FAMES

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Models and Frameworks

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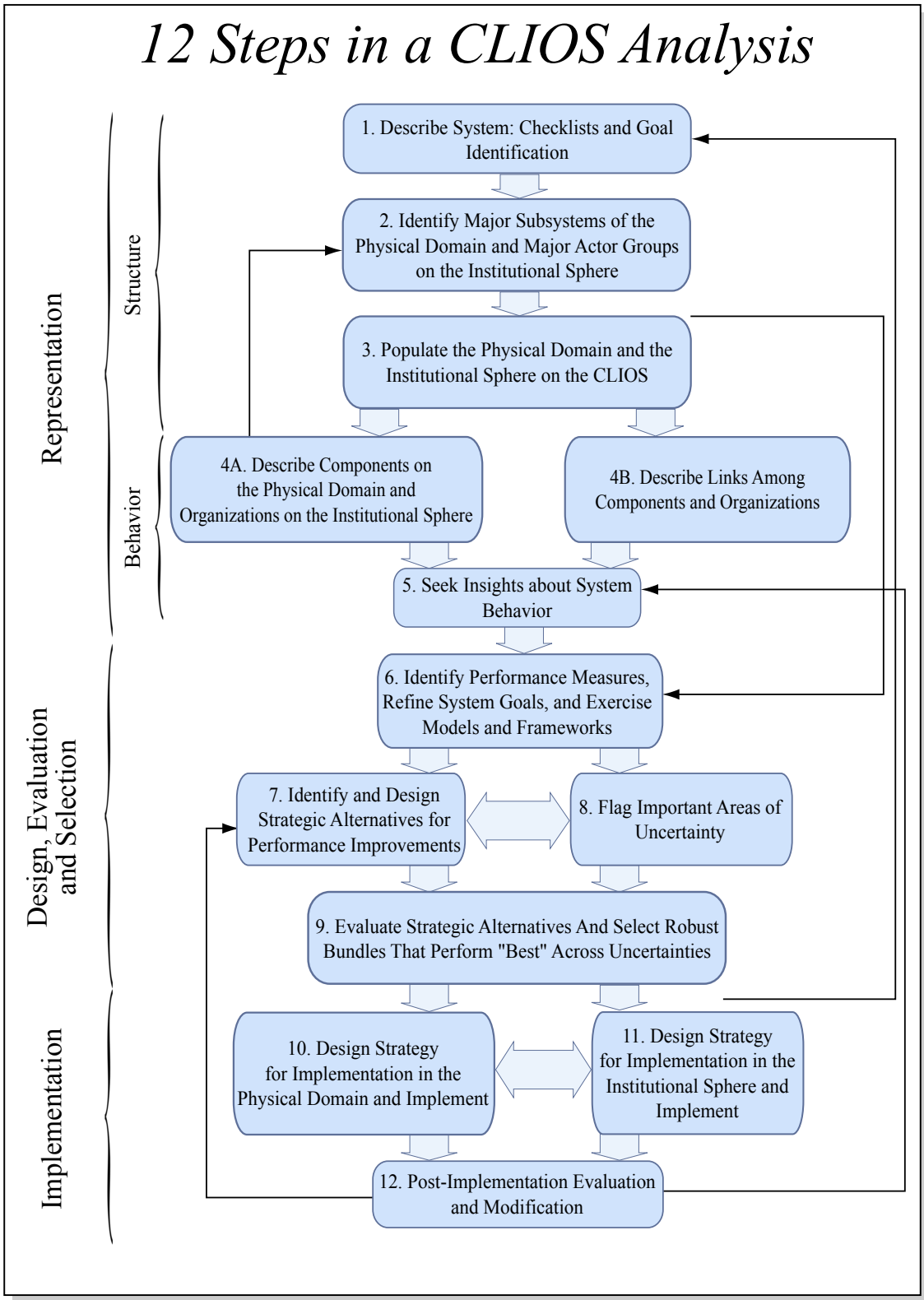


Figure by MIT OpenCourseWare.

Models and Frameworks

Our focus thus far has been on the CLIOS Process as an organized way to think about system representation, design-evaluation-selection, and implementation – the Christmas Tree.

Now we shift our focus to the "ornaments" of the Christmas Tree – Models and Frameworks.

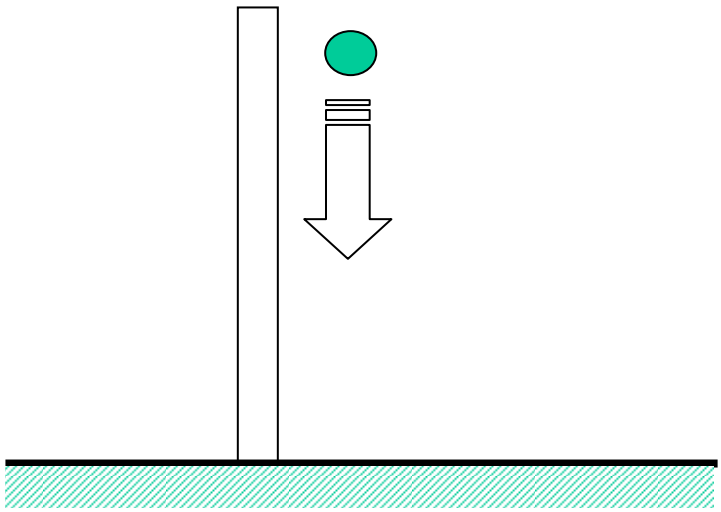
Models and Frameworks: an Introduction

- Models are mathematical abstractions of a system.
- Frameworks are qualitative abstractions for analyzing a system.
- We can use both models and frameworks to do analysis – they produce results

Models and Frameworks: an Introduction

You have all used / developed models/frameworks in your earlier? Subjects.

For example



Falling body – predict velocity on impact.

Mathematical equations models allow us to predict.

What in the real world do we abstract out?

Models and Frameworks: an Introduction

All models are wrong; Some are useful.

We invariably remove some reality when going from the real world to the abstraction – the model/framework.

Models and Frameworks: an Introduction

Now, let's back up a bit and think about where models/frameworks come from – how do we conceive them?

And then, how do we use them?

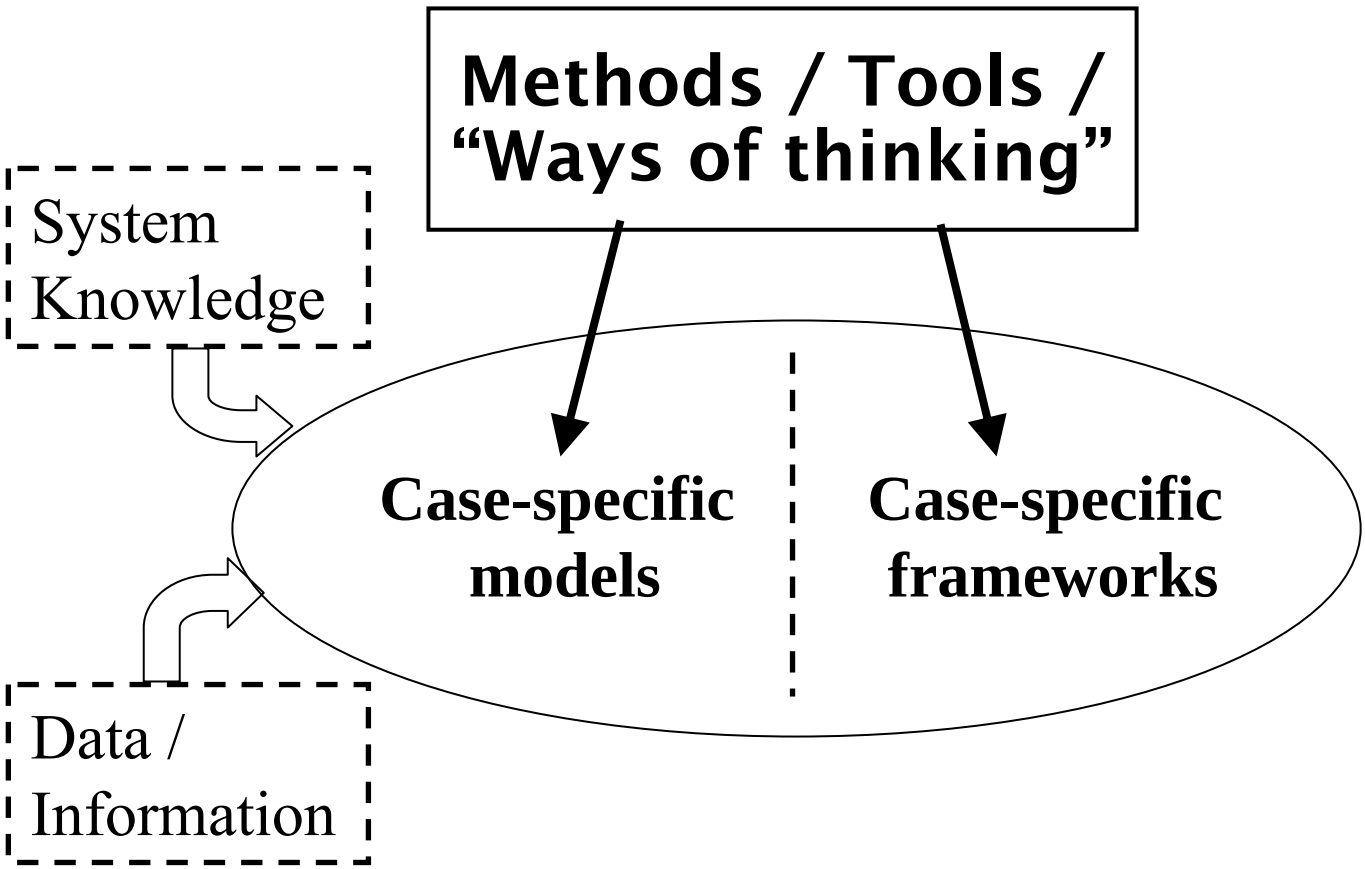
Methods / Tools / "Ways of thinking"

Some examples:

- Benefit / Cost Analysis
- Simulation
- System Dynamics
- Linear Programming (a method for optimizing linear systems)
- Probabilistic Risk Assessment
- Differential Equations
- and so forth

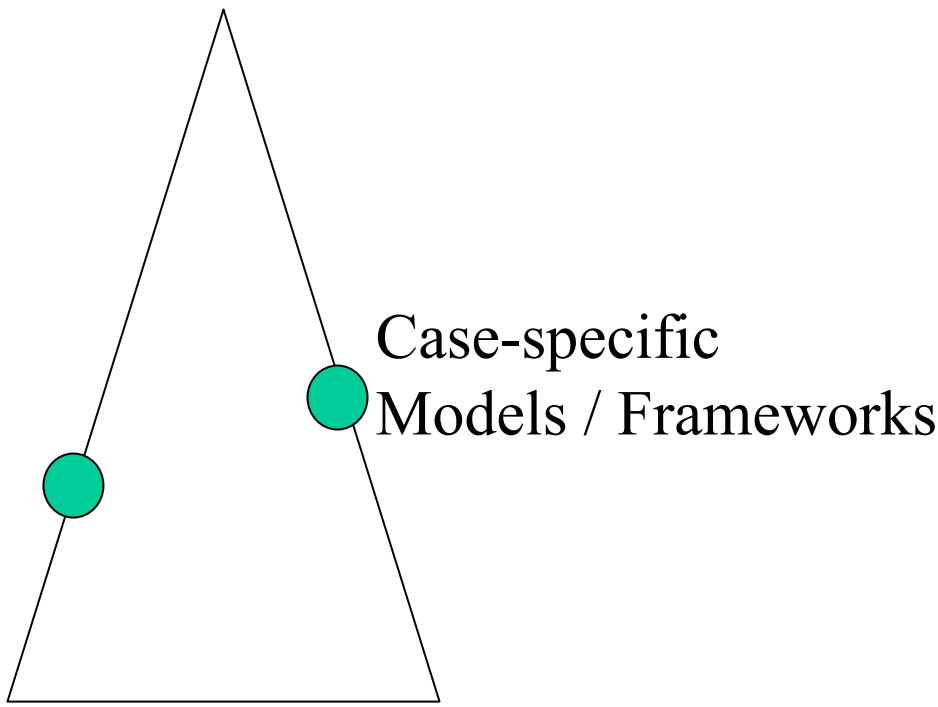
These are various lenses of viewing a system (may or may not be a CLIOS System)

A key question: "What kind of a problem are we dealing with?



Underlying disciplines: Economics, Physics, Fluid Mechanics, Political Science, Mathematics, Thermodynamics, and so forth.

Case specific Models and Frameworks can be incorporated into Processes, such as, but of course not limited to, the CLIOS Process



Our Structure

- Methods / Tools / "Ways of Thinking"
- Case-specific Models
- Case-specific Frameworks
- Assemble case-specific models / frameworks into processes
- Building on underlying disciplines