

Coping with Complexity: Abstractions, Models and Data

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Abstract

People have been dealing with complex systems since the dawn of time. They have tried to predict the weather, cure disease and interact with society, even in the most primitive of times. This talk argues that we (humans) have approached complex systems using a standard approach, utilizing the following steps:

- collect data from (make observations of) the system
- create some useful abstractions of some features of the system,
- develop a model of the system, and
- use this model to try to predict future behavior of the system.

Today, analysts use simulation models in exactly the same way. We observe the system, develop some abstractions, and then construct a simulation of the system. We then we use this model to make predictions about the future behavior of the system. The talk explores some earlier attempts at developing models. It then shows how simulation models are a natural outgrowth of these earlier models. The talk concludes with a discussion of tradeoffs associated with conducting systems analysis projects. The key question is: “if this stuff is so good, why don’t more people use it?”