# Are We Doing What We Say We Do? Goals and Gaps in Achieving Society Objectives

**The 2010 International Conference of the System Dynamics Society**
**Presidential Address**
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**Seoul, South Korea, July 28 2010**

It is a great honor and privilege to speak in Seoul this morning as the president of the System Dynamics Society.

Over the last few years, in particular since the celebration of the 50th anniversary of the foundation of the field, the society members have gone through an introspective and reflective period trying to address the issues on whether the field is living up to its potential, and how we can increase the visibility and impact of SD work.

Several ideas have been put forward: We initiated a strategic planning process, some have argued for a public relations campaign, and others desire a formalization of a core SD curriculum. There is tremendous potential in some of these ideas. Nevertheless, it must be recognized that, with the exception of our capable 'home office,' the society's activities and governance structure are staffed through voluntary work from its members, and all of us, the society members, have other responsibilities and priorities that frequently take precedence over the promotional objectives of the society. Many ideas have lost their momentum as proponents realize that we cannot find the time or that is difficult to attract the capabilities and resources to execute them.

There is, however, one area where we all have a direct overlap of interests and incentives, and individual members have the potential to help the society increase the field's impact and visibility.

Whenever the issue is raised, I've heard John Sterman state, in his characteristically non-compromising way, that the main leverage point for giving visibility to the field is just to "do good work … and publish it." Good work is being done, as evidenced by the ever-increasing list of awards being offered by the society and its chapters. The challenge has been, I believe, how to publish that work and give it visibility.

I want to spend the next few minutes suggesting a framework to think about the contribution of our work and the appropriate target audiences for it. I will then look at how the society has been structured to address this challenge of diffusion and suggest some future directions for our organization.

Since its inception, SD has been embedded within an engineering/problem-solving paradigm:
  a) We model problems, not systems;
  b) We learn through continuous experimentation and improvement of our models; and
  c) The best validity criteria for any of our models is a *functional* criteria. That is, does the model shed light on structural causes of the observed behavior and on potential policies to improve it?

Specifically, an SD study requires us to apply a series of principles (endogenous causes of behavior, feedback loops, accumulations, etc.) to a real-world problem situation. We do this via a deliberate process through which we ensure that our model is an acceptable representation of that piece of the real world in which we want to intervene and develop policies and insights through systematic experimentation with that model.

Professor Peter Checkland likes to use a diagram to capture this process of systematically applying a set of concepts to intervene in the real world (see Figure 1).
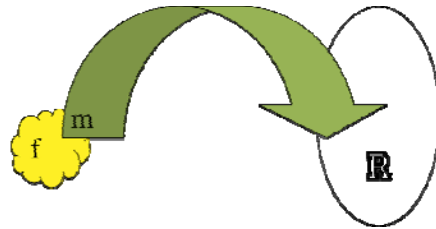


**Figure 1. Overview of a purposeful intervention**

In this figure,

- The *f* represents all the theoretical frameworks at our disposal to make sense of the real world, e.g., feedback loops, endogenous behavior, thermodynamics, trigonometry, linguistics, psychology, etc.
- The *m* represents the method through which we deliberately apply those concepts in the framework to make sense of the real world. Examples of 'methods' in the SD context might be group modeling, checking for unit consistency, developing simulation microworlds, detecting structural causes of behavior, constructing? model validation tests, etc.
- The bubble *R* represents the messy and unstructured real world where we want to intervene. This is what we often call the *application domain*. Examples of application domains where SD has been utilized are: project management, urban planning, environmental sciences, public policy, etc.

When confronting theoretical frameworks with the real world, the contrast allows us to see new dimensions? and brings into focus the real-world problem situation. Hopefully, this gives us the opportunity to improve the problem situation-- the intended goal of the intervention. Additionally, in the process of doing SD (applying *f* through *m*), it might happen that we develop new insights or ideas about the frameworks that we are applying, or better methodological approaches to intervene (see Figure 2).
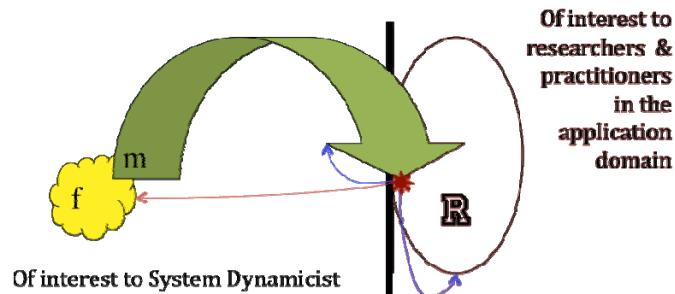


**Figure 2. Learning from an intervention**

A good SD intervention might yield improvement in all three spaces.

This new set of insights and lessons about frameworks, methods, and a particular application domain is *learning*. And it is this learning that we need to capture and disseminate, i.e., to publish. By the way, the etymology of publish is the Latin *publicare*, which literally means "to make public."

Only when these insights and lessons become publicly available will other researchers become aware of the impact of the ideas and decide to adopt the lessons for future interventions or to make sense of their application domain. Making our lessons public and subject to peer review makes the accumulation of

knowledge possible, and allows us, in Newton's words, "to stand on the shoulders of giants."

So, where to publish these hard-gained insight from interventions? I argue that this depends on the kind of lessons that emerged. If the insights are about the SD frameworks or methods, then clearly the intended audience should be other system dynamicists who would benefit from learning about the new ideas or techniques developed to make intervention work. The *System Dynamics Review* should be the target journal, and the goal of this publication should be to expand the theoretical framework or the methodological tools of SD.

However, if the insights are about the application domain, then clearly the target audience should be other people that care about that particular piece of the real world. That is, if because of the endogenous and feedback perspective you have developed an improved explanation of how a pharmaceutical supply line works in a developing economy, then the audience that needs to hear about these insights are the people who care about pharmaceutical supply lines in developing economies, and your target journal should be a journal in the operations management or the health management domains.

**This distinction, I believe, is very important.** With 50 years of experience in the field and 26 years of publishing the journal, most of the society membership is confident that the domains where SD might be applied are boundless. So a paper that just states: "we built a model of domain *R* and we learned this about *R*" might not be enough of a contribution for the system dynamics community. Yes, the model formulation or the mapping analogy might be of interest to the community, but the main point, about the benefits of using an endogenous perspective to shed light in a problem situation, is already well known and accepted by this community. It is like preaching to the choir. The audience that really needs to hear about these powerful explanations and insights are the people who have never heard of system dynamics but that share a passion for that particular application domain. By placing an article in an application domain journal, we increase the probability that it will be read outside the SD community. This will lead to more people becoming aware of the impact of SD, becoming curious about its capabilities, and eventually reading and citing our journals. *This is how you increase the visibility and the impact of SD across academic communities.*

Publishing outside our methodological domain, however, is a challenge, as editors and reviewers are not necessarily receptive to a model that clearly expands the traditional boundaries of the academic silos. Yet the insights about an application domain belong with those audiences, and we should make an effort to take them out there. I encourage you to revisit Nelson Repenning's, Forrester Award lecture in 2003, in which he developed a set of guidelines for "selling" system dynamics to other social sciences.

Getting out of our comfort zone and publishing in other outlets is the first step to increase the visibility of our field.

*(Skipped during the presentation). I would like to make two parenthetical comments at this point. First, the SD conference is a setting where we come to learn about the new work in the field and to receive useful feedback from our colleagues. From that perspective, I encourage you to bring forward all your SD work to the conference. However, if the lessons and insights from your work are about the application domain, I also encourage you to consider other conferences that specialize on that application domain. Second, for completeness, we should note that real-world interventions are not the only sources of improvement for SD concepts and methods. As academics, we also explore other conceptual frameworks and theories and look back at previous interventions to extend and unify the knowledge contributing to understanding of feedback control systems. Again, the main audience is other system dynamicists who will benefit from adopting those insights into their practices.*

When the society was created in 1985, the articles of organization stated the following objectives for the

society:
- To identify, extend and unify knowledge contributing to the understanding of feedback control systems;
- To promote the design of structures and policies to improve the behavior of such systems;
- To promote the development of the field of system dynamics and the free interchange of information about systems as they are found in all fields of endeavor

The society supports those objectives through the publication of the society journal (*The System Dynamics Review*), the organization of an annual conference, the bibliographical database that allows us to report to the community our SD contributions in other outlets, and the support of geographical chapters and special interest groups. Under this set of mandates, the main responsibility of the society is to maintain the quality and caliber of the journal and the annual conference to ensure a solid knowledge base for the field.

Yes, we could do some of those activities a little better. For example, for the last four years there has been a significant effort to improve the caliber of the papers presented at the conference, and we are currently working on a proposal for how the society might support geographical chapters in creating training programs for their members. But the bottom line is that if you do your part—that is, "good work"—and decide to "publish it," the society, in line with its charter, does provide the mechanisms to support that activity and ensure the development of the field. Specifically, in the society governance there are VPs for publications, annual meetings, chapters, and member services to ensure that these activities take place consistently and with a determined quality level.

So, for academics, driven by incentives to "publish or perish," the advice "do good work and publish it" is not only in line with their local incentives, but the society seems to have the institutional mechanisms to leverage that work for the development and diffusion of the field.

Let me pause here for a second and state that this is where I had originally planned to end this address. I just wanted to build a framework and an argument for us to improve the impact of our publications. However, as I was developing this argument that I just presented, I discovered something that I have not been able to put behind me, and now I feel it would be inappropriate to ignore. So, please bear with me for a few more minutes as I describe this discovery and its implications.

I just stated that the society, according to its charter, has been doing a tremendous job of providing the institutional mechanisms to leverage the work of academics for the development and diffusion of the field to other academic disciplines.

Academics, however, are only one of the constituencies of the society. The 1985 articles of organization state two additional objectives for the society:
- To promote the dissemination of information on such topics to the general public, and
- To encourage and develop educational programs in the behavior of systems.

These additional objectives clearly suggest two other constituencies for the society: practitioners and potential users of SD and educators.

Interestingly enough, these three audiences—researchers, practitioners, and educators—are also the audiences that Harvard Business School has defined for its professors. Under these criteria, an idea is truly successful only when it has been made available to other researchers for scrutiny, has been adopted by practitioners, and is being taught by educators all over the world. This means that the idea has to be presented in academic journals, in magazines and books that practitioners read, and in cases and

textbooks so that instructors adopt them into their syllabus. I mention this to illustrate an arguably successful strategy that has given the world of management ideas like: competitive analysis, value chain, balance scorecard, and the service profit chain. While the intrinsic value of these frameworks might be debated, there is no question that these ideas have captured the minds and imagination of managers, consultants, and researchers and teachers in business schools all over the world. Addressing these three audiences seems an effective way to give ideas visibility and improve their impact. I believe our founders were onto something when they articulated these objectives for the society.

If we look at the list of Forrester Award winners over the years, there are clear examples of publications that are intended for educators and the general public, or at least practitioners in a particular domain. A case in point is this year's award to Mark Paich, Corey Peck, and Jason Valant. These successes, however, are few and far apart. And I note that the society has not created the structures and processes to support the objectives of disseminating our insights to the general public, nor have we explicitly supported the development of educational programs or curricula. For instance, we have no VPs for diffusion or educational programs, nor processes to aid our members in reaching these audiences.

There are various potential explanations for this. First, for most academics, pursuing the objectives on disseminating information to the public and developing educational programs is not necessarily in line with local incentives. Thus, it is not surprising that the society has had difficulties in pursuing initiatives under these objectives through voluntary work. Another potential explanation is that we have focused on establishing our credibility as an academic discipline to the detriment of these two objectives. Regardless of the reasons, if the role of the society is to invest in activities that will lead to accomplishment of the objectives in its charter, it seems to me that for the last 28 years we have not been doing our work on these two dimensions.

At one level, it seems evident that the society will need to *invest* in these capabilities, since the incentives are not aligned to achieve them through voluntary work. Thankfully, the society is in a financial position where it can make some of these investments. However, it is not clear, or at least not clear to me, what capabilities and processes will support these goals.

There are some ideas in the education front. As I mentioned before, we are committing to provide more support to society chapters for workshops to develop local modeling capabilities, but at this point this is only a statement of purpose and we have not figured out the details. I'm sure there are many other potential models. For example, I do believe that it should be possible for the society to become a repository of expertise and materials to support instructors interested in developing new courses or institutions developing SD programs.

Immediate steps are not as clear on the public diffusion front. But I'm certain that we cannot in good conscience continue to ignore these two objectives, and the society needs to needs to begin experimenting with different models to disseminate our work to the general public.

Summarizing, I've suggested a two-tier strategy to increase the visibility of the field. First, publish in journals in other disciplines and diverse applications domains. We are well equipped to do this, and it entails doing what we currently do, but in a different context. The second dimension of the strategy, publishing for the general public and educators, is a game-changing strategy for the society and will require a set of talents and capabilities that we currently do not possess. I would like to invite all society members to embrace this challenge and help us figure out what these support mechanisms should look like.

Thank you for your patience and the honor of the opportunity to deliver these ideas.