

## **Devoted to encouraging the development and use**

Presidential Address to the Thirty-Fifth International Conference of the System Dynamics Society, July 18<sup>th</sup> 2017, Cambridge, MA

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Greetings System Dynamics friends and colleagues and soon-to be friends and colleagues. It is my honor to be addressing you as President of the System Dynamics Society.

The System Dynamics Society is an international, nonprofit organization devoted to encouraging the development and use of System Dynamics and systems thinking around the world. This year we celebrate the 60th anniversary of the founding of the field of System Dynamics. 60 years, not much in geologic time but a large proportion of the lifespan of many of us in this room. In perspective, 1957 is the year Mr. Lennon met Mr. McCartney.

President of the System Dynamics Society! What a long strange trip it's been. I co-organized this very conference in 2009 in my hometown, Albuquerque, New Mexico. That led to a position on the Policy Council, then Vice President of Meetings, then Chair of the Society Program Oversight Committee, then visiting scholar at the European Master in System Dynamics program, and then the Presidency itself. How novel, a president that has experience with the system he presides over!

In the past, Society president's speeches have addressed Society operations, growth and strategies for the growth of the field, recognition of our work, our successes and failures, our hopes and desires.

When it comes to desires, all of us have them. In a Society such as ours there is no lack of expression of desire in the form of comments, criticisms, recommendations, and initiatives to undertake.

Fortunately we have a smart, hard-working, dedicated Society Home Office staff and a group of volunteers in our Policy Council and elsewhere to listen and act, or not, upon those desires. We owe all of them a large debt of gratitude.

For enabling this conference: thank you to program chairs, reviewers, volunteers, thread chairs, Society Home Office staff, all presenters, attendees, sponsors, and hotel staff.

For enabling the System Dynamics Society: thank you Society Home Office staff, SIG and Chapter representatives and members, ad hoc committees, standing committees, awards committees, nomination committee, Policy Council officers, sponsors, and all Society members.

Now, getting back to decisions. Society writ large and our Society will always struggle with understanding systems and making decisions.

A person that I, and most others, recognize as wise once said, “You have this high-order, nonlinear, dynamic system in front of you as a diagram on the page. You presume you can understand its behavior by looking at it, and there’s simply nobody who can do that.”<sup>1</sup> His conclusion, you build a model and simulate. Let’s take a look at System Dynamics models and modeling.

Perhaps you or someone you know is posed with this conundrum. You are deciding which model to use to understand behavior. Which would you choose and how? How do you determine its quality?

Well, what is quality? Is it a state of being free from defects, deficiencies and significant variations? What is it in the context of System Dynamics models? What are the processes that assure quality models? Have you wondered what model builders are consciously and subconsciously doing when they build models?

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<sup>1</sup> Fisher, Lawrence M. The Prophet of Unintended Consequences, *strategy + business*, Issue 40, Reprint No. 05308

In order to determine quality:

- What criteria might you use?
- Is there a hierarchy to those criteria?
- Are the measures objective, subjective or both?
- Are there degrees of compliance or is the criteria absolute?

Of course, there are well known, well understood criteria that we use to test models. I want to look more fundamentally at building models and building simulations.

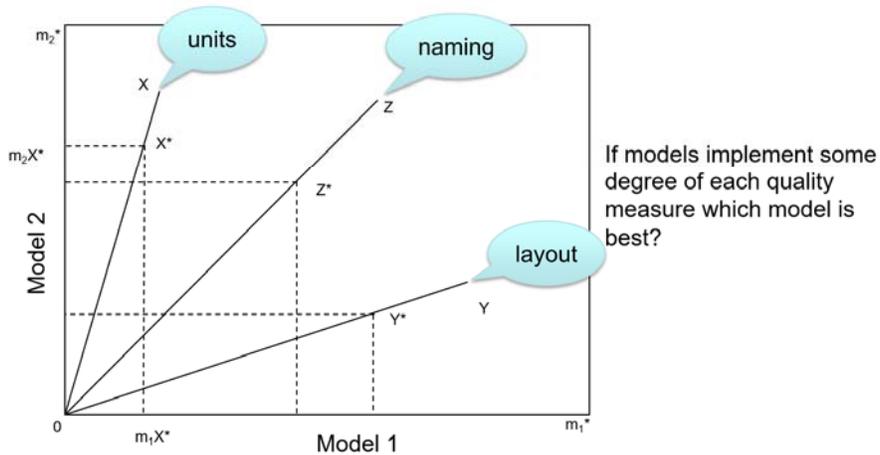
In order to further examine this I will use an approach simpler than System Dynamics, which is economic theory of course; specifically, Kelvin Lancaster's characteristics theory of consumption.<sup>2</sup> Basically, Lancaster hypothesized that we don't consume goods but we consume bundles of attributes embodied in a good or service. An example might be purchasing food to obtain calories and vitamins. Let's take a look at models.

I have inverted Lancaster's concept by putting the two models on the two axes and the attributes in the space. Each model's degree of quality in an attribute has been normalized on the model axis, much like a radar chart in two dimensions. And, as a good economist would, I assumed no budget constraints.

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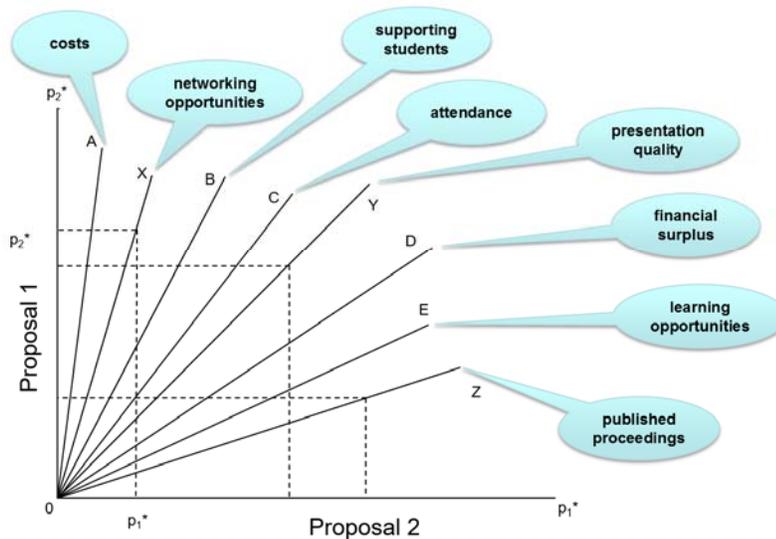
<sup>2</sup> K.J. Lancaster, "A New Approach to Consumer Theory", *Journal of Political Economy* 74 (April 1966): 132-157.

## A model's quality measured by attributes (normalized scores for three attributes)



Each model exhibits different degrees of each of the attributes. The challenge is to determine which model is best. Now I would like to apply this same approach to the planning that supports the International Conference of the System Dynamics Society.

## Managing a conference: many attributes



Conference programs can be judged by the degree to which each plan addresses a characteristic. These are some, but not all, of the complementary and competitive attributes we look for in a conference. I have a hunch that many of you see the dynamic nature of conference management and are eager to start modeling. Hold on, there's an ad hoc committee just waiting for you to join it!

Conference planning is, in many respects, different from building models. As a modeler tries her best to satisfy all quality criteria when modeling; a conference tries to balance the desires of many different persons. As you might expect these desires conflict but, as I mentioned earlier, there are smart, hard-working, and diligent people managing these different objective functions. Nevertheless any complex human system suffers from policy resistance and may spawn unintended consequences.

What conclusion can be drawn from these two examples? I propose that models and conferences are methods that support the mission of the Society. Of course models and conferences support other goals, such as recognition, learning, and networking to name a few, but the Society's mission is now my mission. Success then comes from doing these two things; building models and holding conferences, as well as we can.

Moving on to our accomplishments. One benefit of social media is that we are made aware of many events taking place around the world. Of course some are trivial but not those on the Society's social media pages. It is there that we are made aware of promotions, events, and publishing among other things. Even selecting examples would, to me, be a disservice to all who contributed to System Dynamics in the past year. Please visit the Society's website, Facebook and twitter pages.

What of the future? Between now and the fall of 2018, the Society will completely change its management process. We will transition from the University at Albany to Capitol Hill Management Services. This is the biggest organizational change in the Society since Roberta

Spencer replaced Julie Pugh as Executive Director in 1996. The Transition Team, Policy Council, Administrative Committee, Home Office, and legal review team spent considerable time on this transition and we believe this is the correct thing to do.

You will see some changes in staff but rest assured the Society will continue to be governed by the Policy Council guided by our Society policies and by-laws. We will continue to be international, nonprofit, and devoted to encouraging the development and use of System Dynamics and systems thinking around the world.

To conclude, in late 2016, our founder, friend, and mentor, Jay W. Forrester left us. This was sad news for all of us. Many of you have commented on Jay's role in changing your lives, career paths, and the ways you look at and understand the world.

An interaction with Jay was once recounted this way, "My reaction was one of annoyance at this brash engineer who thought he knew how to predict social phenomena."<sup>3</sup> That reaction, by none other than Herbert Simon, was in response to a presentation by Jay about the Club of Rome report; described in *World Dynamics*, and *The Limits to Growth*. One of my own encounters with Jay was quite different. Jay recommended to me, "keep practicing" and "be courageous." Thank you Jay for putting all of us on this path.

Now, what will you do? Will you be courageous? Will you continue to practice? Will you be brash? Will you diligently do quality work? Will you come forward and volunteer to help your Society achieve success by being "devoted to encouraging the development and use of System Dynamics and systems thinking around the world"?

Well then, *please* join us. Thank you for listening.

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<sup>3</sup> Simon, Herbert, "Models of My Life". MIT Press, 1996.