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Performance Improvement

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The Two Performers: People and Technology

There are two types of performers that do the work of organizations – people and technology. They can perform work independent of each other, but often perform the work together as a human-technology team. Both are performing the work of the organization's business processes. In order to effectively diagnose performance, design and implement change, and manage process performance, we need to understand and engineer the performance of individuals and technology systems.

Each of these performers exists in a performance system: a system of variables that influences how well the performer executes the work. Let us first understand these systems, the Human Performance System and the Technology Performance System. Later we will explore the usefulness of these models to those of us concerned with improving and sustaining process performance.

The Human Performance System

The Human Performance System (HPS) is a model describing the finite set of variables that influence the behavior and effectiveness of a person in a work system. The HPS model has been used by performance analysts and others for some 40 years to diagnose and even predict the likely behavior of human beings in given performance situations. To our knowledge, the earliest version of this model was created in the 1960's by Geary Rummler and Dale Brethower. Today, there are any number of versions, but the original, shown in Figure 1, is still powerful and relevant to anyone interested in understanding or improving performance.

The model is based on several important tenets:

- Every organization is a complex system designed to transform inputs into valued outputs for customers.
- Every performer, from CEO to line worker, inside any organization is also part of a unique personal performance system.
- When an individual fails to produce a desired outcome in an organization, it is due to the failure of one or more components of that person's HPS.

The components of any HPS, as shown in Figure 1, are as follows:

The performer (1) is expected to produce some set of outputs (2). For each output there is a set of inputs (3). For every output produced (as well as for the action it took to make the output), there is a resulting set of consequences (4)—something that happens to the performer, which in turn is interpreted by the performer as either positive or negative. This interpretation is the key to understanding the performer's future behavior, because the HPS is governed by the behavioral law that people's behavior is affected by consequences, meaning they are likely to repeat

behaviors that lead to positive consequences and also likely to avoid behaviors that lead to negative consequences. The final element of the HPS is feedback (5) to the performer about the output.

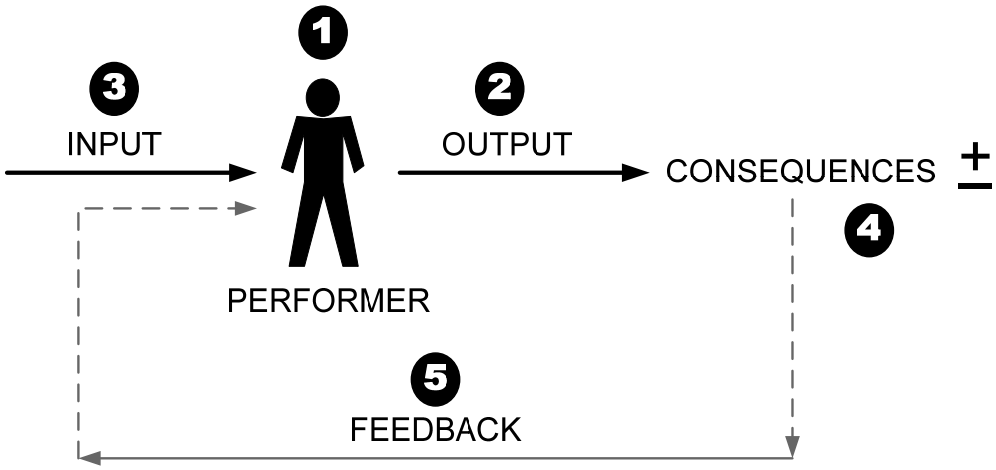

Figure 1. The Human Performance System

This model describes the situation in which every human performer exists. In Figure 2 is the ideal HPS, with descriptions of each component in its ideal state;

- Output definition: The performer knows what outputs and outcomes are expected and what standards determine success.
- Inputs: All required supplies, materials etc., are available, a signal to begin is triggered, and the performer has all the necessary tools, equipment, funds, instructions, etc., in order to transform the inputs into outputs as expected.
- Consequences: What happens when the performer executes the job or task is sufficiently positive that the performer is likely to repeat the same action.
- Feedback—The performer frequently gets information that indicates how well he or she is performing, or what the results of performance have been.
- Knowledge, skills, capacity—The performer has been adequately trained in the job requirements and has the necessary attributes or capabilities required.

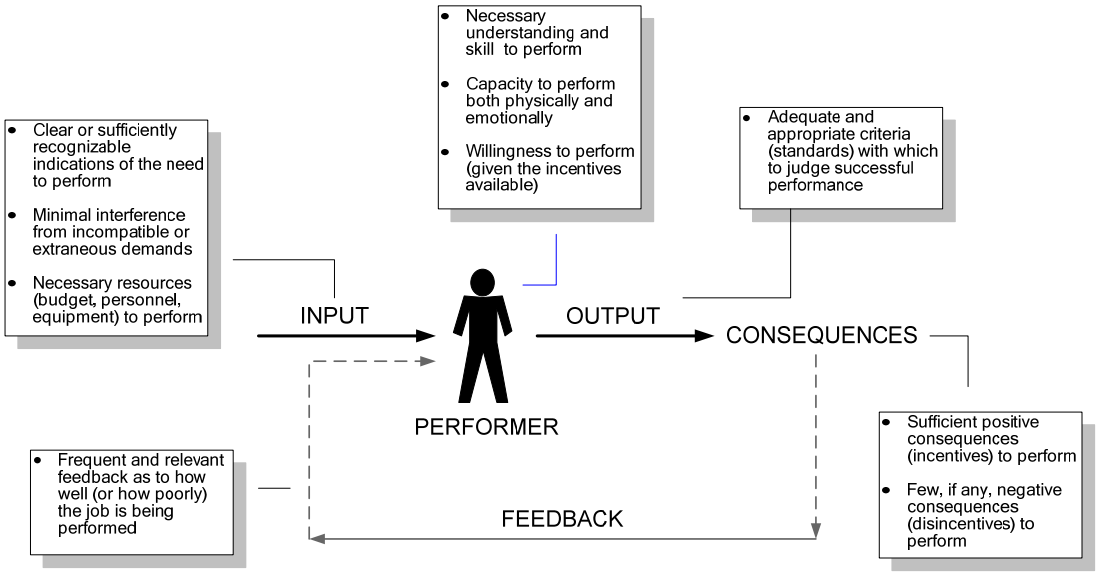

Figure 2. The Ideal HPS

This template of human performance can be used to diagnose any performance problem, and more important, it can be used to design better human performance. Let's look now at the parallel performance system that influences the performance of technology.

The Technology Performance System

In many of today's organizations, technology functions not just as a frequent enabler of human performance but, in many cases, functions as the performer itself. Like a human performer, the technology performer also exists in and is influenced by a set of variables, the Technology Performance System (TPS). When a task is performed by a human and technology together these two systems overlap and influence each other.

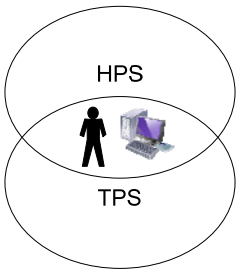

Figure 3. HPS and TPS

The components of the Technology Performance System (TPS), as shown in Figure 4, are as follows:

The performer, in this case the IT system, is expected to produce some set of outputs. For each output there is a set of inputs and resources. An IT system cannot experience and interpret consequences, so this is where the two models begin to differ. There is feedback, as in the HPS model, but it is received and interpreted by the maintaining function. The final element of the TPS is user impact. In the cases where IT and a human performer must produce the output together, the system performance is also influenced by the user. And of course the user's performance is equally influenced by the system. This is our connection back to the HPS. We have all seen the impact on a technology system when the users do not have the appropriate knowledge and skill

to use the system. Likewise, we know that a user is likely to avoid, if possible, using a system or technology that they perceive as punishing to use –too many screens to click through, repeated entry of the same data, etc.

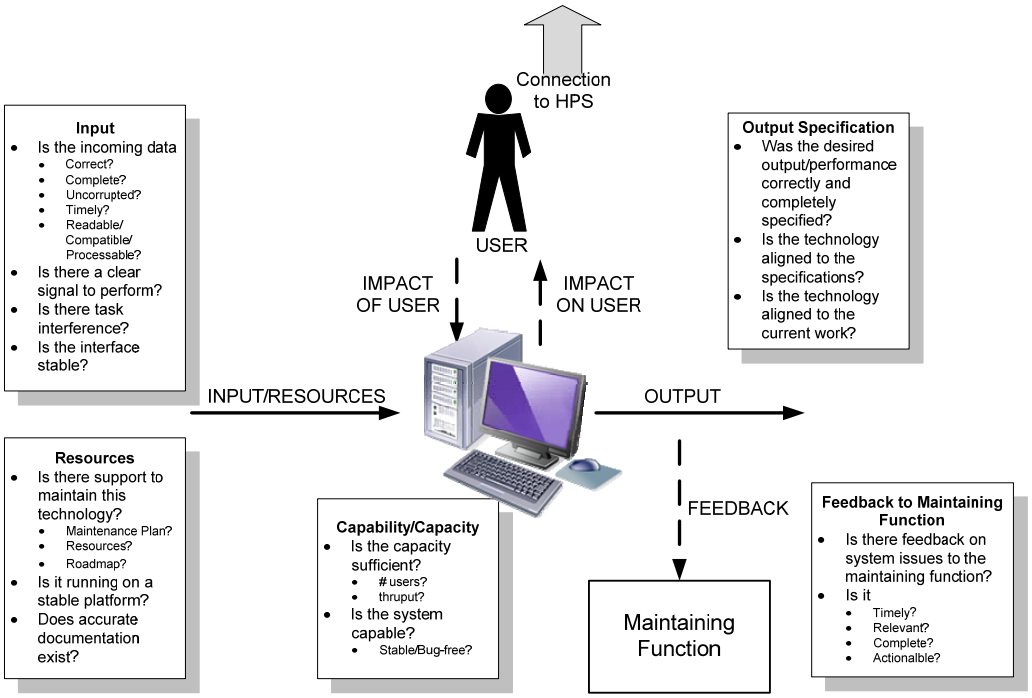

Figure 4. The Technology Performance System (TPS)

Figure 4 includes a set of troubleshooting questions that can help determine which component (s) of the TPS may be missing or causing poor performance:

- Output specification: Was the output and its performance specifications correctly and completely described and then the technology made to meet those specs? Are those specs still relevant to the way the work needs to happen today?
- Input: Is the technology suffering from missing or poor inputs (bad data, bad data entry)? Is it clear when the system is to perform and can it perform without interference (other tasks running causing slow response)? Is the interface to the inputting system stable?
- Resources: Is the supporting system for this technology in place and operating effectively? Is the platform on which it runs reliable? Is there adequate documentation to support troubleshooting and maintenance?
- User Impact: Are users available, capable, and willing to use the system? Do the users use the system properly? Does the user's HPS support their use of the system?
- Feedback: Is there adequate and actionable feedback to those who have to maintain the technology?
- Capability/Capacity: Is the system capable of performing (stable and bug free)? Does the system have adequate capacity?

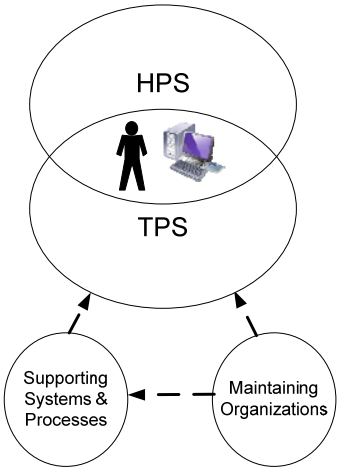

Figure 5. HPS and TPS connections

Figure 5 shows the complete view of the HPS and the TPS with the connections to maintaining functions and supporting systems and processes. Like the HPS template, the TPS template can be used to diagnose performance issues and as a checklist when making changes in technology systems.

Application of the HPS and TPS

Both of these models have utility for the analysis and design of work. In order to fully diagnose the performance of a process we often need to get down to the performer level in order to determine the variables contributing to the poor performance. In order to solve those issues, we then need to engineer the performance system to deliver the desired performance. Process designs must be driven to the performer level in order to ensure process performance.

Analysis

When used as an analysis template, the HPS can reveal the causes of undesired performance for an individual performer or a class of performers all doing a given job. These issues are too easily assumed to be some deficiency with the performers themselves. In fact, in the application of this template over time years, some patterns of performance have become apparent. For example, 90% of the time, performance deficiencies that might appear to be caused by a human performer(s), or a class of performers, are actually the result of other things being wrong in their HPS:

- Missing materials
- No clear direction or expected output
- Interference while trying to do their work
- Lack of any meaningful feedback
- Strong negative consequences for trying to do the job
- No positive consequences for succeeding
- Broken, unavailable, obsolete equipment

Most often, it is not one, but several, of the HPS variables that are deficient. There is no 80/20 rule that can be applied to the solution – all of the deficient variables must be addressed.

Similarly the TPS can also be applied as an analysis template to diagnose poor performance where technology is involved. While much of this would be obvious to a practitioner with experience in IT, the model serves to take some of the mystery out of IT performance and give

those without a background in IT a basis for asking the right questions. It also makes it obvious that there may be more going on than just “that stupid application.”

Design and Testing

When we design a process we are designing the work of the performers. If we then fail to address the performance systems of those performers, it can be predicted that our new process will likely not perform as expected. Failure to drive the design down to the performer level and address the HPS and or TPS variables amounts to wishful thinking on the part of the process improvement practitioners. We may need other professionals to complete the detailed designs of jobs and systems, but the HPS and TPS templates provide us with a useful design checklist of the variables that we need to specify before we make the handoff to developers and implementers.

For example, when we specify changes in the steps performed by call-center phone reps in the customer complaint resolution process, have we also designed a feedback system to let them know how well they are performing those steps? Have we engineered the consequences so that performing the steps is more rewarding than it is punishing? Have we set and communicated clear performance standards? When we specify changes in the system that phone reps use to record and analyze customer data, have we also specified the type of performance data that needs to get back to the maintaining function? Have we considered all of the HPS variables of the users?

During the testing or piloting phases of the new process, we can use the templates as we did in analysis to diagnose why we are not getting the expected performance.

Last, in order to keep the performance systems in alignment and sustain performance, we need to ensure that the management system for the process is addressing, and will continue to address, all of the HPS and TPS components. We need to be sure that all managers of the process performers continue to translate process goals into clear performance expectations and standards for the performer. The managers need to ensure that the performers continue to have access to adequate resources. They need to ensure that the performers will not be inundated with competing tasks.

Figure 6 is a table of the tasks that process improvement practitioners and process managers need to address in order to fully address the Human and Technology Performance Systems when implementing a process change and managing the on-going performance of the process. For each element in the HPS and TPS models, there is a corresponding set of process design tasks and managerial tasks.

HPS/TPS Variable	Process Design and Implementation Tasks	On-going Managerial Performance Support Tasks
Output Requirements & Standards	• Define exactly what outputs and outcomes are expected from a given job or process • Redefine the performance standards (quantity, quality, time, cost, etc.) for the outputs • Communicate these requirements clearly to the performers (human) or developers and maintainers (technology) as a part of implementing the changes	• Redefine the outputs and outcomes as the business environment and customer requirements change • Redefine the performance standards (quantity, quality, time, cost, etc.) for the outputs • Communicate these requirements clearly to the performers/maintainers on a continual basis
Inputs/ Resources	• Specify what resources are needed by performers • Ensure or add capability to the enabling systems that will supply the inputs/resources • Evaluate and adjust the work environment to eliminate anything that hinders performance (e.g., poor work space, job interference)	• Adjust resources requirements as the business environment and customer requirements change • Provide the resources in sufficient quantities when needed • Ensure a continual resupply of consumable inputs • Monitor the work environment and eliminate anything that hinders performance (e.g., poor work space, job interference, contradictory instructions)
Consequences	• Design the job or task so that it can be performed without excessive difficulty by a well-prepared employee under most circumstances	• Observe the job as it is being performed and make changes to eliminate causes of delay, irritation, ambiguity, overload and other negative consequences
Feedback	• Design a feedback system to provide relevant and timely feedback to performers (human) and/or to maintaining functions (technology) • Define the management and maintenance roles and responsibilities regarding monitoring, analysis and corrective action	• Provide constructive coaching as the job is being performed (human) • Provide understandable written and verbal information about the performance frequently • Provide feedback about results (e.g., customer comments, downstream comments, quantitative results)
Knowledge, skills, capacity	• Define the additional knowledge, skills and capacity needed to do the job (human) • Specify and ensure the development and delivery of appropriate training as a part of implementation • Integrate training into new hire/on-going learning system • Define and communicate the technology capacity requirements to developers and maintenance functions	• Maintain an inventory of the knowledge, skills and capacity needed to do the job • Establish a learning system to provide both initial and on-going formal training to provide knowledge and skills • Monitor actual performance and gauge whether formal training is providing appropriate and useful content • Provide job requirements to HR so that qualified candidates are hired • Provide capacity requirements to maintaining functions

Figure 6. Implementing and Managing HPS and TPS

By explicitly designing the Human Performance System and the Technology Performance System and their corresponding management system, process improvement practitioners can deliver predictable and sustainable process results. Our failure to pay attention to systems that surround and influence an organization's performers will result in more of the improvement project failures that we have seen in the past:

- Technology implementations that failed because they did not take into account the full users context, resulting in expensive work-arounds and late in the game development rework.
- New job performance expectations that are initially met but erode over time because the balance of consequences doesn't support the performers meeting those expectations.
- Process performance that declines after implementation because there is no feedback system to performers that allows them to adjust performance.

If we are in the business of improving processes, we must also be in the business of engineering performer systems to deliver results.