
FAMES
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THE CLIOS PROCESS

**STAGE 2: DESIGN, EVALUATION AND
SELECTION**

**STAGE 3: IMPLEMENTATION
(INTRODUCTORY COMMENTS)**

PART III

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March 13, 2007 and forward

Step 9: Evaluate Strategic Alternatives and Select Robust Bundles that Perform “Best” Across Futures (2)

- ◆ Evaluation of alternatives according to performance measures
 - ◆ Assess trade-offs-- optimization is difficult (evaluative complexity)
- ◆ Engineering-based or cost-benefit analysis
- ◆ Assess the possible impacts on:
 - ◆ Other components of the same subsystem layer
 - ◆ Other subsystems
 - ◆ Different actors on the institutional sphere
- ◆ Some modeling and quantitative analysis is central to this step
- ◆ Create robust bundles of strategic alternatives – where robustness is the ability to perform reasonably well in different futures

Performance of Bundles across different Futures

Discussion-- which bundle would you choose?

	<i>Future1</i>	<i>Future2</i>	<i>Future3</i>
<i>Bundle 1</i>	+	-	++
<i>Bundle 2</i>	+	++	+
<i>Bundle 3</i>	+	0	+

Evaluative Complexity Rears its Head!

What does “good performance” mean?

“Optimizing” not a realistic goal – finding something that works is more realistic.

Do we optimize?

This is NOT the world of

$$\frac{d\beta(x)}{dx} = 0$$

and we are all done.

Stage 3: Implementation

Plan and Implement Changes to

**10. Physical Domain /
Subsystems**

11. Institutional Sphere

**12. Evaluate, Monitor & Adapt
Strategic Alternatives
for CLIOS Systems**

In the CLIOS Process, we distinguish between “strategic alternatives,” developed in Stage 2, and a “plan” for implementation although sometimes this is a fine point.

We will discuss Stage 3 in detail later

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The CLIOS Process: Some Closing Comments

- ◆ The Christmas Tree image – the CLIOS Process must be augmented with models and Frameworks (the ornaments) appropriate to our CLIOS System to be “executed”
- ◆ The CLIOS Process as a way of thinking about Complex Socio-technical Systems – but it is not magic
- ◆ Continuous iteration as required in executing the CLIOS Process

- *Policy Analysis is a discipline for working within political and economic systems, not for changing them.*

- Framework for Analysis:
 1. Establishing the context.
 2. Laying out the alternatives.
 3. Predicting the consequences.
 4. Valuing the outcomes.
 5. Making a choice.

from *A Primer for Policy Analysis*
Chapter 1: Rational Decision-Making
by Edith Stokey and Richard Zeckhauser

- Do we agree? In “Complex Policy Analysis”
 - “Predicting the consequences” understates the profound difficulties in doing so when we deal with CLIOS, multiple simultaneous policy possibilities and highly uncertain futures.
 - Institutional change *is* a potential strategy.
 - Implementation should be part of the analysis. An unimplementable policy prescription is not worth much.

THE ISSUE OF COMPLEXITY AND UNCERTAINTY IN THE CLIOS

- In order to monitor and evaluate the effectiveness of individual policy alternatives, one needs to measure changes in performance across multiple dimensions.
- Improvement of the ability to monitor and evaluate the impacts of policy measures on air quality may be a policy alternative in itself (Molina and Molina, 2002).

CLIOS Analysis as a Systems Approach

- Analysts
 - Framework for approaching Engineering Systems
 - Qualitatively-oriented analysts, who must grapple with both highly complex physical systems and institutional spheres
- Audience
 - Communicate the dynamics and tradeoffs inherent in the system
 - Support dialogue between decision makers on the institutional sphere
 - Assist in the development of a policy/institutional architecture that is better able to manage the system

CLIOS Analysis as a Systems Approach

- Represents the entire system as is relevant to the problem definition
- Explicitly includes the policy world as a part of the system
 - Recognizes changes to existing policy structures as possible and sometimes necessary
- Qualitative as well as quantitative factors
 - Necessary step if systems thinking is to be applied to social and political systems
- Not searching for a system optimum
 - Focuses instead on the tradeoffs and uncertainties that are more characteristic of the political process

Coping with Complexity

- Flexibility in the detail given to each subsystem
 - Allows the analyst to tailor the CLIOS Process to address the issues that motivate the analysis
 - Analysis highly dependent upon the values and perspective of the analyst
 - But, the diagrammatic aspect and explicit specification of performance measures provides transparency
- Balance between capturing the detail and complexity of the CLIOS System, and exceeding the cognitive limits of the analyst
 - Could be problematic, but forces a systems mindset
 - Introduced layering, nesting and expanding as possible tools to contain the complexity of an individual system diagram

Evolution of the CLIOS Process

- The CLIOS Process has evolved significantly from a conceptual framework to a new system approach
 - *Structured process for moving from problem definition to implementation within a single system framework*
- Further application to other systems (Regional Strategic Transportation Planning, Mexico City, Santiago, Air Combat, Malaysia ITS, Houston ITS, Municipal Electric Utilities, Cape Wind... and others?)

We ought not to be surprised that organizations resist innovation. They are supposed to resist it. The reason an organization is created is in large part to replace the uncertain expectations and haphazard activities of voluntary endeavors with the stability and routes of organized relationships. The standard operating procedure is not the enemy of the organization; it is the essence of organization.

*from **Bureaucracy: What Government Agencies Do and Why they Do It**
by J. Q. Wilson*