Our Ship and Our efforts: Four Espoused Values and Two Analogies

Paulo Goncalves – System Dynamics Society Presidential Address 2021

Thank you for the opportunity to serve as the President of the System Dynamics Society and to speak with you today. First, I would like to thank all members of the system dynamics community, colleagues and dear friends system dynamicists. The personal and professional relationships that I have built within the system dynamics field are among the most valuable in my life, they have also led to fruitful interdisciplinary research.

Twenty five years ago, you have welcomed me to into the field. I am extremely grateful for that. Your work has inspire me then and continues to do so today. I also continue to be impressed by System Dynamics' ability to shed light on important contemporary issues, and extending our understanding of the behavior of complex systems by capturing patterns of behavior and uncovering the structures that generate them.

It is an honor to be here today and provide some of my thoughts on the state of the System Dynamics Society and its future. But, instead of laying out a path for the future of our field, or answer some of the challenging questions that we have grappled with, I would like to share some analogies and invite us to think hard about them and consider what they may mean to our field. I will start by reviewing the state of the System Dynamics Society

Espoused Values of the System Dynamics Society

"The System Dynamics Society is an international, nonprofit organization devoted to encouraging the development and use of systems thinking and System Dynamics modeling around the world. It provides a forum in which researchers, educators, students, consultants and practitioners in the academic, corporate and public sectors can interact to keep abreast of current developments, build on each other's work and introduce newcomers to the field."

The definition above (taken from the society's webpage) highlights a few of its important values, such as ***diversity***, ***interconnectivity***, and ***inclusivity***. Let me spend a little time on each one of these values.

Diversity

Let me start with diversity. As David Lane reminded us in his 2011 address, Amartya Sen, in his 2006 book "Identity and Violence: The illusion of destiny" describes how people often define others by a single attribute, to then highlight their differences. This is all too common a perspective with people being labeled as democrats/republicans, blacks/whites, liberals/conservatives, Christians/Jews, Hindus/Muslims, etc. This simplistic approach, reducing the identity of a person to a single attribute, may help people form (and pass) judgments, but it entirely misses the point of what characterizes an individual's identity. As the Dalai Lama puts it: "*Underlying this diversity are basic human principles that bind us all together as members of the same human family. … We all have common human needs and concerns. We all seek happiness and try to avoid suffering regardless of our race, religion, sex or social status.*" The society embraces diversity, as exemplified and emphasized by Jürgen Strohhecker's 2015 presidential address. From the System Dynamics Society (our) point of view, the common concern of systems thinkers and system dynamicists with the behavior of complex systems, the structures capable of generating said behavior, the identification, design and implementation of high-leverage policies to improve the human condition further binds us together.

Interconnectivity

Next, let me consider interconnectivity. In his letter from the Birmingham jail, reverend Martin Luther Kind Jr. replied to the criticism by local Alabama clergymen condemning civil rights demonstrations as "*directed and led by outsiders*" (that is, condemning his actions and that of his associates). In his reply, King reasoned that they were " *… caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly ...*"

System dynamics espouses interconnectivity. In Forrester's (1971) "*World Dynamics*", Meadows' et al. (1972) "*Limits to Growth*", Randers' (2012) "*2052: A Global Forecast for the Next Forty Years*", the world modeling work of our colleagues recognize our understanding of interconnectivity and concern for the shared fate of the world. They alerted us about the physical limitations of our planet Earth and our intertwined fate. Their conclusions that growth in the **human ecological footprint** will have to stop, and humanity's resource use and environmental impact will have to be within **sustainable levels.** At the same time, they recognize the existing income inequality, differences in quality of life across people in the world, and the need to address such discrepancies. We are all tied in the same garment of destiny,

characterized by the destiny of our common world. Whatever affects one directly, affects all of us indirectly.

Inclusivity

Finally, let me briefly mention that the System Dynamics Society embraces inclusivity, as emphasized by Etienne Rouwette's 2016 presidential address and his particular focus on first time attendees and newcomers to the field.

These espoused values of diversity, interconnectivity, and inclusivity are important to the society, but are not the only ones. While not stated in its mandate, the society also espouses *continuity*. A number of process innovations initiated in previous terms remain to this day.

Continuity

Under Erling Moxnes' presidency in 2009, the strategy committee was formed after the realization that a one-year period was too short for both analysis and implementation of strategic initiatives. Erling's vision was extended to the operation of the presidency of the society, with president-elect, president, and past-president, operating more aligned as a team. This effort continued in 2010, under Rogelio Oliva's presidency and continues to this day. It overcomes the shortcomings of a one-year presidency term and ensures the society retains much-required leadership continuity to achieve its mission.

The strategy for the Society with its mission statement and initiatives to achieve its vision, put in place during the Kim Warren presidency in 2013, continues to guide strategic work of the society today and informs initiatives undertaken by the strategy committee.

The efforts to increase the society's presence in the Asia-Pacific region initiated in 2014 during Ed Anderson's presidency has led to the successful APAC chapter capable of proposing and undertaking original initiatives.

Consider the recent changes in the format and length of the Policy Council meetings proposed by Birgit Kopainsky during her presidency in 2020. The Policy Council used to meet twice a year (once every six months) for an entire day. They now take place every month for 90 minutes. The change has significantly reduced decision-making delays in the society while also increasing constructive participation of the PC members.

All these innovations, implemented in previous presidencies, remain today and together they build up a set of process capabilities that helps the society successfully do its work.

And, there is an incredible amount of work required to keep the system dynamics society running. A large part of this work is done by a small-dedicated group of people in the *home office* -- I like to thank them for their work: Fernando Redivo, Meagan Colvin, Raquel Froese, Roberta Spencer and Rebecca Niles. Thank you!

Then, a large group of *volunteers* making up the past-president and president elect, the Vice Presidents for the various committees, the members of the Policy Council, and SIG and Chapter officers complement the work. All of these volunteers help the society fulfil its role and achieve its goals. My personal gratitude also goes out to all of you who dedicate your time and effort to ensure the society keeps on running.

Now, I want to give you a more recent perspective on our efforts to maintain continuity. Birgit Kopainsky's 2020 presidential address described **Seven Principles for Building Resilience in Social-Ecological Systems.** The components of these principles include Manage Connectivity, Encourage Learning, Promote Polycentric Governance, Maintain Diversity and Redundancy, Broaden Participation, Manage Slow Variables and Feedback, and Foster Complex Adaptive Systems Thinking. Below, I discuss each of these seven principles in the efforts of our society this year.

1. In terms of **Managing Connectivity,** the society has:
    - Steadily grown its social media presence. It has not only been broadcasting on social media, but also creating value. It has effectively increased engagement and connectivity, and amplified the visibility of our SD work;
    - Systematically reached out to our members and our community at large and on social media to build our volunteer base. This initiative has led to the increased participation of and contribution from volunteers;
    - Actively rolled out its networking series. To date, we have ran a few events, each with approximately 60 or 70 people connected virtually. We are planning several additional events in the coming months;
    - Revamped its career services, sharing career offers to people more proactively and it also integrated the career fair at the conference;
    - Significantly expanded chapters and SIGs committees, and shared cross learnings and best practices, with chapters and SIGs' leadership meeting more regularly; and
    - Received support from John Richardson in the APCC (by funding a China Liaison & identified a volunteer (Jenson Goh) that has reinvigorated the APCC

2. In terms of **Encourage Learning,** the society has:

- Established a vibrant learning community with mentoring programs, SD courses, webinars and other educational opportunities;
- Piloted a new Mentorship program in collaboration with Jack Homer. In addition, the Modeling Assistance Workshop (MAW), Publishing Assistance Workshop (PAW), and the Peer Mentoring Program (PMP) have now crossed the boundaries of the annual SD conference, and are available year round;
- Setup a new Seminar Series (webinar) promoting SD awareness and highlighting fruitful application areas. These webinars had over 1100 participants from January to July 2021;
- Taught the SD Summer School regularly the last five years, honing in its ability to teach it;
- Implemented free SD courses with vendor sponsorship. The first of these offered by Nici Zimmerman in the Fall of 2021 and sponsored by Vensim has already 340 people registered. The following one featuring Len Malczynski will be sponsored by Powersim;
- Marketed traditional SD courses at new attractive price points. A course by WPI is already available online. The Jay Forrester Seminar Series is expected to be available soon; and
- Supported the Acadeum initiative, a platform that allows universities to share courses with other universities, championed by WPI & University of Bergen, and planned for 2022. Acadeum will help programs with a smaller number of SD courses to complement their offerings.

3. The society **Promotes Polycentric Governance**:

- With its more frequent Policy Council meetings, we have achieved more active participation of VPs and more frequent discussion of different topics;
- With constant checks and balances among Executive Director, VPs, PC members and different committee members before reaching important decisions;
- Chapter and SIGs leadership have been interacting more frequently, learning from each other, and identifying and sharing best practices; and
- The society is offering more (centralized) support to chapters and SIGs operations, and promoting a shared vision across them.

4. The society **Maintains Diversity and Redundancy**,

- Its seminar: "Women in System Dynamics" has had over 70 participants;
- Diversity in the home office encompasses gender, geography, interests, and culture;
- Diversity in the home office's work policies and procedures focusing on staff understanding of overall problems has avoided hyper-specialization and increased ability to handle problems;
- Diversity committee has commissioned survey and delivered its report; and
- Structural racism SIG has become very active.

5. The society **Broadens Participation**, by:

- Reaching out and expanding our volunteer base;
- Offering an online virtual conference that made it cheaper and more accessible. We intend to maintain our online presence in the future;
- Expanding our presence in social media and setting in motion several virtuous reinforcing mechanisms;
- Embracing the diversity of our community, in terms of qualitative and systems thinking members; and initiating an effort to reach out to practitioners & industry clients;
- Making SD courses cheaper and more accessible all year long; and
- Making our PC meetings more regular, more connected, and more interactive, giving a better chance to different groups and more people to interact.

6. The society **Manages Slow Variables and Feedback**, by:
    - Changing the way in which it approached complex challenges. In the past, home office was overloaded, which led to burnout, demotivation, and inability to meet all demands, ostracized some of our constituencies, making it hard to win them back. The strategy seemed impossible to implement, since it represented major challenges and depended on the good will and effort of volunteers;
    - In our new approach, we have started to "Chunk" initiatives in the strategy portfolio, breaking them down into small initiatives that could be translated into small experiments. Then, we have tried to identify small group of volunteers that have energy around those initiatives and partnered them with senior member. In tackling those initiatives, we emphasize that experimentation and failure is OK. This has created a sense of optimism and ability to change.

7. Finally, the society **Fosters Complex Adaptive Systems Thinking**, by upholding its mandate.

Shifting gears, I would like to offer two analogies for important issues in our system dynamics field.

Analogy #1 - Theseus Ship

The first analogy that I would like to share with you is associated with the Theseus Ship paradox. Introduced by Plutarch , the ship of Theseus posited a thought experiment regarding the identity of an object. It asked whether a ship that had every single one of its old wooden planks replaced with new stronger ones, remained the same ship. More generally, if an object has all of its components replaced, does it remains the same object?

The relevance to system dynamics has been brought forward by several of our colleagues over the years. In his 2011 presidential address, David Lane cited papers offering reflective critiques in operations research and management science (OR/MS) and managerial research of their respective limitations.

Historically, those two fields have been close to System Dynamics. From that proximity, we have adopted similar language, addressed similar problems, and complemented our traditional methods with several aspects of theirs. Lane put forward the questions: "*How much does it constrain System Dynamics to be … [open to these] managerial fields?*" And, … "*is there a risk of being so 'open' that we lose our identity?*" (Lane 2011) By being open, in our analogy, we are replacing some of the old planks with new ones.

More recently, Sterman (2018) in the 60th anniversary edition of the field, reminded us that:

> "*We must master the state of the art and modern methods … wherever they originated. Where needed, we must innovate to develop new methods to address the pressing challenges we face.*"

John (Sterman) calls us to replace the old wooden planks (*where needed*) with new and stronger ones. Is the result still System Dynamics (is it the same ship)?

Aristotle's causes (or reasons) offer a solution to the paradox. Instead of focusing on what the ship is made of (e.g., the original or replaced planks), Aristotle considers its "raison d'etre," its purpose for the definition of its identity. Since Theseus' ship retains its original cause, it is still the same ship.

For System Dynamics, since we are still interested in "*developing, testing, communicating, and implementing rigorous, reliable and effective insights into the dynamics of complex systems*"(Sterman 2018) it remains the same System Dynamics.

Analogy #2 - Growth vs Impact

My second analogy draws from more recent theory put forward by Harvard's Clayton Christensen. His theory of good money and bad money state that when financiers consider investing in a new startup they have two key objectives: growth and profitability. When the winning strategy of a new firm is not yet clear, good money from investors needs to be patient for growth but impatient for profit. That is, managers' priority should be to find out a strategy that works (that is, a strategy that generates profits). However, once a profitable strategy has been found, investors should change their focus and become impatient for growth (and patient for profit). That is, once the startup has found its profitable strategy then it can focus on scalability.

Christensen's theory states that good money is impatient for profit, and patient for growth, while bad money is impatient for growth, yet patient for profit. If a company accepts bad money, managerial

decisions will likely be influenced towards scalability before a sound strategy may be in place. Which would lead to its demise.

In the past, system dynamicists have been concerned about the growth of the field. The relevant analogy to System Dynamics is one about *growth vs. impact*. As we invest our time and effort in the field, we should consider whether our efforts should be impatient for growth and patient for impact, or patient for growth and impatient for impact. Let me call this the *good effort, bad effort analogy*. And, let me suggest that our society's members' priority should be to find out a system dynamics strategy that works: a strategy that generates clear positive impact (not only clear to us, but to all exposed to it). In that sense, our good efforts should be *impatient for impact*. Only when an impactful strategy has been found (and can be effectively replicated) should we change our focus and become *impatient for growth* (focusing on wide spread scalability).

Now, some of you may argue that we have already clear examples of positive impact in academia, practice, education, and so on. And, to some extent, I agree with you. Perhaps then, what we have not figure out as a field, is how to codify such strategies in a way that they are not idiosyncratic and specific to individuals and/or organizations, but could be replicated and generalized to others. As a field, that challenge remains, and until we figure out a generalizable strategy for impact, our efforts should remain *impatient for impact*.

As a case in point, this year marks the 50th anniversary of "World dynamics". "Limits to growth" will celebrate 50 years next year. Economic policies of most of the world countries espouse economic growth fueled by ever-growing consumption. This ubiquitous behavior takes place despite our (system dynamicists) broad understanding that indefinite growth in a finite planet is not possible. An impact strategy for the field would be one that would spread such wisdom and reverse those trends.

Conclusion

These two analogies represent a perspective on important issues that many of us have grappled with over the years. They capture my personal point of view. They do not represent "truth." I hope that they can foster constructive conversation among and can lead to concrete actions by us.

I started this address mentioning that I was inspired by the work of many of my system dynamics friends and colleagues. In his "path forward" Sterman's remids us that "*Jay always dared us to have courage, be bold, and work on the most important challenges facing humanity.*" John called upon us to "*follow his

example." I would like to invite you to join me on this voyage, bringing your best effort forward and ensuring that it is impatient for impact.

References:

Anderson, E. (2014). System Dynamics Society Presidential Address.

Christensen, C.M. (2019). "There Is Good Money and There Is Bad Money." Harvard Business School Module Note 420-019.

DalaiLama.com. Retrieved 2021-07-22. https://www.dalailama.com/messages/world-peace/human-rights-democracy-and-freedom

Falcon, A. (2019) "Aristotle on Causality". The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.). Retrieved 2021-07-23 https://plato.stanford.edu/archives/spr2019/entries/aristotle-causality/

Forrester JW. 1971. *World Dynamics*. Wright Allen Press, Cambridge, Mass.

King, M.L., Jr. (1963). "Letter from Birmingham Jail". Stanford, CA: The Martin Luther King, Jr. Research and Education Institute. Retrieved 2021-07-22. http://okra.stanford.edu/transcription/document_images/undecided/630416-019.pdf

Kopainsky, B. (2020). "Crises as Opportunities". System Dynamics Society Presidential Address.

Lane, D.C. (2011). "The Ship And The Voyage". System Dynamics Society Presidential Address.

Meadows D, DL Meadows, J Randers, WW Behrens III. 1972. The Limits to Growth. A Report for the Club of Rome's Project on the Predicament of Mankind. Universe Books, New York.

Plutarch. "Theseus (23.1)". The Internet Classics Archive. Retrieved 2021-07-23 http://classics.mit.edu/Plutarch/theseus.html

Randers, J. (2012). "2052 – A Global Forecast for the Next Forty Years." Chelsea Green Publishing.

Rouwette, E. (2016). "Now, doesn't that sound a little bit like System Dynamics?" System Dynamics Society Presidential Address.

Sen, A. (2006). "Identity and violence: The illusion of destiny." New York: W.W. Norton & Co.

Simonsen S.H, Biggs R., Schlüter M., Schoon M., Bohensky E., Cundill G., Dakos V., Daw T., Kotschy K., Leitch A., Quinlan A., Peterson G., Moberg F. (2014). "Applying Resilience Thinking. Seven Principles for Building Resilience in Social-Ecological Systems." Stockholm Resilience Center. Stockholm, Sweden.

Sterman, J. "System Dynamics at Sixty: The Path Forward". System Dynamics Review. 35. 5-47.

Strohhecker, J. (2015). "Continuing the voyage, expanding the fleet". System Dynamics Society Presidential Address.

Warren, K. (2013). "Taking the Opportunity" System Dynamics Society Presidential Address.