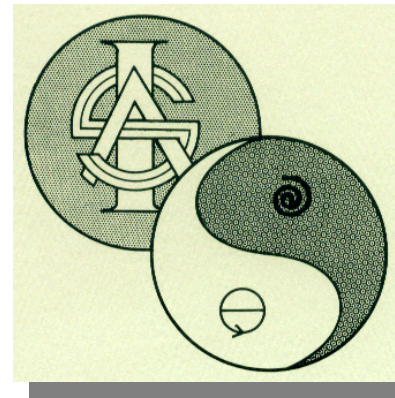


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A Meta-model of General Systems Processes and Their Linkages Hyperlinked to Supporting Peer-Reviewed Research Materials

Conventions and Techniques for Use of and Contribution to the GenSysML Tool: Computer Programming of the System of Systems Processes GST Model

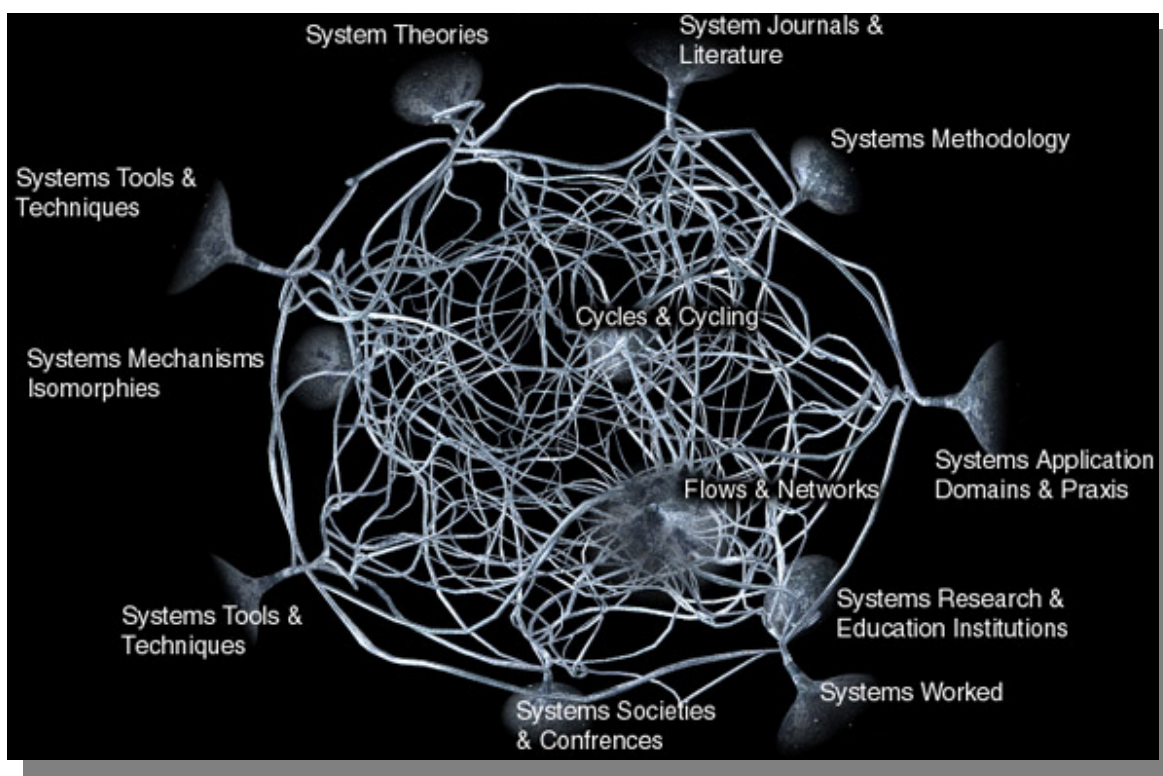


A “Scheme of Ideas”

...the true method of philosophical construction is to frame a scheme of ideas, the best that one can, and unflinchingly to explore the interpretation of experience in terms of that scheme... All constructive thought on the various topics of scientific interest is dominated by some such scheme, unacknowledged, but no less influential in guiding the imagination. The importance of philosophy lies in its sustained effort to make such schemes explicit, and thereby capable of criticism and improvement.

—Alfred North Whitehead, “Process and Reality”

Organizing the Complexity of Interacting Parts

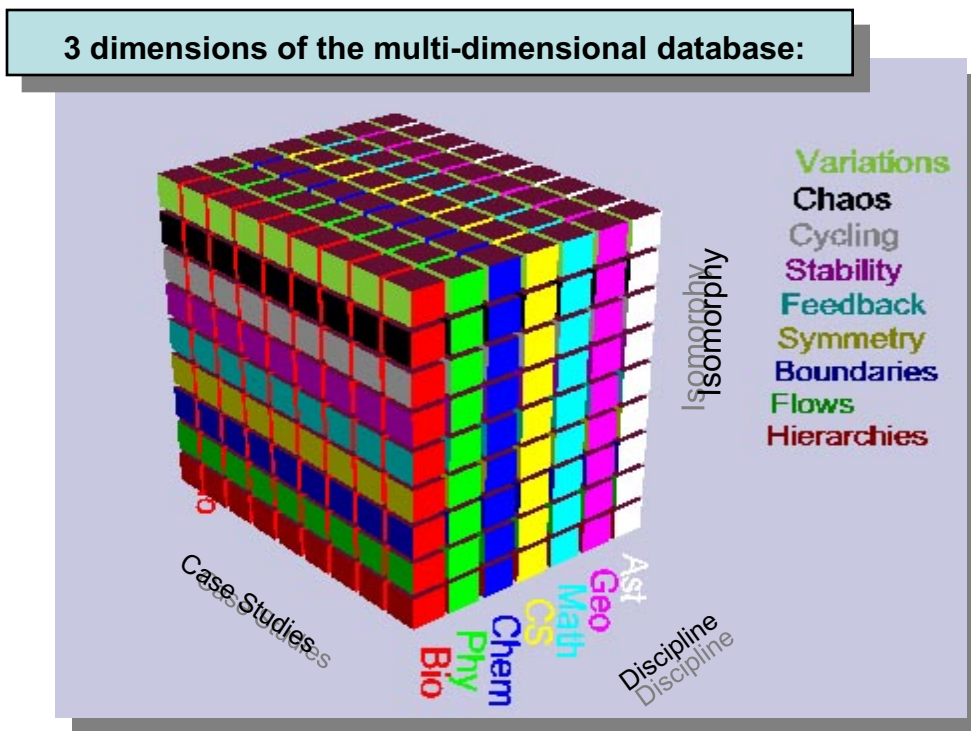
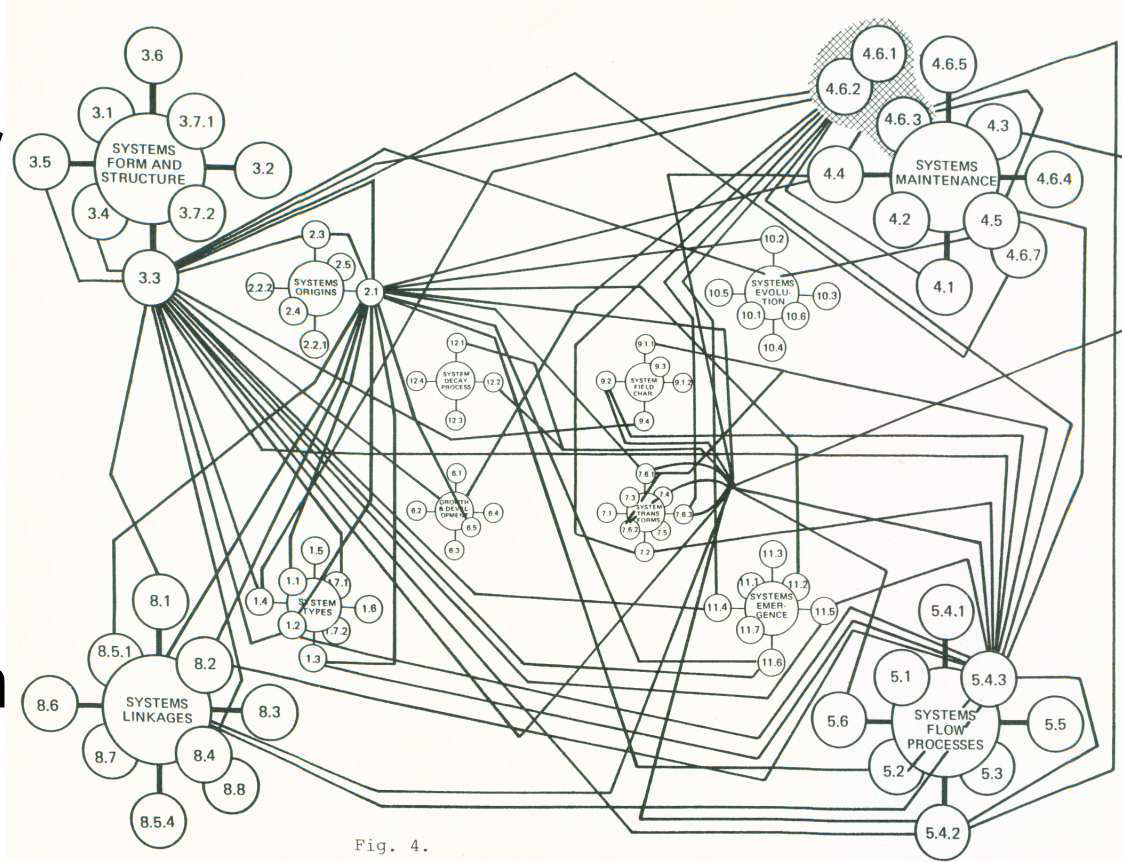


... characteristics of “wholes” are typical for all groups of interacting parts when the parts maintain some basic sets of relationships among themselves...The systems view is the emerging contemporary view of organized complexity, one step beyond the Newtonian view of organized simplicity, and two steps beyond the classical world views of divinely ordered or imaginatively envisaged complexity.

—Ervin Laszlo, “The Systems View of the World—The Natural Philosophy of the New Developments in the Sciences”

A Tool for the General Systems Researcher

This poster outlines the software design for a tool based partly on the SSP Model (Troncale, 1978, 1982, 1984, 1986) that any general systems researcher could use as an internet-based resource platform. Our premises are that: 1) There is a need for a shared repository and coordination center for information describing fundamental components of candidate general systems theories and their supporting research materials. 2) That information needs to be readily accessible by a researcher or student over the internet using a browser. 3) Analysis and discovery of meaningful data should be user-driven and intuitive via an intelligent, graphics-based interface. 4) An open standards-based means of transactional data exchange is needed to facilitate computer-to-computer interchange and query. 5) General systems researchers and student users should be able to regard this system and its capabilities as a tool for their work in General Systems, becoming an aggregate expression of what is known and enabling more consensus across a field ironically known for fragmentation rather than synthesis. As a collection of independent but interrelated results, the specific findings of any one researcher may be supported by corollary and corroborative findings by others.



A Shared Repository Based on Open Standards

The General Systems research community is invited to submit information which will be provisionally accepted pending a review and authentication process yet to be determined. All submissions include contributor identification and a timestamp. Transactions for insertion of new materials and owner-updates of existing data will be sent in XML format and must comply with the emerging GenSysML schema. Compliant XML templates and sample html pages with cascading style sheets will be made available. Because information is completely encapsulated within the schema, the underlying information systems may be replaced or rebuilt from the transactions themselves.

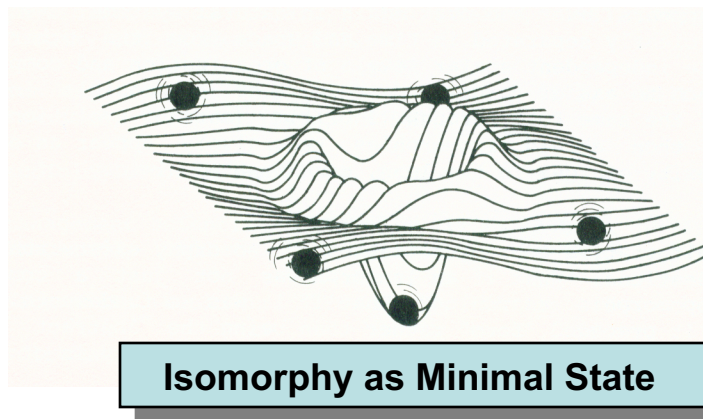
We are currently planning a multi-dimensional data warehouse built from open sourced SQL databases housed at the California State Polytechnic University. Ongoing augmentation and reconfiguration is planned so that the GenSysML model adapts to improvements in our conceptual understanding, accommodates new features and incorporates suggestions and requests from our international audience of students and scholars. Even in these planning stages, we welcome your input and insight.

A Framework Upon Which to Organize Findings

Contributions in GenSysML are categorized as: isomorphies, linkage propositions, information bits and references to supporting and related materials.

Isomorphies—the Nodes

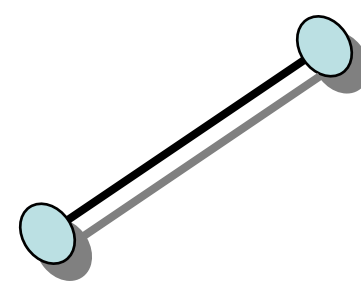
The basic unit of the SSP. Each isomorphy represents a pervasive “mechanism” or “process” pattern recognizable in nature that is functionally generic, i.e., supportive of the argument that the special [real] cases [in manifest systems] are all variants of a more general, single case... Used to define, describe, diagnose and prescribe characteristics of systems... Each is thought to be scale-invariant, transdisciplinary, and essential to the origin, stability, maintenance, and continuance of a healthy system. —L Troncale, “Selection and Sequencing of Systems Concepts for Systems Education”, ISSS Proceedings, 1993.



Data items, referenced objects: Name of isomorphy; definitions; identifying features or criteria (qualitative, descriptive); comparative definitions; intriguing examples in real systems (exemplars); case studies; role or function in Systems Life Cycle; discinymys (discipline-specific synonyms); types and taxonomies; formal development (references to models which may be mathematical); tests for transdisciplinarity; analysis of requirements and prerequisites; special techniques; relationship to systems’ analytical methods; role in known pathologies of systems; design intervention opportunities (DIO’s); discovery and history; data to-date; multimedia; evaluation of current status as isomorphy, future questions; literature database (citations); institutions and workers...more.

Linkage Propositions—Dynamic Connections

Expressions of all known interactions or couplings between isomorphies, forming a transcendental network—a system of systems processes (SSP). Each is an interaction-influence-association statement between isomorphies (a many-to-many relation). Makes discreet and testable hypotheses about how systems mechanisms work together as a whole.

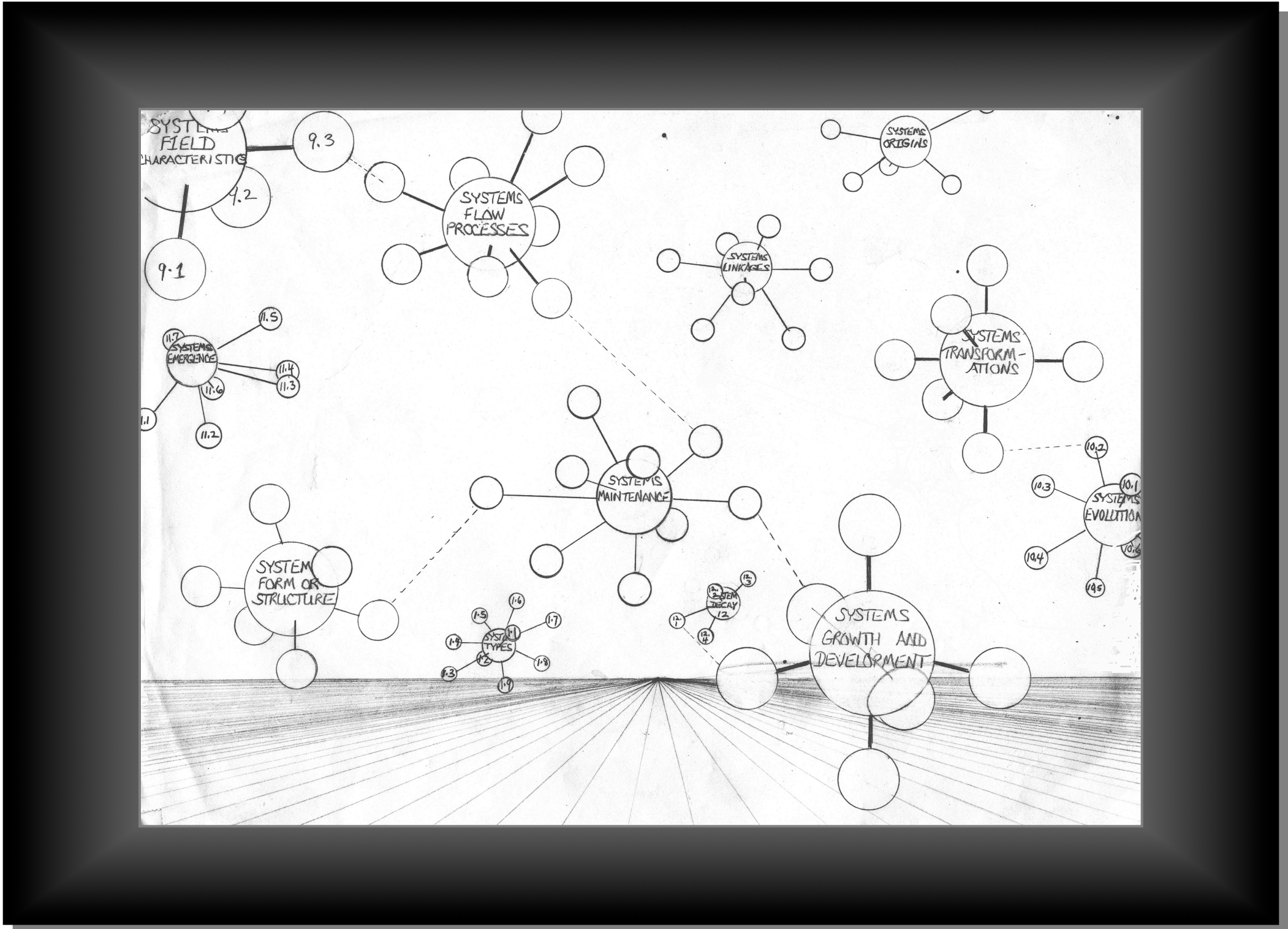


GenSysML supports LPs as defined in “Towards a Formalization of Systems Linkage Propositions”, L. R. Troncale and B. H. Voorhees; General Systems Yearbook, 1983; information bits include rules and links to citations and case studies.

In system science, similarities of process, structure, behavior, and effect—whether expressed mathematically or not—are described as isomorphic... Most of the tools of systems analysis, and most of the explanatory power of systems theory derives from isomorphies and...these are, therefore, the proper focus of study of general systems... Isomorph[ie]s are the fundamental level of information in general systems science. All else is built up from the level of isomorphy. All else is philosophy, design of practical tools, epistemology, application, or description of methodology. Isomorph[ie]s are the principle systems concepts, the “special knowledge” of the field, the theoretical basis.

—L Troncale, “Knowing Natural Systems Enables Better Design of Man-Made Systems: The Linkage Proposition Model” from “Power, Autonomy, and Utopia: New Approaches toward Complex Systems,” 1986, R. Trappl, Ed., Plenum Press, NY.

Show me all of the Linkage Propositions connected to the isomorphy, “Boundary Condition.”



Show me the linkage net between isomorphies with linkage propositions of type “necessary and sufficient for...”

Follow the linkage trail from this isomorphy along this <preselected> linkage trail...

Show me the linkage net between isomorphies “Damped Oscillation” and “Disequilibrium.”

Give me a view of all linkage propositions using any of the following keywords in the statement: “suspected”, “may”, “might”.