Building Data Sharing Infrastructures

Taking Context and Stakeholders Seriously

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Why am I Talking?
Builder of Interagency Data Partnerships & Systems

- 511 Virginia
  - Virginia State Police
  - Virginia Department of Transportation
  - Virginia Tourism Corporation
  - Virginia Tech
- Child HANDS
  - Virginia Department of Education
  - Virginia Department of Social Services
  - Virginia Department of Health
- Virginia Longitudinal Data System
  - Virginia Department of Education
  - State Council on Higher Education in Virginia
  - Virginia Employment Commission
  - Virginia Community College System
- Metropolitan Analytics Infrastructure (current)

Technology facilitates, but isn't the key

Long processes of trust and partnership-building are paramount

Keys to Building Successful Data Partnerships

- Must get to a shared vision

- Must establish TRUST between all key data partners

- Technology should be designed as much as possible to work within the existing political and economic context of the deployment

What am I Talking About?

- Some approaches and tools that I have come to rely upon to effectively create **Implementation Networks**
- The "Steps" to my "Method"
  - Contextual Assessment
  - Stakeholder Analysis, Selection & Management
  - Joint-Visioning

Implementation Network: "*a highly differentiated and complex array of public and private organizations that are involved in the translation of the policy intentions … into appropriate measures or actions for the realization of these objectives (O´Toole, 139).*"

Why am I Talking About That?
Public-sector "Big Data" Analytics is Different

- "Big" data infrastructure recommendations for data analytics commonplace in IT journals and vendor whitepapers
- However
  - domain is almost universally considered private sector, and
  - data to be analyzed generally assumed to be either publicly available or privately owned or contracted (that is, accessible without restriction)
- Therefore, issues discussed generally relate to capacity issues like storage, processing scalability and latency

Why am I Talking About That?
Public-sector "Big Data" Analytics is Different

- once we include data managed by the public sector, especially at the individual-level, complexity of requirements grows exponentially

- necessitates the application of analytics to data constructed **across** both *jurisdictional* and *legal* boundaries

- What makes "big" data analytics difficult in the public sector is the <u>special set of requirements that must be satisfied in order to combine and use the data in the first place</u>

Example
Implementation Environment of the Virginia Longitudinal Data System

- Multiple levels of statutory law
- Multiple implementations of regulatory law at each level of statutory law
- Most conservative interpretation of regulatory law becomes de facto standard

  "No one person , inside or outside a government agency, should be able to create a set of identified linked data records between partner agencies"

- Has a direct and significant effect on the potential success of the technical approach chosen – A Centralized, Hierarchical Data Warehouse will likely Fail!
- Easy to see, if you look for it!
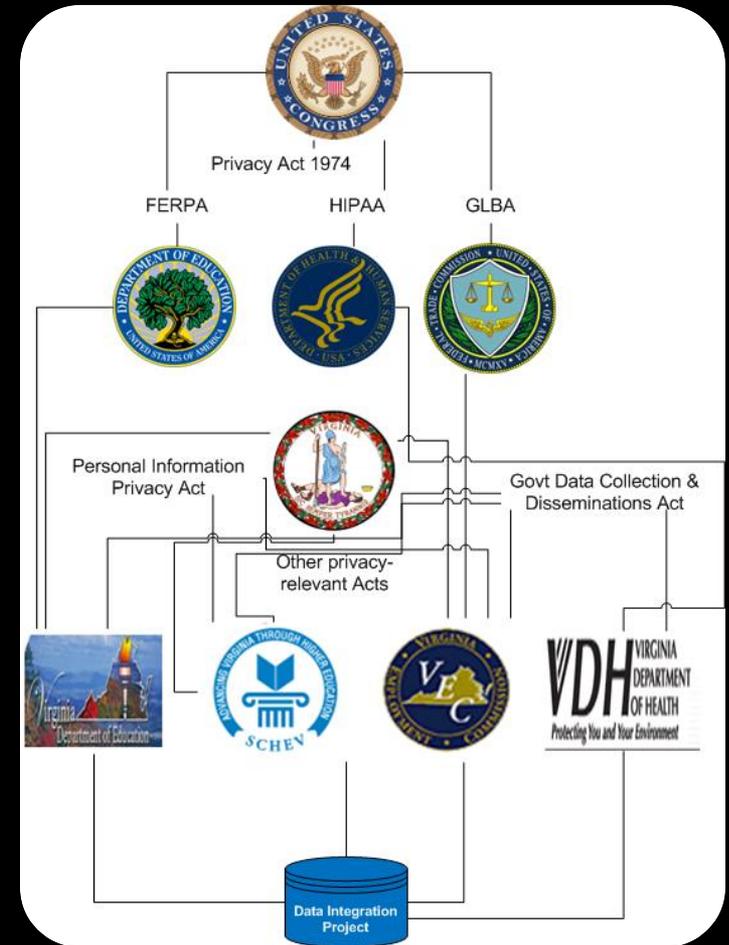
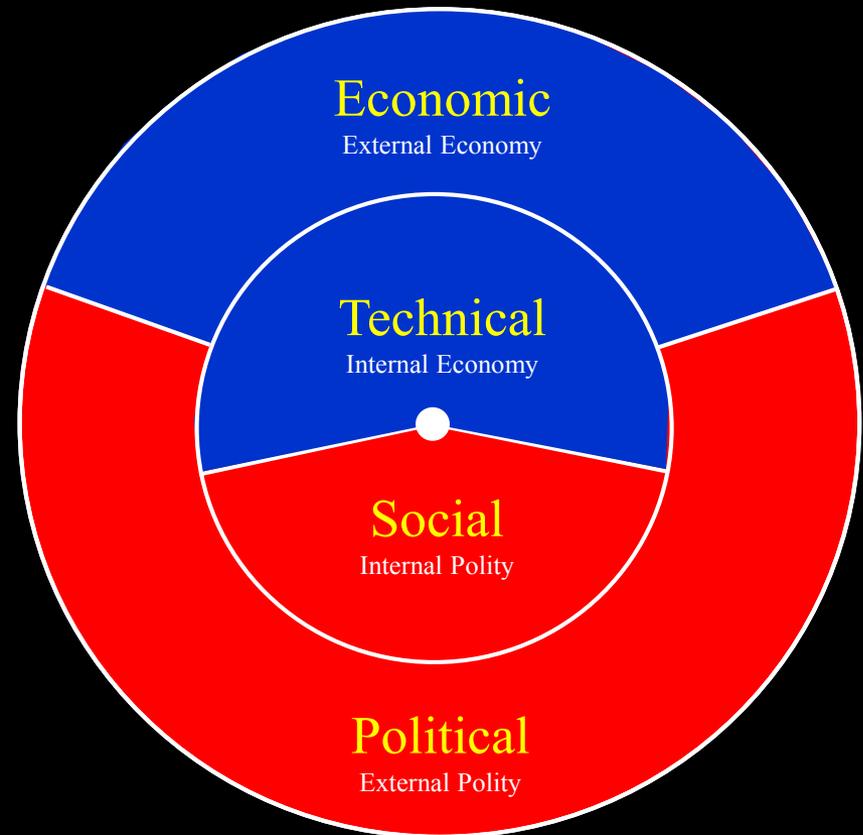# So, How Do I "See" my Implementation Environment?

- There are, of course, MANY tools/frameworks/rubrics to help you frame your potential implementation

- Many are based on some form of systems/dependency-network analysis

- I find that they miss or give short-shrift to what I have found to be the most important elements of implementation in complex multi-organizational, multi-sectorial scenarios. Namely, the Political, Economic, and Organizational dimensions – in addition to the Technical Dimension

Understanding Implementation
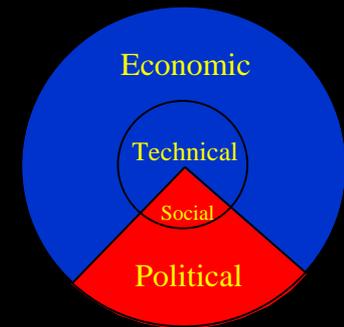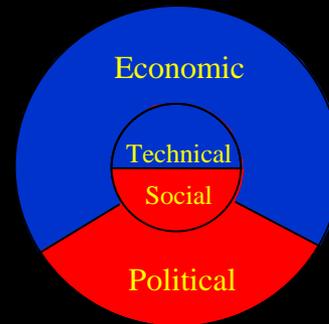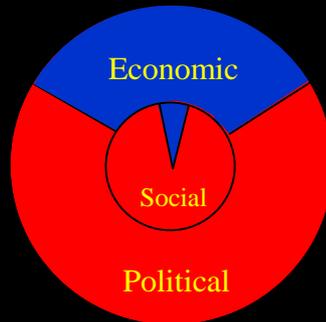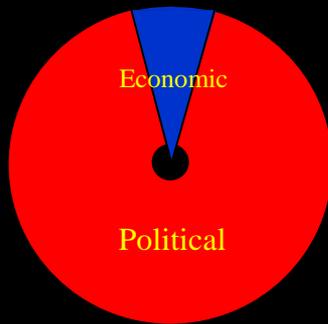## The Political Economic Framework

- **Political Environment**
  - Who likes us?
  - Level of surveillance by external actors; External actors understanding of org. goals; Match between statutory charge and political environment; Level which external control mechanisms dictate internal resource allocation; Level of external support & influence available to org. from larger network

- **Economic Environment**
  - Show me the money!
  - Level of demand for outputs (products); Availability of resource inputs (personnel, $$, technical resources); Recipients of outputs (citizens, customers?); Amount received for output ($$, power, prestige, fuzzy feeling?); Level of competition

- **Social / Organizational System**
  - Sempre Fi!
  - Organization mission; Organization goals; Dominant norms and values; Measurement and analysis of job performance; Recruitment system(s); Incentive System(s)

- **Technical / Functional System**
  - Which budget do we pay for the 100-base-T upgrade with?
  - The "production system"; Primary system functions; Required functional positions; Required functional responsibilities; Technological requirements; Budget and budgeting system; Purchasing & accounting system

The Four Political Economic Dimensions
(Re-envisioned, Re-named, Dynamized)

Economic — External Economy
Technical — Internal Economy
Social — Internal Polity
Political — External Polity

Network Implementation as Political Economy
Where you want to go

Theories and Methods for my "Steps"

- Assessing the Environment or Contextual Assessment
  - Political Economy of Organizations
  - Quota Sampling
  - Snowballing

- Selecting and Building a Stakeholder Network
  - Political Economy of Organizations
  - Stakeholder Analysis

- Building a New Organization/System from the Stakeholder Network or Joint Visioning
  - Political Economy of Organizations
  - Implementation Networks
  - Techniques of Facilitation

Contextual Analysis

- Discovering what the potential environment of your implementation will be by first discovering what the current environments are of your likely future stakeholders.

- ***Their problems will be your problems***

Contextual Assessment
Your potential environment

Network's PE Environment

Political

Social

Technical

Economic

dictates

Amalgamated
Political
Economies -
All Individuals

Economic

Political

Political Economic
Environment of
New Implementation
Network
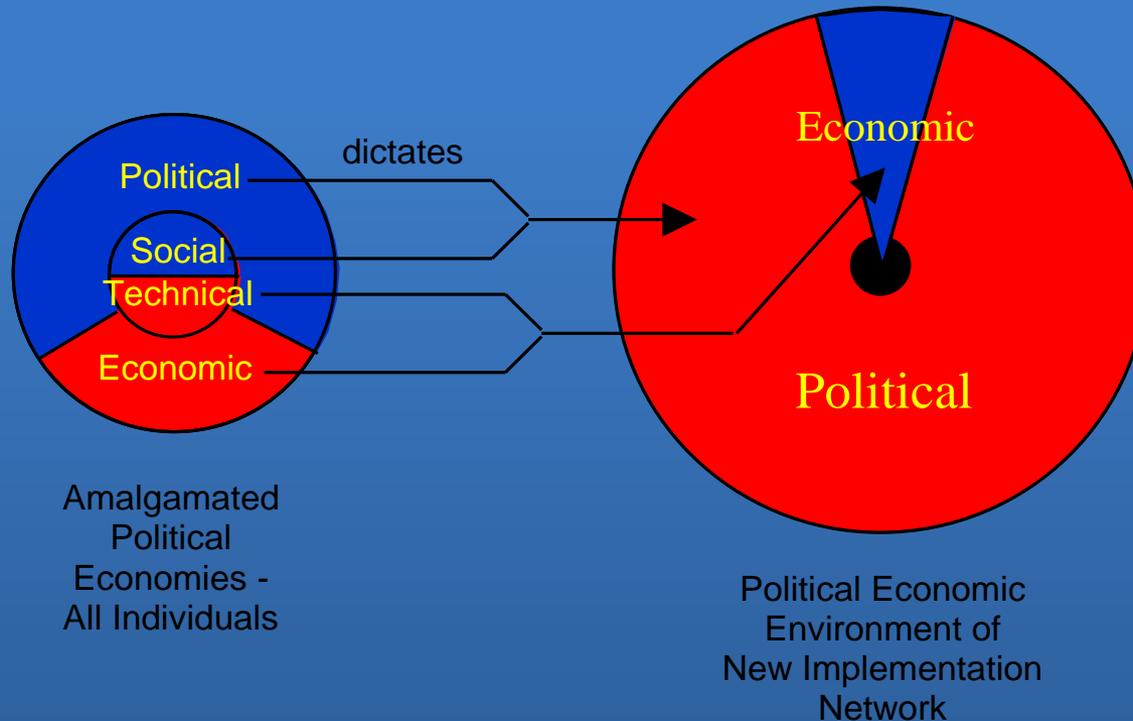
Contextual Assessment
PE Interview Instrument

Master List of Political Economic Questions for Interview Instrument

Political Questions

- If we were to go ahead with this idea, how do think it will be perceived by stakeholders outside your organization?
- How much surveillance by these external actors occurs currently?
- Do you think that implementation of this idea matches well with your existing political environment?
- How much latitude does your organization have to lend resources to this implementation effort?
- Do you perceive a high or low level of external support & influence available to organization?

Economic Questions

- What do you think is the potential level of demand for what it is this new system will produce?
- Do you perceive trouble in getting the necessary resources to support the effort?
- Who will be the primary recipients of what is produced?
- What sort of payment will your organization get back for its participation (payment, power, prestige)?
- How much of each type of payment do you project would be received?
- How much competition is there in this field?

Social / Organizational Questions

- What's your organization's mission? Do you have a mission statement? Does this new effort support that mission?
- Have the goals of your organization been articulated? Does this new effort support those goals?
- How would you describe the work culture of your organization? Are there any dominant norms or values that come to mind?
- How is job performance measured?
- What incentive system(s) does your organization have in place to reward performance?
- How do you recruit new staff members?

Technical / Functional Questions

- What are the primary functions of the organization? How would they be impacted by this new implementation?
- What are the required functional positions needed by your organization? Will more be needed?
- What are the required functional responsibilities of these positions? Will they have to be changed?
- What technological requirements does the organization have to perform its functions? Will you need more?
- What is the size of your budget? How does your budgeting system operate?
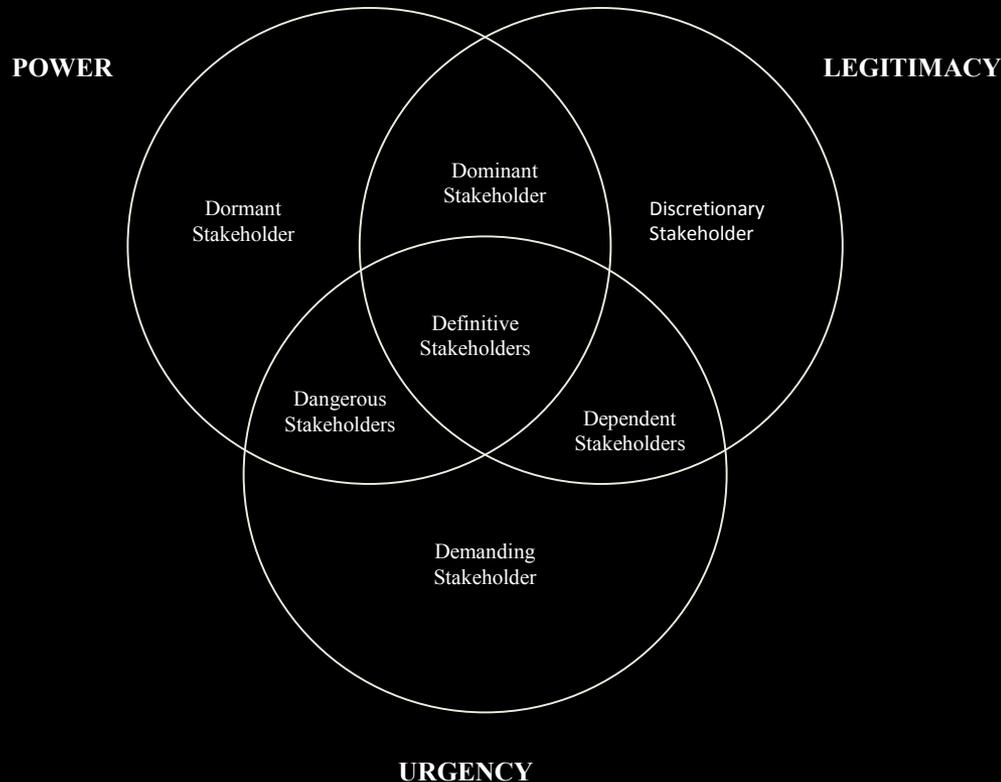
Contextual Assessment
Some Tools

- Quota Sampling
  - Taking a first shot of ensuring representation across the political, economic, organizational, and technical dimensions

- Snowballing
  - The simple process of expanding the zone of contacts by soliciting from the initial stakeholders from the quota sample others to include
  - BUT, being sure to solicit their opinions in the context of the political economic dimensions

Stakeholder Analysis & Selection

- **From your potential environment:**
  - Who do you choose to participate as a bona-fide stakeholder? Everybody? No.
  - Why are they chosen?
  - Once chosen, are all stakeholders created equally? How do you tell?
- Failure to take this task seriously results, I believe, in the vast majority of "surprise" implementation failures

Stakeholder Analysis and Selection
Power, Legitimacy and Urgency

POWER

LEGITIMACY

Dormant
Stakeholder

Dominant
Stakeholder

Discretionary
Stakeholder

Definitive
Stakeholders

Dangerous
Stakeholders

Dependent
Stakeholders

Demanding
Stakeholder

URGENCY

Definitive Stakeholder   = All 3 Attributes
These are the most "important" stakeholders and almost always should be included in the process.

Secondary Stakeholders = Any 2 Attributes
• *Dominant* stakeholders are those who are considered powerful and legitimate stakeholders and tend to be the most influential stakeholders within this secondary realm.
• *Dependent* stakeholders are those with urgent and legitimate claims and are reliant upon other powerful stakeholders who are considerate of their claims on the process at hand.
• *Dangerous* stakeholders score high on both the urgent and powerful attributes are classified as dangerous because they lack legitimacy in the process. These stakeholders are likely to use coercive or utilitarian power to influence a process as opposed to symbolic power.

Tertiary Stakeholders   = Any 1 Attribute
• *Dormant* stakeholders are unlikely to exercise any of their power without any sense of urgency or legitimacy with respect to the process, but possess the *potential* to change status rapidly.
• *Discretionary* stakeholders have no power to assert their claims, nor a sense of urgency to make themselves be heard.
• *Demanding* stakeholders are those who are neither powerful nor legitimate, but perceive a deep sense of urgency with respect to a particular issue, and hence, try desperately to enter the field of legitimate and powerful stakeholders, and generally have to rely on others to help them voice their concerns.

Mitchell, Agle, and Wood (1997), define stakeholders as being identified by their possession or attribution of one, two, or all three of the following attributes:
(1) the stakeholder's *power* to influence the firm or organization,
(2) the *legitimacy* of the stakeholder's relationship with the firm or organization, and,
(3) the *urgency* of the stakeholder's claim on the firm or organization (854).

Stakeholder Analysis and Selection
Threat vs Cooperation

Diagnostic Typology for Primary Stakeholders

		Stakeholder's Potential for Threat to Organization	
		High	**Low**
Stakeholder's Potential for Cooperation with the Organization	**High**	Type 4 MIXED BLESSING Strategy: COLLABORATE	Type 1 SUPPORTIVE Strategy: INVOLVE
	Low	Type 3 NONSUPPORTIVE Strategy: DEFEND	Type 2 MARGINAL Strategy: MONITOR

Source: Blair and Whitehead, 1988: 158.

Sample Stakeholder Interview Instrument

Power
To what extent do you think this stakeholder has an affect or can influence the outcome of this project?
Can the project continue without the inclusion of this stakeholder?
What interests would this stakeholder have in this kind of project?
To what extent can this stakeholder influence other stakeholders in the process?
What resources can this stakeholder use to advance their interests in the process?

Legitimacy
To what extent do these stakeholders provide resources critical to the outcome of this project?
To what extent are we responsible to this stakeholder with respect to this project?
To what extent does this stakeholder have a right, or a moral or legal claim, to be involved in this project? Does this stakeholder have a genuine or legitimate place in this process?
Is there any risk involved to this stakeholder with respect to being included in this project?
To what extent will this stakeholder benefit from, or will be harmed by the outcome of this project?

Urgency
Do you think this stakeholders' claims will demand immediate attention with respect to this project? To what extent does this stakeholder demand immediate attention in this project?
Will it be problematic to keep this stakeholder waiting until the project proceeds further along the implementation schedule?
To what extent do you think this project is critical or urgent to this stakeholder?
To what extent do you think any managerial delay in addressing this stakeholder's interests will become problematic for the stakeholder?
Do you think this stakeholder will bring a sense of crisis or haste to this project?

Cooperation
To what extent does this stakeholder control resources necessary for the completion of this project?
How powerful is this stakeholder with respect to this project?
Overall, how supportive do you think this stakeholder will be with respect to this project?
Do you think this stakeholder is likely to take any action which is likely to undermine this project?
Do you think this stakeholder will be willing to collaborate with other stakeholders to form a coalition in support of this project? Against it?

Threat
To what extent do you think this stakeholder is a potential threat to the success of this project? Would you be insecure about including this stakeholder in this process?
How much power do you think this stakeholder has relative to other stakeholders?
Is there an immediate *opportunity* for this stakeholder to impede or become a threat to this project?
Would this stakeholder be willing to use it s resources as a threat to the project?

Confidence
How familiar do you think you are about these stakeholders' interests with respect to this project? How confident are you about your insight into this stakeholder and the various interests you think they will bring to this project?
How did you come to be familiar with or knowledgeable about this stakeholder?
How long have you had interaction with this stakeholder?
Please tell us why you think you can be confident, or not confident about your assessment of this stakeholder?

Joint Visioning

- Now that the initial set of stakeholders has been identified, how do we proceed to build our implementation network?

- The implementation network MUST be the joint-vision of the stakeholders involved (at least the primary stakeholders)

Joint Visioning
Building the Implementation Network

- (O'Toole, 1998) Successful Implementation Networks are Comprised of Three Sub-Networks

  - Goal Setting Network

    - Brings together Primary, Cooperative Stakeholders to decide how to engage in development and promotion of new system/organization

  - Program Development Network

    - Creation of program level operating plans designed to reach established goals

  - Operational Implementation Network

    - Where procedures and routines for deployment takes place

    - Line-level Implementation Issues addressed here

Goal Setting

Feedback

Program Development

Feedback

Operational Implementation of New System
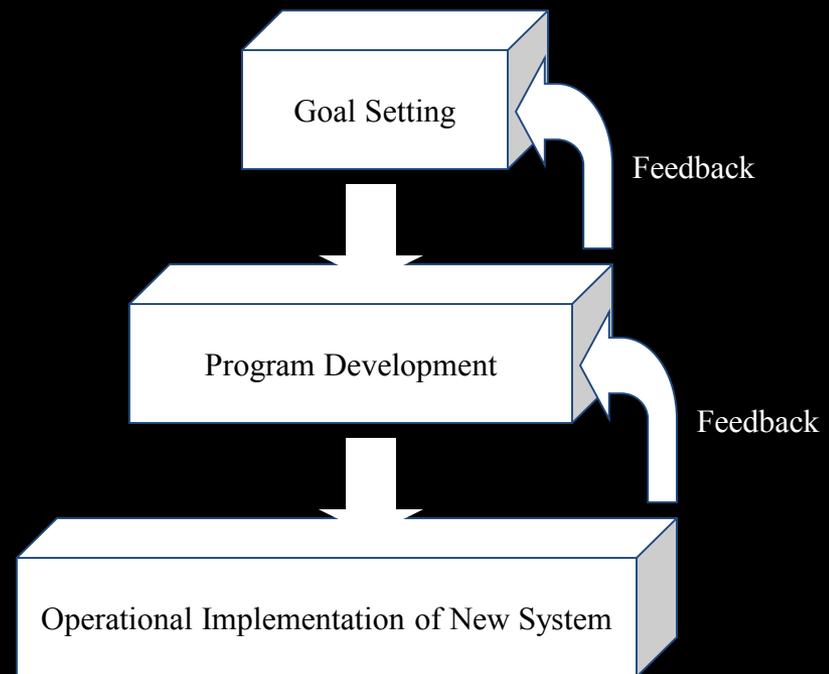
The Evolution of 511 Virginia

To Start: *No "Organization" to speak of. Only a loosely configured political environment. Many thoughts on what to do, but little, if any, mobilization of resources.*

Goal Setting Network

Original Stakeholders
ITS Director, Virginia Department of Transportation (VDOT)
President, Virginia Tourism Corporation (VTC)
Associate Planner, Lord Fairfax Planning District Commission (LFPDC)
Vice President, SHENTEL Telephone Corp. (SHENTEL)
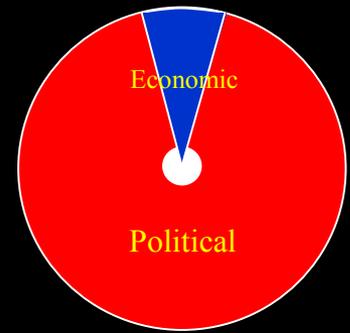Dir. Tech Policy & Deployment, Center for Transportation Research (CTR)

Additional Stakeholders Added After Iteration
EDS Dir., Virginia State Police (VSP)
Dir. Public Affairs, Shenandoah National Park
Dir. Shenandoah Valley Travel Association (SVTA)

Result of Goal Setting
As stakeholders are brought together to discuss the possible implementation of a new system, ideas about what this means to each stakeholder begin to coalesce. An Idea about what this new system/organization might look like, and who would be responsible for it begins to form (the internal structure begins to form). This coming together of ideas allows the preliminary commitment of resources to begin (an economy begins to form).

Program Development Network

Original Program Level Representatives
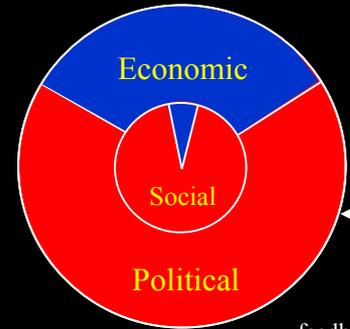
Policy Analyst, ITS Department, VDOT   Special Projects Dir., VTC
Dir. Shenandoah.Com, SHENTEL   Dir. Tech Policy & Deployment, CTR
Sr. Transport Research Fellow, CTR   Research Associate, CTR

Additional Representatives Added After Iteration
Dir. Emergency Operations Center (EOC), VDOT
Dir. Shenandoah Valley Travel Association (SVTA)
Dir. Virginia.Org, VTC/VT

Result of Program Development
After organizational commitment is secured, departmental responsibilities are assigned. The economic viability of the new organization is more secure, and the technical side of the new organization begins to grow.

Operational Implementation Network

Original Operational Implementation Network Staff
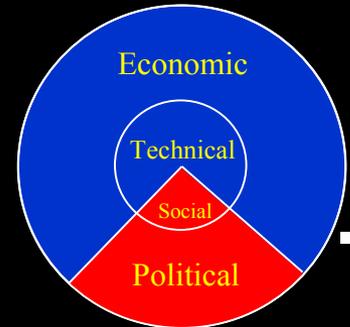Dir. Tech Policy & Deployment, CTR   Sr. Transportation Research Fellow, CTR
Research Associate, CTR   Systems/Database Programmer, CTR
Ops. Mgr. EOC, VDOT   Systems/Database Programmer, EOC, VDOT
Dir. Shenandoah.Com, SHENTEL   Systems/Database Programmer, VT Outreach/VTC

Additional Staff Added After Iteration
Research Associate, CTR   Marketing Dir., TravelShenandoah.Com (TS), SHENTEL
Data Analyst 1, TS, SHENTEL   Data Analyst 2, TS, SHENTEL
Commission Sales Staff, TS, SHENTEL   Data Analyst, CTR
Market Analyst, CTR   Systems/Database Programmer, SVTA

Result of Operational Implementation
The ideal result of the operational implementation stage is a socio-technical system (internal PE) that is functioning as a stable production system in balance with its political economic environment.

Economic
Political

Economic
Social
Political

feedback

Economic
Technical
Social
Political

feedback

Economic
Technical
Social
Political

Inter-organizational, multi-sectorial, project timing Rule of Thumb

- 75%
  - Building trust and the attendant political and economic support necessary for implementation to be allowed to succeed
- 25%
  - Building, Testing and Deploying the technology

(if you find most of your initial time is spent on the technology, you should be concerned)

Thank You!