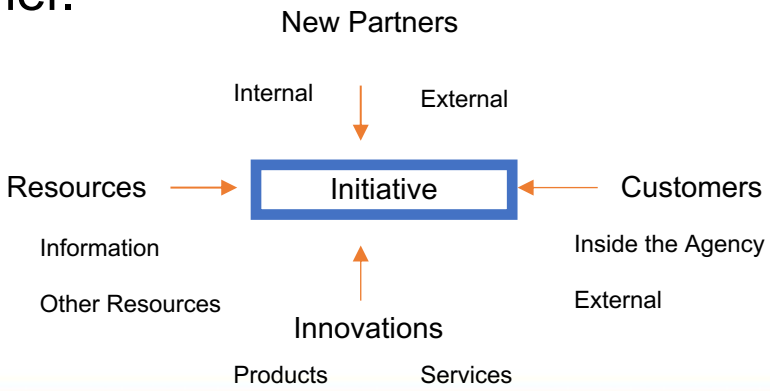
Customers

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



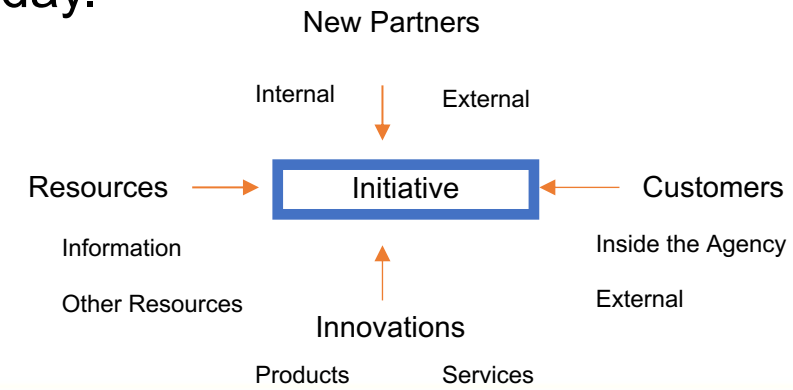
Partners

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.



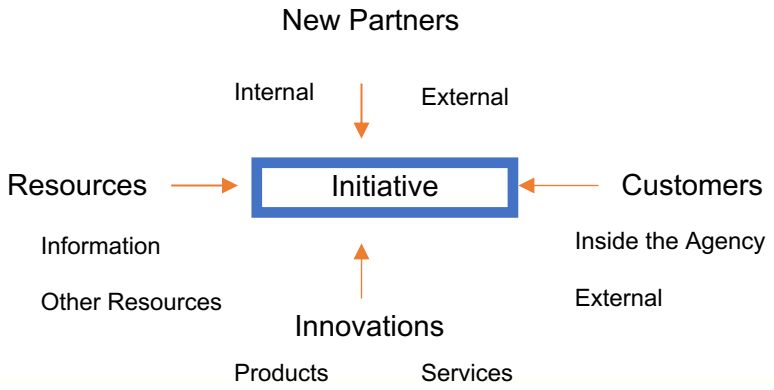
Innovation

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

Small Group Activity

- 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!