Preface

Wednesday, June 28, 2023 9:47 PM

ModelingComplexSystems.net
Series: Dynamic Modeling: from concept to code
Collection: Model Construction
Title: Methodology

Begin at the beginning and go on till you come to the end: then stop.

The King
(*Alice in Wonderland*)

We began this project with the publication of a comprehensive *Resource Database* that includes several different fields of study. Some important questions need to be answered about how we choose what information goes into this database, and how we organize that information.

Our choices for entries depend on our ultimate goals, and our organizational schema is not without cause as you shall soon see. Note that a lot of time has been spent by information specialists trying to design organizational schemas.

We, of course, are not trying to organize all human knowledge. The knowledge we need is only that necessary to solve the problems we are interested in solving. Our *Site Map* shows that our primary interest is in solving problems related to health care. In addition, we are proposing that the best way to solve these problems is to determine how they arise in the systems of interest. To do this, we recommend building dynamic models of these systems, and then determining if we can cause the problems to appear in the model in the same way that they appear in reality.

Once we understand what causes a problem — from our perspective — we can make informed decisions about how to solve that problem. We plan to put this methodology to good use in solving heretofore intractable problems in the field of health care/medicine.

Dynamic modeling is more than a means for solving problems; it has the added benefit of compelling us to find relationships between many seemingly disparate subjects: subjects that form the network of dependencies needed to build a viable model. By using a model as our ultimate information resource, we will be reversing the reductionist attitude that currently pervades education, especially medical education and practice. We are confident that both patients and health care professionals will benefit by this reversal.

The onus then is to build models that meet this lofty goal. We are going to begin our work by describing a methodology that is capable of capturing much of the reality of a real world system. This methodology, which we call eXtended System Dynamics (XSD), is capable of simulating behavior that can be characterized by one or more of the following attributes: continuous, discrete, deterministic, stochastic, lumped, agent based, single scale, multi scale, chaotic, predictable, qualitative, quantitative, analytic, and numerical. Most modeling methodologies that are available commercially specialize in one or two of these attributes, only to leave the user without recourse when they encounter a situation that begs for an additional attribute needed to characterize the behavior of a

system.

How we accomplish this goal will require this book length description. However, to maintain your already high level of interest in the solution (we hope), we have provided a fast start guide under the heading of *Preview* in this, the first web integrated book (wib) under preparation in our series. FYI, the series title is *Dynamic Modeling: from concept to code*. This approach will not only give the user a means for conceptualizing a complex system, provide the necessary means for describing that system to others with easily understood diagrams, assist the user to learn just enough Java or Python code to complete a model of a system, run it, and generate the needed data to analyze its behavior: all with the simplest of software tools.

If you have questions about the nature of this site, our goals, or questions related to the methodology or the models themselves, please send a "join "request to the Forum, and participate in our private Facebook group. A link to the Forum can be found in the top menu bar that appears on several of the web pages.

Now, at the King's suggestion, we take the liberty to "go on . . .", and ask you to give it a go as well.