

Complex systems and Society
A WEB PORTAL FOR KNOWLEDGE EXCHANGE

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ABSTRACT

In this project we outline the idea of a web portal aimed at being a general clearing house for complex systems science applied to human and social systems. This document is a more or less structured collection of our ideas, and serves as a planning platform for ourselves, as we aim to get the project onto its feet and into the real world.

AGENDA

"It's true we'll make a better day". So go the lyrics. And so, we could say, is the aim of this project, a project that originated from the belief that complex systems science can have wide reaching implications for future attempts to dream up and bring about a better world.

As any news source can tell, there are a multitude of human and social issues to be dealt with in our world: Global poverty, racism, wealth inequality, education, trade policy and so on. This list is easily extended. The point is however that many of these issues can be dealt with in the context of complex systems, whether addressed by agent-based modeling, evolutionary game theory or other tools from the complex systems toolbox. This brings us to our goal: To find ways to link the study of complex systems with people for varied lines of work - academics, activists, researchers, policy-makers, scientists, educators, journalists, etc. By bringing together those looking for information, papers, opportunities for collaboration, new opinions or insights, new tools and methodologies, and those who are simply curious, we hope to bring the insights of complex systems study to any and all working to make a better world for tomorrow.

How do we make this link? We suggest to put up a web portal aimed to be a general clearinghouse for any and all interested in the social aspects of the study of complex systems. Combining a forum (in order to make finding information on topics easy), blog (for longer-form contributions, posting of general questions, announcements, calls for collaboration), and a wiki (designed to help make complex systems topics more accessible for those who may be unfamiliar with varying terms used on the site), we hope to foster dialogue, discussion, and exchange of information, opportunities, resources and contacts.

BACKGROUND: WHY COMPLEX SYSTEMS?

While there are many definitions of complex systems, over the past two decades, a general consensus has emerged that complex systems have a series of elements, which distinguish them from those that are merely 'complicated.' A car engine, for example, is complicated, being composed of many interrelated parts, which must be machined in very precise ways. That said, an engine is not generally considered 'complex' (in the sense used by 'complex systems researchers') for a variety of reasons.

1. Firstly, complex systems are self-organizing. A car engine doesn't organize itself, but a colony of ants does.

2. Secondly, complex systems are generally controlled in a manner which is distributed, rather than centralized. So, while a single driver controls the performance of a car engine while the car is in use, a colony of ants building a nest has no central director. Rather, local actions of many actors contribute to an overall macro-behavior.
3. Thirdly, a complex system leads to the emergence of behavior which is greater than the action of the sum of its parts. In a car engine, all the parts fit together to create the action of the whole, but nothing unexpected should emerge unless the engine malfunctions. In the case of an ant colony building a nest, however, the nest will never get built unless the micro-rules exercised by many ants, each with limited insight and information, lead to a macro-structure which cannot be predicted from the micro-rules used by each ant - namely, the structure of the nest.

For all the reasons listed above, complex systems theory defines a car engine as a complicated system, while a colony of ants building a nest is considered complex. Complex systems abound in nature, from vortexes in a drainpipe to weather patterns, from the mass-migration of bees to a food source to the reactions of crowds doing 'the wave' at a baseball game. While there has been extensive research in complex systems in nature, there is also a growing literature on complex social systems. Our goal is to help bring the insights in the study of complex systems to a wider public seeking to make the world a better place.

DESIGN AND FUNCTIONALITY OF THE WEBSITE

We believe the ideal way to initiate a project like this is through a web portal. This allows for a rapid, small-scale start up of the project, with no need for initial financial means. Further expansion of the project will be considered at a later stage, based on the experiences gained from this first platform.

The web portal must cover for different needs: information source, discussion forum, collaboration network, announcements, etc. It is convenient to divide up the web portal into different subsections and functionalities. We sketch up a preliminary list of the different components:

1. General information: This part of the web portal contains information about the Complex systems and Society project, including goals, background information, organizers, etc. All this will be up front on the web page, so that a new visitor first arrives here, and then is guided to the other part of the web portal. This part will be served by the administrators and appear static to any

visitor.

2. Specific information pages: Here we provide background information on Complex Systems literature and "Best practice". This part will have a dynamic interface, to allow users to provide information.

4. Research group pages: Pages containing information about different research groups and their possible interest in complex systems and society.

4. Blog: The blog will contain more loose and up to date information on various topics. We plan to rely both on ourselves and on our network of associates to contribute to the blog.

5. Forum: This is the "common market place", where everyone is free to air their opinions, announcements, services or anything else.

6. Wiki: At first, we wish to use the wiki as a collaborative between the initiators. As we are located around the globe, this can be a structured way to the project on track.

Initially, we have built a prototype web page, illustrating some of the aspects what we have in mind. This is shown in the figure below. The page is functional, but we are planning to have further discussions on the outline of the portal and also the technology behind it. A newer version is released at the web address: <http://cssjp.org/>

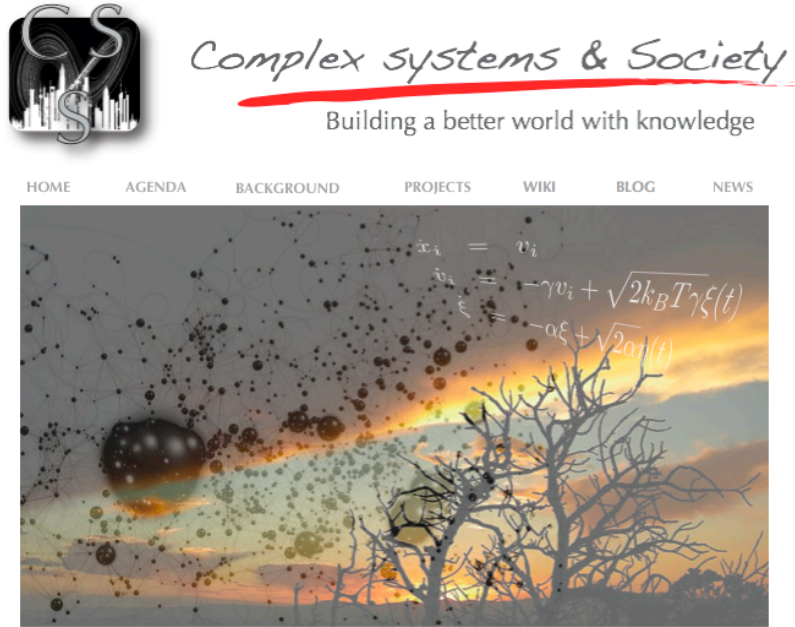


Figure 1: Prototype of web portal.

TARGET AUDIENCE AND CONTENT AREAS

Our target audience is decision-makers, activists, and academics interested in applying complexity sciences to social justice questions. We want to make sure that there is something of interest on the website for each audience and so plan to focus on two general areas: 1) tools and theory, 2) and practical applications.

1. Tools and theory

As the tools and theory section is primarily meant to help non-specialists learn about the tools of complex systems study, we will focus on the following tools: agent-based modeling, network and graph theory, and evolutionary / game theory. For each of these areas, we will collect links to websites and papers with “best practices” and elegant solutions. We will also focus on these topics in the blogs. For example, we may provide literature summaries, paper reviews, and thoughtful analyses at a level appropriate to non-specialists.

2. Practical applications

Practical applications will help decision-makers and activists to identify areas in which complex systems techniques may be useful. For example, blogs may cover the following types of questions:

- What can agent-based modeling do practically?
- What can network analyses bring to decision-making?
- What can game theory bring to decision-making?
- What characterizes a successful collaboration between complex systems researchers and activists / decision-makers?

For all of the technique questions, explore when the technique is useful (and when it is not). Also, compile case studies about their practical uses.

WIKI AND BLOGGING

The CSSJP team will create a private discussion area (perhaps a wiki) to communicate and coordinate about the content. Specifically, proposed blog topics, people to contact for contributions, and tentative completion dates will be identified. Further, the content areas will be divided into four areas, with one person primarily responsible (though not solely) for each. [This is totally up for negotiation - we can rotate responsibility, split it in half and have 2 teams, whatever.] Each of us will contribute, or contact others for their contributions, between 2 and 3 blogs / pages per month, with the potential topics identified well in advance of their expected completion.

“COMPLEX SYSTEMS AND SOCIETY” AS AN ORGANIZATION

While we emphasize the need for kick starting the project through the outlined web portal, we recognize the need for a formal organizational structure in the future. There are a few obvious reasons for this: To raise capital, it is mandatory that the organization has a legal structure. Currently, we are carrying the limited cost of the project ourselves, but that is not an option if the projects grows the way we want. Access to financial resources possible could make it possible to have a dedicated coordinator. Since the project initiators are located around the globe geographically, this would ensure a better long-term administration of the project. And just in terms of representing ourselves as an organization, it would be beneficial to have a formal structure.

- INGO - the preferred structure

Our work is non-profit, voluntarily and international. These are characteristics that make "international nongovernmental organization" (INGO) our preferred form of legal structure. This will probably also have financial benefits as tax reduction. We need to get into the details at a later stage.

- Directions and Goals

While we have a reasonably clear vision of the close future direction and goals, it can be good to have even longer perspectives in mind. Certainly, our knowledge platform will be shaped and influenced by its users, which in turn might point to possible directions of the organization. It is worth to have in mind the famous INGO Oxfam, which could serve as a good role model for us. The organization originated in Oxford by a group of Quakers, social activists, and Oxford academics in 1942. Their start was indeed to serve as a knowledge platform. Later they grew into an organization of international influence, and nowadays they have member organizations in 13 countries.

We are not ambitious to get to comparable in size anytime soon. But we are eager to reach out and try out our ideas. In this context, support from academia is crucial to us. Currently we have a potential project from a junior researcher, Jonathan Mijs, who works for MaxGoote Knowledge Centre on Adult and Vocational Education in the Netherlands. He is also a junior lecturer at the University of Amsterdam. The project involves a small social proposal to the Amsterdam government about segregation problem in certain areas and fits very well with the aim of our CSSS08 project. We will probably be involved with the simulation aspects of the project. We also believe we can take advantage of the diversity of knowledge and skills possessed by our friends at the CSSS08 and likewise with previous summer school participants.

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