# Structure, Environment, Purpose, and a Grand Challenge for the ASC

by "Stella Octangula"

Introduction

This proposal is based on a view of the ASC as a system that consists of an organism that exists in, and operates purposefully on an environment. We propose changes to the organism and its environment. Our first proposal changes the structure of the ASC organism to make it explicitly and functionally second-order cybernetic. The second proposal changes the environment of influence of the ASC organism.
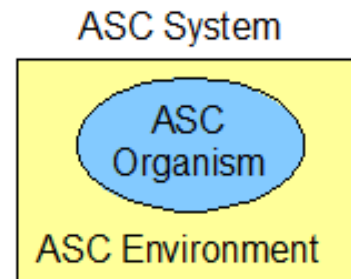
PART I: Changing the structure of the ASC Organism

The ASC Organism figure illustrates some of the "Organs" that are explicitly defined in the ASC Constitution[1]. The preamble of the constitution already recognizes the need for the ASC to occasionally self-reorganize, and rewrite the constitution. That is already a second-order cybernetic feature, and it has clearly functioned, more or less, for 30 years, but instead of being reduced to a preambular appendage, we'd like to recode the Constitutional DNA so that the resulting ASC Organism has a structure that is explicitly, and functionally second-order cybernetic.


Specifically, we propose adapting the Constitution to require a new Organ; a fourth standing committee, named the "Steering Committee". We expect it to maximally organize itself, define the key metrics (such as vitality, relevance, and effectiveness) that it will periodically evaluate, and propose appropriate corrective actions if any metrics deviate from their comfort zones. The actions could, for example, include creating a new workgroup, organizing a conference, or making a change to the Constitution. The concept of an organization having a Steering Committee is not new, yet the ASC conspicuously does not officially have one. Presumably, until now, one of the existing ASC boards has assumed such responsibilities.

---

1   See http://www.asc-cybernetics.org/organization/constitution.htm

The diagram of the Second Order Cybernetic ASC Organism, is intended to convey how the Steering Committee is driven by feedback about the ASC and its environment, and that it can propose any change or activity to any part of the ASC Organism, including constitutional changes.

Second-Order Cybernetic ASC Organism

Constitution

Officers
Trustees
Executive Board
Board of Directors
Working Groups
Membership

Standing Committees:
Nominating
Membership
Finance

Steering Committee

ASC Metrics

That might sound disconcertingly omnipotent, however the Steering Committee is not a new dictator, it does not actually have the power to change the Constitution or to issue commands to the other ASC Organs, because, like the other standing committees, it is bound by article 8.1 of the Constitution, which restricts it "... to develop proposals and prepare suggestions for decisions to be made by the Executive Board or by the Membership." Thus, the Steering Committee is a benevolent overseer that initiates redirective actions by communicating proposals and suggestions for democratic consideration.
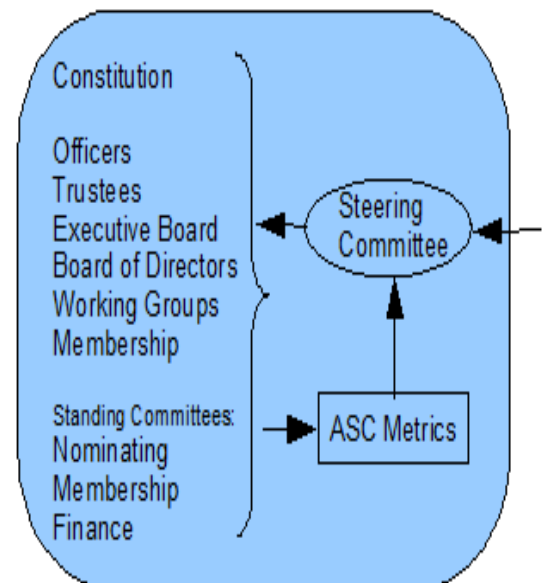
OK, that was Part I, the structural reengineering of the society. From a theoretical viewpoint, that is sufficient to transform the ASC to become cybernetically second-order, but in reality, all we have done is to solve a problem by delegating it to an as yet, non-existent committee. We need something more, something that will inspire people and increase the vitality of the ASC Organism. And that's where Part II comes in.

In Part II, we will propose a subtle, yet radical, repurposing of the scope of the society, including a grand challenge proposal, to revitalize and inspire members and non-members alike.

PART II: Changing the environment and purpose of the ASC Organism
Environment and purpose are closely bound by the fact that our actions on objects are normally associated with an intention. Our use of the term "environment" is intended to refer narrowly to the entities to which our "purpose" actually applies. In essence, everything that the ASC organism can act upon or affect directly, that is to say, its sphere of influence.

To determine what the ASC environment is, we look to the Constitution again: Paraphrasing articles 2.1 and 2.2 of the ASC Constitution, the purpose of the society is "The advancement and promotion of cybernetics as a science, a discipline, and a meta-discipline." The membership may or may not agree whether that is an accurate description of what the society actually does, but it clearly defines a limitation on the possible sphere of influence of the ASC Organism.

The trivially obvious fact that the immediate environment in which the ASC operates is "Cybernetics" is of absolutely no surprise to anyone. And yet, it is easy to overlook that this is a limitation. And it seems that all areas in which cybernetics can be applied in practice, for example, in economics, electrical engineering, and psychology, already have their own own specialist communities.
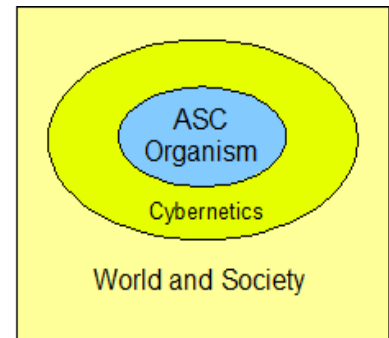
And, for example, where there is an explicit cybernetic specialization, such as socio-cybernetics, it is correct that that domain belongs to the sociologists rather than the cyberneticians. Of course an individual can belong to both camps, but the ASC can't. What is left behind might be summarized as "pure cybernetics plus examples". It is as if the very universal utility of cybernetics condemns the ASC to existing one step removed from affecting the real world. This awareness is also not new. The ASC, like pure mathematics, is well insulated from the real world. That is OK, and is the stated purpose of the society, but having no real-life target for practical application is self-limiting in both scope and vitality. Somehow, the magnificent visions and hopes of the founders of the society are not being realized. Their hopes and dreams were not simply for the ASC to flourish on cybernetic principles, but for the World and Society too. Surely what really matters is not the power or intellectual beauty of our theories, techniques, or technologies, but how they are applied in the real world. In particular, whether their application is for the good of the planet and people, or not. Now this is finally starting to sound more like a Grand Challenge :-)

We would like to see a new emphasis on making the world a better place. Wasn't that the essence of the founders' hopes? With hindsight, we can see that their assumption that the world would eagerly adopt cybernetics for the greater good, naïvely underestimated the power of greed and selfishness. We could argue whether such idealistic goals belong in the realm of second-order cybernetics, general systems theory, sociocybernetics, politics, or something else, but we'd rather use our hindsight and energy to purposefully re-accept the challenge to be relevant and make a difference.

Extending the Purpose of the ASC

Firstly, we require the ASC to open up more to having a closer involvement with the real world:

> II/1: We suggest augmenting the ASC Constitution with a third purpose, with the following flavor: "The facilitation, promotion, and application of cybernetic principles for the advancement of the World and Society." − where cybernetic principles is understood to include second-order cybernetics.

That change is intended to expand the sphere of influence of the ASC. Perhaps some people will claim that this "new" purpose is already implicit in the existing purpose statements, but we feel that it must be stated clearly.

Enabling and requiring a Grand Challenge

We want to go beyond mere statements of intention or purpose by proposing a vehicle for activity. An ideal vehicle would be a Grand Challenge[2] that rallies interest and participation:

> II/2: We propose including a constitutional requirement that the Steering Committee should seek, define, and maintain a Grand Challenge that infuses the society with vitality and purpose.

These two steps are still not sufficient. And we've just delegated even more to the as-yet non-existent Steering Committee, which is a questionable technique for solving problems. But so that the committee can make a running start, we would like to propose the first Grand Challenge[3].

Selecting the First Grand Challenge

To talk of requiring a Grand Challenge without proposing one would be cheating; like providing a short-cut to nowhere. But how should we select a suitable Grand Challenge from all the problems that exist in the World and Society? Ideally, a Grand Challenge has the potential to become a rich field for theoretical and practical exploration. In our case, something that second-order cybernetics can help to solve, that is multidisciplinary, and isn't already owned by an existing discipline.

To kick things off, we must be pragmatic and start with something that can provide a starting impulse to make the ASC system dynamic again and to attract participation in making something new and exciting happen. After much thought and reflection on the problems that face us today and

---

2   The need for a Grand Challenge was inspired by Johann Eder's "Grand Challenges for Computer Science Research" presentation at the 20th European Meeting on Cybernetics and Systems Research, organized by the Austrian Society for Cybernetic Studies, Vienna, 6-9 April 2010. *Cybernetics and Systems 2010* (ed. Robert Trappl), pp. xix-xxv.

3   We can't expect a fully mature grand challenge at the first attempt. Let's start somewhere, and trust self-organization, the workgroup, and steering committee to refine and formulate as necessary to get a well-formed Grand Challenge.

the opportunities that exist for us to make a difference helping to solve them, we are ready to propose our final concrete action:

II/3: We propose establishing an open workgroup that will focus on the first Grand Challenge of studying world metrics and social indicators.

The "Open Metrics" project will promote research, standards, and the effective definition, measurement, and publication of reliable feedback for the World and Society. A good metric can change the world by influencing awareness and perception of priorities and behaviors of politicians, corporations, and individuals.

Currently, such measurements are defined, measured, and published by many different organizations, ranging from governments and special interest groups to international charities and the United Nations. Metrics range from standard government statistics to hybrids such as the "Quality of Living Survey[4]", which has been successful at causing the residents and politicians of bad scoring cities to seek to emulate more successful cities. However, it doesn't help if each city or country has its own way of measuring national, social, or environmental indicators. Comparisons require standardization. Establishing standards for the field of metrics will improve transparency, decision making, and improve the predictive powers of simulations that consume the metrics.

Good progress is being made in some specific areas, such as standardizing the definition of the Ecological Footprint[5], yet other areas and higher theoretical levels need more work. Some metrics are manipulated for political and financial reasons. Others cause unforeseen counter-intended effects as a direct side-effect of people becoming aware of the metric. There is no doubt that this problem area is fundamentally second-order cybernetic, and multi-disciplinary in nature.

In this figure, the dashed line around "Metrics" conveys the new expanded boundary for the ASC Organism that, via the multi-disciplinary Grand Challenge, becomes highly permeable to ideas and people, and brings an end to the isolation and impotence from which the old ASC Organism suffered. Over time, the "Open Metrics" project can grow organically to encompass more aspects at different levels of the World and Society.

---
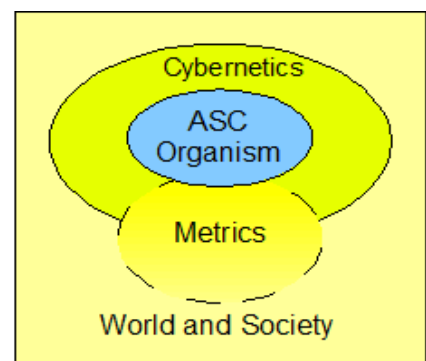
4 Mercer's annual hybrid metric ranks 221 cities based on criteria such as safety, education, hygiene, health care, culture, environment, political-economic stability, and public transportation.
5 Defined as a standard by the Global Footprint Network, this is the source of the better known Carbon Footprint.

This is an area in need of standards, research, and publicity. And no existing group is charged with herding all those cats into providing ordered and trustworthy feedback to the World's leaders, organizations, and people, who collectively, are the feedback-driven controllers of the World and Society. By focusing on metrics, we can gain the chance to make a significant contribution to helping provide the World and Society with the means to make better informed decisions.

Why Metrics?

Our use of the term "metric" includes concepts such as social indicator, key performance indicator, essential variable, and environment variable, however we believe that metrics deserve to be recognized as a new class of feedback.

Well-defined metrics are not just numerical measurements, they are complex entities that can have an underlying purpose, preferred direction of change, comfort zone, alarm levels, and short/medium/long-term target values. Each metric, has a known history, and comparable sampling locations (set of other cities, schools, hospitals, countries etc. that use the same metric).

A controller's effectiveness depends heavily on the quality of his, her, or its feedback. Metrics can be powerfully influential, in decision making, financial rewards, and elections, and are the subject of both intentional and unintentional distortion. A good metric should be tamper-resistant. Whenever a performance metric is defined, some parts of the system might adapt and distort around it. Absurd examples are plentiful.

Traditionally, we think of feedback as being a one-dimensional signal, such as voltage, temperature, or employee turnover rate, that is measured, and travels a well-defined path in the system to a limited number of known recipients, which tend to be the decision making subsystems or people responsible for steering the system, achieving targets, and avoiding disasters. Early cyberneticians were concerned about the capacities of feedback channels, which were a significant limitation at the time. Now, primarily through advances in microelectronics, bandwidth and measurement precision are no longer the limiting factors that they used to be.

In contrast to traditional feedback signals, which are effectively hardwired for limited distribution in the system, public metrics are broadcast. Defining a metric, measuring it, and publishing it is a second-order cybernetic act that amplifies a deliberately selected feedback signal by making it available to anyone who can make good use of it. Everyone in the World with an Internet connection can access any public metric. The field of metrics is a powerful point of leverage that can benefit greatly if we direct our attention and efforts to it.

Conclusion

These proposed changes in structure and purpose are designed to engineer, promote, and refine second-order cybernetic principles, activities, and emergent altruistic behavior, that benefits the health and vitality of the ASC, the World, and Society in general.

To be bold enough to consciously and deliberately reach beyond ourselves, to accept a Grand Challenge for the greater good, would be an act of self-actualization. The alternative is to shrink back into the safety of our shell as non-participating observers.