

Human Performance System Analysis

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Evolution of Understanding

The origins of Human Performance Systems Analysis can be traced from the late 1950's and early 1960's. These were times of activism and social reform in the United States. The field, initially called behavior technology, was a product of that spirit. In the early 1960's a number of behavioral scientists and their graduate students made the decision to take what they had learned in their *learning laboratories* and apply those lessons to real world issues of learning and performance.

They began with the most basic and widespread model of performance, the operant or ABC model. The model describes how a person (or any organism) interacts with and manipulates or responds to the environment. ABC stands for:

One of the earliest applications of this model was programmed instruction (PI). Though it was short-lived (lasting only a little longer than some of the earliest personal computers), it was the springboard for widespread applications. PI focused on all three parts of the operant model. It emphasized the careful sequencing of input information, the need for active responding and heavily concentration on managing the consequence variables – i.e. providing confirmation as a reinforcing consequence for correct responses.

These early practitioners quickly found that the real world is much less controllable than the laboratory, and they learned some powerful lessons when dealing with the many variables that can impact individual and group performance. Human Performance Systems Analysis consists of a few principles and a host of applications. The power of Human performance systems analysis comes from the fact that it is fundamental to an understanding of virtually all forms of purposeful activity ranging from the actions of an individual to the actions of an international organization

The author began his career developing programmed instruction at TMI (Teaching Machines Inc.) in 1960 TMI was the largest and most successful of the PI companies, publishing more than 60 commercial programs and earning revenues in excess of $10,000,000 in its short existence (five years).

Expanding the Model

In 1964 the non profit arm of TMI was awarded a contract with the U.S Office of Education to design a classroom experience that would maximize the benefits of PI. We were now confronted with a more complex task than just designing effective instructional material. We had to do more than just arrange for active responding and confirmation. We had to look at many factors in the environment and consider a total performance system.

We went to the ABC model and looked at how we might be able to expand it to handle greater complexity and make it more useful for our classroom design efforts. We made three modifications to the basic model.

First we divided *antecedent conditions* into two categories

- **Conditions:** things that were relatively fixed or given, such as the physical environment, equipment, resources, etc. (Later we added the social and organizational environment)
- **Directions or Input:** the information or instructions given to a performer that initiated and guided performance

Next we defined the *"behavior"* component of the model more broadly as encompassing the variables associated with the performer. What skill or knowledge was required?

Finally, we also split *consequent events* into two categories of variables:

- Motivational consequences, which encouraged or discouraged continued behavior or performance, and
- Feedback, which provided information to the performer to guide future modification of behavior

The model then looked like this

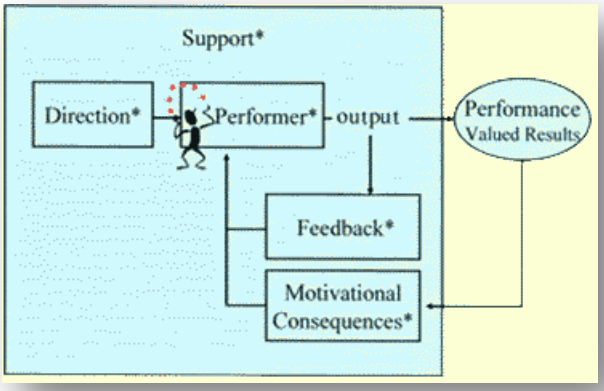
Refining the Model

We weren't the only ones looking for ways to expand the basic behavior model to accommodate more complex situations. During this time many others proposed models for performance analysis, both in print and in presentations. Most of these took a somewhat different approach, focusing on how to diagnose deficiencies in performance. They tended to be troubleshooting and repair models rather than planning and design models – and seemed to us no more comprehensive – and often less so – than our "behavioral engineering" model as we called it then.

But like most of the others building and applying new models, we were always looking for ways to make ours more useful and comprehensive – and two in particular influenced us to modify it.

Systems Approach: Brethower

Perhaps the most significant new idea for performance models introduced during this period was Dale Brethower's presentation of performance as a system (Brethower 1972). It caused us to rethink the structure of our model and reorganize it into a systems framework. Thus our behavior engineering system model evolved into something like this:



The Performance Systems model as shown above provided a framework that allowed us to examine any performance situation in terms of the influence of the five factors. The definitions for the five variables of the performer system were as follows:

- Support: The physical, social and organizational environment that enables the performer to take action to achieve desired results—it consists of the workspace, working conditions, tools, structure and policies.
- Direction: Clear communication of what the performer is expected to accomplish—it may also include information of the means by which it is to be accomplished and the priorities for action.
- Performer: The people who through their conduct and their execution of tasks produce the desired results. This includes the performer's own history, capabilities and skills, interests, etc.
- Motivational Consequences: Events that occur as a result of a performance that either increase or decrease the likelihood of future action by the performer.
- Feedback: Information about the outcome or results that effect a change in the direction or form of the action.

Using a systems framework to structure the model helped clarify the relationships among the variables, as well as make the model more flexible. It became easier to see how to use the framework to either design new performance systems or troubleshoot existing ones. We were hooked. The Performance System Model has been part of all our work since then.

Performance Engineering Approach: Gilbert

Tom Gilbert's first presented his Performance Engineering model at the Washington NSPI Conference in 1969. Gilbert used a taxonomy model rather than a systems model. His model also used the performer rather than the performance result as his reference. He therefore divided the world into three variable categories which were external and three which were internal to the performer.

We preferred to continue to use a Performance Systems Model as our base for analysis rather than adopt Gilbert's Performance Engineering model. We feel there are two major advantages of systems models. First, these models not only identify classes of variables (just as taxonomies do), but they provide insight into the interdependent relationships among the variables Second, systems models in general are scalable. That is, "systems logic" can be applied to individuals, to operations, to the

administration of the whole organization and to the organization's interactions with its marketplace and community.

This last point proved to be of immense importance. Geary Rummler used the systems model to widen the scope of analysis to include variables outside the performer by "scaling up" to include the work processes. Again, it took the field a while to recognize and begin to act on the significance of this work. Among other things, Geary's work demonstrated that much more of the variance in performance was attributable to inadequate processes than by deficiencies in individual performance.

The idea is that the there are basic categories of system variables that can be examined at every level of organization, and that we can to a great extent generalize our analytical methodologies across these levels. This notion provides the performance professional with the opportunity to apply his/her knowledge to virtually every aspect of an organization's functioning. Performance professionals have successfully re-engineered whole companies, changed organizational cultures, created new brand support programs to increase customer retention, provided effective training programs that assure mastery and fluency, installed better quality assurance programs, smoothed the transition in mergers, developed ways to accelerate new product development and helped customer relationship software developers provide more effective implementation.

By the late 1970's, Many people like Geary Rummler had developed a method for looking at the entire organization and could "hunt down" key performance influences by looking at three major levels of organization:

Level 1. Organizational/the Administration

Level 2. Operational/the Work

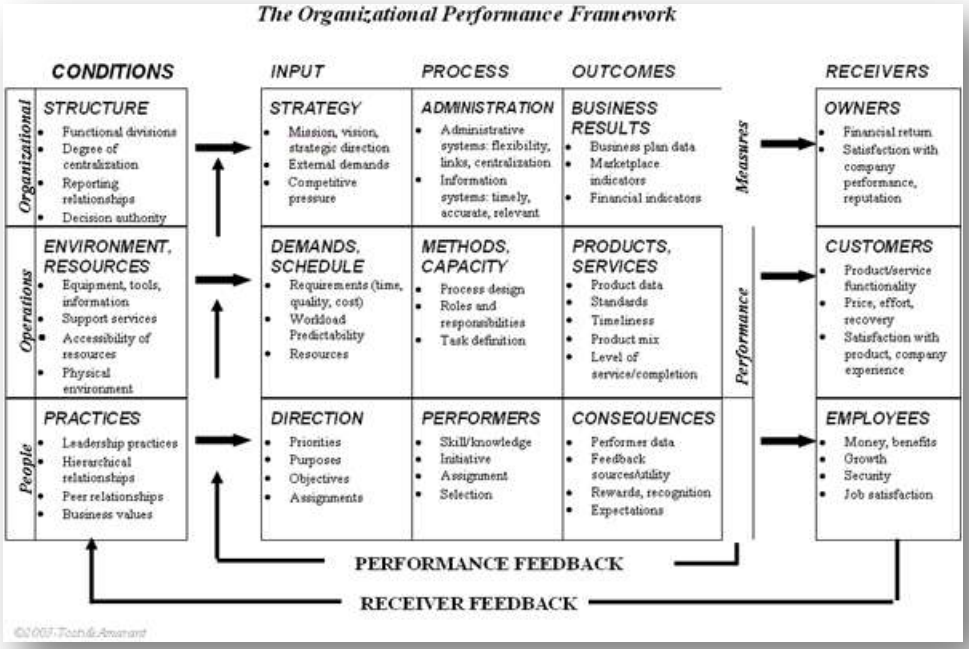
Level 3. People/the Job

Scalability

The power of the systems approach is that it can be "scaled up" to the organizational level or down to the job level. A scalable systems model allows us not only to do a better job of troubleshooting at the job level, but also allows us to move to the operational and organizational levels while maintaining a consistent approach in our analysis/diagnosis. This approach accommodates the need to address complex problems/solutions where problems at various levels are magnifying the consequences of problems at another level.

The graphic on the next page illustrates the power of the scaled systems logic. It uses the five categories of the performance system to identify system variables for each of the three primary levels of organization. This permits one to organize the million or so variables that can effect the organizations performance into a single workable framework.

Adding the three most important stakeholder/receivers of value; the owners, customers, and employees we can use the Organizational Performance Framework for either for analysis and diagnosis or for planning and design.



Human Performance Systems Analysis uses a Two-dimensional Logic

So far we have been looking at the organization in terms of what might best be called a Functional Systems viewpoint. That is one that looks at the transition from initial conditions to the receiver. It represents a sequence of the functional sequence of activities that form a value chain and which can be looked at in terms of systems logic. The Performance System Framework shows how Functional Systems Analysis can work at any one of the three levels.

The Functional Systems viewpoint provides a horizontal systems logic driven by the resulting value consequences. Functional Systems Analysis applies to:

- The execution of the work at the job level
- The processes that make up the value chain at the operational level
- The administrative systems and management practices that function at the organizational level

There is another way to view a complex system and that is in terms of the alignment between the various levels of organization. For example if we wish to analyze the human body we could start with the cell, then how cells work together to create a particular organ. Next, we would look at how the organs work together to form a functional system like the nervous system or the digestive system. This second form of systems analysis looks at how the various levels of the organization support each other in the production of the results. We refer to this as Alignment Systems Analysis. It is the vertical dimension of performance.

The concept of alignment applies to both the external alignment of the organizations with its community, marketplace, and business environment, and the internal alignment of the organizations across the levels of administration, operations and job. Internally the organization should be aligned around the results the organization is striving to achieve.

The Organization Alignment System: Linking the levels

The functional systems logic is important to understanding how well the components integrate with one another **within** a given level of the organization. The alignment systems logic allows us to analyze the relationships of components **across** levels. Alignment of sub-systems is critical to optimum performance of any complex system – an organization, the human body, an automobile. If the various sub-systems are not aligned, they cannot work together to produce optimum results.

The Strategy/Tactics Factor; *Aligning Processes*

Managers have the job of implementing the strategy. They do this tactically by making sure that the three levels of organizational complexity are vertically aligned to achieve results. This is done to the design and execution of operational processes. This requires using the strategy and mission as a means of aligning goals and objectives, then aligning processes with those goals, and finally by aligning the tasks that people perform with the processes. This form of alignment is common and typically represented by the figure below.

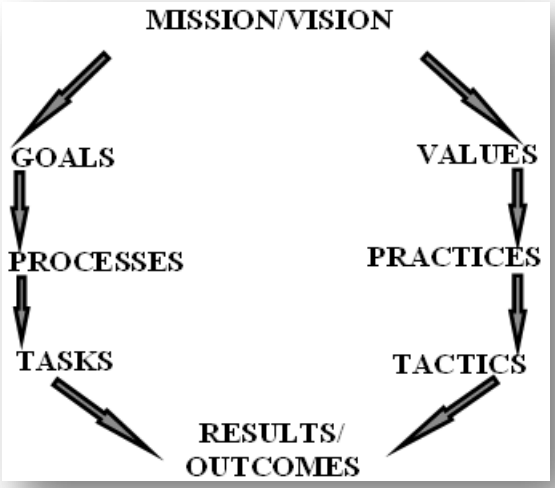
When we are looking at how to strengthen performance, or solve performance problems, it is critical to consider all three levels. A large part of our analysis and intervention, however, occurs at the operational level – just as physicians focus much of their effort on the body's functions and systems, rather than at the cell level of the body or the person as a whole.

The Culture Factor: *aligning practices*

When we look more closely at the organization from a Human Performance Systems analysis viewpoint it is clear that results depend not just on *what* we do (the processes people follow) but also on *how* we behave as we do things (the practices people demonstrate). Even with well-designed processes, the behavioral practices of groups and individuals can make the difference between merely adequate

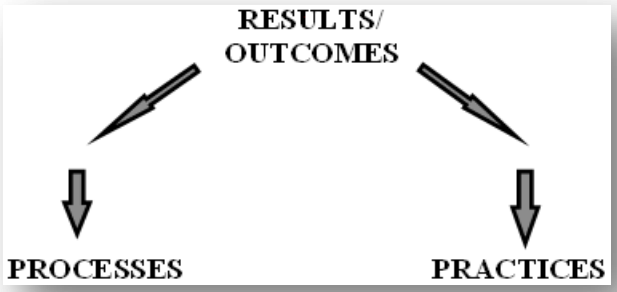
results and outstanding results. In the worst case, poor practices can destroy good processes. Despite this, it is only in relatively recent years that managers and performance consultants have given serious attention to practices. Practices can be viewed in the context of an alignment framework similar to that for processes:

Putting those two alignment frameworks together allows us to create a balanced systems model for organizational alignment:



Determining Desired Strategic Processes and Cultural Practices

If we are going to create a desired process we would first examine our strategy and mission to determine what results we want. Then working back from results we would define the processes that would best produce that result. The various processes would be linked to form the operations.



A similar methodology would be used in determining the desired cultural practices. We first examine and get agreement on desired results. Then working backs from results we would define a set of practices which would support the production of that result. These practices could then be grouped together under value labels.

Let's see how that would work in practice

Suppose we defined a desired result as "increasing customer loyalty" Then we would gather data from company employees and perhaps customers on how we should behave to deliver this result. This could be done in many ways, such as surveys, card sorts, interviews, focus groups, observations etc. Now it is quite likely this research effort would indicate some practices like the following:

- Always be honest: never pass on inaccurate information
- Always meet your commitments
- Make sure your advice is based on fact not just your personal agenda

These practices could easily be grouped under a value of "**trustworthy**" and then be positioned as an operational value.

This method is often referred to as a "criterion referenced" approach since it begins with a specific criterion; that is the desired business result and uses that as a reference point to determine what actions we should take.

The Power of Cultural Alignment

Operational values are not just nice to have, they are absolutely critical if we are to deliver the desired results. This fact can also provide a strong motivation for change. The one thing we know from research on culture change is that it is most likely to occur when people in the culture see a clear advantage for that change; the most powerful advantage being to survive and/or to thrive as a community.

Since the practices are directly linked to the results of the business, operational values can more easily be described as those things we must demonstrate as a company in order to survive and thrive. What's more, operational values as they are derived from data from a cross-section of employees at all levels are easier to buy into than those generated by managers at some retreat.

The other advantage is that operational values are derived from clustering of practices. The practices in turn are derived from what was necessary to deliver results. Thus a clear "audit trail" exists from results to practices to values.

Another important factor in culture change is the ability to measure it. Since in the process of creating operational values we defined the practices, these can provide opportunities to measure present level of demonstration by the culture. Therefore the extent to which the culture is aligned with the strategy can be objectively assessed and the "cultural gap" determined. This is a powerful tool for culture change it allows us to justifiably claim that our value alignment is not being driven by dictates of management but by dictates of the business.

There are many cultural assessments instruments available in the marketplace. But virtually all of these are "norm referenced" rather than "criterion referenced". A criterion referenced assessment is derived from an analysis of the business requirements consistent with the company's own strategy. A norm referenced assessment is derived from a statistical analysis of some cultural dimensional theory across a wide variety of organizations with widely different strategies. Furthermore the dimensions derived from norm referenced instruments are seldom congruent with either the operational values of the organization making it even harder for people to make the linkages.

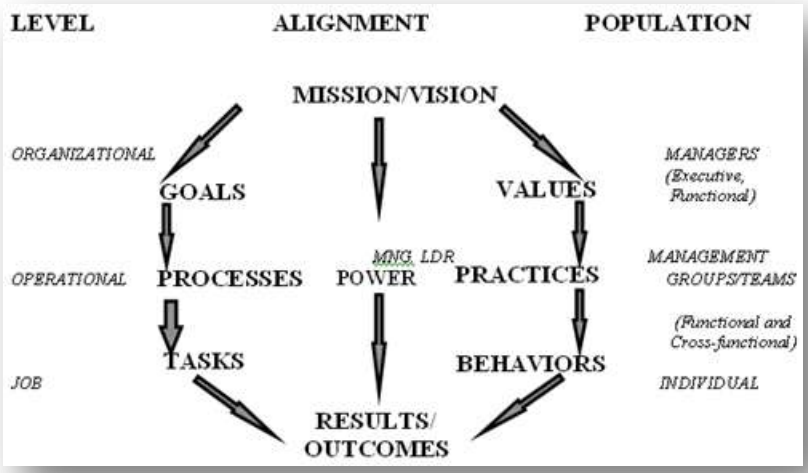
The Management/Leadership Factor: *Aligning Power*

Creating and maintaining a balanced and aligned organization requires decisions about organizational direction and intent – what the organization is in business to do, and what is important about the way it conducts its business. These functions are performed by the organization's managers and administrative support.

Thus the leadership and management of the organization constitute another critical set of factors that must be considered in efforts to improve performance. Many people believe that leadership and management are the most critical influence on performance, because they have the widest impact on the organization. They represent the primary source of power in organizations. In an organizational context power can be defined as "**the capability to accomplish."** Power is a positive concept when it is aligned and linked to the organizations results. Power is negative where the accomplishment only benefits a small group of people and\or is detrimental to the "health" of the organization.

Although the terms of management and leadership are far broader and richer than the definitions we have given here; in alignment we are primarily concerned with only their power aspects.

In alignment terms Management Power is clearly a set of processes while Leadership Power is based on a set of practices. Integration of the leadership/management function in the organizational alignment model allows us to create a comprehensive picture of organizational alignment as shown as follows.



We have defined organizational power as the capacity to achieve desired results. Two general ways of doing this are as follows:

1. Through the allocation and control of resources to achieve results which requires alignment of processes and management practices.
2. Through influencing people to take appropriate action to achieve results which requires alignment of the cultural and leadership practices of the organization.

Although organizations seem to be reasonably good and aligning their processes and management practices with a focus on results; they seem far less capable of aligning their culture and leadership toward results. Yet it is critical that all four components of Organizational Power are aligned with the business strategy

Conclusion

Understanding that every organization at its most basic level is a Human Performance System is critical for the success of virtually any attempt to improve or maintain performance. It is as important for every manager and every consultant to grasp this reality as it is for a medical doctor to recognize that the human body is at its basic level a biological system. Too many so called “solutions” have either failed or are short lived precisely because they failed to adequately address the “people” issues with a systems understanding.

Looking a both dimensions of the performance system, we can develop a broader viewpoint of organizational performance. The Functional Systems logic as illustrated by the Human Performance Systems Framework supports an assessment of the interrelationship of the functional flow of the organization. The Alignment Systems logic that underlies the Organizational Alignment Model provides a way to examine the relations across the hierarchy of sub-systems. By examining the alignment of the three factors (Process, Practice and Power) with the mission and the results we can address some of the most critical aspects of Organizational systems. This integrated systems approach enables consultants to

test new concepts or models against an existing understanding of organization systems and the need for alignment for results.

The future of Human Performance Systems Analysis is unlimited.

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