

## **Now, doesn't that sound a little bit like System Dynamics?**

Dear fellow system dynamicists,

Today I have the honour and the privilege to speak to you as the president of the System Dynamics Society. System Dynamics prides itself on its broad perspective and that is reflected in the audience. Participants in this conference are practitioners, academics, consultants, students – working in different areas such as health, public policy, strategy, operations management – from many different parts of the globe. About one in three people at this conference is a first time attendant. I would like to address the newcomers and also speak about some things which I think all of us have in common. And, I imagine, a big part of that is the passion system dynamicists have for their work.

Being here for the first time, you must have thought about what System Dynamics is and what you can expect from a System Dynamics Society conference. You may not have a clear idea on what the System Dynamics Society or its president are or do. Let me try to put a vivid image in your mind of what a System Dynamics president does. My first experience with a genuine System Dynamics Society president goes back to 2003 when Pål Davidsen had this role. At the time I was in my early twenties – that's a joke – and finishing my PhD studies. My supervisor told me Pål wanted to talk to me about a possible joint project. So there I was, waiting for a call by this distinguished colleague that I had not met in person or spoken to before. When the phone rang and I picked up he said 'hello Etiënne, this is your president speaking'. I thought this was a great line and when I started my year as a president, 13 years later, I set myself the goal to call at least one member of the Society every month and say: 'hello, this is your president speaking'. So let me say this to everyone here today: good afternoon, my name is Etiënne Rouwette, and this is your president speaking.

Unfortunately, that is about the full extent of the power of a System Dynamics Society president. Essentially, the Society consists of a small number of employees and a big group of volunteers. There is little in the sense of presidential ceremony, no salary, there are no leased cars, you can't start an intervention in other countries or even scientific disciplines. The Society has a small team of paid employees at the Home Office in Albany. The Home Office is really the constant factor, the engine that drives the Society and many of its core activities: organising the conference every year, keeping the website and social media presence up to date and answering your emails about anything System Dynamics related. Add to this the group of volunteers, for instance the local team that organised the conference in Delft for the second time, the program chairs, thread chairs and the reviewers that are responsible for the conference program and the student volunteers that help to make the conference run smoothly. The Society is run by a Policy Council which operates as a board of directors, and Vice Presidents, based in many different countries. All of these people work together to grow the field of System Dynamics, thinking of initiatives and supporting their implementation.

So far this was a story about the inner workings of the System Dynamics field, let me now change perspective. Why are we doing this? Why do we think having more system dynamicists and more analysis based on System Dynamics models, is a good idea? To put it more concretely, why did you come to this conference, be it the first, fifth or tenth time? Especially if that field focuses on complex issues and takes years to master. Students often say that System Dynamics is one of the most difficult topics they encountered in their classes. Building a model is hard. It is often

two steps forward and one step back. Why bother? My suspicion is that people keep using System Dynamics because the hard work actually pays off. Gathering the data, thinking about possible explanations, building and testing a model all take a lot of effort but along the journey there are many rewards: unexpected insights, increased understanding, an aha moment. And ultimately there is the chance to make a real contribution to changing a system for the better: to improve a situation that has a real impact on people.

Once again, why is this relevant? There are many other methods out there that academics, consultants, or others use, and often with great success. This question takes an even wider perspective, but my answer is going to be more personal. So this is one person's view. Sit back and relax. You don't have to agree, but hopefully this gets you thinking about what your answer would be.

It is an understatement to say that we live in interesting times. In the last few weeks the European Union for the first time in its history became smaller. The United Kingdom chose to leave and it is unclear what this may mean in terms of the different reactions by England, Scotland, Wales and Northern Ireland, the UK-EU relation and the European economy. A major topic in the discussions leading up to Brexit was immigration, most recently by refugees from the Middle East and Africa, and their relocation across European countries. Many refugees are fleeing the war in their home countries, the same wars that have inspired bombings around the world. All of this plays out against the background of a slow recovery from the financial crisis in 2008, increasing worry over environmental problems such as climate change and shifts in the balance between economic and military powers. This story is pieced together on the basis of newspaper articles, but to really understand what is going on we would need to single out a particular problem and capture it in a model. This is only a small slice of what is going on and I am sure that if you are from Asia, Africa, the Americas, or the Pacific, you can add many more examples that play out closer to home. The world appears to be in flux. What strikes me in conversations with friends, family and colleagues, is that many people feel insignificant when thinking about these developments. It is as if we observe great changes taking their course and there is no way to influence them. Powerless to change anything. That in turn may inspire a move towards more autonomy, or a demand to return to the good old days. In general, a tendency to focus on local and short term improvements.

Does this leave room for an approach that is founded on deep analysis, takes the long view, and incorporates judgemental elements of decision making? That maintains that intuitive reactions may be misguided and we need to look at the big picture? On the other hand, what alternative can you think of? It seems clear that the world is getting more interconnected. There is a bigger impact of events and decisions in other places of the world on what happens here. This is not only the case because it is easier to get information on what is going on, but there are also more means to make your opinion heard, to travel, to switch loyalty to another brand or idea. It seems logical to expect that more people will want to have a say in decisions shaping their life. If I had to think of an approach that would help in such a situation, I would say it needs to see the whole picture, instead of singling out one aspect and spending all time and energy in analysing that part in depth. I would say it had to look at how stakeholders see their world, what goals they have and decisions they make. It would need to be realistic, in the sense that it captures what is going on and does not take an idealised or normative view. This means that the full range of data needs to be used, from decision makers' stories to observable behaviour to quantitative data. I would hope such a method would still be transparent, so that people involved can check the

analysis and the reasoning that drove it. So that its results can be explained and recommendations implemented. Now, doesn't that sound a little bit like System Dynamics?

I am sure that System Dynamics, in its current form, is not the only or the best approach to increase understanding of big issues in public policy, strategy, health and other disciplines. But I am convinced we have a solid basis on which we can build. I expect that in the coming years our method will develop further, in terms of more powerful software and better approaches to engaging clients. But I think these changes will be incremental additions rather than a radical change from our current approach.

I am reminded of Jack Homer's statement that System Dynamics at its best is like the scientific method. We posit a hypothesis on what causes problematic behaviour, bring together all available data, use that to build a model and rigorously test our idea. That takes a lot of effort, thinking and checking. It has a certain old-fashioned ring to it and to some it may sound a bit boring. Two reactions come to mind. One is that the scientific method has been called the best way to advance our knowledge. It is not ideal, but so far there is nothing better. The same is true for System Dynamics as the study of complex, multi-loop problems, in my opinion. I hope in the future our methodology will improve further but what we have is already quite impressive. We would like to see everyone struggling with complex problems use it. My second reaction is that someone who thinks modelling must be boring, has probably never done it. How many people here have had that great moment of pleasure when a model is nearing the end and you think 'I built it and it works'? Building or creating something, in addition to analysing it by breaking it down into smaller parts, is one of the things that makes modelling fun.

In other words, my answer to why System Dynamics is a good idea is the following: because it helps to come to grips with major issues, issues that have an impact on the lives of many people. I hope I have shown that the headlines in the papers today point to systemic issues and stakeholder decisions that are connected in feedback loops. Let me give three examples to make that more tangible.

System Dynamics has a long tradition of studies on resource constraints and the environment. In recent years it has made a clear contribution to the understanding of the dynamics of climate change, through Climate Interactive, as we could see in John Sterman's presentation this afternoon. In the climate conference in Paris last year, Travis Franck, Drew Jones, John Sterman, Ellie Johnston, Juliette Rooney Varga and others ran the C-ROADS simulation with many of the representatives. The interactive simulation shows players the consequences of their decisions and thereby nudges them towards more systemic solutions. Since tracking attendance 19,000 people have played the game.

Another recent example of a study with great impact is the Munroe report on child protection in the UK. Eileen Munro, David Lane and Elke Husemann used System Dynamics in a review of child protection activities in England for the Department for Education. The review shows how a compliance culture had been created, for example leading experienced personnel to leave because they wanted to spend more time with children and parents instead of on bureaucracy. Their subsequent recommendations aim to change the services into a learning organisation, another field in which System Dynamics has made important contributions. The results of their analysis are already being implemented in changes to the inspection regime and changes to the laws of the UK. As a result, children's lives are being changed for the better.

My third example is the work of Ivan Radulovic, a student in the European Master in System Dynamics. Ivan completed his master thesis at the Dutch National Bank and the Authority for the Financial Markets. On the basis of document analysis, interviews and group model building sessions, he shows how banks' business models, internal control mechanisms and external control by the Dutch National Bank and the Authority for the Financial Markets interact. In line with work by Nacho Martinez-Moyano and colleagues for the US, he shows that these interactions create a regulatory pendulum. Ivan's thesis defence will be at this conference and attended by two supervisors from the Authority for the Financial Markets. The time available for this speech is too short to go into the great examples we have from business. In the plenary sessions today we saw presentations on business tsunamis and just now on the financial crisis of 2008, and there are many more in the rest of the program.

I started my talk today with the limited executive powers of a president of the System Dynamics Society. I then explained how the Society consists of the Home Office and a large team of volunteers around the world. The Society exists to support the field of System Dynamics. Now, at the end of this speech let me address the newcomers again. Over the course of the conference you will form your own ideas on what sort of a community the System Dynamics Society is. What I have tried to bring across is the idea that system dynamicists are passionate about their field. Let me speak for myself: I am proud to work in a field that helps one to understand complex issues and improve decision making. Saying 'I am proud' is a big thing for a Dutch person. The Dutch have this image of rational, maybe somewhat cold people. Maybe it's all the milk. The System Dynamics Society to a great extent depends on volunteers. That automatically means that there are a lot of different opinions competing for attention. Ideas with no energy behind them will gain traction only very slowly. If you, who are new to the field, have an idea on how to support the System Dynamics field better, please let us know. We really need you – and let me repeat this: *need* you – to tell us how to spread the word and work on today's problems. Otherwise we seriously run the risk of not seeing the opportunities, or missing the boat altogether. If in addition to ideas, if you have time to spend on working with the Society: even better. I hope you have a great time at this year's conference and we have a chance to speak. And I hope we meet again at the 60<sup>th</sup> anniversary next year in Cambridge.

Thank you for your time and I look forward to talking to you during the rest of the conference. This was your president speaking.