

*Images of Organization* by Gareth Morgan  
Chapter 4: Organizations as Brains

Background: American psychologist, Karl Lashley removed increasing amounts of rats' brains and observed the effect this had on their previously learned skill of running through a maze. Up to 90% of the cortex could be removed without significant deterioration in a rat's performance (only a lack of precision was noted.) These experiments reveal the unique capacity of multiple sections of the brain to memorize a function, the only difference being in the level of refinement of the skill.

Images of the Brain: Viewing the brain as a holographic system explains why Lashley's rats were able to function so well even when major parts of the brain were removed. ***Holography*** is a method in which information about a whole image is stored in parts then reconstructed to produce the complete image. Interestingly, any single piece of a hologram can be used to reconstruct the entire image. Most descriptions of brain function are over centralized, focusing on the brain as a CPU that transforms billions of bits of input data into patterns or routines. The hologram image decentralizes the brain's intelligence, suggesting the brain stores and processes information in many parts simultaneously. It is from this, we see pattern and order emerge. One unique feature of the brain that is not captured by the holographic image, however, is that of specialization. We recognize that the brain also has specialization centers responsible for refinement in a particular skill performance.

The paradox of the brain being both holographic *and* specialized is clearly illustrated in the results of ***"split brain" research***. *We are each likely to be either right- or left- brain dominant for a given task. The brain's right hemisphere is known to dominate creativity, intuition, emotions, acoustics, pattern recognition and control of the left side of the body. The brain's left hemisphere is more involved in rationality, analysis, linguistics, visual and verbal functions and control of the right side of the body.* Although different people may bring their dominate hemisphere and resulting strengths to a specific task, both are needed for effective action.

Another image of the brain, suggested by cognitive philosopher, Daniel Dennett, is that it actually has no centralized intelligence. Rather, the brain houses a chaotic process where multiple possibilities are generated and the final coherent pattern comes from diverse parallel activities located all over the brain.

I. Viewing Organizations as Brains: The complexity of brains raises many possibilities when viewing organizations as brains. Morgan discusses these in three interconnected ways: A) Information Processing B) Complex Learning Systems and C) Holographic System

**A. Organizations as Information Processing Brains** : Once known as "the decision-making approach", this emphasizes organizations as information processing brains since organizations work as information systems, communication systems and decision-making systems. Herbert Simon argued, however, that organizations can never be perfectly rational because members have limited information processing capabilities. That is, they usually have incomplete information, are able to explore only a limited number of options/consequences, and are incapable of accurately measuring outcomes. Thus, organizational structures tend to control decision-making by fragmenting, routinizing, and bounding the process in order to make it more manageable. Paradoxically, the impact of Simon's work has been a growth in systems designed to improve the information and tools needed to make rational decisions. Such fields as operations research (OR), management decision systems (MDS), and management information systems (MIS) have provided invaluable tools to large, complex organizations. Even with such helpful tools, organizations struggle in decision-making when uncertainty increases. They usually end up finding ways to control outputs (by setting goals or targets) rather than by controlling behaviors (through rules and programs) or relying on continuous feedback.

One criticism of the information processing perspective is its bias toward left-brain behavior and over centralization (reinforcing the bureaucratic model.) This perspective would be better if it integrated both the left and right brain capacities. The right brain would encompass decisions based on intuition, logic or pattern recognition. It would enable organizations to find solutions that go looking for problems (not vice versa.) Rather than trying to reduce uncertainty, this approach focuses on confronting and moving along with that uncertainty by open-minded thinking and decision-making that goes beyond rationality.

Another criticism of the information processing perspective is that it over-emphasizes the limited-information processing capacities of individual organizational members. Technology is moving us in the direction of more accurate, complete, timely information. This is changing the organizational design of many

companies. For example, with the use of bar codes, merchandise or parts are tracked for demand and stocking. On-line ordering expedites the process and delivery is coded and tracked as well. This replaces the more traditional system requiring human interaction. The networking and technology today have led many organizations to work with just a small staff of central coordinators. Their primary structure is based on a system of electronic intelligence.

**B. Creating Learning Organizations:** Since rapid change is now the norm for many organizations, they are often faced with the added challenge of how to constantly be planning and learning.

1. ***Cybernetics is an interdisciplinary science focused on the study of information communication and control.*** It emerged from the complex design challenge surrounding the firing of a gun at a moving target. Cybernetics relies on ***negative feedback***; a method of error detection and correction involving repeated error corrections based on some specified bounds of acceptable limits. In the end, a “target” or “goal” is reached simply by avoiding error. Cybernetics leads to a theory of communication and learning that stresses a system must:

- (a) sense, monitor, scan important aspects of environment
- (b) relate information to operating norms that guide system behavior (that is, employ negative feedback to create
- (c) desired system by avoiding noxious states.)
- (d) detect significant deviations from these norms
- (e) initiate corrective action when discrepancy is detected

If these four conditions remain satisfied, operations continue to run smoothly in a self-regulating manner.

However, if a change occurs that is outside the specified standards, the system breaks down.

If an unexpected change or problem is encountered the negative feedback system could make a correction that results in inappropriate behavior. So, we see there is a difference between the process of learning and the process of learning to learn. These are also identified as “single-loop” and “double-loop” learning, respectively.

***Single-loop learning*** rests in the ability to detect and correct error in relation to a given set of operating norms.

***Double-loop learning*** depends on the ability to take a “double look” at the situation by questioning the relevance of operating norms.

Proficiency in double-loop learning is not easily acquired. It requires a system that regularly reviews and challenges the basic paradigms and operating norms. Bureaucracies have several obstructions to this learning.

- (a) they operate in fragmented way
- (b) organizational divisions foster distinctions between different elements of the organization
- (c) system of accountability and reward encourage “hiding” problems
- (d) defensive routines are prevalent where people seek to protect themselves and others from embarrassment or threat (leading to “group-think”.)

Peter Senge of MIT points out that most organizations have “learning disabilities” but this admission is a first step toward a solution. In order to become an organization that is capable of learning, the single-loop learning process must be avoided and replaced by double-loop learning.

2. Guidelines for “Learning Organizations”: They must develop capacities that allow them to scan/anticipate the environment for change, question/challenge/change norms and assumptions and allow emergence of new strategy and pattern for the organization. These capacities are elaborated below.

(a) **Scanning and Anticipating Environmental Change:** An organization must embrace environmental change as the norm. This involves the active process of integrating the use of information to work effectively in the present but also be sensitive to any clues that indicate new future possibilities. Such organizations are immersed in their environment. They are involved not only cognitively but also intuitively and emotionally. In this way, they can actually change the environment. Morgan reminds us how much this contrasts with the bounded mechanistic model of an organization that monitors its environment, shields itself from uncertainty, and seeks to maintain a stable internal system.

(b) **Challenging Operating Norms and Assumptions:** The double-loop learning process requires a clear understanding of current organizational assumptions, frames and norms in order to effectively challenge and change them when necessary. This self-reflective process is also known as “framing and reframing.” This allows an organization to avoid being trapped in the status quo; seeing the current reality as the *only* reality.

The method of ***TQM, Total Quality Management***, exemplifies the practice of challenging norms and practices at the operational level. *It is a process where employees seek to root out the forces producing recurring problems, examine existing practices and suggest better ones, and create a mind-set that makes learning and change a top priority.* Problems in TQM occur when strategic and operational dimensions aren't in sync. Often, strategy runs over operation as the organization's operations are more likely rooted in the old bureaucracy.

The culture that instigates double-loop learning encourages change and risk, open dialogue and conflicting points of view, recognizing error, uncertainty and lack of control as resources for new learning (not problems to avoid), and learning through action.

(c) Encouraging "Emergent" Organizations: Creating a "learning to learn" organization requires a shift from the old "top-down" management where leaders provide direction and impose goals. One might ask then, "How are managers and leaders to function?" Instead of targets, double-loop learning evolves from "points-of-reference" that relay vision, norms, values, and limits that leave space for a variety of actions and behaviors. This encourages innovation as well as opportunities to challenge imposed limits.

Often when a goal or end-game is pursued, action and attention is all focused there. Inevitably people edit their understanding of the environment and manipulate it in order to achieve the desired ends. This leads to dysfunction and undesirable consequences. The cybernetic approach would both relay goals *and* limits in behavior. Then noxians are avoided as goals are pursued. For managers, this means encouraging dialogue on the limits of action and the creation of space in which desirable futures, strategies and modes of organization can develop. True learning always creates a paradox of promoting disagreement in order to create a consensus. Skill in managing this kind of paradox is important if double-loop learning is to be facilitated.

The previous discussion emphasizes the need to create double-loop learning in an organization and transcend the single-loop processes. This, in part, relies on the appropriate management philosophy; one that encourages the capacity of learning to learn. It also resets in organizational principles and design, which leads us to the holographic approach to organization.

**C. Organizations as Holographic Brains:** The metaphor of a hologram enables us to view an organization as a system of parts that are continually able to self-organize and regenerate. The holographic organization would have the following attributes:

- a memory accessible to all parts
- ability to process massive amounts of information for different purposes
- able to comfortably manage varied points of view
- "self-contained" units: any unit can take on any challenge
- ability to function even with a major section missing
- capabilities, control and intelligence are distributed so that any single entity could become vital to all
- ability to grow, develop, change with changing experiences

It is common for organizations to possess some aspects of the holographic design but sometimes they are suppressed by more conventional organizational characteristics. Morgan gives us five principles that could help create contexts in which holographic self-organization can flourish.

1. Build the "Whole" into All the "Parts". Below are four ways in which this can be done in practice.

- Corporate "DNA" is the sense of purpose that binds an organization together. Every member should realize the core values and vision of the organization and therefore act in a way that represents the whole. These cultural dimensions of vision and values must still provide the space needed for innovation and change when necessary, as previously discussed.
- Networked intelligence refers to an information system that everyone can access. The system should allow the interaction needed for all members to participate in the organization's direction and evolution.
- Holographic structure is the structure that provides a way to grow large while staying small. One way to do this is to create "break off" units from those that get too large. The small break off unit is some replica of the original large unit, performing the same function.
- Holistic teams and diversified roles will allow break off units to act in a self-organized fashion. This implies that a member's work role is not a specified, unique job. Instead, work teams are created and able to perform multiple jobs. Within each team, multiple people are trained to perform multiple jobs. An appropriate balance of differentiation and specialization must be met, however.

One important point Morgan makes here; some circumstances are not conducive to creating “clone” units. In each organizational environment, creativity is needed in order to put the “whole” into “parts” principle into practice.

2. The Importance of Redundancy: This refers to sharing information, “parallel processing” and other methods used to promote shared decision-making. When an organization creates “multiple drafts” of an idea based on the multiple perspectives of its members, there is great redundancy. Another form of redundancy is that of *redundancy of function* which is achieved through the shared job roles as discussed above.

3. **Requisite Variety**: Since it is impossible for all people to become skilled in all jobs within an organization, the principle of requisite variety should be employed. That is, *any control system must be as varied and complex as the environment being controlled*. If the organization is simple and all skills can be processed by all members of a team then they can exist as a self-regulated work group. On the other hand, if the environment is too complex or large, multi-functional teams must work together to accomplish the mission.

4. Minimum Specs: Managers should define a minimum of details when launching any new initiative. This leaves the necessary space for innovation and creativity. Over-controlling by a manager only squelches this.

5. Learning to Learn: Organizations must employ double-loop learning as described earlier.

#### Strengths of the Brain Metaphor:

- The brain metaphor offers concrete guidelines as to how to create learning organizations.
- It offers a more powerful use of information technology. It is not viewed as a tool to reinforce bureaucracy but rather a way to foster interaction for self-organization as well as shared decision-making.
- It lays the foundation for new management theory. Goals should be accompanied by limits to avoid noxious outcomes.

#### Limitations of the Brain Metaphor:

- Since there is no coherent image of the brain to which everyone subscribes, other metaphors were invoked (holograms and DNA for example.)
- There is the realization that self-organization and the openness required of the metaphor challenges the traditional hierarchical structure and those who hold the “real power.” The application of these ideas will require both a “power shift” and a “mind shift” in the members of an organization.