

The Evolution of a Performance Analysis Job Aid

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Line managers and supervisors begin each day by comparing present and desired levels of performance. They then use some rudimentary form of cause analysis, select solutions from what they've found to be successful in the past, make the intervention, and evaluate the results. It's long past time that we bring what we have learned about performance technology to managers for use on the tactical problems that they confront each day. It's time that we assisted managers in creating work environments where their people can succeed.

For the past 18 years, I have worked on and off on developing a performance analysis job aid for use by line managers. This article will trace the development of the latest version of the job aid that combines gap and cause analysis together with force field analysis as a means for identifying, weighting, and displaying causes of a performance shortfall. While managers are the target audience for the job aid, performance consultants may find that it is a useful tool for them as well.

SYSTEMS ANALYSIS AND FORCE FIELD ANALYSIS

My first attempt at producing a performance analysis job aid for managers was published in the November/December 1990 edition of *Performance and Instruction* (Chevalier, 1990). The underlying systems model divided an organization into four major subsystems: human/social, technical, information/decision making, and structural. These in turn were broken down to identify factors that could influence performance for each of the sub-systems as are depicted in Figure 1.

SUBSYSTEM	POTENTIAL PROBLEM AREAS
Human/Social	Knowledge Skills Motivation Reward system Group norms Informal leaders Political climate
Technical	Job design Tools/equipment Procedures Technology
Information / Decision Making	Goals/objectives Measurement Data/information Decision makers Sub-optimization
Structural	Organization Control systems Flexibility Clear roles Feedback

Figure 1: Systems Analysis

Line managers begin the performance analysis process by defining a performance gap as the difference between “Where we are” (the present level of performance) and “Where we want to be” (the desired level of performance) as shown in Figure 2.

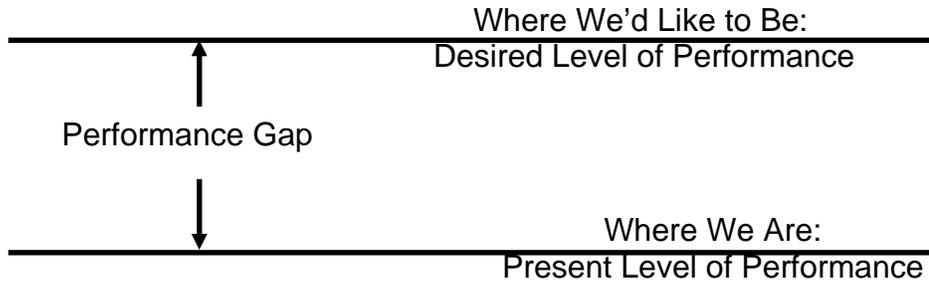


Figure 2: Performance Gap Analysis

Each of the four subsystems can then reviewed to see how the related factors for each subsystem is helping (driving forces) or hindering (restraining forces) to close the performance gap. Developed by Kurt Lewin, force field analysis provides a methodology for identifying, displaying, and weighting the relative strength of the factors that contribute to the present level of performance. (Lewin, 1947).

Driving forces are those factors that are already working to close the gap between the present level of performance and desired levels of performance. These are identified and evaluated as to their relative strength on a +1 to +4 scale. Restraining forces are those factors that are working against closing the gap between the present level of performance and desired levels of performance. These are identified and evaluated as to their relative strength on a -1 to -4 scale. To graphically depict the forces we use opposing arrows for the driving and restraining forces as shown in Figure 3.

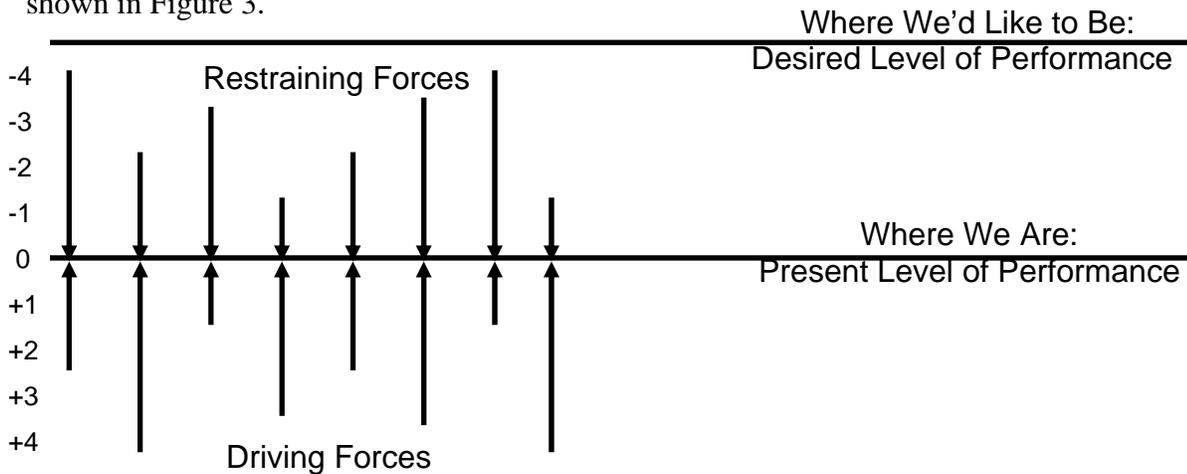


Figure 3: Force Field Analysis

The Performance Discrepancy Force Field Analysis Worksheet as shown in Figure 4 combines the systems analysis approach with gap analysis and force field analysis enabling managers to systematically and systemically identify, weight, and display the factors that contribute to the performance gap.

Performance Discrepancy Force Field Analysis Worksheet									
Where we are _____									

Where we want to be (stated in terms of quantity, quality, time and cost) _____									

Factors	Driving Forces					Restraining			
HUMAN/SOCIAL	+4	+3	+2	+1	0	-1	-2	-3	-4
knowledge									
skills									
motivation									
reward systems									
informal leaders									
political climate									
TECHNICAL									
job design									
tools/equipment									
procedures									
technology									
INFORMATION									
goals/objectives									
measurement									
data/information									
filtering									
decision makers									
sub-optimization									
STRUCTURAL									
organization									
control systems									
flexibility									
clear roles									
feedback									

Figure 4: Performance Discrepancy Forces Field Analysis Worksheet

This early article went on to discuss the appropriateness of training as a potential solution and suggested that there may be better alternatives if the performance discrepancy was not caused by a lack of knowledge and skills.

BEHAVIOR ENGINEERING AND FORCE FIELD ANALYSIS

About ten years passed before I returned to the idea of improving the performance analysis skills of line managers. As an instructor in ISPI's Principles and Practices Institute, I became better acquainted with Thomas Gilbert's Behavior Engineering Model (BEM) as depicted in Figure 5 that he presented in his seminal work, *Human Competence* (Gilbert, 1978).

	Information	Instrumentation	Motivation
Environmental Supports	<p><i>Data</i></p> <ol style="list-style-type: none"> 1. Relevant and frequent feedback about the adequacy of performance 2. Descriptions of what is expected of performance 3. Clear and relevant guides to adequate performance 	<p><i>Resources</i></p> <ol style="list-style-type: none"> 1. Tools and materials of work designed scientifically to match human factors 	<p><i>Incentives</i></p> <ol style="list-style-type: none"> 1. Adequate financial incentives made contingent upon performance 2. Non-monetary incentives made available 3. Career-development opportunities
Person's Repertory of Behavior	<p><i>Knowledge</i></p> <ol style="list-style-type: none"> 1. Systematically designed training that matches the requirements of exemplary performance 2. Placement 	<p><i>Capacity</i></p> <ol style="list-style-type: none"> 1. Flexible scheduling of performance to match peak capacity 2. Prosthesis 3. Physical shaping 4. Adaptation 5. Selection 	<p><i>Motives</i></p> <ol style="list-style-type: none"> 1. Assessment of people's motives to work 2. Recruitment of people to match the realities of the situation

Figure 5: Behavior Engineering Model

The BEM provided me with another way to systematically and systemically identify barriers to individual and organizational performance. According to Gilbert, the BEM distinguishes between a person's repertory of behavior (what the individual brings to the performance equation) and the environmental supports (the work environment factors that encourage or impede performance). I revised Gilbert's BEM in my article, *Updating the Behavior Engineering Model* (Chevalier, 2003) to reflect what had been learned since Gilbert published the model in 1978.

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In Figure 6, I adapted some of the terms used by Gilbert to reflect the way we commonly speak about performance and numbered them to identify the order in which the causes should be identified and remedied.

- | | | | |
|--------------------|----------------|--------------|---------------|
| Environment | 1. Information | 2. Resources | 3. Incentives |
| Individual | 6. Knowledge | 5. Capacity | 4. Motives |

Figure 6: Updated Behavior Engineering Model Cells

I then adapted the BEM to provide current management terms and to identify the more important opportunities for improving individual or work group performance. Like the original model, the updated version shown in Figure 7 provides a structure for troubleshooting performance problems. It is important to remember that cause analysis does not direct us to the best solutions for correcting the problem, but rather provides a framework for discovering the underlying causes.

Environment	<p>Information</p> <ol style="list-style-type: none"> 1. Roles and performance expectations are clearly defined; employees are given relevant and frequent feedback about the adequacy of performance. 2. Clear and relevant guides are used to describe the work process. 3. The performance management system guides employee performance and development. 	<p>Resources</p> <ol style="list-style-type: none"> 1. Materials, tools and time needed to do the job are present. 2. Processes and procedures are clearly defined and enhance individual performance if followed. 3. Overall physical and psychological work environment contributes to improved performance; work conditions are safe, clean, organized, and conducive to performance. 	<p>Incentives</p> <ol style="list-style-type: none"> 1. Financial and non-financial incentives are present; measurement and reward systems reinforce positive performance. 2. Jobs are enriched to allow for fulfillment of employee needs. 3. Overall work environment is positive, where employees believe they have an opportunity to succeed; career development opportunities are present.
Individual	<p>Knowledge / Skills</p> <ol style="list-style-type: none"> 1. Employees have the necessary knowledge, experience and skills to do the desired behaviors 2. Employees with the necessary knowledge, experience and skills are properly placed to use and share what they know. 3. Employees are cross-trained to understand each other's roles. 	<p>Capacity</p> <ol style="list-style-type: none"> 1. Employees have the capacity to learn and do what is needed to perform successfully. 2. Employees are recruited and selected to match the realities of the work situation. 3. Employees are free of emotional limitations that would interfere with their performance. 	<p>Motives</p> <ol style="list-style-type: none"> 1. Motives of employees are aligned with the work and the work environment. 2. Employees desire to perform the required jobs. 3. Employees are recruited and selected to match the realities of the work situation.

Figure 7: Updated Behavior Engineering Model

Conducting a thorough cause analysis will help managers to better define the reasons why the gap in performance exists. As was the case for using the Performance Discrepancy Force Field Analysis Worksheet, the starting point in using the Cause Analysis Worksheet, as shown as Figure 8, is identifying the individual's or the organization's present level of performance (where they are) and their desired level of performance (where they'd like to be). The difference between where they are and where they want to be is the performance gap.

Another useful step is setting a reasonable goal, something that moves the organization in the direction toward where they want to be and can be accomplished in a short time. This should be defined clearly with measures of quality, quantity, time, and cost delineated for the goal. This short-term goal will serve to motivate those who are working to close the performance gap and as a milestone to show progress in closing the performance gap.

Managers then assess the impact of the environmental individual factors that are influencing the performance gap. Environmental factors such as information, resources, and incentives are usually more cost-effective to fix than individual factors. Motives, capacity, and knowledge are usually more expensive to fix since they indicate that the selection of the employees was flawed or that the requirements of the job have changed to a point where the present employees are no longer able to perform. Even if a manager were to successfully change these individual factors, performance will most likely not improve if there are environmental factors that remain unresolved. The process begins by asking questions to identify how each of these factors is presently impacting the performance gap.

Whether the manager is working with an individual or a group, the worksheet gives the needed structure to guide questions to identify the driving and restraining forces. When the worksheet is complete, the manager has a picture of the performance gap, set a reasonable goal, and identified the factors working for and against closing the gap. A case study and a completed version of the Cause Analysis Worksheet are included in my 2003 article and will not be repeated here.

Cause Analysis Worksheet

Present Level of Performance: _____

Desired Level of Performance: _____

Reasonable Goal: _____

<u>Factors</u>	<u>Driving Forces</u>				<u>Restraining Forces</u>				
	+4	+3	+2	+1	0	-1	-2	-3	-4
<u>Information</u>									
clear expectations
relevant feedback
relevant guides
performance mgmt
<u>Resources</u>									
materials/tools
time
processes/procedures
safe environment
<u>Incentives</u>									
financial incentives
other incentives
enriched jobs
work environment
<u>Motives</u>									
motives aligned with work
desire to perform
expectations are realistic
recruit/select right people
<u>Capacity</u>									
capacity to learn
capacity to do
recruit/select right people
emotional limitations
<u>Knowledge/Skills</u>									
necessary knowledge
necessary skills
proper placement
cross trained

Figure 7: Cause Analysis Worksheet

BEHAVIOR ENGINEERING MODEL – NUCLEAR

The next phase of the development of the performance analysis worksheet happened when Tony Mascara of the Institute of Nuclear Power Operations (INPO) took the ISPI two-day Certified Performance Technologist (CPT) application preparation course in March, 2006. During this workshop, I delivered the Updated Behavior Engineering Model. When Tony returned to the INPO headquarters he worked to develop a nuclear version of the Updated BEM for use by managers in the nuclear community. After several iterations that I reviewed for Tony, the nuclear version as shown in Figure 8 was published by INPO in 2006 (INPO, 2006).

	Direction to Act	Opportunity to Act	Willingness to Act
	<u>Job or Task-Related Information</u> (requirements / guidance on what one is supposed to do and how well)	<u>Resources and Environment</u> (external conditions affecting performance of the job or task)	<u>Incentives and Disincentives</u> (an environment of rewards and sanctions explicitly or implicitly associated with the job or task)
Environment	<ol style="list-style-type: none"> 1. Job or task goals, desired results, roles and responsibilities, and criteria for success are clearly identified. 2. The risk importance of the job or task and critical steps, if any, have been denoted and communicated as such. 3. Clear expectations and standards for the conduct of work exist and have been communicated. 4. The usability, accuracy, and availability of procedures support error-free performance. 5. Relevant feedback on previous job or task performance, including opportunities for development, has been given to the individual (if applicable). 	<ol style="list-style-type: none"> 1. Tools, material, clothing, furniture, facilities, systems, and equipment accommodate human limitations and are available and accessible. 2. Other individuals or organizations are available for support, if needed. 3. Adequate time is allotted, and other work conditions that could hinder performance are eliminated or minimized. 4. The values, norms, attitudes, and beliefs of the person's immediate supervisor and work group about hazards in the workplace support safe practices. 	<ol style="list-style-type: none"> 1. The job's financial and non-financial rewards and disincentives are contingent on performance. 2. Competing incentives for poor performance are eliminated. 3. The job or task provides opportunities for success and career advancement, meets employee needs, and result in identifiable pieces of work traceable to the individual. 4. People are treated with honesty, fairness and respect regardless of position in the organization. 5. Work group standards are consistent with the above.
Individual	<ol style="list-style-type: none"> 1. Individual is qualified for the job or task and possesses the knowledge, skills, experience, and proficiency necessary to perform the task successfully. 2. Individual understands the job or task objective(s), critical steps, and potential consequences to safety and reliability if performed improperly. 3. Individual understands the roles and responsibilities of others. 	<ol style="list-style-type: none"> 1. Individual possesses the intelligence, sociability, aptitude, size, strength, and dexterity to perform the job or task successfully. 2. Individual is available for work, undistracted, and fit for duty. 	<ol style="list-style-type: none"> 1. Individual cares about performing the job or task well. 2. Individual possesses a healthy work ethic and is willing to do what is right regardless of what others would do. 3. Individual feels that the job or task is meaningful and attainable, progress is recognizable, and the task generates a personal sense of accomplishment.

Figure 8: Behavior Engineering Model – Nuclear

PERFORMANCE ANALYSIS WORKSHEET – NUCLEAR

The next step in the development of the Performance Analysis Worksheet occurred when I was privileged to serve as a member of a team assembled by the International Atomic Energy Agency (IAEA) to develop guidelines for managers to better evaluate the impact of training and to improve organizational performance. Two meetings were held at the IAEA Headquarters in Vienna, Austria in June 2006 and May 2007. The other members of the team included Alexey

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Kazenov of the IAEA, Jane LeClair, Ed.D., of Excelsior College, Hakan Andersson, Ph.D., of Karnkraftsakerhet och Utbildning AB, and Rob Templeton of Ontario Power Generation.

During these meetings, I introduced my colleagues to the Updated Behavior Engineering Model, the related Cause Analysis Worksheet, and the Behavior Engineering Model – Nuclear. The team decided to take the Cause Analysis Worksheet to a new level by using the descriptive terms used in INPO’s Behavior Engineering Model and by adding space for the manager to describe the factors affecting performance. This produced a form for managers at nuclear facilities to use in analyzing the causes of performance shortfalls. The Nuclear Cause Analysis Worksheet is shown as Figure 8.

Job or Task-related Information	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Job or task goals, desired results, roles and responsibilities, and criteria for success are clearly identified.									
2. The risk importance of the job or task and critical steps, if any, have been denoted and communicated as such.									
3. Clear expectations and standards for the conduct of work exist and have been communicated.									
4. The usability, accuracy and availability of procedures support error-free performance.									
5. Relevant feedback on previous job or task performance, including opportunities for development, has been given to the individual (if applicable).									
Resources and Environment	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Tools, material, clothing, furniture, facilities, systems, and equipment accommodate human limitations and are available and accessible.									
2. Other individuals or organizations are available if needed.									

3. Adequate time is allotted, and other work conditions that could hinder performance are eliminated or minimized.									
4. The values, attitudes, and beliefs of the person's immediate workgroup about hazards in the workplace support safe work practices.									
Incentives and Disincentives	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Financial and non-financial rewards and disincentives are contingent on performance.									
2. Competing incentives for poor performance are eliminated.									
3. The job or task provides opportunities for success and career advancement, meets employee needs, and results in identifiable pieces of work traceable to the individual.									
4. People are treated with honesty, fairness and respect, regardless of position in the organization.									
5. Workgroup standards are consistent with the above.									
Knowledge / Skills	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Individuals qualify for the job or task and possess the knowledge, skills, experience, and proficiency necessary to perform the task successfully.									
2. Individual understands the job or task objective(s), critical steps, and potential consequences if performed improperly.									

3. Individual understands the roles and responsibilities of others.									
Capacity and Readiness	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Individual possesses the intelligence, sociability, aptitude, size, strength, and dexterity to perform the job or task successfully.									
2. Individual is available for work, undistracted, and fit for duty.									
Personal Motives	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Individual cares about performing the job or task well.									
2. Individual possesses a healthy work ethic and is willing to do what is right regardless of what others would do.									
3. Individual feels that the job or task is meaningful and attainable, progress is recognizable, and the task generates a personal sense of accomplishment.									

Figure 8: Nuclear Performance Analysis Worksheet

GENERIC PERFORMANCE ANALYSIS WORKSHEET

These changes to the models and job aids have led me to develop a new generic Performance Analysis Worksheet that has been improved by what was learned during its evolution in the nuclear industry. This is depicted as Figure 9. While longer than the one-page Cause Analysis Worksheet, the new Performance Analysis Worksheet has the advantage of complete descriptions of the various factors that can affect performance and a place for recording what was observed. For a Microsoft Word version of the Performance Analysis Worksheet to use within the organizations you serve, please e-mail me at roger@aboutiwp.com.

Performance Analysis Worksheet

Present Level of Performance: _____

Desired Level of Performance: _____

Reasonable Goal: _____

Measures of Quantity: _____

Measures of Quality: _____

Measure of Time: _____

Measures of Cost: _____

Other Key Measures: _____

Job or Task-related Information	Description of Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Roles and performance expectations are clearly defined; employees are given relevant and frequent feedback about the adequacy of performance.									
2. Clear and relevant guides are used to describe the work process.									
3. The performance management system guides employee performance and development.									
Resources	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Materials, tools and time needed to do the job are present.									
2. Processes and procedures are clearly defined and enhance individual performance if followed.									
3. Overall physical and psychological work environment contributes to improved performance; work conditions are safe, clean, organized, and conducive to performance.									

Incentives	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Financial and non-financial incentives are present; measurement and reward systems reinforce positive performance.									
2. Jobs are enriched to allow for fulfillment of employee needs.									
3. Overall work environment is positive, where employees believe they have an opportunity to succeed; career development opportunities are present.									
Motives	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Motives of employees are aligned with the work and the work environment.									
2. Employees desire to perform the required jobs.									
3. Employees are recruited and selected to match the realities of the work situation.									

Capacity	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Employees have the capacity to learn and do what is needed to perform successfully.									
2. Employees are recruited and selected to match the realities of the work situation.									
3. Employees are free of emotional limitations that would interfere with their performance.									
Knowledge / Skills	Factors Affecting Performance	Driving Forces				Restraining Forces			
		+4	+3	+2	+1	-1	-2	-3	-4
1. Employees have the necessary knowledge, experience and skills to do the desired behaviors									
2. Employees with the necessary knowledge, experience and skills are properly placed to use and share what they know.									
3. Employees are cross-trained to understand each other's roles.									

Figure 9: Generic Performance Analysis Worksheet

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The development of the enhanced generic Performance Analysis Worksheet would not have been possible without the efforts of the others who wanted to develop a nuclear industry-specific model and job aid. While I believe that the Cause Analysis Worksheet provides sufficient structure for line-managers and supervisors to define performance gaps and the underlying causes, the Performance Analysis Worksheet allows for more complete descriptions of the factors affecting performance and may have greater application for more senior managers and performance consultants.

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