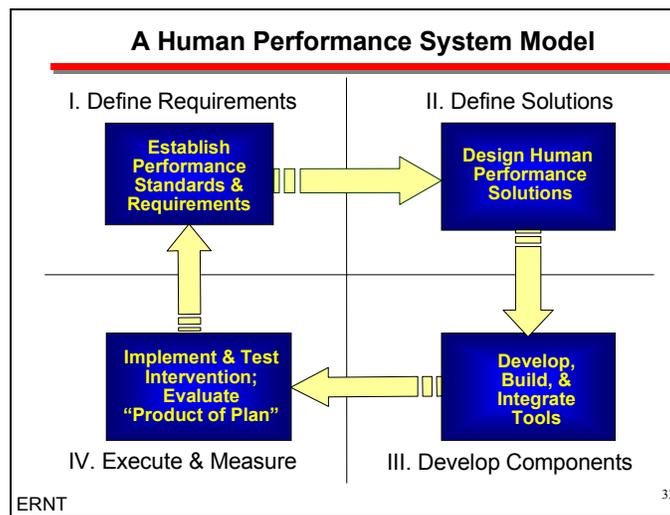


## Human Performance System Model (HPSM)

For the Navy to gain a competitive advantage in technical training and address its human performance problems, it must first develop a process by which it can turn critical information into a shared knowledge and value base. We have conceptualized a formal process for human performance as a cyclical model that defines human performance requirements, establish how best to achieve this performance, develops the necessary tools or products, implements the solution, and provides feedback based on an evaluation of the outcome. By creating this process, our training system can function while continually learning, adapting, and rejuvenating itself. This leads to an improved organizational problem-solving ability and capacity for action.



### Quadrant I: Define Requirements

The first step in the process, found in quadrant one, is to define human performance requirements and identify inhibitors to performance. Performance issues may be related to lack of skills organizational factors, errant processes, management, personnel selection, personnel interface, and others. This may require conducting a Job Task Analysis (JTA), describing the current and anticipated job environment, and specifying measures of effectiveness/performance.

Conducting a JTA means breaking down jobs and job tasks into specific behaviors and competencies. These are expressed in terms of what human operators are expected to do, and not in the current practice of using terms of training that drive to a particular solution. For example, the current practice allows stating the requirements like this: "provide a training course in C-school for missile operators." In this case, the requirement is stated in such a way as to preclude a human performance assessment, and drives directly to a specific solution (a training course). In contrast, our new concept allows requirements to be expressed in terms of what the human operator (or team) needs to do to accomplish the job or mission. For example, "the operator must be able to shoot a missile within 30 seconds." Stated in this way, the requirement does

not pre-determine a solution; rather, it states a human performance target that may be met in several ways. More importantly, it allows for an appropriate analysis to be conducted so that measures of effectiveness can be established and optimal solution(s) can be devised. Then interventions are developed to solve the performance issue. For example, a training intervention would provide the needed Knowledge and Skills to the workforce in an efficient and effective manner. A follow-on step to the JTA is to translate human performance requirements into competencies – that is, what does the learner need to perform the job or task. Competencies can be expressed in terms of knowledge, skills, abilities (KSAs). Other models factor in attitudes as well. By conducting this analysis, we can determine:

- What tasks need to be done?
- What competencies (knowledge and skills) are required to do the tasks?
- What are the differences between required and existing competencies?

In addition, a dynamic component is essential – job performance requirements can be specified for different stages of a career (apprentice, journeyman, or master levels of proficiency).

In the case of defining the job requirements, first determine the behaviors and competencies that our Sailors must exhibit. These behaviors and competencies must further be defined for the different stages of a career. Once these are defined, the CFFC (or equivalent) must validate and prioritize them to determine specific job performance standards.

To ensure consistency of results a defined process is critical. The Quadrant I process includes:

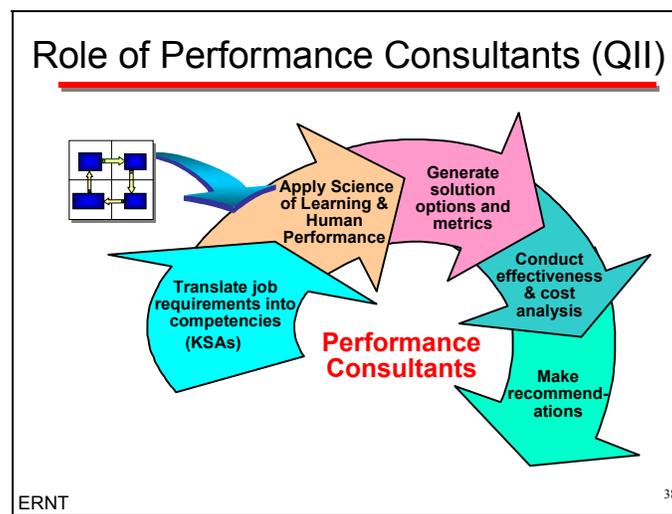
- 1) Conduct a Pre-Scoping Meeting (identify Scoping Meeting participants/stake holders)
- 2) Conduct a Scoping Meeting (define objectives/scope and develop a Plan of Action and Milestone (POA&M))
- 3) Prepare for the workshop (gather data, prepare package)
- 4) Conduct Job/Task workshop(s) (get inputs from fleet/SMEs)
- 5) Analyze results and prepare report for validation workshop
- 6) Present the report to working group (validate results)
- 7) Develop final report
- 8) Present final JTA report (Jobs/Tasks and MOEs/MOPs) to Commander Fleet Forces Command (CFFC) for approval

The JTA is important in order to address the capabilities of our sailors, however, it is not enough to focus only on the JTA during this analysis stage. We must also determine what organizational barriers may be impeding our sailors from performing at the highest levels. It has been estimated that only 20% of an organization's performance problems can be traced to individual issues (i.e., lack of skill), and the other 80% are due to problems in the organization itself. Faulty incentive programs, lack of management

support, outdated tools and technology, etc. are all organizational issues that training will not fix. Yet, if we do not address issues of this kind, our training efforts will be wasted.

## Quadrant II: Design Solutions

Once human performance requirements have been established, certified, and prioritized, they need to be translated into a menu of options for intervention from which the CFFC(s) can select. The crux of this process is analytical – that is, analysts and subject matter experts must evaluate the requirements and determine how best to meet them. This is the step in the process where the science of learning and human performance is applied.



The above figure displays the process associated with Quadrant II in more detail. As noted, this process depends on the skill, talent, and awareness of experts who can analyze human performance requirements and develop “enhancement solutions.” The first step in this quadrant is to analyze the data provided from the Quadrant I analysis to determine gaps between requirements and existing performance. Once gaps are identified, feasible alternative solutions can be identified and compared on dimensions such as pros, cons, risk, cost, effectiveness resources, time to implement, comprehensiveness, etc. A comparative analysis of alternatives addressing a given performance issue will provide justification for recommendations to the CFFC.

To ensure consistency of results a defined process is critical. The Quadrant II process includes:

- 1) Perform a Gap Analysis (GA)
- 2) Identify solutions (Draft Solution Set)
- 3) Gather data (Feasibility, Pros/Cons, Cost)
- 4) Perform a comparative analysis (Rank Solutions)
- 5) Develop draft Situational Analysis (SA) Report

- 6) Present finding to the working group
- 7) Develop final SA Report
- 8) Present SA Report to CFFC

### **Quadrant III: Develop, Build, and Integrate Tools**

The recommendations (solution options) generated in Quadrant II are passed to the decision-makers in Quadrant I. The CFFC, or equivalent, selects the appropriate intervention(s) based on effectiveness, cost, etc. The choice(s), then, are passed to Quadrant III for development. A number of processes and organizations may contribute to the building of the integrated components of the solutions. Solution options can include traditional classroom instruction; e-Learning; job performance aids; electronic performance support systems; manpower adjustments; on-the-job-training; integrated electronic technical manuals (IETM(s)); simulations, models or games; experience; job redesign/automation and so on. Performance consultants stay engaged to conduct initial assessments and provide important feedback to developers as the intervention is being designed. Development of the specific training tools in Quadrant III should take place in the competitive marketplace.

### **Quadrant IV: Execute and Measure Effectiveness**

Quadrant IV is where both the execution and the evaluation of the intervention occur. If training is the solution chosen and built, it is here in Quadrant IV that the training is done and the results measured. Executing the intervention, which is separate from "how to meet the requirement" (determined in Quadrant II), applies the solution built in Quadrant III. Although many organizations can be involved in the execution, their efforts can be integrated and coordinated so that duplication is avoided. An integrated training (or intervention) organization can leverage the strengths of and improve the efficiency of, multiple training entities.

A critical lesson to learn is that measures of effectiveness need to be specified in Quadrant I. This serves two purposes. First, identifying measures of performance in Quadrant I will help to drive the interventions toward meaningfulness. This means that if we know how effectiveness will be measured at the end, we are more likely to build interventions to succeed. Second, identifying the measures in Quadrant I makes the measurement in Quadrant IV meaningful. Measurement in hindsight is both self-serving and often inaccurate. We must focus on measurement in the early stages if it is to have an impact.

The evaluation function of Quadrant IV begins with the training experience. The evaluation provides for immediate level 1 and 2 feedback at this point:

- Is the student enjoying the experience?
- Is the student learning the facts?

In addition, level 3 and 4 measurement is conducted by the CFFC and used for evaluating the effectiveness of the intervention on the level of performance that is

important to them. In other words, the organization that sets the requirement gets to evaluate the product of the plan. This feedback includes:

- Is the Sailor more productive in prescribed tasks?
- Is the team/command more proficient because of the performance enhancement solution?

At the conclusion of the Quadrant IV evaluation phase, the CFFC and other CFFC-equivalents, as well as performance consultants and executors, receive information on whether the original objectives were met. This information is then used in Quadrant I for refining performance requirements and in Quadrant II for evaluating the intervention strategies. By allowing the end-users to determine human performance requirements and incorporating them into both the first and last steps of the process, we have a mechanism for continuous improvement based on direct feedback, changing operational needs, and advances in technology.

There are compelling reasons to make this change. In the HPSM, job requirements initiate the process. This has several advantages. First, operators know what tasks are required in order to form high performing teams. Second, performance consultants can translate required tasks into human performance systems that are most likely to achieve the competencies required to successfully complete the tasks. Third, instructors in the system can make modifications as they become apparent because they can easily determine which ones will lead to more successful completion of the course. Fourth, because the requirements are defined as tasks, they are easier to understand, test and modify. Lastly, the sponsors of the requirements can easily measure whether “graduates” have successfully completed their studies. If graduates can perform the defined tasks, the system has worked. In essence, by defining the requirements in terms of tasks, the requirement sponsors, the performance consultants, the instructors and the Sailors can communicate in the “language of work.”

This model suggests that Navy’s use of “training requirements” have led to traditional and unimaginative solutions. We worked through 10-job performance “use cases” using the HPSM and found that adopting the HPSM leads directly to retiring the term “training requirement.” Training, as one of many performance-enhancing tools, is merely a method of meeting an operational requirement, not a requirement itself. As part of this Revolution, we recognize that there are only “human performance requirements” and that by stating them in terms of the tasks required to do a job, we open the door to new learning technologies, new learning continuums, and a more responsive human development system.