Structured Abstracts

Beginning in 2025, the International System Dynamics Conference is moving to structured abstracts. These are intended to make it easier for those looking at submitted work to understand what it is about and what can be learned from it. The structured abstract is divided into four elements:

1. Introduction to the problem that lets the reader quickly know what the work is about.
2. Approach to the work that lets the reader quickly understand was or is being done to address the issue from 1.
3. Results of the work so far that lets the reader quickly know what was learned from the work.
4. Discussion that lets the reader quickly know the implications of the work for their own practice and research.

These categories are intended to be generic, and thereby encompass the variety of variety of work that is submitted to the conference. A table showing how to think about these categories for different types of work commonly submitted to the conference is shown on the next page. This list is neither exhaustive nor are the types of work exclusive of one another. It is hoped, however, that the listing will help you in structing your own abstract. The main things to try to achieve are:

- Brevity
- Clarity
- Providing context
- Realistically showing the boundaries of the work done
    - Don't overpromise
    - Don't make references that can only be understood by reading the full submission.

Though there are exceptions, it will generally work best to not include references in the abstract. Those should be part of the fuller submission.

For each of these categories, provide between 30 and 70 words. For work in progress submissions, the results section can be left blank, or list preliminary results.

A number of examples of potential structured abstracts are included starting after the table.

New in 2025 we are also asking all authors to indicate the way in which AI was used in the work being submitted.

Type of work	Applying the tools of system dynamics to a real world problem.	Adding to the toolset of people trying to do work in system dynamics.	Finding insights from, identifying valuable elements of, and exposign flaws in xisting models and other artifacts of work done in system dynamics.	Measuring the way that learning system dynamics or applying its tools changes understanding and outcomes.	Discussion ways to teach system dynamics and providing examples of curricula used.	Book reviews, op-eds, and other work relevant to system dynamics.
Short Label	**Application**	**Methodology**	**Insights**	**Outcomes**	**Curriculum**	**Commentary**
Introduction to the Problem	What is ther problem being addressed and what improvement in performance or undestanding are expected?	What task is difficult or hard to understand when working in system dynamics? What tool, insight, or set of steps will be provided to help with the task?	What can be learned from an artifact (diagram, model, recipe) of system dynamics? What type of insights do the authors expect to glean from the work?	What project, experiment, or coursework are the outcomes being evaluated for?	What is being taught in what context? Who else could use the material being described?	What is being commented on? In one sentence what is the comment being made?
Approach to the Work	What tools of system dynamics modelling such as qualitative mapping, quantiative simulation or group moodel building are being employed? What knowledge, literature, and data will be drawn upon to demonstrate rigor?	What are the tools of system dynamics (from the literature or practice) being refined or extended?	What techniques are being used to gain insight into the artfact and how do these relate to those described in the literature and commonly used in practice?	What methods will be used to collect and assess data related to impact? What are the foundations for the survey and statistical tools employed.	What are the pedagogical foundations of the curriculum material and how do they relate to system dyanamics.	What is the analytical, observational, or philosophical basis for the commentary?
Results	What was learned or improved?	What do we learn applying the innovtion to specific examples?	What have we learned about the artifact under investigation?	Does the use of system dynamics matter in this context? What are the elements of system dynamics most important to making a difference?	How effective is the material in teaching the intended concepts?	What observation, judgement, or call for action is being made?
Discussion	What was the ulimate contribution? What follow up work might be valuable?	Does the demonstrated learning match expectations? Are there continuations or complementary innovations what would be valuable?	Are there methodological innovations that would improve this type of exploration?	What refinments or adjustments to the evaluation approach would be helpful. What other types or applications or teaching could the work done be applied to?	What teachers in what contexts should adopt or adapt the material? What other areas of teaching could a similar approach be adoped for?	Why does this matter for the field of system dynamics? Are there other works or areas of application that would benefit from similar commentary?

Examples

Note – these are intended only to help show how to present your abstracts for different types of work. They should be helpful even if your work does not fall into one of the categories, or spans multiple categories.

In the future we will use examples from past conferences. Right now, they are NOT real examples, and are NOT taken from the conference proceedings.

Application

Introduction	The use of AI is improving aircraft reliability through better prediction of part and assembly failure. In this study we try to understand the implication of this for demands on the supply chain as the improved analytics are implemented for an aircraft fleet.
Approach	We develop an aggregated deterministic model representing the failure process on average to look at fleet reliability and parts consumption. Using maintenance records the model is calibrated to past experience with performance improvements from AI given a range to allow scenario analysis.
Results	Depending on the effectiveness of the AI prediction techniques and the speed with which they are rolled out, there can be a significant short-term strain on the supply chain as the parts stock is substantially updated to get to the new steady state. There are also steady state outcomes in which the overall fleet performance is only marginally improved with a substantial increase in overall maintenance cost.
Discussion	The advent of AI increases the solution space for human endeavors which makes the tools of system dynamics that much more important in understanding what is happening around us. Tools inspired by the behavior of servomechanisms are again demonstrating their value in the age or knowledge.
Use of AI	None

Application

Introduction	The increasing availability of health data has the ability to substantially improve healthcare, but at the same time creates numerous privacy concerns. Understanding how people respond to these privacy concerns can improve the design of information systems and specification of best practices. We used a system mapping approach to better balance privacy and clinical outcomes.
Approach	We did a series of group model building (GMB) sessions with clinicians, IT professionals, and patients. In them we developed maps of benefits and concerns, including the way in which perceived benefits could alleviate patient concerns. Based on the mapping done there we developed several scenarios related to the rollout of new health information collection and sharing innovations. These scenarios were then shared with the GMB participants in a follow-up session.
Results	Based on the map, scenarios, and discussion, a number of areas where slowing the adoption of data collection and sharing seemed to be beneficial. These areas seemed largely to be related to behavioral risk factors of individuals. In contrast, speeding the rollout of IT systems related to environmental risk factors seemed advantageous.
Discussion	One of the most interesting discussion points that came up during this work was the role of centralization in managing health care data. Though beyond the scope of our research, it was a common topic of discussion that under a single payer system with centralized oversight of all IT activities the level of comfort related to information sharing would be higher. It would be interesting to repeat this study in a single payer system such as that in the UK.
Use of AI	None

Methodology

Introduction	Starting a model in equilibrium is a challenge faced by modelers at all skill levels. We develop a set of steps to aid in this process by creating a set of dependency relationships among the stocks in a model. This allows model developers to specify some stock values and automatically compute the remaining values necessary for equilibrium.
Approach	We run models millions of times from randomly assigned starting conditions. For those that reach a steady state, we record the associated stock values. We then create a distribution of all attainable steady states.
Results	For strongly convergent models with a single steady state we simply report the equilibrium values found. For weakly convergent models which reach steady state, but at different stock values, we report the distribution of stock values attainable. For partially convergent models we report the distribution of stock values attainable, and the distribution on stock values that do not achieve steady state.
Discussion	Though we set out to develop a tool to determine stead state, we have found that the application of our tool actually tells us more about the nature of the model under investigation, identifying them as strongly, weakly, partially, or not convergent. Extending the tool to do the same type of analysis on models that has balanced growth where the relative values of stocks are unchanging, would be even more insightful.
Use of AI	None

Insights

Introduction	The World3 model has an equation for life expectancy that makes a sudden jump in 1940. While the reasons for this formulation are clearly stated, it begs the question of whether a more endogenous formulation would change any of the results significantly. We introduce such an endogenous formulation and rerun several of the books scenarios to answer this question.
Approach	We took the 1993 version of the World3 model and changed the formulation for the lifetime multiplier for health services to be the same before and after 1940 but to have a component of technological change. The resulting formulation gives largely similar, though not identical, results in the historic period to 1972 (and to 1993).
Results	Though the results were different, and the magnitude of the difference grew after 2000, they were not substantially different. Population, the thing most directly affected by the change, altered only about 3% relative to the original runs, and the timing of the peak by less than 5 years. More importantly, running the alternative scenarios and comparing them to the new base run showed the same changes in behavior.
Discussion	Revisiting some of the classic models from the past is an interesting learning exercise. It is so much easier to do this type of analysis today than when the original work was done, that exploring some of the pathways never taken in the classic work can help us better understand the strengths and weaknesses of the past work.
Use of AI	None

Learning Assessment

Introduction	A systems perspective is well integrated into most college ecology courses, but few ever introduce the students to formal modeling. Based on a standard undergraduate ecology course, we compared student performance for sections that included or excluded a module on system dynamics to determine its value in the curriculum.
Approach	There were four sections a course offered. For each of them, the same material was covered except for one week during which either a specialized topic was covered, or basic system dynamics was taught. A voluntary exam was used to measure the value of the special week.
Results	There were 212 students overall and 160 participated in the exam. Students in sections that received a module for a specific topic area did significantly better on questions related to that topic area, but not significantly different on other questions. Students that were taught System Dynamics did significantly better on the general questions. They did better (not significantly) on specific questions than students who did not take the related module.
Discussion	Systems literacy has value in learning about many things, though the amount that can be learned in a week is limited. It would be interesting to see if a one semester course on system dynamics would make an even more significant difference. The design of such an assessment is straightforward, but getting a large enough sample size to generate meaningful results is likely difficult.
Use of AI	None

Pedagogy

Introduction	Describing the motion of a pendulum is a standard part of high school physics curriculum. We introduced a system dynamics model, and to some extent system dynamics modeling, as part of teaching the pendulum.
Approach	The class is first given a lab in which they measure period under different lengths and initial displacements. Then they are given the standard theory and analytical solution and asked to compare those results to their lab measurements. They are then introduced to a system dynamics model that includes both friction and the nonlinearity resulting from larger displacements. Then we repeat the mathematical solution.
Results	After conducting the lab and going over the formal solution only the top 20% of the students really seem to understand. When the simulation is introduced, most of the class is engaged, and can see the direct connection between the model and the experiment. Going back to the analytic solution is easy at this point. More understand it, and there is a clearer understanding of its limitations.
Discussion	System dynamics provides a fun and effective way of teaching the pendulum. Based on this material we are extending the use of system dynamics to other parts of the curriculum. The work is additive, and students don't think of it as learning system dynamics so much as an alternative to formally derived solutions. We are also working on developing more labs that only use the simulations where a physical lab would be impractical, but still keeping as many physical labs as possible as that work is foundational to good science.
Use of AI	None

Commentary

Introduction	Building models and presenting results has become far too easy and is impeding our ability to really think about the problems we are working on. Compounding this, the focus on attractive and colorful presentation material prevents the proper communication of what insights there are.
Approach	System dynamics is all about building an understanding of how parts of a system come together in order to generate behavior. The ability to internalize that comes from repeated attempts to capture problem behavior, with each attempt being refined or discarded. The quality of modern software with all its guard rails and fancy graphics makes it look like things are "good enough" far to soon. Worse, when the final presentation is judged on how pretty it is the need to getting things right disappear.
Results	We need to go back to DYNAMO. Diagrams should be sketched by hand, or using drawing software, but should not be integrated into the modeling process. That step, from a diagrammatic representation, whether stock and flow or causal loop, to equations is where the magic happens. It is hard, and making it seem easy just makes it less likely that it is done right.
Discussion	Ultimately, if we are striving to have more people who can truly understand systems we need to give them the rigorous training they need to do it right. Shortcuts are not helpful. They build confidence without building competence.
Use of AI	None