

A Question of Performance

Part II: Applying the PROBE Model

Playing Poker With Human Capital

By THOMAS F. GILBERT

All at once "productivity" is the big word, and we can no longer take any comfort in thinking of it as "cutting heads"—that is not "the way the Japanese do it." And capital and energy no longer have the leverage they once had.

Where, then, is it possible to get big changes in productivity? Only here—in human behavior, our one certain renewable resource. Now we must play our poker with human capital, and the odds are loaded in favor of those who play with a theory.

PROBE is one element of such a theory. It is more than just a bunch of questions. When applied well, it is a concept that helps us isolate human resource leverage points, just as accounting and economics get us to think about ways to leverage capital.

I have described the rudiments of the PROBE theory in Part I* of this paper, and in Table 1 I have reprinted the most useful questions generated by this model of behavior.

The case history that follows describes an application of PROBE illustrating a behavioral strategy that produced nearly a threefold improvement in performance. The example, a real one, is of a simple job—more complex jobs would require too much explanation.

But the simplicity of the job

should not suggest that PROBE cannot be applied to high technology work or to the duties of higher management. In my experience in applying PROBE, the more difficult the jobs, the more likely the behavioral strategies are to pay off.

Picking lipsticks for Rose

The Rose Corporation sells sundries from door to door—some 1,500 separate items (not counting colors, flavors and sizes) of jewelry, cosmetics and the like. Every two weeks the Rose sales reps mail in their orders to a regional distribution center. The computer prints each rep's order on a "pick list," which is put in a box and placed on a conveyor line with 18 positions (or "stations") on each line. A "picker" at each station then removes the list and packs the items stored at her position. (All the pickers are women.)

The Rose executives are concerned with the error rates of the pickers. The average rate is now about one error in 1,200 picks, although it used to be about one in 1,500. (Exemplary performers now make about one error in 1,800.) This may not seem like many errors, but every error translates into a disappointed customer. Rose attributes the error increase to two factors. The first is the growth in the variety of products. The second

is the increase in turnover, resulting from a changing labor market.

Rose executives posed the performance problem this way: "How can we reduce errors in picking? We've considered four possibilities: One is to improve our training of employees in skills of accuracy; a second is to motivate our pickers better—perhaps we could select people with greater aptitude for accuracy. And we've even considered introducing special training every two weeks when the products change their location in the bins."

Rose emphasized this fourth possibility because the products featured for sale change biweekly. Since the new featured products constitute most of the items on the pick list, they have to be put in those bins up front that are most easily accessible to the picker. (Each station has about 100 bins.) This means that a particular lipstick that had been placed in a bin in front of the picker only two weeks before might now be near the floor to her rear. So, this practice of changing locations, although convenient for picking, discourages reliable picking habits.

I also made these observations

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that will help the reader understand the analysis:

- Rose is a profitable company with very "modern" management and personnel practices. It has a large HRD department and an excellent group of industrial engineers.

- The unionized pickers and other distribution employees are paid competitive wages that are above the average expectations. Privately, the union rates both employee relations and benefits as excellent and, as a result, has few grievances.

- Supervisory training is extensive and the quality of the supervision seems to be high. Supervisors maintain a business-like but friendly, non-punitive atmosphere.

- Pickers are required to be able to read. Most of them have a high school education, and they must pass a task-relevant "picking test."

- No bonuses or perks are awarded for superior performance.

- Competent human factors specialists engineered the "stations"; these were made as comfortable as was reasonable with custom-designed stools. All items are clearly visible in the bins.

- Supervisors give employees excellent individual training and attention. They also stress the importance of accuracy, and the speed of the picking line places no particular pressure on the pickers.

- Every two weeks, as the items in the bins are changed, the computer estimates the frequency with which items will appear on the pick list. It also determines the exact bin location of each item. Items are then printed on the list in the order in which they appear in the bins, from left to right and down.

- Two items nearly identical in appearance are located at different stations (e.g., two colors of the same lipstick).

- The computer knows the weight of every individual item and the number of items entered into each bin. Items of a kind differ very little in weight.

- A checker removes five per-

cent of the boxes from the end of the assembly line and counts the errors. Error counts from the sample are made for each picker. Once a month, each picker has a "feedback" session with her supervisor, who discusses her error counts. Supervisors have been through more than one course emphasizing motivation and positive approaches to employees. Warehouse error performance is posted, but not individual performance. Top performers are not publicly recognized, but the average and best performances are posted without names attached.

- A performance audit revealed that a reduction of the average error rate from 1-in-1,200 picks to the former 1-in-1,500 picks would be worth a lot of money each year in actual cost savings, not counting even greater economic gains from the effects on sales. Automation is not considered cost-effective for another six years or more.

If you want to try working an exercise, study the observations carefully before reading the analysis that follows. Make a list of the approaches you might take to help improve picking accuracy at Rose. Then carefully ask all of the PROBE questions in Table 1. List your relevant "no" answers, and reconsider your approach. Naturally, you can't know all the facts, but you can assume that I have described anything that was out of the ordinary and everything I think is relevant. Any common-sense answers to any other questions you have are probably correct.

My analysis of the Rose picker

These are the questions I answered with a "no."

A-3. The items in the bins are easily confused, and so are the numbers on the pick list (for example, "9 three-inch stick pins" and "4 ten-ounce bath salts").

A-4. The pick lists have unnecessary "data glut" (why should the picker know the

manufacturer, weight or the number to a carton?).

B-2 and B-4. Once-a-month feedback sessions are too infrequent to help people remember their poor performance.

D-4. The procedures are certainly not free of boring and tiresome repetition.

F-4. No pay or formal recognition is given for doing a good job.

F-2. No bonuses or raises are awarded for good performance.

G-6. Every two weeks the skill of picking from bins has to be relearned.

I-2. The high turnover provides evidence that the motives don't endure. This is a boring job.

To summarize my "no" answers, I concluded that:

- Stimulus confusion in the bins and pick lists, as well as data glut, invites errors;

- Feedback is too slow to support excellent performance;

- Little recognition is given for good performance in a boring, repetitive job;

- The biweekly requirement to relearn bin locations seriously increases errors and slows performance.

But clients don't want just "no" answers; they want answers that say more: "No—and here's what you can do about it." For this reason, the PROBE questions cannot be asked mechanically—because some of them lead to further, more detailed questions. For example, we need to ask, "What are the ways we might provide feedback?"

Some people are better trained or experienced than others to ask—and answer—some of these questions. For example, as a psychologist with a long interest in stimulus competition and inadequate data, I am especially good at refining these kinds of questions. However, even though you may not be as experienced at such questions as I am, you probably will come up with a pretty good answer, too. (I know, because I have tried this experiment. The PROBE questions helped about 80 percent of more than 100 people develop a good approach to this problem. Before

Table 1.
PROBE Questions

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E—QUESTIONS ABOUT THE BEHAVIORAL ENVIRONMENT

A. DIRECTIONAL DATA

1. Are there sufficient, readily accessible data (or signals) to direct an experienced person to perform well?
2. Are they accurate?
3. Are they free of confusion—"stimulus competition"—that slows performance and invites errors?
4. Are they free of "data glut"—stripped down to simple forms and not buried in a lot of extraneous data?
5. Are they up-to-date and timely?
6. Are good models of behavior available?
7. Are clear and measurable performance standards communicated so that people know how well they are supposed to perform?
8. Do they accept the standards as reasonable?

B. CONFIRMATION

1. Is feedback provided that is "work-related"—describing results consistent with the standards and not just behavior?
2. Is it immediate and frequent enough to help people remember what they did?
3. Is it selective and specific—limited to few matters of importance and free of "data glut" and vague generalities?
4. Is it educational—positive and constructive so that people learn something from it?

C. TOOLS AND EQUIPMENT

1. Are the necessary implements usually on hand for doing the job?
2. Are they reliable and efficient?
3. Are they safe?

D. PROCEDURES

1. Are the procedures efficient and designed to avoid unnecessary steps and wasted emotion?
2. Are they based on sound methods rather than historical happenstance?
3. Are they appropriate to the job and the skill level?
4. Are they free of boring and tiresome repetition?

E. RESOURCES

1. Are adequate materials, supplies, assistance, etc. usually available to do the job well?
2. Are they efficiently tailored to the job?
3. Do ambient conditions provide comfort and prevent unnecessary interference?

F. INCENTIVES

1. Is pay for the job competitive?
2. Are there significant bonuses or raises based on good performance?
3. Does good performance have any relationship to career advancement?
4. Are there meaningful non-pay incentives (recognition, and so on) for good performance (based on results and not behavior)?
5. Are they scheduled well, or so frequently as to lose meaning and so infrequently as to be useless?
6. Is there an absence of punishment for performing well?
7. Is there an absence of hidden incentives to perform poorly?
8. Is the balance of positive and negative incentives in favor of good performance?

P—QUESTIONS ABOUT BEHAVIORAL REPERTORIES

G. KNOWLEDGE AND TRAINING

1. Do people understand the consequences of both good and poor performance?
2. Do they grasp the essentials of performance—do they get the "big picture"?
3. Do they have the technical concepts to perform well?
4. Do they have sufficient basic skills—reading and so on?
5. Do they have sufficient specialized skills?
6. Do they always have the skills after initial training?
7. Are good job aids available?

H. CAPACITY

1. Do the incumbents have the basic capacity to learn the necessary perceptual discriminations with accuracy and speed?
2. Are they free of emotional limitations that would interfere with performance?
3. Do they have sufficient strength and dexterity to learn to do the job well?

I. MOTIVES

1. Do incumbents seem to have the desire to perform when they enter the job?
2. Do their motives endure—e.g., is the turnover high?

they were given PROBE, success was rare.)

Analysis of Rose pickers

Here is my way of helping Rose pickers:

- *Stimulus confusion.* To overcome this, I recommended labeling the bins; I asked the computer to print only the labels, not the content, of the bins.

Since the computer knows where every item is located, all it needs to do is print the label of the location regardless of what it directs the bin-loaders to put into the bins. Note the rationale for these labels. They are meant to be easily memorized and associated with a location. The four bins to the far left are all names of the same class (terms used in card games), and they have an alphabetical order.

Others are names of food, body parts and animals. An animal name immediately clues the picker to go to the far right. Also, words were chosen that were difficult to confuse with each other (no "vat" and "fat," for example). The same holds true for letters—if "M" is there, "N" shouldn't be. Labeling the bins with numbers or Roman numerals would not be as effective because these are too easily confused with the quantities printed on the list. Nor are symbols as good as words because we carry words in our heads better when we look away from the pick list. But either kind of labeling, symbols or words, would be better than no labeling at all.

This approach provided a nearly threefold increase in accuracy. The average performer now did better than the top old-timers used to. Speed also increased by 10 or 15 percent.

- *Biweekly training.* The need for relearning the bins every two weeks disappeared with the labeling. And the proficiency of new employees peaked in about 5 or 10 days rather than the two to three months previously required.

This example nicely illustrates the "transactional" nature of behavior—meaning, if you offset one aspect, you may have some effect on one or more of the

others. It also illustrates leverage—that is, we could have invested in intensive training that might have yielded a threefold improvement in accuracy, but it would have been an incredibly difficult undertaking and would have required low turnover to pay off. Improving the data provided the great leverage.

- *Feedback.* We considered several ways to offer instant confirmation of an error—or at least more immediate and frequent feedback about proficiency. One method seemed especially promising: weighing the boxes. Since the computer knows the weight of every item, and items of a kind have small variances in weight, we thought of putting a scale on the conveyor belt at each position. If the picker put in too many or too few items, or the wrong item, the scale could show the error. We believed this arrangement would catch a substantial number of errors.

This weighing approach was not adopted though, because a study showed that scales sensitive and sturdy enough to do the job were quite expensive, and four or five years would be required to recapture the investment if nothing else were done to reduce errors. Labeling was so effective that it made the weighing approach not worth it.

I must confess to a fundamental error I made in using PROBE here. I am deeply infected with the rush-to-solution disease, and the weigh-the-boxes approach to confirmation carried me away. The project probably would have proceeded more smoothly had I practiced what I preach and arrived at a sound strategic approach before delving too deeply into any single approach. PROBE will help impede bandwagon hopping.

- *A boring job with little recognition for excellent performance.* The union shot down two approaches that we considered: pay-for-performance and rotation of people among the several boring jobs in the warehouse. The "code-picking" method, as bin-labeling came to be called, would have made rotation feasible

because it reduced the training requirements. The company accepted a recommendation to provide such perks as free lunches; however, "code-picking" so greatly reduced the variance in performance that outstanding pickers were not much better than the average. This confirmed another principle of "performance engineering"—effective programs reduce variances in performance.¹

Table 2 summarizes the PROBE analysis and shows a simplified version of a worksheet used to sort out the potential leverage of behavioral approaches.

Things to know about PROBE

I repeat for emphasis: PROBE is not a tool that should be used mechanically. An understanding of its concepts and experience in its use in the situations where it is applied will substantially increase its effectiveness. After all, it doesn't answer the questions; it just prompts us to think of answers and helps us to sort them out.

For some situations, I find it useful to pose the questions so that job incumbents, their managers and subordinates all can answer them—and not answer them just with "yes" or "no," but also analyze the barriers to performance and develop their own approaches.

Another useful procedure is to first apply PROBE to a job in a general way, and then to go back through the questions for each of its important responsibilities. This can accomplish two things. The first trial tends to reveal the large barriers to performance, usually created by management. The detailed analysis tends to reveal technical problems that are likely to be hidden.

For example, asking questions of highest-level sales managers about the job-as-a-whole helped us focus on the inadequacies of their data to tell them how their decisions affect profits, not just revenues. This led to an extensive restructuring of their data system. But later questions about the specific accomplishment of

Table 2.

Balancing the Behavioral Equation (Example: Order Picker)

PROBLEMS	APPROACHES	EXPECTED RESULTS	COST	VALUE COST	ACTION
1. Unnecessary confusion and glut in the data	Redesign order form and bin stimuli	Should greatly increase accuracy and productivity	Very low	High	Now
2. Delayed, non-instructive feedback	Weigh boxes	Catch errors, improve accuracy, slow productivity	High capital investment	?	Study
3. Almost no non-contract incentives	Institute performance based incentives	Might improve accuracy and productivity	Low recurring expense	Low to moderate	Now
4. Skill training required every two weeks	Design "two-week" skill training program	Might improve accuracy and productivity for a couple days each month	Moderate recurring expense	?	Wait

making pricing decisions revealed a defect in their application of some key concepts in pricing theory. A smart training director in this company recognized the importance of training here and that it had no alternative. Let's see why.

No alternatives to training...but...

It has been more than 20 years since the "D_F or D_K?" question settled in my mind (planted there by Joe Hammock, a friend who answers questions with better questions). In my inexperience, I thought of the question as a way to find alternatives to training. Now I know that the more alternatives we find, the more we need training. New approaches to performance mean change, and preparing people for change is the business of training and its only justification.

Recently, two companies, each

with high technology departments, submitted themselves to a painful performance analysis. In both, the analysis resulted in a radical restructuring of how they do their work—not their technology, but the management and measurement of their performance. The HRD people in both companies participated at the beginning. But those in Company A made themselves scarce when all semblances to traditional training approaches seemed to disappear, whereas in Company B, they remained part of the project team. Implementation of the changes was a difficult challenge facing great resistance. In company B, the training people were able to lead the transition, much to the benefit of their company—and to the relief of line managers, who were not skilled in preparing people for change.

Company A, however, without this resource, suffered substan-

tially. Even when help was requested, Company A's training department offered to prepare audio-visuals without asking whether they were needed. Managers at Company A discovered that there was no alternative to training, but there was an alternative to the training department.

Reference

1. Gilbert, T.F. *Human competence*. New York: McGraw-Hill, 1978, chapter two.