

Final Plenary – round table with workshop leaders

Participants: Steven Bishop, Ilan Chabay, Carlo C. Jaeger, Patrik Jansson, Antoine Mandel, Diana Mangalagiu, Sander Van der Leeuw,

GSS conference
Saturday 10th November 2012

Carlo Jaeger

- As we approach to the end of our conference, we should think of this not as an end to anything but to the beginning of a process that ought to last many years.

Sander van der Leeuw:

- There are a couple of issues that we ought to take into account and which could help us to structure the process of making the kinds of questions and tools that we need to have in order to know the **role of ICT in GSS**: First, it's the huge variety of data out there that needs to be looked at in order to know what needs to be done; and second, the different levels and scales of such data to be scrutinised. So the real challenge is how to go down -away from too higher scales- so we can **get much more real diversity of information about what is really going on** about at the level of individuals, social groupings and networks and also, for instance, at the level of city systems.
- In GSS we need also to be **able to deal with** a series of some of the **'hairy problems'** which have been going on for long **in public policy**, such as urban management, transport, income differentials, and many other social problems [but now considering the current global dimension of these problems].
- Thus a pertinent question in this context is: **What kinds of tools** we already have so far to **understand global dynamics**? At the moment, what we have is a 'chaotic toolkit' which is not connected in any systemic way. **We need to be able to adapt these**, and avoid having many tools for one purpose and only one tool for many purposes, as it is now the case. Then we also should also be able to **connect these tools in a more theoretical way** and in a mode which is able to support the management of such difficult public policy problems [which now take a global character].
- But: how we're going **to connect such information with models and scenarios in ways which are useful for policy making**? One possibility could be getting first the relevant information; running computer experiments and making use of ITC tools; and then, also doing all this in ways that connect such insights with the lessons learnt from the past and for the future so to adapting and creating adequate models to do all this.

- Hence the following research questions are relevant [with regard to the urban topic of our sessions]: 1. **What is the global systems of cities?** 2. How is the multi-net in which different kinds of cities are linked with each other and in different ways? How different ways of structuring networks can be conceived [e.g. in a more sustainable way], for instance, by a transport systems focused and structured on demand rather than on supply – with an intensive use of ICT (e.g., Smart Cities). 3. What are the wider implications of the Information Revolution [in these contexts]?

Ilan Chabay:

- We need to be clear about **what we mean by narratives here**; they are not only stories, they can also be can be images, performances, etc, and **they should not only be understood a means for communicating but also for engaging publics**. We need to realise that these narratives **emerge in many cases from models** and that they are the product of an **interactive process with the larger community of stakeholders**. The existence of these narratives depends on the possibility of creating such relationship and a process that goes along the whole he generation of models and production of model outputs as well as during [the process or organising and making sense of] the collection and analysis of data.
- But: **How do we describe the systems in the models?** This process should not be normative or predictive –telling us how things should be or will be- but only to **provide a series of options about the future which in turn depends on how we act in a particular way**. So we need to consider the following questions: Who is asking these questions?, How do we create visions on the future? (so there is a motivation to move it into collective behaviour change), How we analyse the responses? And whether we begin to see changes or not.
- In addition, **we also need to capture both the quantitative and qualitative** aspects in the modelling, analysis and data in ICT, so we don't loss the richness of the qualitative aspects of the narratives.

Steven Bishop:

- There are not only a series of challenges for Global Systems science, but also a series of **dichotomies**, the first being that policy makers usually do not want to hear about the challenges unless they come with the solution. So we may need policy makers to be more present in all this in order to understand the whole process we are dealing with.
- Furthermore, policy makers are often interested in single answers, but as Michael Resch put it, **single answers are not going to be the outcome from the simulations of the type of systems we are looking at**. So we also need to be able to convey the sense of the uncertainty involved in the production of these outcomes.

- Narratives can be based on **pictures and images**, and these can be very powerful means **to capture complex issues** which can be very difficult to communicate otherwise. But a challenge is also how to provide the *right* picture in ways that then it can be used to readjust our models.

Diana Mangalagiu:

- What GSS can bring to **understand and deal with global sustainability challenges?**
- When you look at the global level you need to couple all different types of levels and systems, both temporally and spatially, all with different speed dynamics. We don't really know how to couple all that, but we need to think what particular tools could address these complex questions.
- Can GSS **identify various [global] transition paths?** What is the role of ICT in this endeavour? From the management of extreme events, there are already many ICT tools which can be used for to support prevention, recovery and so on, but in GSS the challenge goes beyond this and it is about the following: **'How ITC can help us to know where we want to go as a society?'**

Patrik Jansson

- **Languages technology** is crucial for ICT and can be used in many aspects of GSS. In particular, we need to consider that while looking at the enormous possibilities that ICT offer in **learning and education**, e.g. through interactive procedures. But at the same time, we need to understand the actual processes that ensure such appropriate interaction and engagement.
- With regard to **simulation and verification of models**, there many complex questions which need to be asked, all of them with many **levels of uncertainty** that emerge in the whole process or modelling and communication of results. Some people are afraid of communicating simulation results too early, but we can learn from the open source modelling so to help to build trust in this respect.
- ICT can also be used to support **social experiments**, e.g. through online communities.
- 'Big Data' may be an overuse word, but **the key is the overall complexity of data**. There are many layers and types of data, ways of cleaning it, analysing and communicating such data. ITC can indeed also play a major role in supporting the visualisation of data.

Antoine Mandel

- One thing we have realised in these workshops is that if we want to engage with policy makers (e.g. EC), we need to be aware that there are some **short-term issues** that scientists/experts should be able to say something about -and try to think about producing particular services, like data on financial markets or to support new regulations. And then, we should be able **to connect** these short-term issues **with the more longer term issues**.

Carlo C. Jaeger:

- We are now moving closer towards **two major goals**: 1. The building of a research **community** that develops ICT in the study and the shaping global systems understanding and 2. The development of a **Research Program** by this community towards this aim.
- The analogy of a telescope can be useful to convey the idea that new tools co-evolve with the development of new forms of science, as it was the case with astronomy. In a similar guise, **global computer models and ITC may now help us to see better what is going on with global systems**. These are systems which we have created and that now have massive consequences; and we're just now at the beginning of getting familiar with these systems.
- On the one hand, we **need innovative ways of using and developing these new tools**, so to produce the right pieces of policy advice. But on the other hand, there seems to be that a canonical framework for **modelling global systems** is developing, e.g. global networks of aggregate agents represented as iterative games; and this new way of modelling seems now to be possible in some domains like in the financial networks.
- Another thing is that when considering the role of GSS we should take into account the idea of **evidence-based politics**. But we need to acknowledge that in many policy fields there is not enough evidence to do so.
- In a similar way that top soccer players also need a coach not because they are better than them, but mostly because they help to reflect on their own work, GSS could also play this reflective role for policy makers [by providing tools and evidence] on what they are doing; and we could be useful if that is the case if we disagree with them because we could support such reflection and dialogue.

Steven Bishop:

- But: How can we embed the ICT in the development of GSS? How much can we 'pull out' ICT from GSS when ICT is already an integral part of GSS?

Comments from the audience:

- The metaphor of the telescope is good, but really to explore what is going on [on Global Systems], **we need to look outside Europe.**
- The truth of the matter is that the **main model used in economics and policy** making (general equilibrium model, etc) is a 'big problem', because **its micro-foundations are of no scientific substance**; and the main problem is the idea of the representative agent. In contrast, what **ICT makes possible is to have many representative agents in complex interactions, with intended and unintended consequences in uncertainty**, instead as already being predefined by the model. As Michael Resch put it 'Theory is Everywhere'. This is one of the values of interdisciplinarity, as it can shed light and **reflection on your own disciplinary theories and assumptions**. Thus we ought to be able to provide a **better understanding of human interactions and the emerging properties of these interactions**. There are also issues that could be addressed this way, like the issue of management of anxiety and the construction/evolution of narratives.

Comments from the audience:

- Three points: 1. **Diversity** and requisite **variety** is absolute essential [in GSS]; 2. There is no clash between **small, local action** [and GSS] which is from this that the big picture can emerge 3. New ICT is all about engagement and empowerment of people; it's about reflexivity, which is fundamental to human behaviour, as the human animal is a modeller, a experimenter and above all, a thinker.
- The challenge for this group and for this emerging discipline is that how we need to **change the way of working and interacting** if we want to engage and collaborate with policy makers, professional, consumers. This is an easy task at all.
- There are some **cultural aspects** (e.g. in language development) that need to be taken into account in developing and communicating GSS, e.g. when discussing the future of communities or how GSS could be useful in other parts of the world (Africa, Latin-America).
- Thinking about characterising global systems we may also need to think about **how people in communities in other parts of the world characterise the 'global'** - which is what they actually see in those communities. In addition, we have global universal problems, but which are manifested in many different ways locally. We should consider what is happening in terms of changes at the local level in these places in the mode of **transition areas**, and how these experiences interact with other scales.

- Therefore, not only we have to create new narratives and visions [on GSS] but also we need to **connect these narratives and vision with many other existing ones which are very diverse**, which could help people learn, to help people understand where they are and we need to listen to them. In this process, ICT could help a lot to support mutual learning.
- We should **look at how the ICT industry has used narratives as a way to define their own future**, in order to help shaping our own future of GSS.
- In building this community of GSS, we could **learn from the experiences of other successful scientific communities**. For instance, there was the emerging field of **ecological economics**, which despite the limited resonance within the academic world it received enormous attention and feedback by the rest of the world –and then also high impact factors in environmental sciences; another case is the community that lead to the World Tourism Organisation.

Ralph Dum:

- **Global System Science** entails addressing global interlinked challenges which need to **combine many different areas** such as energy, mobility, environment, social inclusion, as well as to cross-cut different **disciplines**. Thus, ‘global’ means more that worldwide, because it’s about combining different areas and disciplines too.
- One of the most complex systems is the **internet in itself and this is as a complex system which can help to understand complex systems**.
- GSS to some extent is not really [yet] a science, as **theories underlying our ideas of global systems have their limits**, e.g. to guide the assumptions and development of models to support decisions.
- While GSS is also it’s also about models, but it is an attempt **to bring these models into society and policy decisions**. So this is the importance of narratives, as they underlines the importance of understanding what is in the models.
- There are two aspects on GSS to take into account: 1. **Policy informatics** –e.g. to help society to confront new realities- and 2. **Society informatics** to help understanding the social processes and influencing those social processes.
- **GSS is also** about coordinating different scientific and policy efforts, not only a research agenda, that is to produce a **coordination agenda**; it’s a coordination effort among different scientific agendas, but also among different stakeholders, and policy agendas.
- All this, can be conceived as a process which could come out as **‘sandwiched emergence’** between, on the one hand, from particular cases, and on the other from new ways to modelling like the ones mentioned on financial markets and urban networks /smart cities. But also a more top-down approach is also necessary to try to understand how ITC influence societal configurations.
- Bear in mind that we will have two or three more workshops in the coming weeks to define this White Paper on GSS, e.g. on modelling, and on city systems.

Sander van der Leeuw:

- Creating the community as this one, which is able to create such atmosphere and complicity, is a fascinating endeavour. But we need to remember that it is only from the interactions between people from very different backgrounds and by keeping this [positive] feeling that we can learn from each other and that we can maintain this community in the long term.

Carlo C. Jaeger

- I learnt a tremendous amount here by having in-depth conversation with all of you. But we need to bear in mind that need to be able to become a community that we can help each other even in difficult times whilst trying to study the life of millions of people.
- Nevertheless, I am particularly worried about what is happening to the project of Europe. We need to see whether we will be able to make a contribution there. But to that aim, GSS should also be able to interact with people in other parts of the world and of different kinds of non-elite people outside Europe too. We're already doing that in Latin-America, Asia, US, Africa, and other places. Let's do our job with confidence.
- A final procedural aspect on next steps: we will produce a first draft document of the GSS agenda and this will be made available on the blog for comments. Also if we ask for particular contributions to some of you, please let us know if you can react and do so fast.

*Summary transcript by J. David Tàbara
In []: added for clarification by J. David Tàbara*