HPT Models: An Overview of the Major Models in the Field

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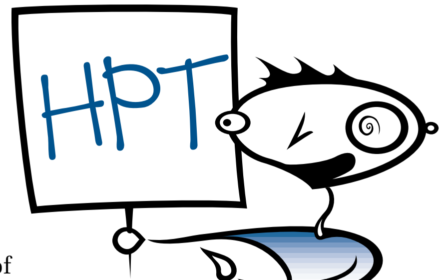

As the field of human performance technology (HPT) begins to gain more mainstream attention in the eyes of those charged with improving organizational efficiency, questions arise about how to put these concepts and theories into practice. Several recent articles (Langdon, 2000; Chevalier, 2000) have described how HPT can be used in an organization. This article aims to identify the major models in the field and examine the ideas and beliefs that have lead to their conception, development, and acceptance.

For the purposes of this article, HPT is defined as "a systematic approach to improving productivity and competence, through a process of analysis, intervention selection and design, development, implementation, and evaluation designed to influence human behavior and accomplishment" (International Society for Performance Improvement, 2000). The article will focus on HPT as a process that bridges the gap between what is and what should be in human performance systems (Applied Performance Improvement Technology, 2000).

HPT Modeling

Modeling has traditionally been an integral part of the instructional design process. Because many of the early practitioners of HPT came from the field of instructional technology, it is not surprising that HPT process modeling has migrated and evolved from those principles. Gustafson and Branch (1997) state that "the role of models in instructional design is to provide us with conceptual and communication tools that we can use to visualize, direct, and manage processes" (p. 18). The key concept here is the ability of the individual when looking at any complex activity, to conceptualize a myriad of causal relationships and chart them in some manner that can be communicated to others. A given model's criterion must enable HPT analysts to accurately conceptualize a suspected performance problem in a given business environment. The ability to visualize and then communicate the process logic to others will be the true measurement of any HPT model's effectiveness and suitability for use.

Stolovitch and Keeps (1992) report that early HPT practitioners attempted to use linear instructional design models to describe performance technology processes. These linear models did not always accurately describe the environment or inter-relationships in sophisticated, multifaceted business processes. As a result, the early pioneers in the HPT field began to develop their own unique models. The diversity and complexity of the analyzed environments, coupled with different perspectives and backgrounds of the profession's pioneers, have created a large number of models, many of which are still emerging and evolving.

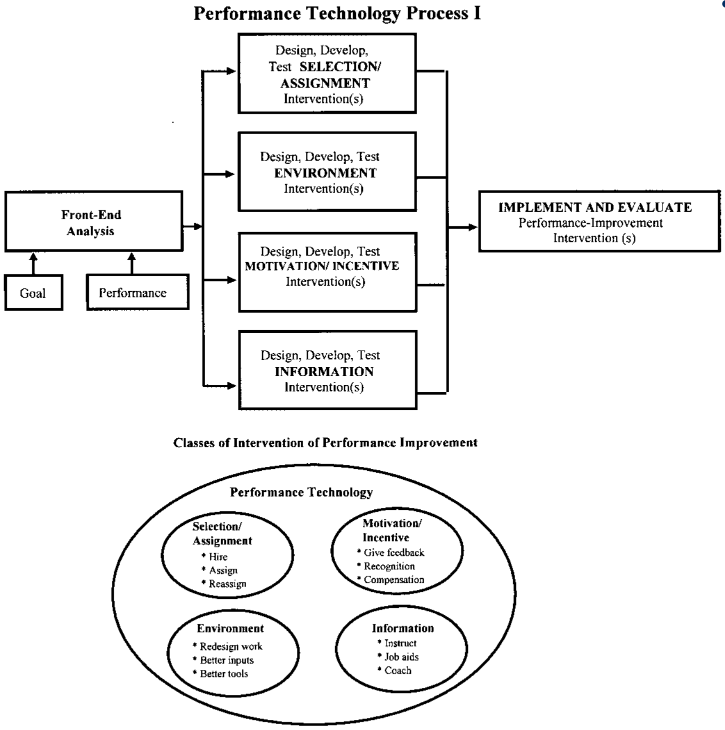

Figure 1. Early HPT Model. (Source: Ripley, 1997)

HPT Pioneers

The works of Gilbert, Harless, Mager, and Rummler became the principles of the foundations for performance analysis and HPT modeling theory (Rosenberg, Coscarelli, & Hutchinson, 1992). Many have acknowledged Thomas Gilbert to be the "Father of Performance Technology" (Dean, 1998). Gilbert felt that improving the performance of people must begin with identifying and resolving the environmental barriers, thus enabling the people (performers) to achieve maximum performance (Dean, 1997).

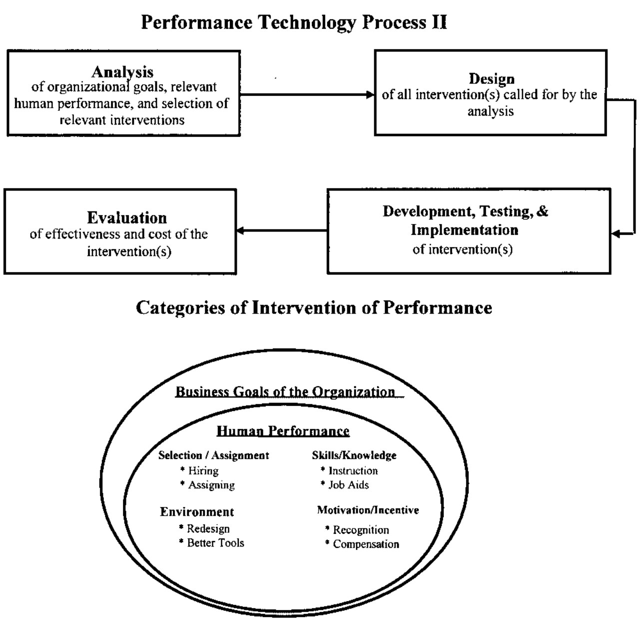

Figure 2. Later HPT Model. (Source: Ripley, 1997)

Another performance technology pioneer who continued with Gilbert's diagnostic approach was Joe Harless. Harless believed that understanding the cause of a problem should drive any solution (Ripley, 1997). This belief would eventually become the process of front-end analysis as reflected in his first performance technology process model (Figure 1). This model had a clear focus on the early determination of goals and performance during the analysis phase. Later, Harless revised his original model so that it included the four phases of analysis, design, development and testing, and implementation and evaluation, which became well known by its abbreviation, ADDIE (Figure 2). Harless proposed to the performance technology disciples that a partnership and business focus should exist in order to apply the most cost-effective intervention.

West (1997a) reports that Robert Mager's book, *Preparing Instructional Objectives,* written in 1984 and later revised in 1997, revolutionized instructional design and performance improvement and is considered to be the standard for the instructional design profession. Mager introduced the notion that instructional designers should move beyond determining what instructors should teach; rather, they should focus on understanding what learners should be able to do as a result of the instruction. His work began to move the HPT field toward human performance objectives. His model breaks down performance objectives into three components: performance, conditions, and criterion (Figure 3). Mager felt that the performance element is what the learner should be able to do; the conditions element comprise the situations under which performance will occur, and the criterion element is the standards or levels of acceptable performance. This model helped to shift analysis away from the instruction process itself and toward the results of instruction that lead to a change in learner performance. It also introduces the notion that human performance must have clear, measurable standards applied within definable conditions.

Performance	What the learner is to be able to do
Conditions	Important conditions under which performance occurs
Criterion	Quality or level of performance considered acceptable

Figure 3. Mager's Model for Instructional Objectives.
(Source: West, 1997a)

In addition to his model for instructional objectives, Mager also developed a flow chart for analyzing performance problems (Mager & Pipe, 1984). In his model, Mager presents a

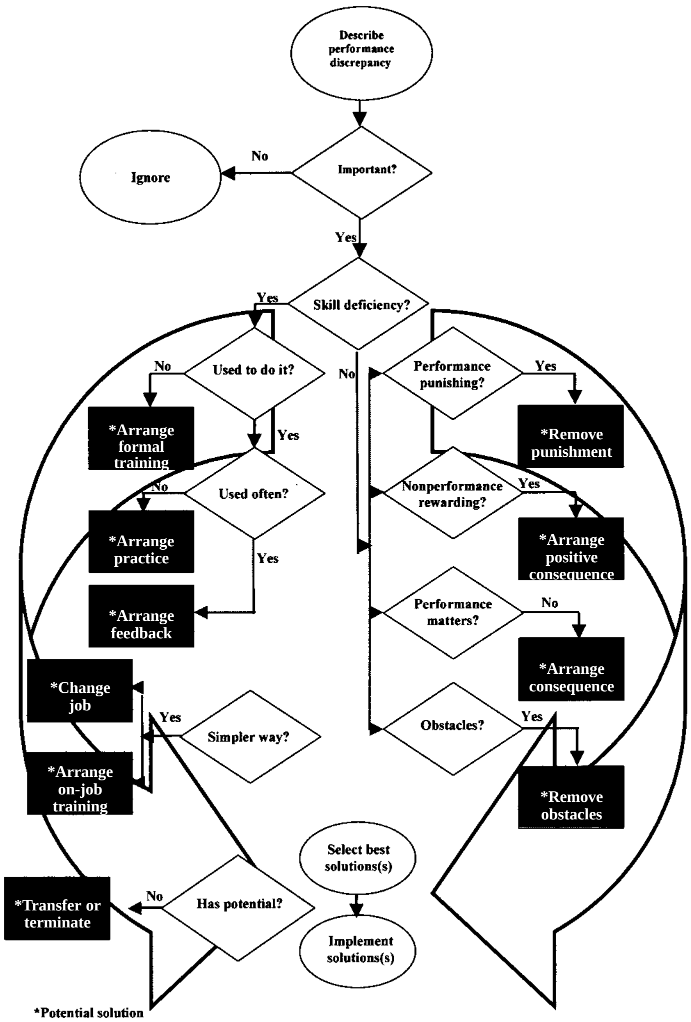

Figure 4. Mager's Performance Analysis Flow Chart.
(Source: Mager & Pipe, 1984)

series of steps that can help identify and correct performance problems. Mager cautions that the model should not be interpreted literally but should be used as a guideline for identifying and solving performance problems. While much of the flow chart is linear in nature, parts of it are not. These nonlinear components of the model are presented as subgroups that are linked together by a series of background arrows that link all of the various groups and subgroups of the model (Figure 4).

Finally, there are the multiple contributions advanced by Geary Rummler. West (1997b) purports that Rummler likened organizations to ecosystems where every component is interrelated and linked together. Rummler felt that analysis should account for the fact that organizational performance and individual performance are unique and require different solutions (Rosenberg et al., 1992). He believed that organizational performance is as important as individual performance.

In Rummler's nine performance variables model (Figure 5), the organizational analysis has three levels: the organizational level, the process level, and the job/performer level. Rummler maintained that the three levels are inter-related across different functions within the organization (West, 1997b). The three performance levels must be simultaneously considered and addressed before the organizational performance problems can be solved. Rummler details nine performance variables under the categories of goals, design, and management. At the job/performance level, a linear logic begins with input to the performer, who then performs thus creating output, which results in consequences. A feedback loop communicates consequences back to the performer. Rummler has identified six factors that affect human performance: performance specification, task support, consequences, feedback, skills/knowledge, and individual capacity. Rummler's thorough consideration of these human performance factors establishes a solid foundation of logic for others to build on.

The work of these early pioneers in making a distinction between a training gap and a performance gap laid the groundwork for future practitioners to construct and test new models. In addition, their establishment of the link between individual performance and organizational performance helped to cement the acceptance and credibility of HPT solutions.

Classification of Models

The diversity in content and structure of the various HPT models allows for a number of different classification

Nine Performance Variables

Performance Levels	Performance Needs		
	GOALS	DESIGN	MANAGEMENT
Organizational level	Organizational Goals	Organizational Design	Organizational Management
Process level	Process Goals	Process Design	Process Management
Job/Performer level	Job Goals	Job Design	Job Management

Factors Affecting Human Performance

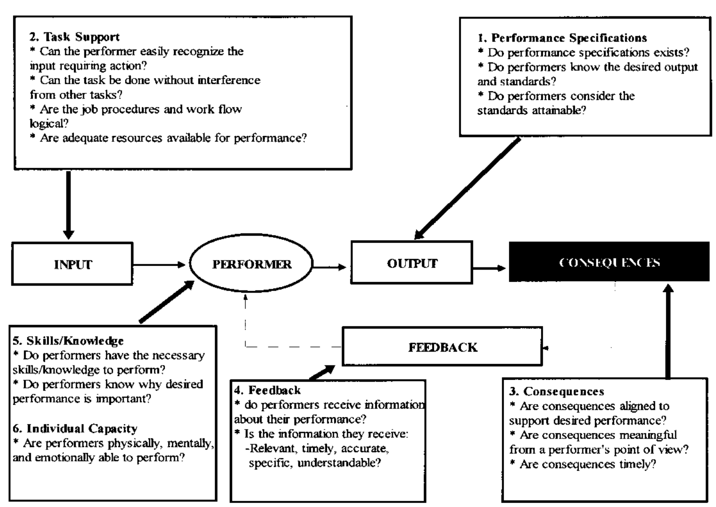

Figure 5. Rummler's Nine Performance Variables. (Source: West, 1997b)

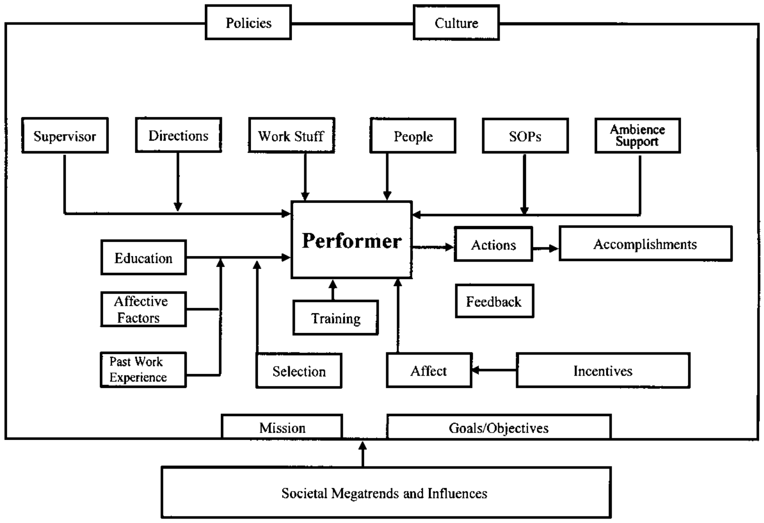

Figure 6. A Performer-Centered HPT Model. (Source: Whiteside, 1998)

schemes. One might be able to identify the general orientation or focus for a given set of models—for instance, those that focus on individual performance versus the performance of the organization. Another might be based on the process flow of the model, such as linear versus nonlinear. This analysis will follow the lead of Rosenberg et al. (1992) and begin with the categories of *diagnostic* and *process* models.

According to Rosenberg et al. (1992), the diagnostic model informs the performance analyst *where* HPT can be applied, and the process model instructs the performance analyst on *how* HPT can be applied. These groupings provide a clear categorization for most of the models studied; however, it became clear that another was necessary. A third category of *holistic* models is appropriate. The integrated approach taken by models in this last category seems to warrant a separate group. With these general categories as a starting point, we can see how the various HPT models align.

Diagnostic Models

Diagnostic models tell the performance analyst *where* HPT may be applied. Harless, with his attention focusing on early determination of goals and performance, seems to subscribe to this modeling direction. Rummler carried the diagnostic analysis to its fullest range, with separate organizational and individual performance domains that require separate solutions. Later diagnostic models followed in the footsteps of these pioneers.

The HPT model developed by William Deterline (Whiteside, 1998) focuses on the individual human element of performance, which Deterline calls the performer (Figure 6). The performer is potentially influenced by multiple factors, both personal and organizational. These factors are often unconnected forces that are rarely working together to improve individual performance. The challenge for the performance analyst in this environment is to effectively identify and communicate these unconnected influences to the decisionmakers within the organization.

David Wile's (1996) synthesized HPT model (Figure 7) is a representative example of recent diagnostic models. It employs an innovative approach by presenting two separate domains and paths of analysis to use when examining human performance. Wile stays true to the diagnostic model's early supporters by focusing on elements both external and internal to the performer. He further subdivides the external domain into the categories of intangibles and tangibles, noting that each requires specific interventions. The model is unique in that it offers concrete solutions to varying performance problems and discriminates between interventions that are training solutions and those that are not. The simplicity of the diagnostic flow in this model makes it easy for the analyst to take the first steps in solving a performance problem.

The model presented in Figure 8 moves beyond the individual performer models previously discussed. This model, advanced by Tosti and Jackson (1997), has many similarities to Rummler's HPT model. Like Rummler, Tosti and Jackson examine a performance problem at multiple levels, including organization, people, and work. Their organizational scan model plots these levels against the criteria domains of conditions, process, and outcomes to show the performance influences in each of the nine areas of the matrix (Tosti &

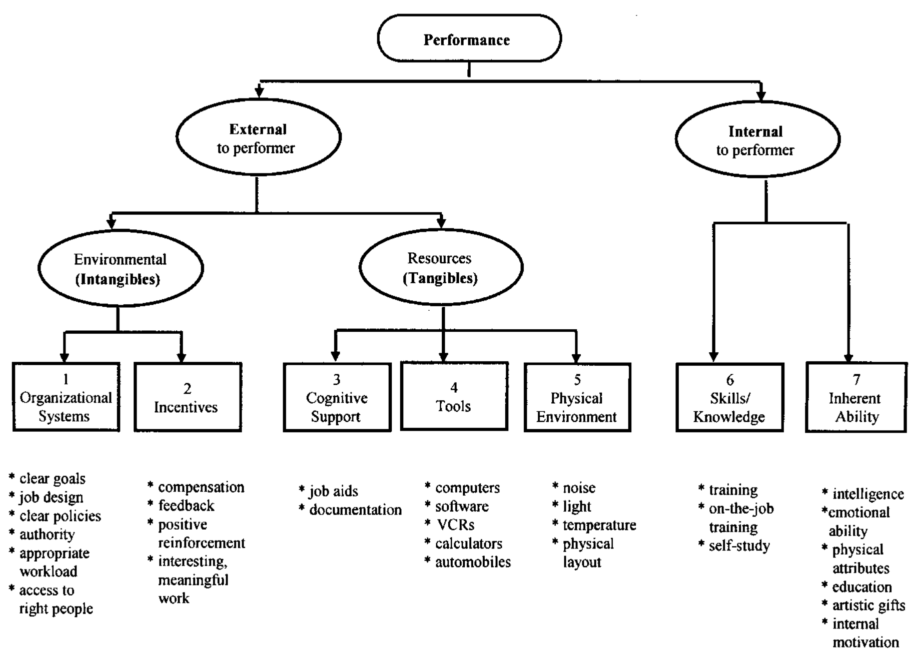

Figure 7. Wile's Synthesized HPT Model. (Source: Wile, 1996)

	Conditions	Process	Outcomes
Organization	**Strategy, Structure** Mission, strategy External business drivers Functional grouping Budget/decision authority	**Systems** Degree of centralization Consistency of operations Flexibility	**Organizational Results** Satisfaction of investors Satisfaction of societal stakeholders Measures of success Goal alignment w/mission
People	**Climate Practices** Company/individual values Management/leadership Team norms Ethics, integrity	**Performer Requirements** Skills, knowledge Job aids/references Selection Conference	**Motivation, Feedback** Satisfaction of employees Frequency, timing, form Rewards and recognition Expectations
Work	**Environment, Resources** Physical environment Tools, materials, information Support personnel/services Accessibility of resources Workload, demands	**Methods** Allocation of functions Process, procedures Workflow Duplication/gaps	**Products, Services** Satisfaction of customers Productivity levels Standards/criteria Quality of product delivery

Figure 8. HPT Model Showing Different Levels of Performance Influence. (Source: Tosti & Jackson, 1997)

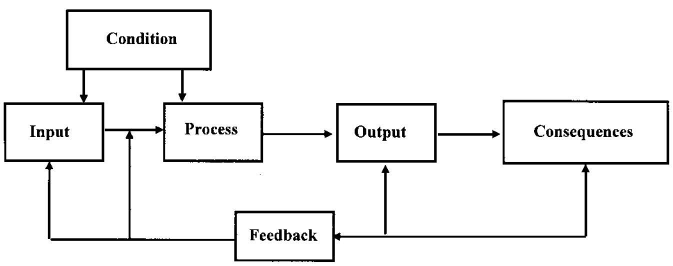

Figure 9. The Language of Work Model. (Whiteside, 1998)

Jackson, 1997). There are three characteristics that make this model an effective tool: it is systematic and comprehensive; it is manageable in terms of the number of areas analyzed; and it is easily communicated to the client.

Danny Langdon designed the last diagnostic model we will examine. Langdon's Language of Work model (Figure 9) is designed to be accessible to novices who have an understanding of the knowledge and skills of their performers, yet are unable to express this knowledge systematically. The model describes performance as flowing from input, moving through processes and output to consequences. It employs a feedback loop that reminds the analyst that outside factors, called conditions here, affect the input and process. Whiteside (1998) claims that the simplicity of Langdon's model allows it to be used to examine performance at four levels: the business unit, the core process, the workgroup, and the individual. As in the previous models, the emphasis is on diagnosing the location of the performance problems.

For certain performance problems, the analyst may only require a model that helps to identify *where* the problems are located. In those cases, one of the models described above may be sufficient and could stand alone to address the problem. In other cases, the analyst might desire to know *how* to apply an HPT solution to solve a performance problem. This process approach might be used in conjunction with, or in place of, one of the models described above.

Process Models

When we consider process models, we are considering those models that go beyond the diagnostic activities of determining *where* to look for performance problems and begin to show us *how* to examine the problem itself. Rosenberg et al. (1992) note that the origins of this type of systems analysis are in early models, such as Harless's ADDIE model. They further report that these early process models tended to be linear in nature and included the process of identifying specific solutions to the performance problems. The application of systems analysis and linear logic is a consistent trait of process models.

There are five general characteristics that help to identify process models. As stated above, most models in this group are linear or sequential. In addition, they often have phased

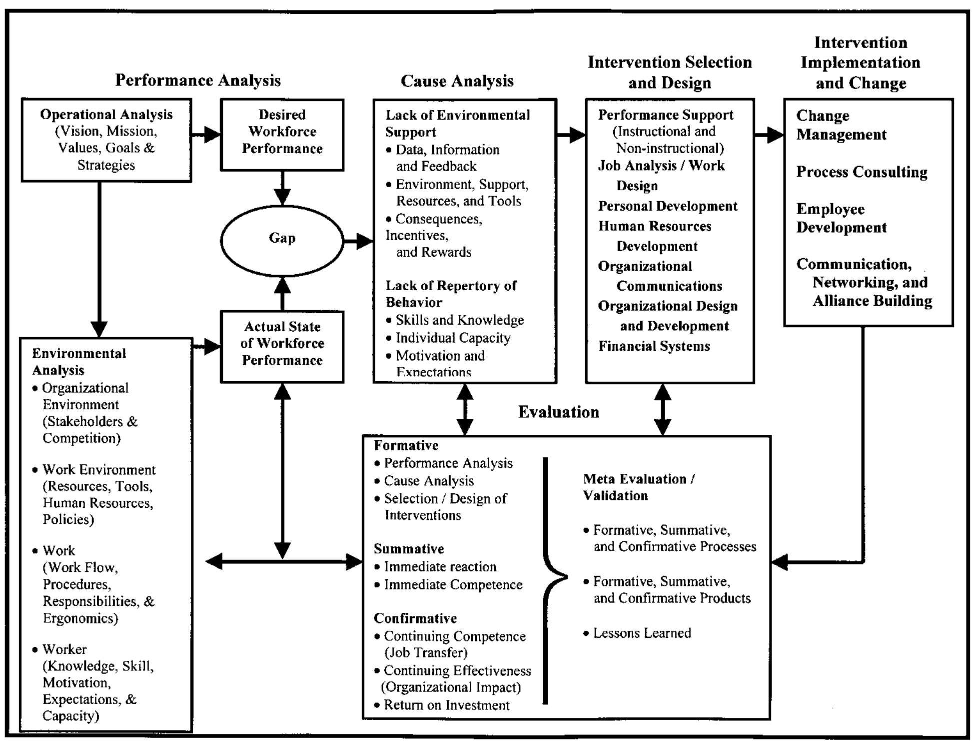

Figure 10. Traditional HPT Process. (Source: ISPI, 2000)

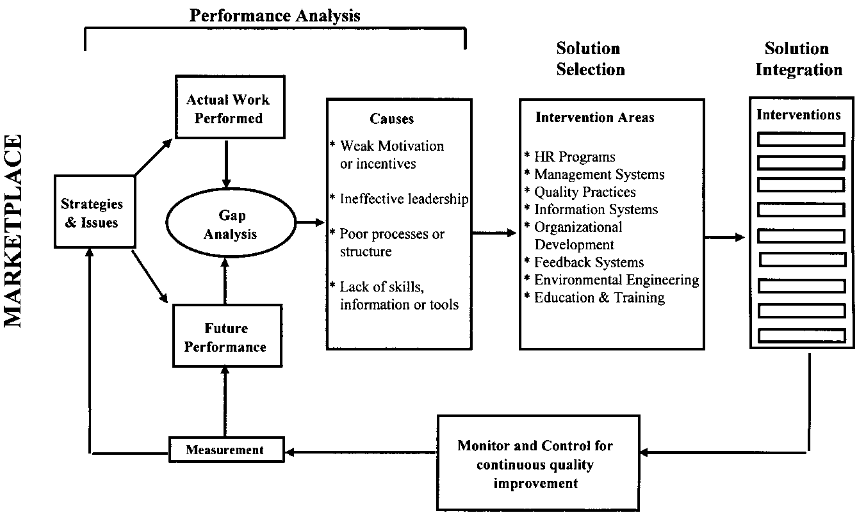

Figure 11. Human Performance Model. (Source: Atkinson & Chalmers, 1999)

or grouped activities, are driven by a gap analysis, are intervention oriented, and usually contain a feedback mechanism. All five characteristics will not be present in every process model, but all of the models will have some of these traits in common. The International Society for Performance Improvement (ISPI) model (ISPI, 2000) pictured in Figure 10 includes all these characteristics and is an appropriate example of a process model.

While most process models are linear in nature, authors of each model often follow different paths to achieve their end result. A number of models begin with organizational mission analysis, then do a gap analysis between the desired and actual human performance states; this is followed by cause analysis, intervention selection, implementation of interventions, and—finally—some form of feedback or evaluation.

The next descriptive characteristic is the use of phased or grouped activities. Most process models detail a number of related activities that achieve a unified goal that represent one step in the process. For instance, there are often a number of activities that fall under the headings "Performance Analysis" and "Intervention Selection." This is the case in the ISPI and the human performance model, which is displayed in Figure 11 (Atkinson & Chalmers, 1999). The steps in the process that the authors of these models choose to group together vary widely from model to model, but what many models have in common is the clear detailing of those groupings.

Gap analysis, another important characteristic, is central to many process models. The performance gap is the difference between the state of what *is* and the state of what *should be* in terms of performance (Robinson & Robinson, 1995). As seen in Figure 12, the ISPI and human performance model identify gap analysis as a step in their process (Human Performance Technologies, 2000). All these models represent the gap as the difference between the desired and actual states of performance. Rarely does a process model focus solely on human performance; instead, most seek to identify both organizational and individual performance gaps. Of the process models discussed so far, only the human performance model focuses solely on individual performance.

Many process models focus on performance interventions as a crucial step in the HPT process. Silber (1992) asserts that HPT interventions have a wide and varied range beginning at the individual performer level and extending to the more complex organizational level. Rarely do performance problems require a singular intervention. Therefore, most process models describe different forms and arrangement of interventions that may be considered when deciding *how* best to close the performance gap. The ISPI and human performance models show a direct cause-and-effect relationship between a performance problem and the intervention.

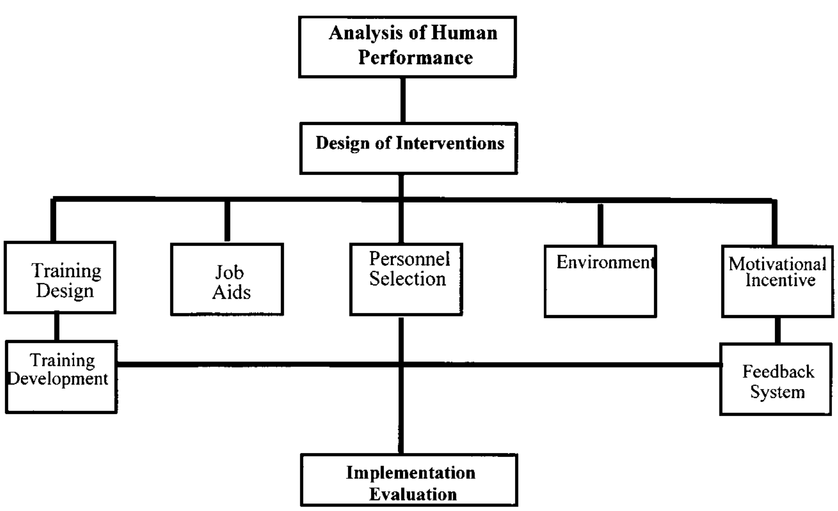

Figure 12. The Peak Performance System (Source: Human Performance Technologies, 2000).

The final characteristic that many process models have in common is the existence of a feedback loop, where the results of implementation are observed, evaluated, and reported. In most HPT models, the result of this evaluation can be the restarting of the process at one of the first steps in the model.

In summary, process models advance HPT activities beyond the discovery of *where* to look for performance problems and into the activities of *how* to analyze performance problems. The models studied have many

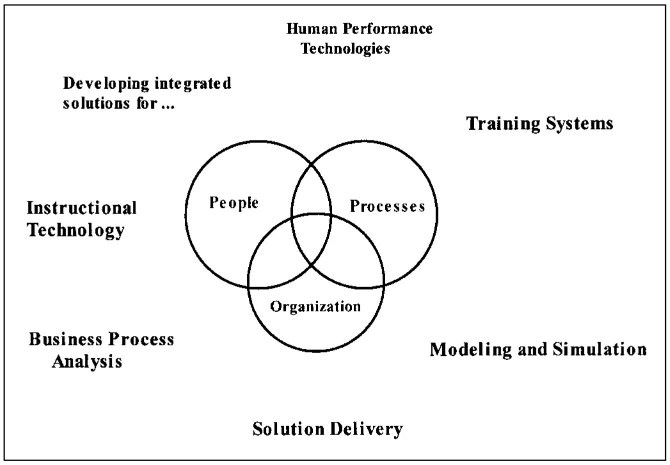

Figure 13. A Holistic Model. (Source: Advancia Consulting, 2000)

similar characteristics; they were linear, had phased or grouped activities, sought out performance gaps, considered multiple intervention possibilities, and evaluated results with an appropriate feedback loop.

Many analysts seeking solutions to their human performance problems will find that a diagnostic model, a process model, or some combination thereof will meet their needs. Other times either the situation, or the preference of the analyst, demands a different approach.

Holistic Models

Holistic models are categorized as such because of their nonlinear form and unique modeling characteristics. These models are often represented by overlapping domains that exist separately, but that form an ideal performance zone when combined.

A pictured in Figure 13, the HPT model uses three interlocking circles to represent people, processes, and organization (Advancia Consulting, 2000). These circles form the domains that symbolize the core activities of the model. Acting as outside influences on the core processes are the external activities of instructional technology, business process analysis, training systems, solution delivery, and modeling and simulations. These activities work together to develop integrated solutions for the domains of people, processes, and organization.

As seen in Figure 14, the three-dimensional HPT model (Stock, 1996) resembles Rummler's models in general diagnostic design. It shows three dimensions of influence over performance, emotion, rationale, and executive, managerial, or performer. The latter two intersect to form nine performance factors within an organization. According to Stock, this model attempts to target the individuals who have the most influence over the organization. Stock's model is unique in its addition of a third dimension that considers the emotional intelligence of the individual when assessing the factors influencing human performance. Stock contends that human emotions have a much greater role in human performance than previously considered in the HPT field. He argues for a new approach and the increased use of emotional intelligence analysis in future HPT modeling. Stock admits that he has had varied success when trying to add intelligence analysis to actual performance problems, but encourages further study and experimentation. In that regard, Stock's HPT model is making a significant contribution to the human performance technology field.

These holistic models are generally explained with less detail than the diagnostic and process models discussed earlier. Thus, HPT practitioners with greater experience feel more comfortable using them than beginners. However, that should not discourage novices from evaluating them when deciding which model best fits their needs.

A Single Model?

There is no single HPT model that can be universally applied to all business environments and problems. It is this struggle to identify and define the root causes of performance problems, while attempting to place some logical framework around the reasons for these performance gaps, that has defined and advanced the field of HPT.

The traditional path in the early years of the HPT movement was to follow the ADDIE model in the instructional design process. This model's linear focus addressed performance problems that required a training solution but ignored nontraining causes of poor performance. The application of training-focused solutions for nontraining problems caused clients to lose both money and confidence in those who were hired to solve their performance problems. This dissatisfaction, coupled with Skinner's work in behavioral sci-

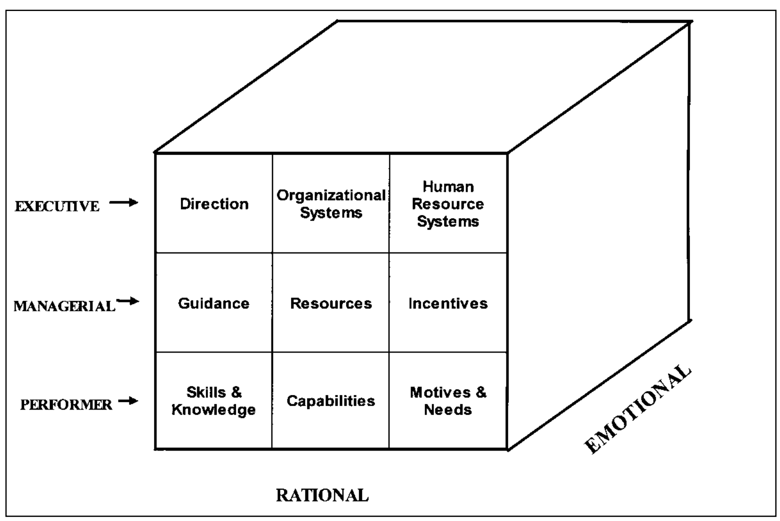

Figure 14. A Three-Dimensional HPT Model. (Source: Stock, 1996)

ences and operant conditioning, opened the door for the early HPT pioneers. Former instructional design practitioners including Harless, Mager, and Rummler began to apply varied sciences and disciplines to the newly emerging field of HPT. Early work in the field sought to explain performance problems by placing heavy emphasis on the importance of the individual and his or her work environment, and by focusing on the analysis portion of the HTP process. Today we see the continued expansion and evolution of the HPT modeling process. The models presented here, while different in their reasoning and approaches, all appear to be having some measure of success.

In addition to summarizing and categorizing the major HPT models in the field, this examination has identified three keys to success for analysts undertaking the HPT process: front-end analysis, measurement, and experience.

Harless first promoted the important concept of front-end-analysis. His belief that the understanding of the cause of a problem should drive the solution has remained prominent in our field. Included within the front-end analysis process is an analysis of the gap between the desired and actual states of performance. Harless contributed another idea that remains crucial to HPT success, the notion of a partnership between the client and the performance analyst. Ideally, this partnership begins during the front-end analysis phase and continues throughout the life of the project. Surprisingly, this important ingredient is missing from many of the models discussed here.

Mager championed the next important concept, that of measurability. He introduced the idea that performance objectives must be applied under definable conditions and criterion. Analysts must have the ability to measure performance gaps, and eventually, performance gains to judge the effectiveness of given interventions. In addition, the existence of measurable performance objectives strengthens the communication between the performance analyst and the business client. Business clients want tangible methods to both quantify and justify their investments. Most of the models examined here followed Mager's lead when creating their structure, and therefore support performance objective-based measurement options.

Finally, there is a wide diversity of talents that HPT models demand from the performance analyst. The range and depth of knowledge required to use any of the models is extensive. There are few individuals who have the background to do a complete and thorough analysis entirely on their own. Because of this, teams of experts usually undertake the HPT process. Most of this expertise is needed only for limited periods and limited purposes. Selection of an HPT model should include a determination of the qualifications needed to perform the complete analysis.

Conclusion

In conclusion, the HPT models examined here appear to be both functional and logical efforts to analyze and communicate performance problems to clients. Selecting the best HPT model can be a daunting task. The challenge for all concerned parties is to select the best model that can be applied or adapted to address and resolve the client's problem. If there is no single HPT model capable of this task, then the performance technology analyst must have a range of HPT models from which to choose to find the best fit for the problem at hand.

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The editor welcomes letters from all readers wishing to comment on articles in this issue of *Performance Improvement (PI).* Early responses have the best chance of being published. Please be concise and include your title and organizational affiliation. *PI* reserves the right to select, solicit, and edit letters. Send letters to: *PI* Editor, 1400 Spring Street, Suite 260, Silver Spring, MD 20910; fax: 301.587.8573; or email: pershin@indiana.edu.

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The article on "HPT Models: An Overview of the Major Models in the Field" (*Performance Improvement*, Vol. 41, No. 8) provides a solid and succinct description of the history of HPT and how the field has evolved to encompass the major models in existence today.

To add to this article, I would like to point out that the Performance Analysis Flow Chart—referenced on page 16 (Figure 4)—underwent significant revisions in 1997 to incorporate Mager and Pipe's latest updates to the performance analysis process. The current flow chart includes analysis on performance expectations, feedback, fast fixes, calculation of benefits vs. costs, plus a number of other additions that make it even more versatile and useful in solving virtually any type of performance problem.

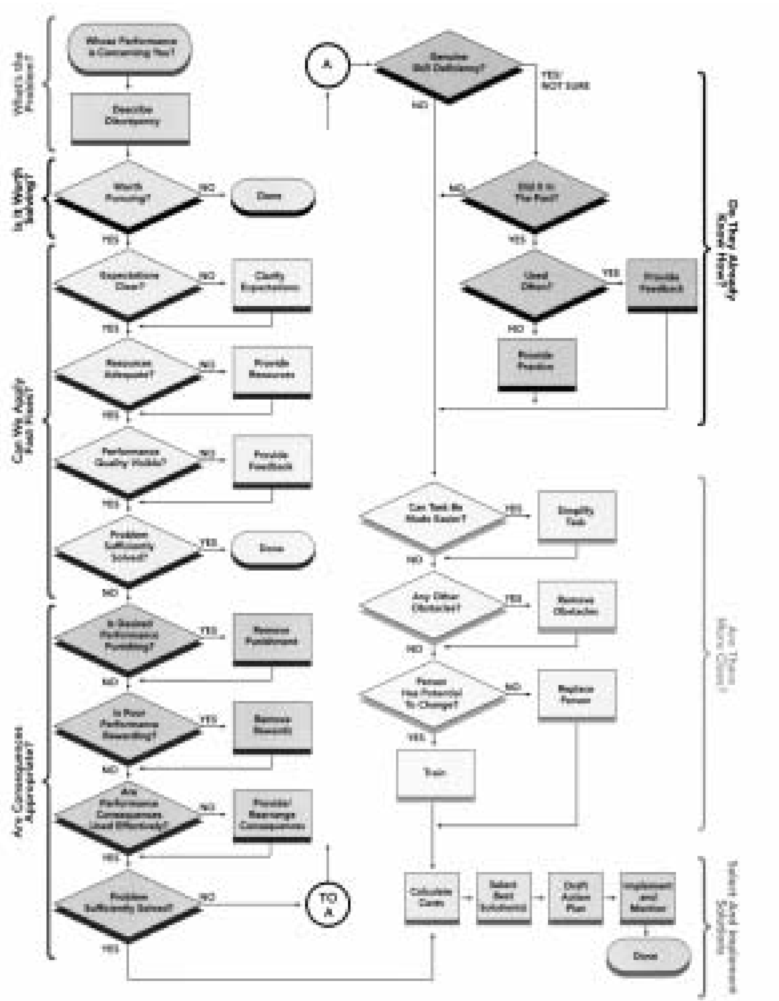

Figure 1: Performance Analysis Flowchart.