

A Brief History: The Impact of Systems Thinking on the Organization of Schools

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Abstract

Over time humans have experienced and learned how to more effectively organize to produce great performance. In the early history of organizations observation, trial and error became key to greater organization performance. The sharing of knowledge overtime became the heart of the learning organization. Once organizations became the subject of formal study scholars discovered the potential for improved performance was greatly increased. This new knowledge applies to schools as schools are one of the best examples of systems thinking in action. School leaders are now learning they are leading a system in fact the most dynamic type of system, a living synergistic social system.

Keywords: Organization performance, analytical thinking, leadership tools, natural forces, synergistic social systems.

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Those who best understand the history that created the present can best leverage the future. Since the dawn of time, organizations have evolved in response to human needs. An organization is viable when two or more persons working together can accomplish more work than the same number of persons working separately. Organizations are synergistic by nature.

Organizations Over Time

From the earliest bands of wandering pre-humans to the Egyptians, Huns, Greeks, Romans, Chinese, and Mayans, humans have used organization as a survival tool to achieve their intent. We can speculate humans learned from their organizations' successes and failures. Organization memory emerged as the key to creating a learning organization. This was accomplished through experimentation, observation, and the ability to capture and share what was learned from experiences. This ability to capture, and retrieve organizational memory is key to the evolution of more effective future designs with higher performance levels. This ability allows organizations to benchmark their performances and apply more effective designs (Pande, Neuman, & Cavanagh, 2002).

The process of implementing more effective designs has not been quick or linear. Because organizations, just as humans, operate from entrenched theories (mental models), resistance to change is built into each design. Mental models only yield to more effective mental models when confronted with extreme environmental conditions or from overwhelming evidence significant advantages can be demonstrated by embracing the new mental model (Senge, 1990).

Early in the twentieth century, the study of organizations began to be formalized. What previously had been learned from passing knowledge down from one generation to the next by military, church, government, and business leaders, became a more formal field of study. The study of organization performance evolved into a science. Practitioners and scholars became interested in how better designed organizations could accomplish more work (Schlechty, 2002). Initially, however, their biases focused on how to better manage the individual workers and their work (Taylor, 1913).

Humans are Tool Users

Our world, our culture, and our very existence rely on our ability to use tools. Even our bodies are tools. Life requires we knowingly or unknowingly facilitate energy flow as a prerequisite to living and working. Humans, above all other earthly creatures, have the potential to use tools and exponentially facilitate energy flow. The use of tools for successful performance applies both to individuals and organizations.

Focus on analysis. Since the Renaissance, the world of study has been dominated by analytical thinking (Ackoff, 1991). This thinking dominates our current world view and for good reasons. By breaking down processes, systems, and functions one can discover how something works.

The analytical approach led to great strides in all fields. It is difficult to name a single aspect of human activity that has not been touched by the analytical approach to thinking and problem solving. By applying analysis, humans began to better understand the role of bacteria and viruses in the control of diseases. Steam engines, internal combustion engines, and nuclear power are all products of this powerful thinking tool used in conjunction with systemic thinking. The application of analysis to organizations produced significant leaps in organization performance. Interchangeable parts, assembly line, mass production, division of labor, job descriptions, selection systems, management by objectives, hierarchy, command/control, motivation theory, human needs, planning, organizing, and supervising among others are all primarily products of analytical thinking. Over time, practitioners and scholars began to recognize the value and flaws inherent in applying analytical thinking to organization performance (Ackoff, 2010).

Organizations as Machines

The formal study of organization performance began in the 20th century with a primary focus on organizations as machines (Taylor, 1995). Significant gains in organization performance were realized by applying this approach.

The impact was so overwhelming no industry could resist applying the basic ideas of assembly line/mass production technology and autocratic governance. Even today, this approach is the foundation on which most organizations are built.

Humans are not mechanical parts. Over time it became obvious humans were not machines. This simple observation led to studies demonstrating the unique ways humans react to each other in a work setting. Humans, unlike machines, are not mechanical parts. Human thought and decision making ride on a river of emotions (Pert, 1997). Humans have needs. In order to best optimize organization performance, these needs must be part of any organization design strategy.

Looking back, the machine metaphor was applied to work and organization at a time when workers had low needs. Complementing this low level of need was the fact that workers had little formal education and few skills. Since the supervisor had more knowledge and skills than the workers, an autocratic type of leadership was effective. The environment was ripe for the mechanical view to produce high levels of organization performance. In most organizations in modern industrial societies these conditions (workers with low needs, little education, and few skills) no longer exist (Conley, 2007). The working environment has changed and the need to view humans as social animals is based on what we have learned about the human condition (Brooks, 2011).

Systems Thinking Begins to Emerge

Little by little, scholars began to realize organizations were not machines. This understanding became more universal as the study of organizations continued throughout the 20th century. Although many managers still view organizations as machines, social scientists have developed theories that present the organization as a system.

It became clear managers were leading systems, but had almost no knowledge of how systems worked. Significant gains in performance became possible when leaders moved from managing the organization as if it were a machine, mechanical system, and began facilitating the organization as a social system (Turner, 1991).

Social organizations are types of very complex social systems called living synergistic social systems. A living synergistic social system has the ability to create the conditions for its own existence. Living synergistic social systems are thinking systems (Maturana & Varela, 1992). Their ability to facilitate energy flow is a result of all the parts of the system functioning as a whole. Wholeness, thinking, and creativity are attributes that exist only when all the parts of a living synergistic social system are viable and supportive of each other. Living synergistic social systems are products of the synergy that results from the interactions that create their wholeness. The essential nature and almost all of the value of a synergistic system resides in its synergy-producing interactions (relationships) and not in its parts. Like all systems, living synergistic systems cannot be separated into parts and maintain their essential natures.

The systems movement revealed flaws in the assumption that organization performance is the sum of the performance of each part taken separately. In contrast, systems thinking revealed the interactions among the parts of a system produce most of the system's performance. In this case the 80/20 rule applies (Koch, 1998). Eighty percent of the systems performance potential is found in the interactions among the system's parts while 20% of the total performance of a typical system is found in the parts themselves.

The administrative leader who treats a system as a machine is focusing only on the parts separate from the system as a whole. The machine age leader by focusing on the parts of the system is only tapping into 20% of the system's potential. According to system's theory, the leader could increase the system's potential by shifting the focus to the interactions of its parts. By designing and facilitating an increase in the number of meaningful interactions among the parts of the system, greater synergy is produced; thus the flow of energy is increased.

In a living synergistic social system, the design typically refers to the structure and the parts refer to the people. The structure creates boundaries in which a certain number of interactions are possible. The workers in the organization determine if the interactions are meaningful. Therefore, meaning is shifted from the leaders to the workers.

As the systems movement matured, scholars observed the need to look at the system's containing system in order to better understand and leverage performance. Organizations aligned with the containing system's intent produced additional gains in organization performance. The concept of alignment became an important tool for leveraging organization performance (Green, 2003).

According to Green (2003), additional performance tools for the third millennium are based on:

- facilitating natural forces governing individual and organization performance
- relying on learning and the effective use of organization learning
- featuring natural laws, mental models, living synergistic social systems, and structure (dynamics)
- using a pattern of systemic leadership
- operating in a stable or unstable environment. (p. 5)

Natural forces are those forces created by the Universe, not humans. Some would say natural forces are those inherent to society. Regardless of which view one has, humans can learn to facilitate and apply natural forces to significantly improve the flow of energy resulting in improvements in individual and organizational performance.

How does systems thinking impact schools and school leadership? Humans are tool users. We are designed to be active and curious. We are always looking for a new tool, a new way (Pink, 1995). The need to discover and use tools effectively applies to individual and organization performance. In turn, these same requirements apply to schools and individuals operating within schools. Student achievement is a product of the use of both mental and physical tools.

Student achievement is a reflection of the performance potential inherent in the tools we provide to school personnel and how they are used. Understanding the capabilities of various tools and their use is at the heart of any learning about individual and organization performance.

The performance tools currently being used in schools were not chosen by the persons working in schools today. The performance tools now in use were chosen four generations ago. That is to say, as we move through the third millennium, we are using performance tools chosen by persons who long ago moved into the hereafter. Even the persons they trained are now deceased. The performance tools that have evolved over generations and still employed by most schools are based on the following:

- applying analytical solutions
- relying on training focused on improved behaviors and attitudes
- featuring programs and practices
- using a pattern of autocratic management and supervision
- operating in a stable environment (Ackoff, 2010, p.24).

Analytical solutions are products of the application of analysis. In analysis, the manager breaks down the problem into small manageable parts and works on the identified parts.

Consider this, about it, 100% of the programs and practices in schools in the late 20th century operated exclusively on the analytical model. Almost every single program and practice was born as a result of analysis. Management development programs are all

products of breaking down a known task or problem and creating a solution to the particular task or problem.

Principal competencies are all products of analysis. By observing outstanding principals and breaking down their behaviors, it is assumed that exemplary practices can be identified, taught, and replicated by others. Of course, this is not true, but it sounds rational. Herein exists the deceit of the current analytical mental model.

The same thinking can be applied to teacher competencies. Most teacher training, observations for performance appraisal and evaluations are based on analysis.

Among the many flaws in this approach is the assumption the participants operate in a stable environment. Most educators would agree schools have never operated in stable environments and have been operating in less and less stable environments over the years.

Even an excellent analysis is flawed. If it were perfect, it would only be good for the day on which it was conducted. What this means is programs and practices are time-fixed, but school environments are constantly changing. Programs and practices have to be updated and retraining is the key means of maintaining analytical performance tools at some level of usefulness.

Not only is the environment changing, but the rate of change is accelerating. This rapidly accelerating rate of change in schools does not allow schools enough time to retrain personnel, and since funds are always in short supply, the process of updating programs and practices is always behind the times. Because the updating and training associated with it require time and funds, the cycle is endless, and schools, as they say, are “a day late and a dollar short.”

Since schools are at different levels of stability, some schools work better than others when analytical solutions are applied. This leads some educators to spin their wheels trying to replicate the processes used at what are considered “better” schools. In the education field this is known as best practices. All of this is an illusion with enormous costs to both schools and taxpayers.

American schools all use performance tools (Senge, 2000). Are there more effective tools than the ones we currently employ? If the answer is no, organization performance would appear to be severely limited. If yes, by increasing our knowledge of these tools we have the potential to realize significant increases in organization performance. Our schools must rethink their choices of performance tools.

Applying only analytical tools has a certain level of impact on performance. The tools of analysis are most effective when used for the purposes of repair. When analytical tools are used for the purpose of improvement beyond the system’s design limits, they can actually reduce performance (Ackoff, 2003). This is why some leaders work so hard and produce so few improvements. They are working on the parts with less than 20% of the system’s potential as opposed to working on the interactions among the system’s parts which can account for up to 80% of the system’s performance potential (Koch, 1998). When schools import programs (e.g., a new math program), they are working on the parts.

As noted, the exclusive application of analytical tools is based on the idea school leaders operate in a stable environment using tools that are products of an analytical process. Since the process of analysis results in the creation of repair tools and not

improvement tools, its use is not a valid performance choice for most school applications in the third millennium.

As we move into the third millennium, management training is the vehicle of choice by universities, colleges, service centers, and district training programs. Most management training focuses on orienting future school leaders to analytical solutions.

“Programs and practices” is the name of the game. Using analysis, the trainees learn more and more about less and less. This is the nature of most analytical practices. The more deeply the researchers apply analysis, the more they learn about smaller aspects of the whole topic.

Analytical leaders are unaware of most of the natural forces that control the flow of energy in living synergistic social systems. A coaching program has revealed a great number of principals and school leaders actually behaving in ways contrary to the natural forces that govern the performance of living social systems (Turner, 1991). In other words, by working harder with good intentions, they are making matters worse. Social systems create cultures. Improvement strategies focusing on an organization’s culture produces the most improvement for the least amount of effort (Lencioni, 2012).

When leaders become aware of system’s thinking (one of the natural forces) and how systems function, they create the potential within themselves to facilitate energy flow within the system in which they work. Since systems thinking is based on naturally occurring laws, they operate effectively in stable and unstable environments relative to the containing environment. Leaders learning the essence of systems thinking constantly build on their knowledge bases, while analytical leaders spend a great deal of their time and energy discarding old knowledge for the replacement knowledge.

Conclusion

The authors see a danger in trying to build better organizations using analysis exclusively. With the emergence of systems thinking we have a new powerful tool for improving organizations. Universities, colleges, school systems, schools and other stakeholder groups are encouraged to become more aware of the emergence of systems thinking and its potential impact on school improvement. Increasing student achievement is possible by applying these learned natural forces.

References

- Ackoff, R. (1991). *From mechanistic to social systems thinking*. Williston, MA: Pegasus Communications.
- Ackoff, R. (2003). *Redesigning society*. Stanford, CA: Stanford University Press.
- Ackoff, R. (2010). *Systems thinking for curious manager*. London, England: Triarchy Press.
- Brooks, D. (2011). *The social animal*. New York, NY: Random House.
- Conley, C. (2007). *Peak*. San Francisco, CA: Josey-Bass.
- Green, R. (2003). *Natural forces*. Tallahassee, FL: Educational Services Consortium.

- Koch, R. (1998). *The 80/20 rule principle*. New York, NY: Doubleday.
- Lencioni, P. (2012). *The advantage*. New York, NY: John Wiley, & Sons.
- Maturana, H., & Varela, F. (1992). *Tree of knowledge*. Boston, MA: Shambhala Publications.
- Pande, P., Neuman, R., & Cavanagh, R. (2002). *The six sigma way*. New York, NY: Mac-Graw Hill.
- Pert, C. (1997). *Molecules of emotion*. New York, NY: Touchstone.
- Pink, D. (1995). *Drive*. New York, NY: Penguin Group.
- Schlechy, P. (2002). *Working on the work*. San Francisco, CA: Josey-Bass.
- Senge, P. (1990). *The fifth discipline*. New York, NY: Doubleday.
- Senge, P. (2000). *Schools that learn*. New York, NY: Doubleday.
- Taylor, D. (1995). *Business engineering with objective technology*. New York, NY: John Wiley & Sons.
- Taylor, F. (1913). *The principles of scientific management*. New York, NY: Harper & Brother Publishers.
- Turner, B. (1991). *The social system*. London, England: Taylor & Francis Group.