

Handout for Global STS Network Montreal Meeting Inter-Organization Design Session September 19, 2014

Inter-Organization STS Design Model Prototype ¹

Introduction

The focus of early Sociotechnical Systems (STS) theory and practice was work design within single enterprises. But by the mid-1960's, Eric Trist and Fred Emery had shifted their focus to the causal texture of organizational environments. Emery and Trist (1965; 1973) recognized that the post-World War II disturbed-reactive environment was giving way to a turbulent environment characterized by unprecedented levels of interdependence and complexity. They observed that the institutional forms and modes of adaptation that emerged during the disturbed-reactive environment of the industrial era were becoming increasingly maladaptive and were generating dysfunctional consequences such as recession, maldistribution of wealth, worker alienation, and environmental degradation (Perlmutter and Trist, 1986).

At the same time, it is becoming increasingly common place that enterprises and social initiatives involve networks of various actors from single sectors such as supply chains and across multiple sectors in the form of public-private partnerships. But not all networks are the same because it depends on the foundational worldview – attitudes, premises, values, beliefs, motivations, and interactive modes -- upon which they are built. The industrial era paradigm of the last 100 years continues to value limitless and unconstrained economic growth, dominance, dependence and competitive individualism, the separation of thinking and doing, and tight hierarchical control of subordinates, all of which were manifest in the technocratic bureaucratic form that populated the institutional landscape.

Conversely, the formation of **sybiotic partnerships** represents the core system principle of the nascent worldview that Perlmutter and Trist (1986) described in their remarkably prescient *Human Relations* article, Paradigms for Societal Transition. The logics of this emerging paradigm are **ecological** and **holistic** and reflect the fundamental interdependence of open systems. The emergent ethos, then, in an increasingly interconnected and interdependent world, is **collaboration** – rather than conquest -- and it is built on the recognition of their interdependence, the cooperation of interest groups, the identification of shared purpose, congruent values, continuous learning, and adaptive planning (Ackoff 1970).

While STS was (and still is) effective in the debureaucratization of single organizations, practice at the societal level was less fully developed, even though much of the theory had already been well-articulated. We believe it can re-emerge as a powerful approach for this new paradigm, but at a higher level of social system – **inter-organizational** - and it can be even more successful if coupled with other robust approaches of organizational transformation.

¹ Our starting assumption underlying the model is that people have already recognized their interdependence and the need to collaborate and that they are coming together to design and carry out the work.

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Inter-organizational networks in STS have been defined by Trist (1983) as networks that form an “inter-organizational domain” versus networks that describe an “organization set”. An **organization set** is an internal network or system of relations that any single organization needs to maintain with other parties in its transactional environment – think traditional supply chains. **Inter-organizational networks at the domain level** engage with a set of challenges or a societal problem area that constitutes a domain of concern for its members, making the set of organizations involved “directly correlated” (Sommerhoff, 1950, 1969) with the complex problem area, often called a *problematique* (Chevalier, 1966) or *mess* (Ackoff, 1974). The issues involved are too extensive and too many-sided to be coped with by any single organization, however large. Thus the response capability required is both inter- and multi-organizational - the type of network design STS is most suited for. Trist has said that “facing a future of increasing complexity means trying self-regulation within interdependence, learning how to cultivate a new logical type.”

This new logical type, which he called a “referent organization”, is regulative, not operational; controlled by the stakeholders involved in the domain, not from the outside; open to external inputs, but whose activities are centered in the locale of the domain. Furthermore, he says that if this domain level of inter-organizational interdependence is not developed towards a desirable human future, we face either a very high degree of totalitarianism or isolated, fragmented, competing entities, neither of which can hold a complex society together. Furthermore, he says that “the needs of domain development in the face of contemporary meta-problems have become so great that their design needs to be undertaken at a more conscious level than has hitherto been the case. This will make them more purposeful, more able to learn from their failures and successes and more able to seize opportunities.

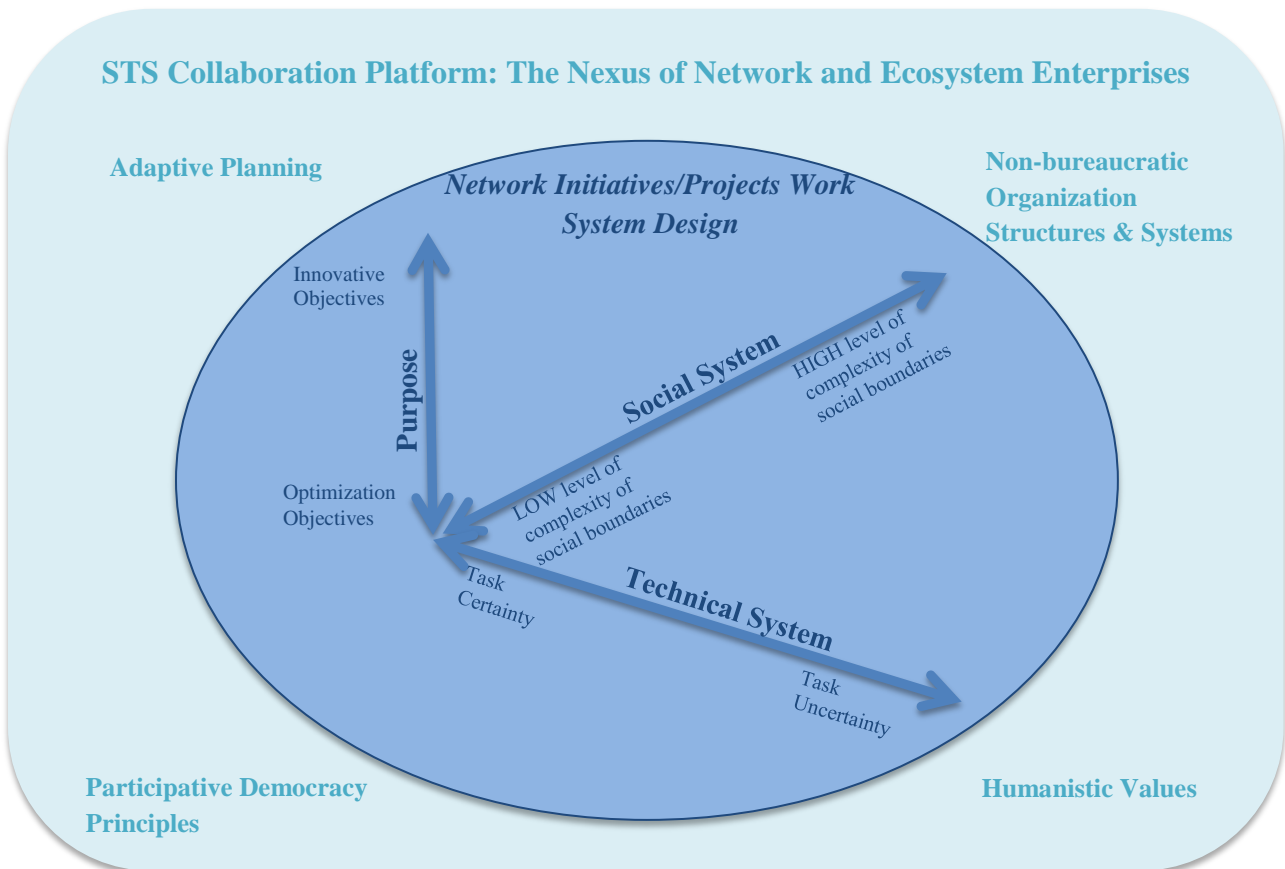
In Europe, the thinking about the applicability of STS to the network organizational form has been similar. Van Hootegeem, Huys and Bender (2011) have described how modern STS can be revitalized in a new organization form, networks, in which the focus of work is the end-to-end creation and realization of value, and not a single organization. They define a network as a complex system of interconnected links of organizations and business functions, each adding a specific value to the overall process; the boundary of the system determined by the choice of relationships the stakeholders who interact in all these subsystems define.

De Sitter states that “The boundary of a system – and thus the system itself – is more of a thinking construction than a reality” (1997). There is a dialectic around purpose – Who are we? How do we allocate our resources? How far does our responsibility extend? Who can say something on our behalf or make promises? -- that Korver (1998) uses to define all individuals who maintain a working relationship as the boundary for the organization. STS is unique in that it does not predefine a boundary, only that a boundary must be set in order to design the system. This boundary is set, not using the traditional criteria of time, territory and technology, but by the relationships and their interactions.

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We have translated Trist's ideas about *self-regulation within interdependence* as the design of:

1. STS Collaboration Platform and referent organizations
2. Self-organizing and self-regulating work of the network (initiatives and projects)



STS Collaboration Platform

As practitioners of STS design, our distinguishing proficiency is the design of humane, open, and scalable **STS Collaboration Platforms** organized around mutually beneficial stakeholder value propositions -- within enterprises, across sectors (for profit, not for profit, government, industry), organizing contexts (individuals/teams, firms, networks, ecosystems), and business models.

An STS collaboration platform clearly promotes **sybiotic partnerships** with a set of clearly defined design elements that are integrated in a holistic framework:

- **Humanistic values** that foster free will, autonomy, challenge, mastery, community, a sense of purpose, and reciprocity
- **Participative democracy principles** that allow everyone to sense, learn and act on events in real time

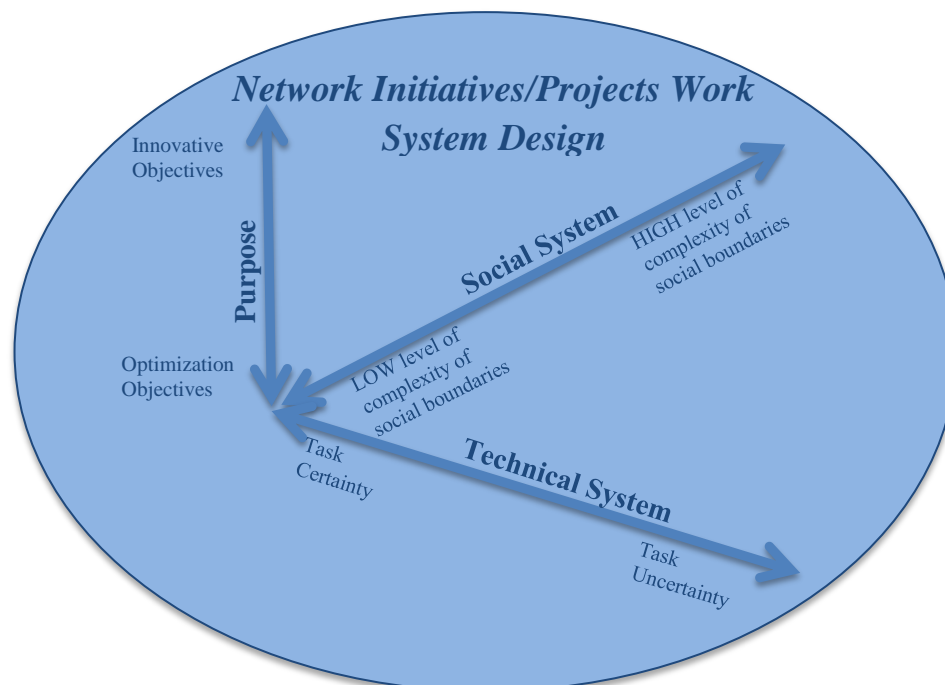
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- **Adaptive planning** based on participative design workshops to create systems maps and carry out stakeholder network analysis; build cultural frames through storytelling frames such as scenario planning; doing hypothesis testing and prototyping via methodologies such as human-centered design in order to create an emergent strategic framework to address complex problems
- **Non-bureaucratic organization structures and systems** that focus on strengthening the systems and relationships that generate solutions, rather than on constructing the solutions themselves

Within a platform, defined by a complex problem area, are many small ecological learning communities, (we have only illustrated one) formed around an initiative or project to address the problem area, that draw their organizing capability from a coherent ecological and holistic paradigm called the STS collaboration platform.

Self-organizing and self-regulating work of the network: Initiatives and projects

Participants draw on the **STS Collaboration Platform capabilities** to organize their own emergent work. The following is a description of a **work system design model** with its three key elements – Purpose, Technical System and Social System. Each element is described by a continuum that places the initiative or project in its appropriate context.



The purpose of an **Inter-Organization STS Model** is to facilitate the ease in which collaborations based on STS shared values of people, planet and prosperity can occur or can be designed. In an emergent and

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constantly changing world, there is no one way to design collaborative work. A variety of tools and approaches are needed that match the specific context of the work to be done. The plethora of collaborative tools and approaches and the fact that they are derived from both of the paradigms, the techno-bureaucratic and the STS, tend to be confusing. ***This Inter-organization STS design model is intended to help designers make informed choices about which of these tools and approaches result in the vision of humanity they want.***

We hope this model will show participants that in all the examples presented on Friday morning, despite their diversity, there are three elements and a set of questions to be addressed that are particularly STS in nature. The Friday morning session offers an opportunity to consider examples of real world efforts to build collaborative, inter-organizational initiatives that both respond to forces that undermine the movement toward a more equitable and humane world and are grounded in shared purpose and values of equity and sustainability. We will hear presentations from four long-time members of the STS Roundtable:

1. **Pam Posey – public education (Snohomish County, Washington, USA)**
2. **Doug Gamble - manufacturing (Manufacturing Renaissance)**
3. **Nina Gregg – new economy, governance and values chain initiatives (Appalachian Harvest, Opportunity Threads, Carolina Textile District)**
4. **Pete Sorenson – offshore oil and gas exploration and development (Deepwater Horizon, US Department of Interior, Bureau of Safety and Environmental Enforcement)**

Each presentation has implications for inter-organizational STS design, for public policy, for enterprise design and for human and social well-being -- and for what will be necessary to achieve humane, open and scalable organizations that are sustainable and deliver shared prosperity.

The Inter-Organization Design Model Prototype – Guiding Questions

The ***STS collaboration platform or referent governance system*** continually produces learning about how to design to achieve these values in every aspect of organizing. In a techno-bureaucratic world, the governance system is hierarchical command-and-control; even in benevolent systems, human beings are seen as parts, resulting in very narrow participation, especially in adaptive planning and organization philosophy. In STS, we value using everyone's input, regardless of level and function, insider or outsider, in the formation of mutually beneficial partnerships.

Salient questions that we will explore through these rich presentations include:

- How was the governance or coordination system (i.e., the STS collaboration platform) defined? How were humanistic values fostered by the governance or coordination system?
- How was participative democracy achieved? How was the system designed and how did it work?
- How was adaptive planning (emergent strategic framework) demonstrated in this case?
- How was the organization philosophy derived – with whom, what processes, etc. – and what types of non-bureaucratic structures and systems resulted?

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- How are all the above continually renewed?

The ***Network projects/initiatives*** are the collaborations in action. Participants draw on the STS collaboration platform to design, plan and organize their own emergent work. The network projects/initiatives design approach has three elements, which need to be considered to help people organize according to STS values. These are purpose, technical system and social system. Each element includes a continuum that places the initiative or project in its appropriate context.

Purpose

We are enabling people to achieve a high degree of shared purpose. For each issue we are trying to resolve, we need to think about the purpose as broadly as possible to elicit a passion that avoids trade-offs and results in co-creation at a new level of understanding.

In a techno-bureaucratic world, the squeakiest wheel gets heard and often determines the purpose from a particular perspective. In STS, we are *strengthening the whole ecosystem simultaneously from the broadest lens of perspectives* – social, technical, financial, ethical, legal, environmental, etc. For example, underlying our four presentations for Montreal is “shared prosperity”, and each presentation will show how its purpose was defined with these values in mind.

Some questions which may elicit how this was done:

- What is the goal of the collaboration? In what degree of detail can this goal be described?
- What approaches/tools were used to bring about this shared view of the goal?
- To what extent do all participants in the collaboration have a shared perspective/idea about the goal? Why?
- Is the collaboration necessary to create added value? How does collaboration add value?

Social systems

According to our assumption, the members of the inter-organizational network have already been selected; this network of people is called a “discretionary coalition” who accomplishes the shared purpose and manages technical system. While the technical system determines what body of expertise in the form of a person or party is brought to the deliberation, the social system is about the relationships among individuals that produce trust so that all voices can be brought to bear on the deliberation.

In a techno-bureaucratic approach, hierarchical power is the driver of relationships and this is grounded in all the support systems as well. In STS, informal and formal relationships have equal consideration and all support systems need to actively support the collaboration.

Some questions which may elicit how this was done:

- How were the members of the discretionary coalition selected?

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- What criteria were used? Was this done explicitly, or implicitly?
- What is the link between on the one hand the kind and number of participants, and on the other hand the purpose of the collaboration?
- Whose voice is brought to bear when and how in the discretionary coalition to achieve unity of meaning and consensus on action?
- How do the support systems actively support the STS collaboration?
- To what degree are multidisciplinary teams being formed that cut across the boundaries of participating organizations?
- Can the decision latitude be characterized as decentralized?
- Does the collaboration in the inter-organizational network primarily take place via hierarchical structures or directly between employees?
- What are the necessary communication characteristics between the participants of the inter-organizational collaboration?

Technical System

Once the purpose is shared and the participants formed into a network, people need to start *organizing* to work on the issue. They need to determine what kind of work needs to be done – linear or nonlinear and what bodies of knowledge are available and how they can be used to do this work.

If there are available codifications of knowledge to supply sufficient solutions in relation to the purpose at hand, the technical system is defined as linear. Process is the key design element of a linear technical system and describes the transformation of problems into solutions through well identified problem – solving steps.

If a given purpose cannot be dealt with by the available knowledge, then this signals it is a nonlinear technical system - a degree of uncertainty. Deliberations are the key design element of a nonlinear technical system that involves a diversity of thinking and other intelligence capabilities to create knowledge. Deliberations describe the dynamics through which the technical system moves through equivocality, i.e. from a one state of nonlinearity - uncertainty - to a state of lesser nonlinearity - more certainty. The technical system is a product of earlier deliberations that were forged by preceding discretionary coalitions (social systems).

In a techno-bureaucratic approach, only specialist or expert knowledge may be deemed legitimate to draw on and analysis considered the favored thinking approach. In STS, multiple intelligence sources are used – expert and “hands on” as well as cognitive, emotional and others and both analysis and synthesis are valued. Also knowledge is looked at not only in terms of facts, but also in terms of the paradigms that underlie its creation.

Some questions which may elicit how this was done:

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- How was the work (deliberations) system and its boundaries defined and by whom? What types of intelligence were used?
- What types of tasks are people doing and is this knowledge work or not? (I.e. did people co-create knowledge in a non-linear way or did they just use already codified work, e.g. manuals, etc. that layout the solution?)
- What was the degree of uncertainty (the number and the variety of disturbances) at various stages of the collaboration? If uncertainty increased, why so? And if it decreased, why so?
- How was this uncertainty minimized? (e.g. what coordination mechanisms were used by participants to do so)
- Is the division of labor structure in line with the characteristics of the environment and the transformation process?
- Is every participating organization responsible for and specialized in a functional part of the transformation process?

These design elements –purpose, social system and technical system - are developed in stages for collaborative projects as follow:

Stages in Inter-Organizational Network Development

Stage 1: Start-up

- Recognition of a vexing social need/issue and the limits of current single sector approaches
- Identify key starting stakeholders
- Convene key stakeholders to achieve shared purpose and vision and shared will
- First action is goal specification to vet the challenge they are facing and to specify the purpose of the collaboration
- Next action is means specification. Participants have to decide on the levers that they have available to them to tackle the challenge at hand: “what tools/knowledge do we have already to accomplish the goal that we aspire to here?” This forms the system boundary.
- This start-up stage is about weighing the goal of a project against the available resources/means. Essentially this is a knowledge management stage to determine the starting point of a project.

Stage 2: Setting up a collaborative structure

- Co-design the different elements (especially coordination mechanisms, governance structure, information flows, etc.)
- The second stage is about creating a work environment that offers the potential to make measurable progress towards the goal/purpose
- Ideally a structure is designed that:
 1. Offers the necessary problem-solving capacity
 2. Allows the needed cross-functional coordination
 3. Enables participants to experiment sufficiently, but not too much
 4. Operationalizes an initial design

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- Essentially this is a balancing exercise across the three elements (purpose, technical system, social system)

Stage 3: Implementation and making progress

- As a project moves on, the idea would be that it becomes increasingly clear to all involved how to attain the goals that have been set.
- The knowledge that is needed should become increasingly clear and codified and therefore more easily transferable to other parties.

Stage 4: Adapting the design of the collaborative structure to the requirements of each stage

- As the nature of the goals of a project, as well as the availability and applicability of the project evolve, it will be necessary to revise the design of the collaborative structure as well. E.g. in a construction project there is hand-over from the architects to the building companies; in product development there is a handover from the R&D and engineering departments to the manufacturing units; in IT there is a handover from requirement specification to technical designers and developers, etc.
- The design can go in either way towards more or less organizational unity as the project moves on.

Stage 5: Knowledge codification and transfer

- To the extent that a collaboration has generated knowledge and experience that helps to avoid inventing tap water the next time a similar challenge comes along, it is advisable to codify what has been learned and to transfer this to others in some way.

*This model is presented as a prototype for learning and experimentation in the Inter-Organization Design Session in Montreal on September 19, 2014. It has been created according to an original STS principle, “**mimimal critical specifications**”, that is specifying nothing more than is absolutely necessary. The focus is on a simple rather than overly complex and restrictive approach that promotes dynamic, rapid, iterative “design-ing” and mutual adaptation, which is also a characteristic of good design in general.*

The members of the Inter-Organization STS Design Model Team are:

Doug Austrom
Hakim Benichou
Don de Guerre
Laura Jacobs
Seth Maenen
Betsy Merck
Carolyn Ordowich
Peter Sorenson

If you are interested in future learning events on this theme, please send an email to Doug Austrom daustrom@tpaconsulting.com or Seth Maenen seth.maenen@flanderssynergy.be.

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