SYSTEMS THINKING RESEARCH REDISCOVERED:
LUDWIG VON BERTALANFFY AND THE SOCIETY FOR GENERAL SYSTEMS RESEARCH'S
RELEVANCE IN THE 21ST CENTURY

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ABSTRACT

This paper ties the roots of Systems Thinking to its crucial relevance for the future by reviewing the influence and work of the Society for General Systems Research (GSR). It is important to understand the history of Systems Thinking and its original definition that is the Foundation of ISSS. This definition is often lost to the detriment of many current practitioners who lack foundational theory. An understanding of the Systems Thinking Approach as the Core Technology of the Haines Centre addresses the recent failure of the economy and rejuvenates many professional, management with practical applications.

The father of Living Systems Thinking and founder of the Society for General Systems Research (later the ISSS) was Austrian Ludwig von Bertalanffy. When Bertalanffy helped formed the GSR in 1954, his goal was to find a unity of science for all complex living things on earth.

The result is Systems Thinking, both an old and new orientation to life. It is the "natural way the world works," giving a simpler, yet holistic view of individuals, teams and organizations as they survive and thrive in today's complex and dynamic global environment. The holistic outcome-oriented approach to Systems Thinking distinguishes it from other narrow and fragmented analytical approaches to life and work. While critical thinking is an important practice, Systems Thinking extends and revolutionizes it in a more extensive and practical way.

Four interrelated main concepts help clarify and simplify how we view our complex world. These concepts— or strands of DNA that compose Systems Thinking— provide a broader mental map to see, think, understand, diagnose and act more effectively.

1. The first DNA strand is the Seven Levels of Living Systems: cell, organ, organism, group, organization, society and supranational system. The paper will focus on the three levels that affect organizations— individuals, teams and organization— and their three levels of collision: one-on-one, team-to-team, and organization-to-environment.

2. The second concept is the Twelve Natural Laws of Living Systems on Earth. These laws, organized into internal and external strands of life— help to point out natural similarities in humans at all Seven Levels. They also aid in comparing Best Practices with traditional human and organization dynamics.

3. The third strand is the ABCs of the Systems Thinking framework. These five Phases provide a simple yet comprehensive approach to integrative and holistic Systems

Thinking. The application of these concepts is Strategic Thinking, a "backward thinking" approach that starts with the desired future, then works backwards to develop plans, strategies and actions to "close the gap" and reach desired outcomes.

4. The fourth DNA strand is The Rollercoaster of Change™, the natural and historical reaction to any desired change. This individual and physiological reaction to change is normal and highly predictable. By anticipating natural reactions, a Systems Thinking approach prepares practitioners for every hurdle they might face in implementation.

With the recent failure of the economy, there has never been a better time to return to the basics. This paper focuses on returning to fundamentals that are often forgotten, in order to replace the cycle of failure with a cycle of success. By returning to the roots of Systems Thinking, practitioners can examine and build on past successes, launching their own cycles of success in whatever ISSS sub-group they join.

Keywords: Living Systems, Systems Thinking, Best Practices, Strategic Thinking, Ludwig von Bertalanffy, Society for General Systems Research

SYSTEMS THINKING RESEARCH REDISCOVERED

Systems Thinking is a heavily researched and rigorous macro-scientific theory with its roots in the Universal Laws of Living Systems on Earth, as well as ecology and biology. Analogous to DNA in humans, Systems Thinking defines our life-giving characteristics.

Austrian Ludwig Von Bertalanffy is one of a few intellectual titans of the 20th Century and the father of General Systems Theory and Systems Thinking, which began more than 50 years ago. Systems Thinking has been a recent focus of Dr. Russell Ackoff (Renaissance Professor Emeritus at University of Pennsylvania) and Dr. Jay Forrestor (Professor at MIT), among others. In fact, my consulting firm has identified more than 25 scientific disciplines— including electronics, architecture, complexity and chaos theory, project management, etc.— whose leading thinkers and writers are moving in the direction of Systems Thinking.

Systems Thinking is an old — yet newly rediscovered — higher orientation to life. It is a better, more natural and holistic view of living systems (such as individuals, teams, and organizations) as they try to survive and thrive in today's dynamic environment.

In short, it is an advanced method of critical thinking. It brings a higher intellect along with an interdependence and connectedness stage of human growth and maturity to bear on life's issues. Holistic, integrated and more purposeful, Systems Thinking's outcome-oriented approach distinguishes its practitioners from consultants whose focus is on the components or separate issues and functions of an organization—a more narrow, piecemeal and fragmented analytic approach.

A system is defined as "a set of elements or components that work together in relationships for the overall objectives/vision of the whole." The focus of all systems' elements in an organization is attaining an organization-wide shared vision of customer satisfaction within today's complex and changing environment.

How we think, is how we plan, is how we act— and that determines the results we get in work and life. Systems Thinking is a higher order thinking about the whole system first rather than its parts.

Background of Systems Thinking

In 1954, von Bertalanffy formed the Society of General Systems Research (now ISSS), along with Margaret Mead and three Nobel prize nominees from economics (Kenneth Boulding) physiology (Ralph Gerard) and physics (Anatol Rapoport). His "General Systems Theory" is the long-term result of these five superstars whose goal was to find "a unity of science for all complex living things on earth." Von Bertalanffy was even nominated for a Nobel Prize himself by Buckminster Fuller, another renowned Systems Thinker, but died before he could be receive the award only granted to the living.

While von Bertalanffy is relatively unknown, his impact through his disciples is enormous. One such disciple is Peter Drucker—the most revered management thinker, the father of management thought and number one management consultant in the world in the 20th Century. Also was from Vienna, Austria, Drucker was influenced by von Bertalanffy and his Society of General Systems Research. Others von Bertalanffy influenced include Aldous Huxley, Karl Menninger, Arthur Koestler Norbert Weiner, Russell Ackoff, Abraham Maslow, Ervin Laszlo, Erik Erikson and Jean Piaget.

Perhaps more well known is W. Edwards Deming, the father of quality and the TQM approach. The "T" in TQM means "total" or "entire system," which was Deming's approach as another renowned Systems Thinker. Unfortunately his thinking was not initially accepted in western management and society, so he went to Japan, where he was so revered that their top quality award is the "Deming Prize." The United States later established the "Baldrige Award for Quality," a much less prestigious name.

One of Deming's prime clients in Japan was Toyota, which has the famous "Toyota Management System." Even with recent setbacks in 2010, Toyota has become one of the world's largest and most profitable automobile firms, surpassing General Motors. Despite learning about Toyota's management system through their joint venture in Fremont, California, called NUMMI (New United Motors Manufacturing Incorporated), GM never could implement Toyota's successful management system because GM's culture rejected its concepts.

In fact, it takes a higher, more integrated intellect and level of human maturity (Erickson's "Interdependence Level") to utilize this different and more effective worldview. Some people see and understand it naturally, but others never get it. As Martin Luther King said of church and religion, "Many attend but few understand." However, many leading theorists are moving towards the higher level concept of Systems Thinking in their writings, and seeing the world as one living system due to global warming has only accelerated this view.

Concepts and Research: Four DNA Strands

My consulting firm's Systems Thinking Approach® uses four interrelated main concepts from more than 50 years of research to clarify and simplify the way we view our complex world. These concepts help us improve as individuals, teams and organizations, giving us a broader framework or mental map to see, think, understand, diagnose and act

more effectively. The most powerful way to improve our effectiveness is to improve the way we think.

The four interrelated Systems Thinking DNA concepts are elegantly simple, providing ease of use in our complex and chaotic world. This paper will overview these four strands of DNA concepts.

DNA #1: The Seven Levels of Living Systems

The Seven Levels of Systems Thinking are in hierarchical relationships with each other, systems within systems. These beginning with earth as the largest living system and extend all the way down to cells, the smallest living system:

1. Cell
2. Organ
3. Individual
4. Group, team or department
5. Organization
6. Society or community
7. Earth

These interrelated hierarchies of systems show that hierarchies are natural and normal. The focus is to have the minimum hierarchy, not bureaucracy, working with you to achieve your goals or outcomes. Further, it is the "collision of systems" within and among these levels— especially levels three, four, five and six— that creates the complexity and chaos we often feel in today's world. The three key levels of living systems that affect organizations are individuals, teams and organizations. Their three levels of collisions/collaboration are one-to-one, team-to-team and organization-to-environment.

The Seven Levels of Living Systems can be envisioned as concentric circles or rings rippling out from the individual to society. There are purposes for developing each ring:

Ring #3—Individuals ("Self Mastery")
- To Improve personal competency and effectiveness
- To work on trustworthiness issues within oneself

Ring #3A—One-to-One Relationships ("Interpersonal Skills")
- To improve the interpersonal and working relationships and effectiveness of each individual
- To work on trust issues between individuals

Ring #4—Work Teams or Groups ("Team Effectiveness")
- To improve the effectiveness of the work team and its members
- To create empowerment and work on role or relationship issues

Ring #4A—Inter-Group ("Conflict Cooperation")
- To improve the working relationships and business processes between departments in order to serve the customer better
- To work on horizontal collaboration and integration issues

Systems Level/Ring #5—Total Organization ("Fit")
- To improve the organization's structures and processes to better achieve business results and develop its adaptive response system capacity in a changing environment.
- To work on alignment and attunement issues.

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Ring #5A—Organization-Environment ("Strategic Plans")
- To improve the organization's sense of direction, response to its customers and proactive management of its environment.
- To adapt to environmental issues.

DNA #2: Twelve Characteristics of Living and Open Systems

Standard and predictable system and organizational dynamics are based on Twelve Characteristics of Living and Open Systems, which stems from the research of the Society of General Systems Research. The original research was first published in the society's 1972 yearbook through the *Academy of Management Journal*. This research listed the 12 Codes or DNA of Successful Living Systems of all types, organized along two similar DNA Strands (our internal and external "strands of life") that allow us to compare people and organizations.

Based on the characteristics of General Systems Theory, standard system dynamics include several elements. In the whole system, "the whole is greater than the sum of the parts." This is characterized by six best practices:
1. Holism—Overall broader, purposeful perspectives and synergy.
2. Open Systems—Open to the environment.
3. Boundaries—Interactive and collaborative boundaries the environment.
4. Input/ Output—Natural systems operation.
5. Feedback— The framework for transformation.
6. Multiple Outcomes—Outcomes- and consequences-oriented.

All living systems also have standard internal relationships and dynamics, which are marked by six laws:
7. Equifinality—Flexible and adaptive.
8. Entropy—Need for renewal and continual reinforcement.
9. Hierarchies—Flatter, more productive order, rather than rigidity and bureaucracy.
10. Interrelated components—Parts are not separate entities.
11. Dynamic Equilibrium—Maintain stability.
12. Internal Elaboration—Details, sophistication and simplicity.

There are a wide variety of dynamics we all see daily as a result of organizations being systems without realizing why and how these dynamics occur. Learning about these dynamics and understanding them is critical for maximum effectiveness.

All systems are actually subsystems of larger systems within their environment. There is an actual hierarchy of these living systems.

DNA #3: Five Phases of the Systems Thinking Framework

Within today's dynamic and ever-changing environment, the standard functioning of every living system includes a circular framework. My consulting firm copyrighted this framework as the Five Phases (A-B-C-D-E) of the Systems Thinking Framework:
- Phase A: "Creating Your Ideal Future" (Output)
- Phase B: "Measurements of Success" (Feedback Loop)
- Phase C: "Converting Strategies to Operations" (Input to Action)
- Phase D: "Successful Implementation" (Throughput/Actions)
- Phase E: "The External Environment" (Context for first four phases)
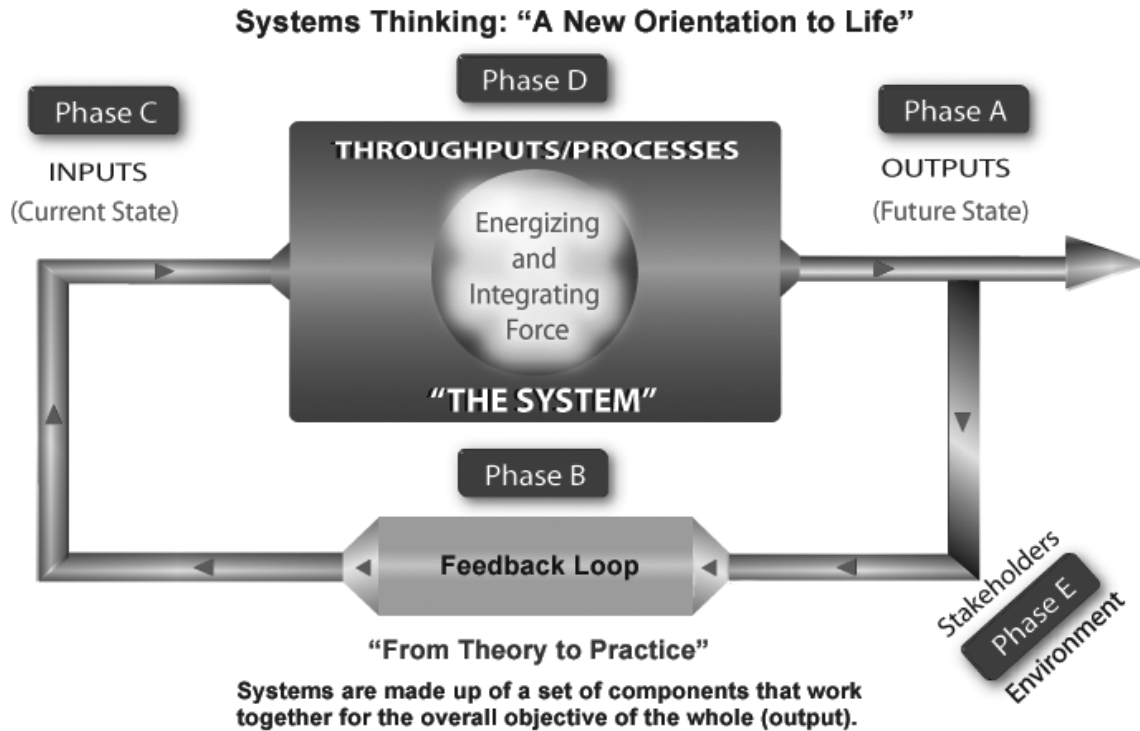
Figure 1. The Simplicity of Systems Thinking

To fully comprehend this system, two terms must be clarified: "Systems Thinking" is based on more than 50 years of scientific research on the characteristics of the "natural way the world works" as a hierarchy of living systems within living systems. "Strategic Thinking" is the application of Systems Thinking to the world's problems, issues and challenges at all seven levels of living systems. This can be described as taking a "helicopter view" of work and life, and it's based on Albert Einstein's famous quote: "Problems that are created by our current level of thinking can't be solved by that same level of thinking."

Too many executives and managers are using the term "Strategic Thinking" without knowing or understanding what it really means. In terms of the Five Phases of the Systems Thinking Framework, "Strategic Thinking" takes place in Phases E, A and B, first and foremost. And it begins with Phase E, because this approach to life requires "backwards thinking"— thinking from future to the present to realize the actions necessary for achieving desired outputs.

Strategic Thinking is also seeing the connectedness and integration of the components of the system, Phase D, with each other, with the desired outcomes and with all the key stakeholders in the environment. In sum, Systems Thinking is the scientific research and Strategic Thinking is its application.

There are many uses of Five Phases of Systems Thinking:
1. Coordinating a Comprehensive Strategic Plan.
2. Creating a Micro Plan or a Quick Strategic Plan, shortened versions for small to midsize organizations.

3. Developing a Business or Functional Strategic Plan, a shortened Three-year Business Planning Process for a line business unit or department.
4. Developing Goals for Strategic Change, an overall change plan for a major project.
5. Creating a Strategic Life Plan.
6. Creating a plan to improve customer value.
7. Implementing Strategic Human Resource Management.
8. Improving your Leadership Development System as a competitive edge.
9. Employing an Organizational Systems Model to systematically assess, redesign and implement change efforts to dramatically increase success.
10. Enhancing team effectiveness.
11. Creating a learning organization by implementing The Systems Thinking Approach® and these learning/feedback concepts, especially Phases A, B and E.
12. Guiding Project Management.

DNA #4: The Rollercoaster of Change™
      The Rollercoaster of Change™ is the natural and historical "cycle of change," which is based on the Twelve Characteristics of Life on Earth. It is the meat of 20 so-called "different" change theories used to assist senior management and all employees in being proactive, innovative and more successful with any kind of personal, team or organizational change. It is the organizing framework for strategic and systematic change processes worldwide.
      My consulting firm called copyrighted this as the "Rollercoaster of Change" because it charts the emotions and reactions that result from implementing change. It is important to note that this individual and psychological change cycle is "natural, normal, and highly predictable." This rollercoaster is a simple way of understanding the dynamics of how to effect positive changes of all types. The cycles from stability to change to instability to new stability are normal and natural. Instead of fighting the inevitable, use it to your advantage.
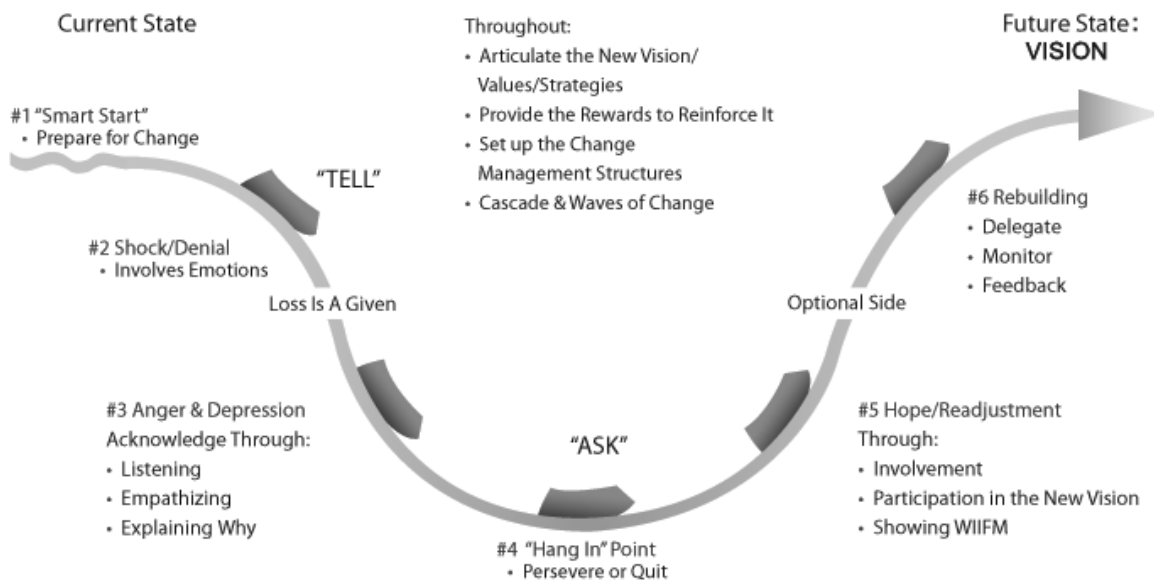
Figure 2. The Rollercoaster of Change

While everyone goes through these stages at different rates, depths and times, it is important to manage them simultaneously.

- Stage #1: Smart Start—Conduct a Plan–to–Plan Day to get educated, assess the situation and organize and tailor the change process before beginning.
- Stage #2: Shock and denial—Be better prepared, give advance notice and clear expectations regarding standards and norms of behavior.
- Stage #3: Depression and anger— Listen, empathize and, only then, explain why the new vision and the change is necessary.
- Stage #4: Hang In—Persevere during the change.
- Stage #5: Hope and adjustment—Clarify each person's new role and new norms of behavior, finding ways to gain maximum involvement and understanding to achieve the new vision and values.
- Stage #6: Rebuilding—Empower the fully committed individuals and teams toward the vision and values. Then stand back, monitor and follow-up.

This Rollercoaster helps as a frame of reference to guide you through any kind of change and is particularly useful in the following situations:

- Coaching and counseling others.
- Working through change and transition.
- Learning new knowledge, ideas and skills.
- Facilitating team building.
- Guiding others through redesign and restructuring.
- Managing technological changes.
- Defining and implementing new corporation strategies.
- Learning how to dialogue to truly discover new solutions.
- Leading organization-wide and cultural changes.
- Developing a foundation to create "The Learning Organization."

The Rollercoaster's application is universal in today's constantly changing environment. Keep in mind that any kind of major change causes this rollercoaster to start. While Stages #2 and #3 are automatic, Stages #4, #5 and #6 only occur effectively with proper leadership and management.

Conclusion

The Systems Thinking Approach® reaps many benefits, including:

- A framework to think strategically and a way to make sense out of life's complexities.
- A way to learn new information more easily, as basic rules stay the same from system to system.
- A better way to learn and a higher order of strategic integration of new ideas within the systems context and dynamics.
- A clearer way to see, understand and assess what is going on in an organization or in any system. Complex problems become easier to understand as do the interrelationships and the multiple causes and effects.
- A new and better way to design solutions, create strategies, solve problems and keep the outcome, vision or goal in mind at all times.
- The unveiling of new and higher points of leverage for strategic change that might otherwise be ignored.

- Teams and people who engage in deeper analysis and identify root problems that, when addressed, provide longer-lasting results and less negative by-products.
- The identification and strategic resolution of issues requiring a deeper structure and obscure relationship improvement that is not obvious by the "quick fix" mentality.
- The development of a common set of terminology and language to improve communications, teamwork, learning and results across the organization

Remember that these four DNA strands of Strategic and Systems Thinking must interrelate and work together for the overall good of the whole system. Using these concepts and applications in collaboration with each other to maximize success. Otherwise, you are using a piecemeal, more linear, analytic approach instead of a higher order of strategic intellect and critical thinking—The Systems Thinking Approach®.

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