

**PRODUCTIVITY IMPROVEMENT TECHNIQUES AND  
STRATEGY FOR THE SUPERMARKET INDUSTRY**

**Prepared for:**

**Coca-Cola Retailing  
Research Planning Council**

**Prepared by:**

**Bobby J. Calder,  
Professor  
Graduate School of Management  
Northwestern University  
Evanston, Illinois 60201**

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## Executive Summary

The objective of this report is to define new approaches and opportunities for productivity improvement in the supermarket industry. In order to determine the current state of the art in the industry, interviews were conducted with executives in key supermarket chains. The interviews yielded a clear pattern of findings. Productivity improvement is presently approached via a cost reduction strategy. Firms attempt to reduce labor costs to make up for rising wages so as to maintain historical labor/sales ratios. This cost reduction strategy of productivity improvement is implemented through automation and industrial engineering techniques.

This report points out the limitations and shortcomings of the prevailing cost reduction orientation. Most important is the lack of fit between the nature of supermarket work and the guiding precept of industrial engineering techniques that work can be standardized in a mechanical fashion.

The opportunity for the supermarket industry lies in the use of behavioral science techniques that seek to maximize employee contribution to the business. Seven techniques that represent the best behavioral science developments are described in detail.

- (1) **Job design** attempts to manipulate factors inherent in the work itself such as meaningfulness, personal responsibility and knowledge of results to stimulate employee contribution.
- (2) **Participatory incentive plans** attempt to increase the control the employee has over his pay to stimulate employee contribution.
- (3) **Objective-setting programs** attempt to translate company goals into personal goals to stimulate employee contribution.
- (4) **Flexible work scheduling** attempts to increase the employee's control over and ability to integrate his work and nonwork time to stimulate employee contribution.
- (5) **Behavioral supervisory training** attempts to bypass detrimental supervisory attitudes by "showing" supervisors how to reinforce employees in order to stimulate their contribution.
- (6) **Autonomous work groups** attempt to use peer pressure to stimulate employee contribution.
- (7) **Survey feedback** attempts to bridge the communication gap between management and employees to stimulate employee contribution.

While versions of these techniques are not uncommon in the supermarket industry, they are presently used in a piecemeal fashion in an attempt to reduce employee resistance to cost reduction.

Effective implementation of behavioral science techniques in the supermarket industry will require a shift away from the industry's cost reduction orientation. A new strategy, termed a market investment strategy, is presented as an alternative to cost reduction. This strategy seeks to increase employee input in order to increase sales output, thereby affording an overall increase in productivity. Though an ongoing effort is needed to operationalize behavioral science techniques in any particular firm, this market investment strategy provides a natural guide to implementation.

## INTRODUCTION

The supermarket industry, along with all businesses in this country, is in the midst of a productivity crisis. During 1979 the productivity rate of private business fell 1.8 percent. This is the first time since 1974 that productivity has declined steadily for four quarters. Moreover, the supermarket industry is generally regarded as being among the lowest in productivity. Labor costs run up to 60 percent of a typical operation's costs. And the trend is for worse, not better, productivity. The Labor Department estimates that from 1972 to 1977 output per manhour dropped an average of one percent a year in the industry. It has become essential for the supermarket industry to reconsider its approach to productivity and to find new ways of combating the crisis.

This report is dedicated to rethinking the industry's productivity efforts. It offers no quick solutions, no magic remedies. It deals with the basic questions any company should be asking.

- What is the supermarket industry presently doing about productivity?
- Are there alternative ways of thinking about productivity? Is there a need to take a totally fresh look at productivity?
- How far should the industry go in embracing traditional industrial engineering techniques?
- What is the relevance of new behavioral science techniques? What are the strengths and weaknesses of such techniques? How do they fit in with current industry efforts?
- What are the requirements for successful implementation of behavioral science techniques?

The remainder of this report presents a detailed discussion and analysis of these questions. At the conclusion of the report we return to the specific questions to summarize the answers arrived at.

## State of the Art of Productivity Improvement in the Supermarket Industry

Supermarket executives are very much aware of the productivity problem. In a survey conducted for this report, fifty-six executives of major chains were asked to compare productivity to three other major problems. Productivity was ranked alongside of market share as the number one problem. As shown in Table 1, buying effectiveness and energy conservation were both put well behind productivity.

Table 1

Relative Priority Given to Productivity  
by Executives

	Average Rank in Importance
Improving Productivity and Motivation	1.68
Improving Market Share	1.74
Improving Buying Effectiveness	3.02
Improving Energy Conservation	3.47

The major objective of the survey was to determine how supermarket executives currently approach productivity. The aim was to identify the state of the art in the industry. Executives were asked to respond to several open-end questions about how their company approached productivity, what productivity programs they employed and where they encountered the most problems. Follow-up interviews were held later with those executives mentioning more innovative approaches and programs.

The following major findings results from the interviews:

**1. Productivity is typically approached informally with little systematic planning.**

Formal productivity improvement programs are rare. The typical approach is to "watch the numbers." Sales per man hour is the key figure, though several executives indicated a preference for physical measures. The implicit, and usually unwritten, objective is to keep these ratios in line with their historical pattern. In practice this means seeking to offset wage increases with reductions in overall labor costs.

Generally the responsibility for maintaining the labor-to-sales ratio lies with line management. There is typically no one person accountable for productivity improvement. Some of the larger firms, however, do have personnel specializing in productivity.

Company A is typical in that all executives are responsible for productivity and the President considers it one of his primary responsibilities. The burden of implementing specific programs falls largely on the Director of Personnel. But overall coordination is left to informal discussion: "It is something we talk about all the time."

Company B assigns responsibility to the V.P. Store Operations. Productivity is expected to be a day-to-day concern of line management.

Company C separates responsibility for productivity between the Director of Research Methods and Scheduling and the Director of Personnel. The former is involved in industrial engineering applications; the latter specializes in employee motivation.

Company D is unusual in having a Director of Productivity who reports to the Executive V.P. Merchandising, Purchasing and Operations. Productivity improvement is thus a staff function. There is a director for each division. About 30 people in all work solely on productivity.

Company E is unique in having a formalized productivity improvement program. The program, called IMPAC, has its own coordinator who reports to the V.P. Human Resources.

Objectives for productivity improvement are also typically informal. Most firms do not have explicitly stated goals. There is only the implicit goal of maintaining labor-to-sales ratios. Even among firms which do attempt systematic planning, there is a consensus that it will be difficult to obtain lower ratios without hurting service levels.

Company A has a number of productivity projects but has no written objectives or plan.

Company B uses their management by objectives system to spell out productivity goals. These are left, however, to individual accomplishment. Quarterly goals are established by the past history of the store. The store managers review progress toward the goals and top management reviews their progress and compares it to industry information. They have been satisfied with "keeping labor dollars to sales constant in the face of rising inflation."

Company C relies on their budgeting process. Weekly productivity goals are written in operation procedure formats.

Company D is not setting any productivity goals for the retail stores in the coming year. The feeling is that "further cuts might impact customer service."

Company E outlines planned productivity improvements in their five-year plan. Goals are stated in measurable terms with emphasis on the number of employees that can be eliminated. But there is a feeling that "given the technology of the business, we feel that we may be about as productive as we're going to be."

**2. Executives think in terms of improving productivity through automation and implementation of industrial engineering standards and work scheduling.**

Almost all executives looked to technology as the ultimate answer to their productivity problems. Most, however, were rather vague when it came to specific kinds of automation. Scanning was mentioned by most, but typically as something to "explore" or as something that looked promising." Beyond scanning, technological advances are, for most, a hope rather than a reality. Only a small minority of firms seem activity committed to trying a variety of new automated equipment.

Company A is typical in not anticipating productivity improvement without significant technological improvements. They look to scanning to eventually reduce shrink, but this "seems to be the only thing on the horizon."

Company B is committed to scanning as a means of on-line scheduling. They are evaluating a machine that sorts and packages returnable bottles and are considering switching from teletype to computerized ordering.

Company C is looking to a much more rapid conversion to scanning than ever anticipated. They are also counting on a computerized warehouse management system and a centralized retail meatcutting facility. Scanning is expected to eventually reduce 173 people from the payroll, the computerized warehouse, 52 full-time equivalents and the centralized meatcutting 277 full-time equivalents.

Although most executives look first to automation, more attention is given to lowering labor costs through industrial engineering standards and work scheduling. Focus is less on improving work methods than on assigning employees to existing tasks more efficiently.

Company A is typical in that Industrial engineering is used to systematize some methods and to make time studies in the stores. These time studies are combined with register readings and truck routes to determine staffing requirements. The optimal schedule and deliveries are determined quarterly for each store. Current efforts are directed toward providing more central office input that will highlight when any particular store is off schedule.

Company B has a more elaborate work measurement program in which minimum standards have been established for every job description by store managers and the union. Employees are made aware of the standards by the store manager. The standards have been gradually raised over time to levels such as 60 cases per hour for packout of cases on shelf and 100 cases per hour for loading off truck.

### 3. Problems with productivity improvement are largely attributed to employee motivation.

When asked about the biggest problems encountered in improving productivity, the majority of executives pointed to employee motivation as the biggest obstacle. Table 2 provides a complete breakdown of the obstacles identified.

Table 2

Most Important Obstacles to Productivity Improvement	
General employee motivation and attitude	54%
Attitude toward the work itself	14%
Attitude toward pay	7%
(All Motivation)	(75%)
Implementing engineered standards	9%
Union Negotiation	7%
Front-end efficiency	5%
Direct store delivery and warehouse operations	4%

Most executives are concerned about the general attitude of employees. They feel that the overall level of motivation is not high. Employees are seen as being more externally oriented than job oriented. Some executives pointed more specifically to negative attitudes toward supermarket work itself or to pay. Relatively few executives are concerned about procedural obstacles such as implementing industrial engineering standards.

When asked what they were doing to overcome the obstacles they mentioned, executives described a variety of projects. As shown in Table 3, these projects covered a broad range. Almost all, however, deal in some way with communicating with employees. The projects are described in terms of giving the employee a better sense of direction and of making the employee more job oriented.

Table 3

Projects to Overcome Obstacles  
to Productivity Improvement

Meetings between management and employees	25%
Motivational training programs	21%
Informational training programs	11%
Communication through newsletter, etc.	7%
Negotiation	7%
Awards, incentives, contests	5%
Redesign of job	4%
Management systems	4%
Scanning/electronic front end	4%
Performance appraisal	2%
None	9%

In short, almost all of the projects were attempts to improve employee motivation. The wide variety of projects is illustrated below.

Company A has two levels of productivity goals. If a store makes the first goal, management has a party sometime when it is closed for "reinforcement." If the store makes the second level goal, the employees are invited to a country club-type of party. Efforts to improve communications with employees include an employee newsletter and a courtesy award. Employees are also surveyed twice a year or if a store's productivity is down. The survey asks for suggestions as well as for employee complaints.



Company B emphasizes meetings between top management and store managers and supervisors.

These are viewed as an opportunity for "exchanging ideas" and letting employees know where the company is going.

Company C employs a permanent retraining staff that rotates from store to store. It observes employees and tries to improve their performance. The training is also a way of meeting with employees for their input. Contests involving TV's, etc., are held for cashiers and assistant department managers.

Company D makes video tapes showing top management discussing various topics. These are shown to employees in the stores. A new training institute for managers has recently been set up around a model store.

Company E also shows video tape programs and follows them up with a thirty-minute discussion. There is also a "Store of the Quarter" award in which the winner is announced in a newsletter and store employees are given pins.

Company F has a monthly newsletter along with a cleanliness contest and customer service contest. Employees elect a winner monthly who receives a \$25 prize. A grand prize ranging from \$1,000 to a vacation trip is awarded at the end of the year in a drawing.

Company G is typical in stressing an incentive program related to quarterly bonuses for department heads. The level of bonus is tied to the store's overall profitability.

Company H uses incentives for all full-time employees. Each employee is a stockholder through an ESOP plan.

Company I emphasizes fringe benefits as incentives. Benefits include a stock ownership plan and superior life insurance and hospital coverage.

The findings of the interviews provide a basis for confidently describing the pattern of industry response to the productivity problem. This pattern may be characterized as follows:

- There is an orientation to cost reduction — the implicit strategy is one of reducing labor costs to make up for rising wages.
- There is a faith in automation and especially in industrial engineering standards and work scheduling as the means of obtaining cost reduction.
- There is a belief that special projects are required to enhance employee motivation and that these do not accomplish cost reduction directly. Rather, they do so indirectly by facilitating industrial engineering efforts. Their effect is to make employees more receptive to industrial engineering changes.

Implicit in the interview responses is the perception that cost reduction and industrial engineering techniques go hand in hand. In contrast, efforts to enhance motivation, while considered crucial, seem to stand apart. The assumption is that motivation is desirable in general and is necessary in particular to overcome employee resistance and apathy to industrial engineering techniques and managerial control. Motivation is necessary for acceptance. While the state of the art of productivity improvement does not differ markedly from that of many other service industries, it is not at the forefront of new developments. Specifically, there

are two major shortcomings with the industry's response. The first is that the industry for the most part does not approach productivity in terms of a planned strategy. Moreover, almost all firms seem to embrace cost reduction through industrial engineering as an implicit strategy without fully realizing the assumptions and implications of this strategy.

The second, and related, problem is that the industry employs a piecemeal approach to most projects. Motivational techniques are used side-by-side with industrial engineering techniques. But there is no common rationale or even coordination between the two. Moreover, the projects undertaken seem to depend on whatever happens to be 'hot' at the time. A particular tactic will be in vogue in the industry. Consulting firms will be pushing a new technique. Some ideas are rejected because they seem 'old hat'. Other ideas are rejected because they seem too novel. 'Not invented here' and 'it'll never work here' attitudes pervade managers' thinking about productivity.

Although piecemeal projects may make sense in themselves, they are unlikely to make a sustained impact on the organization. Once implemented, projects tend to fade away or their impact becomes diluted. This is true even for projects that initially seem successful. Either they are dropped or forgotten, or they lose their effectiveness. Meanwhile, productivity becomes more and more of a problem.

In sum, the cost reduction orientation of the industry has not allowed supermarkets to develop integrated programs of projects guided by an overall productivity improvement strategy. In the next two sections the reasons for the inadequacy of cost reduction as a strategy are outlined. Then some current developments in the use of behavioral science techniques are described. Finally, a strategic alternative to the cost reduction orientation is presented as the key to implementing the behavioral science techniques.

## The Cost Reduction Strategy

Cost reduction is so ingrained in a supermarket management's thinking that it seems not so much a strategy for productivity improvement as the only strategy. Productivity is synonymous in the mind of many with decreased labor costs. It is necessary to recognize, first of all, that cost reduction is only one approach to productivity.

To see this, we must turn to the basic concept of productivity. A business is a system which transforms various inputs into some output. The productivity of the system is the amount of output produced by the input. One way of raising productivity is to decrease the amount of input relative to output. This is the strategy of cost reduction. Another way of raising productivity is to increase input in such a way as to increase output proportionally more. This will be referred to as an investment strategy. Cost reduction and investment are logically distinct strategies.

The cost reduction strategy is founded on two premises. One is that capital equipment can be favorably substituted for labor. And, in fact, over much of U.S. history this has been the case. For the period 1948 to 1973, for instance, the ratio of capital to labor grew three percent a year. More recently, this rate of increase has dropped to 1.7 percent annually. Economists relate this drop directly to lowered productivity.

The second premise of the cost reduction strategy is that employees can be treated as equipment even if they cannot actually be replaced by equipment. This notion dates back to the very beginnings of management thinking in the early 1900's. The goal of management, as expressed by Frederick Taylor and others, was to "scientifically" remove inefficiencies from human work. Inefficiency was construed as anything which could be eliminated from the performance of a task. Hence planning time was to be eliminated as well as wasted time. The adjective "scientific" was subsequently lost but the notion that workers could be used as machines persisted. In 1915, there were less than five courses on management in American colleges. Ten years later, almost all colleges had a series of courses. As these courses evolved, employees came to be discussed in more humanistic terms. Still, productivity was linked mainly to substituting more efficient workers for a larger number of inefficient ones.

The industrial engineering methods associated with the cost reduction strategy follow directly from the twin premises of substituting equipment and/or more efficient workers for existing workers. Jobs must be engineered for efficient performance. The assumption is that there is one "best" way of performing a job. Frederick Taylor himself hit on this in his first studies for Bethlehem Steel. He found that performance peaked with a shovel-load of twenty-one pounds. Based on this task-performance link, he designed shovels of different sizes for coal, ashes, etc. Out of this emerged the concern of industrial engineering with "methods improvement."

### The Industrial Engineering Philosophy

At the heart of industrial engineering is the idea that any job can be broken into three parts: the content of individual tasks, the method prescribed for doing each task and the combination of tasks into a job. The first and last refer to what is done, the second to how it is done. Industrial engineers focus on the second, the method prescribed. They seek to develop methods, to train workers to follow the method and to standardize material, equipment and working conditions.

This focus leads to **work simplification**. Every task activity is scrutinized to eliminate unnecessary operations — from rearranging work stations and equipment to eliminating waste motions in manual tasks. In simplifying work, the industrial engineer relies heavily on two types of analytical tools. Process charts are used to classify the "events" which occur in a task (e.g., operations, transportations, inspections, etc.).

Two or more events are portrayed graphically as that their interrelationship becomes apparent. Methods are designed around the elimination of unnecessary events. Motion study is used to divide tasks into their most basic elements. After unnecessary events have been eliminated through process charting, the ones which remain can be scrutinized through motion study to eliminate noncontributing elements within events.

The industrial engineer thus designs the "best method" for doing a job by simplifying the content of the job. This is an important point. Job content is not the focus of the industrial engineer. But he finds the best methods by stripping away unnecessary operations. Once the employee has been trained in the best method, it follows that he should specialize in that method, thereby limiting the combination of tasks going into the job.

Industrial engineers are often criticized today for trying to create simplified jobs. This is somewhat misleading. Work simplification is really a by-product of the way industrial engineers try to create efficient work methods. Still, the result is a simplified job, albeit one associated with a "best" method. A catch phrase among industrial engineers is "a questioning attitude." This sums up their approach to the work itself. Anything which gets in the way of the most straightforward method does not belong in the job.

Pay is used to force the worker to perform at an acceptable level or beyond. The worker has no choice but to perform well if he is to receive pay appropriate to the job. This emphasis on control follows from the use of work simplification. The worker cannot be expected to perform well unless forced to by external pressure.

Industrial engineers therefore develop standards which are commonly expressed as the minimum acceptable level of performance. Incentive plans provide for increased pay proportional to the worker's increased effort over the standard level. Sometimes there is a cap, or upper limit on incentives, to avoid any possible exploitation of the system.

Standards are thus objectives reflecting the normal time for doing a task. A variety of methods, including time study, work sampling and standard date, are used to determine normal time. When normal time is adjusted for delays inherent in the job, fatigue allowance and allowance for personal time, there exists a "standard" against which to compare worker performance. Standards arrived at by more casual methods are referred to as "reasonable expectancies."

Standards are conceived by industrial engineers as goals set by management. Management holds the employee to the goal through supervision and pay. Techniques such as Short Interval Scheduling (SIS) call for the supervisor to check on the employee's progress toward the goal at frequent intervals. Pay depends on meeting the standard (measured daywork) and, in the case of incentive plans, on exceeding it.

### Summary

Cost reduction is thus a particular strategy of productivity improvement. It is a substitution strategy. Equipment is to be substituted for employee labor. When this is not possible, employees are to be treated as equipment and designed to operate more efficiently. Industrial engineering techniques are intended solely for this purpose. A more efficient method is found for the employee, the employee is trained in the method, the performance level (standard) resulting from the use of the method is determined and pay and supervision are used to ensure that the employee does in fact operate according to design. The most machine-like way of doing the work is found and it is made in the employee's self-interest to do the work that way. The "engineered" employee is to be substituted for regular labor.

## Cost Reduction and Supermarket Industry

The cost reduction strategy has proved to be a valid approach to productivity improvement. It has been employed most extensively in manufacturing industries. Obviously, the opportunities have been greatest there, due to the routinized nature of the work, for automation and methods improvement. Unfortunately, industries in which the work has not readily lent itself to this have been labeled "low productivity" industries. The implication has been that the service industries could have reaped productivity gains similar to those of manufacturing but have failed to do so. While such gains might have been more difficult, they could have at least been approximated through greater cost reduction efforts.

The common perception is thus that the supermarket industry has lower productivity relative to manufacturing *because* it has not been able to emulate the latter's cost reduction strategy. Although the supermarket industry is oriented toward cost reduction and looks to industrial engineering techniques, it has just not put enough effort into this strategy. Again, the implication is that, properly executed, the cost reduction strategy could have proved as effective in the supermarket industry as it has in manufacturing.

Certainly cost reduction efforts have been useful in the super market industry. In many cases industrial engineering techniques have led to labor savings. Yet there is little evidence that the cost reduction strategy could ever be as successful in the supermarket industry as it has been in manufacturing. Applications of industrial engineering in the industry have typically involved programs designed to correct rather gross inefficiencies. Consider the use of labor scheduling systems, which have probably been utilized by more supermarkets than any other technique. For the industrial engineer, scheduling is really the outgrowth of proper standards and work load estimation. The only thing that scheduling per se contributes is to make sure that an employee is available for the time and at the time a task needs to be performed. The benefit of scheduling is to eliminate idle time due to delays and time spent on the wrong task. It follows that labor scheduling only improves productivity if problems of idle time and inappropriate time exist. Systematic labor scheduling can help to minimize these problems. Performance itself, however, is not a scheduling problem and will not be affected by the technique.

In manufacturing, no industrial engineer would begin with labor scheduling or rely on it as a primary technique. It is a final step after methods improvement has taken place. Supermarkets, however, typically begin with labor scheduling and even rely on it exclusively. Industrial engineers justify this as a way of "getting started," as a way of introducing industrial engineering to the organization. But any success in using scheduling merely reflects the existence of gross amounts of idle time. Success stories owe far more to this than to any substitution of "engineered" employees for regular employees.

Nor has the actual substitution of equipment for employees in the supermarket been analogous to automation in manufacturing. Equipment introduced in a supermarket does not replace the employee or change his role. In manufacturing, machinery either replaces or, at a minimum, changes the employee's function. But a scanner certainly does not directly substitute for a checker. Moreover, it does not even really turn the checker into a machine operator.

**Again, this is not to deny that the industry has accomplished productivity gains using industrial engineering techniques.** And at a point in time these techniques can bring badly needed management discipline to inefficiencies. The point is that it has by no means been demonstrated that a cost reduction strategy could work in the supermarket industry just as it has worked in manufacturing. Or that, by implication, productivity is low because not enough effort has gone into executing this strategy. On the evidence, one might just as well conclude that supermarkets can never attain high productivity through the cost reduction strategy. The possibilities for substitution may be too limited. Machine or machine-like labor may just not be possible. It

may even turn out that manufacturing itself has reaped as much improvement as possible and that future productivity gains from this strategy will not be as large as past gains even in manufacturing.

**Regardless of how one evaluates the potential gain from the cost reduction strategy, the conclusion seems inescapable that this strategy ought not to be the only one considered.** This appears to be exactly what has happened in the supermarket and other service industries, however. As shown in the survey conducted for this report, supermarket executives continue to embrace cost reduction and with it industrial engineering techniques as the one and only way to productivity. Nonindustrial engineering techniques are employed on a piecemeal, ad hoc basis if at all.

## The Use of Nonindustrial Engineering Techniques

The first step in moving away from a simple reliance on cost reduction to improve productivity is to realize that nonindustrial engineering techniques are available. Though such techniques are not uncommon in the supermarket industry, their rationale and systematic use is not generally appreciated. As revealed by the interviews conducted for this report, nonindustrial engineering techniques are used, if at all, mainly to decrease employee resistance to cost reduction efforts. This is not the way they should be used. The techniques described here must be understood as ways of *increasing* employee input rather than substituting for it.

These techniques are by no means fully developed. Their evolution began in the 1950's with the "human relations" approach to personnel. This approach was largely a reaction against industrial engineering techniques. It held that, if workers were treated in a more human way, instead of as machines, they would perform even better. This orientation matured in the 1960's into what is now referred to as the "behavioral science" approach. The thrust of the approach is still to emphasize the potential contribution of employees. The techniques under development seek to motivate the employee to contribute. Motivation is not left merely to "humanization" but is stimulated by psychological methods. While there still exists a tension between these techniques and those of industrial engineering, they are no longer aimed simply at undoing industrial engineering. They are aimed at stimulating the employee to contribute to the business. Because they are oriented toward employee contribution, behavioral science techniques are well suited to the supermarket environment. Almost all employees in this environment directly impact the customer. Many have direct customer contact and the work of almost all is directly visible to the customer. Those supermarkets which have in the past used various behavioral science techniques have not appreciated this 'fit.' Behavioral science techniques must be undertaken from the contribution point of view described here.

Subsequent sections seek to make this point of view clear by focusing on seven specific techniques at the forefront of behavioral science development. The objective is to present each technique in as pure a form as possible in order to demonstrate its value apart from cost reduction.

The techniques covered were selected through an extensive review of the techniques which have been written about and discussed. Computer searches were conducted of the published literature. Over 2,000 items were reviewed, most in abstract form, a good deal in the original. This was supplemented by contacts with various experts in retailing and other industries in order to capture unpublished discussion. Wherever possible, references to the literature are included in this report for documentation. The references are highly selective, but afford a starting point for follow up.

Each of the ideas is presented in four sections.

- (1) The background *assumptions* behind each technique are exposed. The core of the technique — why it is supposed to work — is analyzed. Since the techniques selected are all current in that they represent what is innovative in productivity improvement, relevant background information is also included.
- (2) The *methods* involved in actually implementing the technique are laid out. Enough information is presented to make it clear how the technique works in practice.
- (3) The *research* supporting the technique is covered. The evidence which indicates that the technique is *good* is highlighted.

(4) The state of the art associated with each technique is discussed. The direction of its evolution is noted.

The techniques are described in order of the amount of attention they have recieved.



## Job Design

Job design refers to organizing the structure of work activities. As a behavioral science technique, the idea has been to use the work itself to motivate the employee. Put succinctly, the core assumption of the job design technique is that what is done affects how well it is done.

The initial impetus to this approach to job content came from the work of Frederick Herzberg (10, 11). He believed that the content of a job provided motivating factors for performance. Among these factors he listed: achievement, recognition, intrinsic interest of the work itself, responsibility, advancement and growth. He further claimed that these factors were *necessary* for high performance. Other factors having to do with the context of the job (e.g., pay, supervision, working conditions, etc.) might cause poor performance but could not in themselves motivate good performance.

Such ideas led a number of firms to try to "undo" the consequences of work simplification created by industrial engineering with the method of *job enlargement*. This entailed either expanding a job to include a variety of tasks or rotating employees through jobs for variety. Although some firms reported success with job enlargement, it soon became evident that methods would have to be more than just an antidote for work simplification.

Attention gradually shifted to efforts to satisfy the underlying motivational needs themselves. Job enrichment arose as a method of building achievement, recognition, intrinsic interest, responsibility, advancement and growth into the job. The key to this was seen a "vertical job loading." Activities normally reserved for the supervisor (planning, organizing, controlling) became part of the employee's job. These higher order activities embodied Herzberg's motivating factors. More recently, the "every man a manager" orientation of job enrichment has begun to give way to a broader orientation termed simply "job design." Rather than assuming that a job must satisfy Herzberg's higher-order motivating needs, job design seeks first to find out what job content factors motivate employees and then to build these factors into the job.

Job design is guided by three general assumptions about the motivational factors of meaningfulness, personal responsibility and knowledge of facts. These assumptions were developed through the research of J. Richard Hackman at Yale University (7, 9).

Meaningfulness requires that job content must be seen as worthwhile by the employee. Employees must identify with the task they perform. They must see some product or outcome of their work and their part in this outcome. They must also use skills that are important to them. Task variety is important if it contributes to the impression of skill utilization.

Personal responsibility requires that the employee be accountable for work outcomes. It is the degree to which the employee sees the work as his own. Knowledge of results requires that employees know on a continuing basis how effectively they are performing. They must see the impact of what they do.

Job design, in contrast to job enrichment, proceeds on the basis that employees can be motivated through meaningfulness, personal responsibility and knowledge of results. Just what these factors entail, however, depends on the group of employees being dealt with. The goal is truly to design the job for the employees, not to change it to conform to some lofty expectation of what employees want.

### Methods

The procedures used in job design efforts are as flexible as the concept itself. There is, however, a state of the art consensus about how to go about job design.

It is necessary to begin with a diagnostic phase. This is increasingly seen as crucial for the entire effort. Typically diagnosis begins with open-end, unstructured interviews with the employees concerned. They are asked to talk about their work and their feelings toward it. The interviews have the dual purpose of obtaining data about how job content bears on the lives of the employees and of making them feel a part of whatever changes occur. Job design seeks not only to bring the employee closer to his work but also the process of changing his job.

These interviews are often followed up by a survey questionnaire. The questionnaire attempts to quantify the specific dimensions of the present job. One such questionnaire in wide use is the Job Diagnostic Survey (9). It measures five dimensions of the job.

- Skill variety — the degree to which the job requires a variety of different activities that involve the use of a number of different skills and talents.
- Task identity — the degree to which the job requires completion of a whole and identifiable piece of work, i.e., doing the job from beginning to end with a visible outcome.
- Task significance — the degree to which the job has a substantial impact on the lives or work of other people.
- Autonomy — the degree to which the job provides substantial freedom and discretion to the individual carrying out the work.
- Feedback — the degree to which activities result in obtaining direct and clear information.

These dimensions obviously relate to the motivational factors of meaningfulness, personal responsibility and knowledge of results assumed to be important. Note, however, that it is the employee's perception of the job that is being measured. A job which might appear to be low on these dimensions might be rated highly by the employee in the job.

Once employees' needs and perceptions are diagnosed, the design phase begins. It is guided by a set of principles emerging from the evolution of job design from job enlargement and job enrichment (7). But these principles are applied only if they are justified by the diagnostic data.

**Principle No. 1: Form a natural unit of work.** If diagnosis indicates that employees do not feel any involvement with their jobs, and rate them low on task identity and task significance, then changes in the connection of the tasks performed should be considered. It may be possible to increase the coherency among tasks so that the job takes on a more natural meaning. Frequently this entails defining the job not by just a certain kind of activity (e.g., stocking) but by a function in the organization (e.g., product display). This change cannot be cosmetic. The job must be designed so that the employee thinks in terms of the significant function, not the activity.

**Principle No. 2: Combine tasks into a large module of work.** If diagnosis indicates that employees feel a lack of challenge with their jobs, and rate them low in skill variety, then changes in the complexity of the tasks performed should be considered. It may be possible to add tasks or upgrade them so as to add variety. Frequently this means emphasizing tasks which employees feel they are good at. Complexity is not the aim per se. The job needs only to foster the impression that not everyone could do it.

**Principle No. 3: Establish client relationship.** If diagnosis indicates that employees feel no one 'cares' about what they do and they rate their job as low in autonomy and feedback, then efforts to establish client relationships should be considered. Tasks should be linked to some user. In this way employees can feel that their services are of use to someone and, therefore, they are obligated not to let the user down.

**Principal No. 4: Delegate planning.** If diagnosis indicates that employees feel like robots rather than themselves on the job, and they rate the job low on autonomy, skill variety and task identify, then delegating planning should be considered. This does not mean giving up supervisory control. It does mean allowing the employees as much leeway as possible in organizing tasks subject to supervisory approval. In other words, the employee is given the task of recommending a course of activity to the supervisor. The supervisor still has responsibility for the plan, but the employee *does* the planning.

**Principle No. 5: Open channels of communication.** If diagnosis indicates that employees know what they are doing but not how well they are doing it, and the job is rated low in feedback, then communication channels should be designed into tasks. It is desirable that employees learn how well they are doing directly from the task rather than having a supervisor tell them at a later time. Frequently this involves making employees responsible for inspecting their work, keeping records, getting machine feedback or interacting with a client.

These principles provide guidance in moving from diagnosis to design. In order to develop specific job changes and to decide among possible changes, brainstorming sessions are used. The sessions move from "green lighting," coming up with ideas for changes, to "red lighting," eliminating ideas that do not on consideration seem usable.

Brainstorming sessions are conducted with supervisors and sometimes with the employees themselves. Regardless of whether the employees brainstorm changes in their jobs, however, actual implementation of changes must begin with employee meetings. Not only must employees understand and accept the changes being made but they must also understand the rationale behind the changes. Employees should feel that they are the source of the change, not the object of change. The design process (assumptions-diagnosis-specific changes) should be made explicit and public. This has the advantage of informing employees, involving the employees and committing the employees. Without this approach to implementation, the spirit of the job design process is lost.

## **Research**

Job design has been marked by more of a tradition of research than is the case with other productivity improvement methods. Three types of studies have been conducted. The earliest studies were attempts to show the dysfunctional consequences of work simplification among blue collar production workers (e.g., 21). The studies found that employees engaged in many behaviors to escape boredom. These behaviors included daydreaming, talking to other workers, wasting time in performing tasks and taking unnecessary breaks. Decreases in alertness and diminished muscular coordination were also found. Work simplification has more recently been linked, in a well known HEW report, **Work in America**, to poor mental health, reduced longevity, higher incidence of coronary problems, high turnover and absenteeism rates, low product quality and labor/management problems.

The second type of study appeared with the advent of job enrichment. These studies attempted to demonstrate that job enrichment works. The studies, and they continue to appear, usually implement job enrichment (in a manner fairly faithful to Herzberg's original ideas) with one group of workers and compare the results before and after or with another group not getting job enrichment.

Perhaps the best known of these demonstration studies was conducted between 1967 and 1968 at AT&T. The person responsible for this research, Robert N. Ford, has described nineteen separate demonstration studies (4, 5). Nine were outstandingly successful, nine were moderately successful and only one was a complete flop. Illustrative is a study of clerical workers in AT&T's shareholder correspondence office. Their jobs, which amounted to routine typing of notices, was changed so that the workers signed their own letters and sent them directly to shareholders. The workers were told that they would be held directly responsible for any shareholder complaints. They were also encouraged to use a more personalized approach in replying to shareholder requests rather than merely typing a form letter. Supervisors relaxed their control over activities; experienced workers served as subject matter experts and consulted with other workers. After six months, the volume of work produced by these workers was higher than for a comparable control group. Turnover, which had been a major problem, was greatly reduced.

More recent studies continue to indicate the success of job enrichment in the Bell System (14). In one, the tasks of auditing clerks were combined so that clerks dealt with whole companies and handled problem cases formerly reserved for supervisors. After six months, errors were down 20% and turnover 15% compared to a control group.

Studies demonstrating the success of job enrichment have been reported for several other major companies across a variety of jobs. Texas Instruments even applied job enrichment to their janitorial personnel (15, 16). The personnel required for cleaning dropped from 120 to 71.

In addition to these classic success stories, a number of other studies are notable because of the care with which they were carried out. One of these was conducted at the Bankers Trust Company of New York among workers handling stock-transfer operations (2). A number of related tasks were introduced into the job to increase responsibility. Work which had been assigned randomly was given to workers specializing in a given customer territory. Six months later, production rates had improved between 92 and 100%. Another convincing study was done at Travelers Insurance Company with keypunch operators (17). Twenty-five changes were introduced into the job in order to create material work modules. After a year, these employees had increased 40% in their capacity to process work.

Beside these studies stand only a handful of studies reporting failures with job enrichment. The Internal Revenue Service, for example, tried to enrich the jobs of tax examiners (18). Examiners were allowed to specialize by industry and perform both verifying and editing activities. Overall, no differences were found compared with a control group.

Although the preponderance of demonstration studies published in the '60s and early '70s supported job enrichment, they by no means firmly established that it "works." For one thing, only successful demonstrations are likely to have been published. An informal survey by J. Richard Hackman indicates that there have been many unreported failures (6). These could have been poor implementations, or they could have been genuine failures. More important has been theoretical research showing that not all workers respond to enrichment.

In the first such study, Turner and Lawrence correlated the extent which a worker had an "enriched job" with performance (20). An enriched job was defined in terms of six characteristics: variety, autonomy, required interaction, optional interaction, knowledge and skill required and responsibility. They found the expected association between these characteristics and performance, but only for workers in small town factories. There was an inverse correlation for workers in larger towns: productivity was *less* for enriched jobs. Subsequent research by Hulin and Blood found that, in general, workers who held traditional values responded well to enriched jobs. However, workers who were already alienated responded negatively (13). This research fits in with other studies casting doubt on the adequacy of Herzberg's list of motivators (3, 12.).

These studies led to the job design approach described in this report. Although orthodox job enrichment is still in wide use, at this point this is probably due more to its faddish appeal than to research support.

Consistent with the emphasis on diagnosis with job design, current research is trying to map out the connection between different kinds of individual needs and job content. The Job Diagnostic Survey discussed in connection with job design is an outgrowth of this research.

One other research finding is worth noting. It has been reported that successful job design efforts lead to the *creation* of higher order needs (1, 8). Viewing people as capable of always growing certainly is not startling. The implications for job design, however, are awesome. It means that job design cannot be a one-time thing. Successful job changes carry within them the need for further change in the future. And, indeed, many firms have observed that the process of making changes seems almost as important as the changes being made. Job design is a long-term proposition.

### State of the Art

Job design has been discussed more, thought about more, researched more, and certainly ballyhooed more, than any other behavioral science technique. It is no longer new, it is clearly not a panacea. It still remains one of the most logical ways of affecting employee performance. The core idea that what is done affects how well it is done, makes more sense today than ever. What we now know is that job content cannot be changed in an arbitrary way. Either arbitrarily "simplified" or arbitrarily "enriched." Changes must be made on the basis of careful diagnosis of what employees will respond to. Job design must be tailored to particular groups of employees.

Given proper diagnosis, the evidence is that job design can work:

- if the company is willing to experiment with changes in case employees do not respond to early changes;
- if job changes are more than cosmetic;
- if it is reconciled with more traditional industrial engineering efforts;
- if management supports the program and does not underestimate the resistance of first level supervision;
- if employees understand what is happening;
- if changes which backfire (e.g., create an unforeseen inventory problem) are recognized as failures of foresight and not failures of job design;
- if it is undertaken with a long-term commitment to a continuing program.

Perhaps most important is the attitude of supervision. Responses such as "it has nothing to do with getting the work out" or "it'll never work with *our* employees" are common (19). Unchecked, they will undermine any job changes.

More generally, it has to be remembered that job design runs against the grain of the organization. Everyone thinks of jobs as inviolate. A person does the job he is hired to do. Breaking this mind set is at the heart of job design.

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## Participatory Incentive Plans

Most pay systems are based on job evaluations. Jobs in the company are described and assessed by the personnel function. Pay ranges are set for each job according to what other area companies pay for the same job. The labor market determines the range of pay. Adjustments within the range determined by job evaluation are then made to reward good performance.

There are as many variations on the job evaluation performance adjustment theme as there are companies. The weak link in all these systems, however, is the relationship of pay to good performance. Most companies acknowledge that their system is weak in relating pay to performance. But few good ideas have been presented for improving this situation. Decisions about the pay system rest largely on considerations of administrative convenience. The objective of participatory incentive plans is to use the administration of pay to increase productivity.

The core idea behind all incentive plans is that people will perform better if pay is strongly contingent on good performance. The problem is how to set up this contingency.

While industrial engineering incentive systems seem eminently logical, their straightforwardness is deceptive. They "control" only the specific behavior covered by the standard, almost always quantity of output. But other behaviors may also be important. Behaviors such as quality of performance, absenteeism and turnover are not covered.

Moreover, employees tend to resent explicit control. Industrial engineering incentive systems have been unpopular from their inception. For this reason, these incentive systems often have a negative impact on other behaviors. In other words, while the systems can maintain high levels of performance, they also can produce negative side effects. For this reason, incentive systems have been on the wane for a number of years. Especially outside of manufacturing, managements have been unwilling to face the possibility of negative side effects.

For this reason, incentive systems have been on the wane for a number of years. Especially outside of manufacturing, managements have been unwilling to face the possibility of negative side effects. This has contributed appreciably to the present situation of weak contingency between pay and performance.

The behavioral science approach has historically inspired little attention to pay systems. Industrial psychologists for the most part accept the assumption that making pay contingent on performance can improve performance. They do not see this as a matter of control, though. They see it as a matter of "expectancy." In thinking about a task, individuals think not only about the work itself but about things that result from their work, material rewards, security, status, etc. To the extent that expectations about such things are positive, the individual should think about the task more favorably.

What the psychologist cannot accept is that contingency, merely paying people for their work effort, automatically creates positive expectations. If the individual perceives incentives as an effort to force or control his behavior, negative expectations are created. It is these negative expectations that cause negative side effects. Contingency therefore presents something of a dilemma.

Recently psychologists, stimulated mainly by the thinking of Edward Lawler at the University of Michigan, have begun to try to resolve the dilemma of contingency. The idea is that an incentive system must be built on more than contingency. There must also be some mechanism for ensuring that employees do not feel controlled by the system. They must feel that they are choosing to go after the incentives. Obtaining the incentive must be seen as part of the task rather than as external pressure. From management's point of view, the incentive system is controlling performance, but this should not be the employee's point of view.



The mechanism for preventing feeling of control is participation. If employees have some choice or involvement with respect to the incentive system, they are less likely to feel controlled. With participation, contingency can operate without negative side effects.

## Methods

Several new procedures are being used to introduce participation into pay systems. There is also renewed interest in comprehensive participatory incentive plans.

Skill evaluation is one procedure utilized to introduce greater participation. In contrast to job evaluation pay plans, which base pay on what the employee is doing, skill evaluation plans pay people according to what they *can* do. That is, people are paid for their abilities rather than their performance. Usually this means that people are paid for the number of tasks they can perform. Alternatively, people may be paid for becoming more skilled at a single task.

Skill evaluation allows the employee to participate more in the pay system. The employee chooses to learn a new task. Since it is his own ability that is being increased, he feels in control. Management is not seen as simply forcing higher output. Another plus is that increased skill is frequently easier to measure than increased performance. So it is easier to establish contingency between skill and pay than between performance and pay.

The key to whether skill evaluation pay plans work, of course, is the connection of skill to performance. The connection need not be a direct one where multiple skills themselves enable the employee to do a better job. Skill evaluation can translate into better performance more indirectly. An employee with more skills knows operations better, is more involved with the company and may take a more professional attitude to any task. If skills are connected to performance, either directly or indirectly, then enhancing skills through an incentive plan will improve performance.

A second procedure for introducing greater participation is to give employees control over when they receive pay increases. Increases typically are spread over the year in installments or are otherwise under administrative control. Lump sum increases allow the employee to decide when he receives an increase. The employee makes a new choice for each increase.

While lump sum increases do not involve any drastic change in an ongoing pay system, this procedure nonetheless has the effect of increasing participation in a fairly dramatic way. It also reinforces contingency in that increases are more visible when considered as lump sums versus as additions to the periodic pay check.

A third procedure for injecting greater participation is cafeteria-style fringe benefits. The employee is allowed to choose among fringe benefits, including the option of taking cash instead of benefits. Not only does this allow choice, it ensures that the employee values the benefits he receives. Contingency is also enhanced because the employee is made aware of the benefits negatively, associating them with payroll deductions. Cafeteria-style fringe benefits make it clear to the employee that he is receiving an incentive.

Comprehensive plans do more than just introduce participation into an incentive plan. They attempt to build the plan on participation. Participation becomes an integral part of the incentive system. Such plans are not new. In fact, they are quite old. Originally they were offered as a means of union-management cooperation. Their resurgence is due more to their ability to minimize the adverse side-effects of contingency.

Most widely used is the Scanlon Plan. Although every application of the plan is different, the basic principles remain the same. In its present manifestation, the Scanlon Plan is *not* a profit-sharing plan. Profit-sharing creates participation, but it undermines contingency itself, because profits are influenced by so much more than employee performance. The Scanlon Plan is a company-wide bonus plan (6, 7, 9). The bonus is usually a fixed percentage of every employee's pay. The percentage is determined by productivity as measured by the ratio of sales to payroll expense (corrected for inflation). Improvement in this ratio from some base period determines the bonus this employee receives. Bonuses average anywhere from five to twenty percent of base pay. Typically, bonuses are paid monthly.

Participation is achieved by giving workers additional opportunity to influence the bonus. Committees are formed to discuss and evaluate suggestions made by the employees. The committees consist of supervisors, elected employees and sometimes union representatives. The scope of committee discussions is quite broad. In short, employees are led to feel that they are determining their bonus and it is directly contingent not only on their performance but on their ideas.

### Research

Pay plans have not been marked by a great deal of research. Some basic research has been done on the premise that participation is necessary for an effective incentive plan. One study, for instance, compared two work groups having the same job and similar incentive plans. However, one group had actually voted on the plan while the other had the plan imposed by management. The group who had voted on the plan had higher productivity over a period of years (1).

Another study introduced the same incentive plan into a number of comparable work groups. The only difference was that the plan was designed and developed by some groups but imposed on others. The plan was successful only in the groups having participation (5). Later, management discontinued the plan in some of the participation groups. Performance then dropped in these groups (11). In sum, this research does confirm the crucial role of participation.

There is also some research relevant to the specific procedures described above. A demonstration study of skill evaluation pay plans has been conducted at General Foods' Topeka dog food plant, which was designed around productivity improvement innovations (10). Workers' pay is based solely on the number of different jobs they have mastered. Their fellow employees vote on whether a job has been mastered. There is a starting rate for everyone, a rate for mastering a single job, one for learning all the jobs on a team and a plant rate for mastering jobs across teams. While the unusual nature of the Topeka plant makes evaluation of this plan difficult, productivity has been high.

Cafeteria-style fringe benefits have been implemented in the TRW Corporation (4). A survey was done first to estimate the demand for alternative benefits. And a computer program had to be developed to administer the plan. Aside from the fact that the plan is implementable, however, there is no data on its impact.

Comprehensive participatory incentive plans have been the subject of more research. There have been several industry studies comparing companies with such plans to those without. The Profit Sharing Research Foundation, for example, compared eleven (of the sixteen largest) grocery chains with profit sharing were superior on sharing to five without it. Those with profit sharing were superior on a number of financial criteria including earnings per employee. Yet there is obviously no indication that profit sharing *caused* these differences. Such studies are of little value.

Fortunately, the Scanlon Plan itself has been the subject of somewhat more rigorous research. Moore and Goodman identified forty-four case studies in which the Scanlon Plan could be classified as successful or

unsuccessful (8). Success outnumbered failures by thirty to fourteen. And six of the fourteen are known to have failed because of poor formulas for computing the bonus percentage.

It has often been contended that the Scanlon Plan can only be implemented in small firms. But this conclusion does not seem to be indicated by the data. Firms from 75 to 6,000 employees have used the plan (9). And several large corporations have used the plan at individual plant locations (e.g., Midland-Ross and Dana Corp.) (2, 9).

### State of the Art

Although there is renewed interest in participatory incentive plans, there is still considerable resistance to them. The trend is probably toward the all-salaried workforce even in manufacturing (3). While there are reasons for this, it is also the case that the failure to use incentive systems means that pay cannot be used to improve productivity. There is simply too little contingency in the usual merit increase system.

Methods such as skill evaluation, lump sum increases and cafeteria-style fringe benefits are not without problems. Skill evaluation can necessitate expensive training. Lump sum increases may require that employees be charged interest for taking their money early. And cafeteria-style fringe benefits pose a real administrative challenge. But these undeniable problems may be outweighed by performance benefits.

Comprehensive participatory plans, like the Scanlon Plan, represent a major commitment by the company. Most importantly, management must be ready to respond to the participation of workers. The worst thing that can happen is for management to fail to channel and capitalize on the incentivized performance. This usually requires, as discussed later in this report, additional productivity methods besides the incentive plan.

Comprehensive participatory plans seem ideal for aggressive managements. In the final analysis, adoption of these plans should depend on management style.

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## Objective Setting Programs

Objective setting involves the specification of significant but attainable goals for employee performance. Objective setting systems are designed to give employees guidance as to how their performance fits company needs.

The core idea behind objective setting is that, even if the employee is highly motivated, he must have some frame of reference for distinguishing acceptable from unacceptable performance. Objectives serve to give meaning to behavior, just as the freezing point does to a thermometer. They enable the employee to know whether his performance is good or bad.

Peter Drucker's contribution was to realize that objectives could be more than just definitions of good or bad performance (2). He suggested that each employee, from the highest to the lowest levels, should have clear objectives that reflect and support those of higher level management. The objectives should translate company objectives into employee performance, thereby giving employees a clearer perspective on what they are trying to accomplish.

Drucker's concept of objective setting was extended by Douglas McGregor (3). He originated the idea of management by objectives (MBO) as a performance appraisal technique. Each employee would establish short term performance goals after reaching agreement with his superior about job responsibilities. Specific plans would also be established for achieving the objectives. The supervisor would then appraise the employee's accomplishments at the end of a short time period, such as six months. Following this, a new round of objective setting would occur.

McGregor argued that his MBO approach was superior to traditional appraisal methods because it gave the employee self-insight and an objective basis for discussing performance with his supervisor.

### Methods

Objective setting programs are typically implemented through MBO. There are as many MBO methods as there are organizations that use it (5). The principles are as follows: (1) the formulation of clear, concise statements of objectives; (2) the development of realistic action plans for the attainment of goals; (3) the systematic monitoring and measuring of performance and achievement; and (4) the taking of the corrective actions necessary to achieve the planned results.

An intensive effort is necessary to prepare a company to follow MBO procedures. Managers are usually trained in MBO before its implementation. The value of goal setting is examined in addition to the procedural details of the MBO program. Managers learn how MBO can be integrated into existing philosophies and practices. Perhaps most important of all, managers are trained in the practice of goal setting and appraisal techniques. The statement of goals in objective terms is clearly a skill that must be learned. Similarly, managers can develop appraisal techniques that will effectively communicate to employees without causing the employee to become defensive. In fact, delivering feedback to employees about their performance is generally aversive to most managers. Training may alleviate some of this unpleasantness.

Once MBO is implemented, objectives are derived from organizational objectives so that they "cascade" down through the organizational hierarchy in the following manner: The process begins at the top with a clear, concise statement of the central purpose of the enterprise. Long-range organizational goals and the strategic plans for their attainment are formulated from this statement. These in turn lead to the establishment of more short-range performance objectives for the organization. When tied to a specified time period such as a year, overall organizational performance objectives become the basis for the objectives of the

chief executive and his top management team. Derivative objectives are then developed for each major department. These, in turn, provide important inputs into the MBO system at that level of management. Objectives are then established for the various subunits in each major department. As above, subunit objectives provide the basis for managing by objectives at that given level. And so on down through the organizational hierarchy (5). The determination of organizational objectives is one of the most valuable contributions of MBO, as it forces top management to review and assess the objectives of the firm and to state them in clear, concrete terms. Objectives must be stated both as desired results, and as general plans and programs designed to achieve the results. Finally, employees must be appraised on the basis of their results.

Appraisal procedures should be planned for employee development as well as assessment. Some experts suggest that an employee's performance and salary should be discussed in separate interviews. Otherwise, the employee thinks only about his salary, and not about how his performance can be improved or how his performance goals relate to company objectives.

### **Research**

The research on MBO program has been mixed, although negative experiences are rarely publicized. They usually take the form of stories about MBO systems that have degenerated to "paper pushing" exercises. Proponents of the MBO method blame negative findings on improper implementation, and claim that there is nothing inherently wrong with the assumptions underlying the MBO process.

The biggest problem with MBO appears to be the amount of paper work and time required of managers. Another problem potentially related to the first, is that not all managers practice MBO after it is instituted into the organization. Continued use of MBO and its success throughout the organization appears to depend on the commitment of top management to the plan.

The following positive effects of MBO have been demonstrated. Studies conducted at General Electric found that attitudes changed in a favorable direction as a result of MBO with regard to: the amount of help the manager was giving employees in improving performance on the job; the degree to which the manager was receptive to new ideas and suggestions; the ability of the manager to plan; the extent to which the manager made use of employees' abilities and experience; the degree to which employees felt that their goals were what they should be; the extent to which the employees receive help from the manager in planning for future job opportunities; and the value of the performance discussions between employees and their managers (4).

Studies at Black and Decker found that increased clarity, relevance and importance of goals resulted in improved boss/subordinate relationships; the degree to which subordinates had influence in setting goals was unrelated to any of the measures of success of the program; the more frequent the feedback sessions, the greater the subordinate's satisfaction, goal accomplishment and relationship with the supervisor; the more time the supervisor spent on MBO, the more satisfied the subordinate, the better the relationship and the greater the success as perceived by the subordinate; and the more the subordinate perceived organizational support for the program, the more satisfied he was with the process (1).

Research thus provides guidance mainly about the operation of MBO programs. There is little evidence regarding their ultimate effect on productivity.

### **State of the Art**

The disadvantage of MBO lies in the bureaucratic red tape created by linking it to the appraisal process. For many companies, formalized MBO programs have become a sham. They are treated as "paperwork."

This situation is leading some companies to consider separating objective setting and appraisal, along the lines of Drucker's original idea. It seems likely that clearly formulated objectives which give the employee a perspective for looking at his performance in terms of the needs of the company cannot help but raise productivity. Goal setting can be an important mechanism for coordinating tasks vertically through the organization.

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## **Flexible Work Scheduling**

No decision is more basic than that of scheduling employees' time. For many years the norm has been the fixed, set schedule, typified by the nine to five day. Variable work scheduling has only been done in industries such as retailing and manufacturing where the nature of the business demands it. Since the early 1970's, however, there has been growing interest in using flexible work schedules. The hallmark of flexible scheduling is that the employee has some choice over when he spends time at work.

The core idea is that allowing employees some choice with respect to scheduling improves their attitude toward their work. The choice allows them more latitude in planning their own affairs and is thus of inherent value. It also makes employees feel more like they come to work because they want to. The separation between work time and other time becomes fuzzier, so that they become more involved in their work.

Flexible labor scheduling seeks to use scheduling to attack a broad range of performance problems. Flexibility is added to the schedule determined by management (either by systematic or more informal methods) so that employees have some range of choice within the overall confines of the schedule. Given that this choice has the effect ascribed to it, scheduling can then help to improve performance levels, quality, etc.

### **Methods**

A wide variety of procedures have been proposed for flexible labor scheduling (1, 4). At first, interest centered on the compressed work week, such as the three-day and four-day week. Although a significant number of employees are now covered by compressed schedules, interest in them subsided around 1973.

Attention has subsequently turned to two other procedures which have been very popular in Europe. One is known as employee chosen staggered hours. With such schedules employees are allowed to select their starting time (which usually determines their stopping time). The same schedule is followed each day.

More freedom is given to employees by a procedure known as flexitime. With it, "core times" are established during which the employee must be on the job. Other times are designated as flexible periods. Employees may schedule their own time within these periods. In some companies, employees must work enough combined core and flexible time to complete a full workday each day. In others, the length of the workday can vary as long as some total number of hours are worked in a week. Some companies require that working schedules be approved in advance, others leave the schedules entirely up to the employee.

The concept of flexitime can be implemented in any situation. Even where there is a systematic work schedule for optimally allocating people to tasks, there is usually some flexibility with fixed tasks which do not depend on the workload. This flexibility can be transferred to the employee.

### **Research**

Companies going to compressed work weeks seem to be satisfied with such schedules, at least to the extent that relatively few have reverted back to the five-day week (5). The leading examples are Texas Instruments and the John Hancock Mutual Insurance Co. But the compressed week does not seem to lead to increases in performance. Absenteeism may be lower, but it has more impact, too. And, while worker acceptance is high, there is some evidence that it may put a long term stress on workers (3).

The best data on staggered hours and flexitime comes from a survey of firms using these procedures (2). For staggered hours, the survey indicated that productivity was reported to have increased in 59% of the cases. Absenteeism decreased in 35% of the cases. For flexitime, the survey found comparable increases in productivity but absenteeism decreased even more, dropping in 65% of the cases.



## State of the Art

Some version of flexible work scheduling can be adapted to the scheduling requirements of any company. Most of the disadvantages, especially the flexitime, appear to be easily surmountable. Communication would seem to be a problem, but experience suggests that communication actually improves if anything. Employees are forced to coordinate their activities better. Supervision worries many firms. But, again, experience indicates that employees react with a sense of responsibility. Moreover, there are now special time clocks made specifically for flexitime application.

Flexible work scheduling does not offer the promise of dramatic boosts in productivity. Even so, it can be a useful tool for stimulating productivity.

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## **Behavioral Supervisory Training**

Supervisory training has long been the mainstay of most companies' efforts to improve productivity. It has spawned the rise of training departments in companies and an entire industry directed at supplying training materials. For all this activity, supervisory training has had difficulty in making any impact on supervision. Most supervisors continue to supervise according to their personal style even after training. This has led to the development of training programs aimed directly at changing supervisory behavior.

The core assumption of behavioral supervisory training methods is that it is difficult, if not impossible, to alter the attitudes of supervisors toward people. An authoritarian supervisor will respond to employees in an authoritarian way no matter how much training he receives in interpersonal skills. Consequently, it is more effective to train supervisors behaviorally. Regardless of the supervisor's attitudes, he is instructed in how to behave in response to employee performance. Specifically, he is taught behaviors which reinforce good employee performance.

The idea behind this is that the employee will respond to the supervisor's behavior. The supervisor's own attitude is irrelevant. According to reinforcement theory, if good performance is met by positive supervisory behavior, this performance should increase.

The basic premise of reinforcement approach is that behavior that leads to positive results tends to be repeated. Another premise is that behavior that is reinforced negatively tends not to be repeated. Hence one might think that criticizing poor performance would stop employees from behaving in ways detrimental to the organization. However, there are several unintended, negative consequences of such negative reinforcement: When individuals are negatively reinforced, they learn what not to do, but they don't learn what they should do. In addition, individuals who are negatively reinforced may begin to resent or dislike the person who gives it, thus resulting in poor interpersonal relationships.

B. F. Skinner, the leading reinforcement theorist, suggests that organizations use a maximum of positive reinforcement and a minimal amount of negative reinforcement, since the latter tends to leave people feeling coerced. According to Skinner, positive reinforcement changes the entire culture and atmosphere of a work group for the better, while producing better results in terms of employee performance. On the other hand, negative reinforcement is likely to produce poor morale as well as higher rates of absenteeism and turnover.

Behavior training thus creates a system in which the supervisor is programmed to shape the employee's performance. By responding positively to good performance, the supervisor increases its frequency. This system reduces the need for the supervisor to think about the interpersonal side of this job. His attention can be devoted to the work itself.

### **Methods**

There are two aspects of behavioral training methods. The first is deciding what reinforcing behaviors to train the supervisors in. Verbal praise and recognition are ideal reinforcing behaviors. They are simple for the supervisor and positive, even if they are perceived as ingratiation, by the employee.

The other aspect is deciding on the training procedure itself. Two procedures are proven useful. One is programmed instruction (2). The supervisor is guided through a set of questions which proceed in step fashion so that he learns as he responds to the questions. Programmed instruction has several advantages: (1) it involves the employee by requiring an active response; (2) it is self-paced and individualized; (3) it can be updated at will; and (4) it necessitates careful specification of the program to be taught.

Another procedure gaining in popularity is modeling. The key component here is the use of films or videotape to portray the actual sequence of behaviors involved in supervisory reinforcement. While this procedure could be applied to any program, it is obviously ideal for teaching behaviors. (J. C. Penney, for instance, uses it to teach attitudinal subjects such as "overcoming resistance to change.") The advantages of modeling include: a clear statement of the behaviors to be applied; a demonstration of the behaviors being applied; practice through role playing of the behaviors; and planning by the supervisor concerning transfer of the behaviors to his job (3).

## Research

Little research has been done on the impact of industrial training. Considering the amounts spent on such training, this is unfortunate.

There is some evidence, however, that behavioral supervisory training is effective. The leading case is that of Emery Air Freight (1). After identifying key types of performance in need of improvement, supervisors received behavior training. They were instructed to reinforce by praise and recognition specific work behaviors. Two programmed instruction workbooks detailed the use of reinforcement.

In Emery's customer service department, standards were met 90-95% of the time compared with 30-40% before the program. And this level has been maintained. In containerized shipping, container use increased from 45% to 95%. Estimated savings over the first three years was \$3 million.

While data clearly indicate that praise and recognition reinforcement yield results that are beneficial to the organization, the Emery case has pointed out a problem with the positive reinforcement program. Emery found that: "Inasmuch as praise is the most readily available no-cost reinforcer, it tends to be the reinforcer used most frequently. However, the result has been to *dull* its effect as a reinforcer through its sheer repetition, even to risk making praise an *irritant* to the receiver." To counter this potential difficulty, Emery supervisors have been taught to expand their reinforcers beyond praise. Among the recommended reinforcers are: giving formal recognition such as a public letter or a letter home, assigning a more enjoyable task after a less enjoyable one, inviting employees to business luncheons or meetings, delegating responsibility and decision making and tying requests such as special time off or any other deviation from normal procedure to performance.

Another study in a manufacturing plant supports Emery's results (3). Training consisted of ten two-hour sessions in which model supervisory behavior was presented on film. Actual relative to standard performance was significantly higher for workers supervised by foremen receiving behavioral training versus another group supervised by foremen receiving traditional content training.

Emery Air Freight is by far the biggest success story for a behavioral training program. Data from other companies claiming improvements as a result of initiating similar programs is limited. Various divisions within Michigan Bell have reported that reinforcement has positively affected attendance, productivity and efficiency, safety, service and satisfaction with superior and co-worker relationships. However, Michigan Bell Maintenance Services reported that employee satisfaction with pay decreased as a result of the reinforcement program. Other companies have reported positive effects on lateness, employee self-esteem and various productivity measures.

## State of the Art

Although behavior training is yet to prove itself fully, it seems to offer an alternative to the quagmire of traditional supervisory training. There has been a tendency, however, to confuse the modeling procedure

with the reinforcement approach. Modeling is well suited to learning reinforcement behavior. But programmed instruction may just be as effective. The real innovation is in the behavioral training itself.

#### References

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## Autonomous Work Groups

It is generally recognized that supervision alone is not sufficient to control the performance of employees. Employees will always be controlled more by their peers than by any authority figure. This realization has led to the autonomous work group. It is a technique of using peer control to enhance performance.

The core idea behind autonomous work groups is that the social (peer) system of an organization must conform to its technical (task) system (4, 6, 10, 11). This idea has been popular in Europe for some time. It is now emerging in the U.S. under the rubric of sociotechnical theory. This theory is usually stated in rather dense jargon, but it is actually very simple.

Sociotechnical theory holds that both the social and technical aspects of the workplace must be integrated and mutually supportive of one another (4). Output of the company is a function of *both* systems. Discrepancies between the two systems result in lower output.

This view is related to, but goes well beyond, the more standard behavior science orientation underlying job design. Not only must work conform to the psychological needs of workers, it must also be in harmony with their relationships with each other.

A useful concept for making sociotechnical theory more concrete is the concept of "norms" (1). Norms are the expectations that people have about how each other should behave. The norm, "Nobody works very hard around here," is inconsistent with technical performance objectives. It is this sort of inconsistency that reduces output.

Saul Pilnick refers to the existence of a "shadow organization" created by systems of norms. The metaphor is a good one. The shadow organization must be brought into correspondence with the formal organization for optimum productivity.

### Methods

The autonomous work group method is a way of forcing social norms into correspondence with technical requirements. In such groups, workers form a team which must share among themselves much of the planning and execution of work (7, 8). The groups are typically small, usually numbering eight to twelve employees. The only principle is that they be large enough to cover a full set of tasks and small enough to interact face-to-face. The teams decide who will do what tasks. Most members learn to do each other's jobs.

Autonomous work groups sometimes represent such a fundamental change that other activities must be brought into line. Direct supervision may be reduced. Supervisors may play more of a supporting, service role. (In some businesses this is often not very different from what they have been able to do in practice anyway.) The pay system may also be geared to the group rather than to the individual. Skill evaluation plans seem especially suited to autonomous working groups.

Whatever the specific procedures used in developing autonomous groups, it is the interaction of the members in confronting tasks that creates new norms. No longer are norms based solely on nontask interaction or on interaction incidental to tasks. They are based on task cooperation. The new norms necessarily reflect the job to be done.

Several procedures have been utilized to help the process of norm creation. One is to use surveys to diagnose pre-existing norms (1). The norms uncovered are pointed out to the group in the context of meetings about task problems.

Another procedure is that of "team building" (5). In essence, team building is a program for training groups to become effective problem-solving units. Training begins with an initial all-day meeting and may go on for months. A three-day program might be typical (2). The first day could be used to clarify the roles of the team members so that they react to each other not as individuals but as team members (9). The second day could be used to enhance the ability of the group to interact freely (3). The third day could be devoted to focusing the group on task problems. The result would be to smooth the interaction of team members so that they can adjust to their tasks.

**Research** The Topeka dog food plant of General Foods is commonly pointed to as the leading demonstration of autonomous work groups (12). The plant was set up under the direction of Richard Walton of Harvard University in 1971 using sociotechnical theory. Each team was set up to perform a complete function. The functions include processing, packaging and shipping and office duties.

Each team on a shift has seven to 14 members who share responsibility for a variety of tasks. The processing team, for example, handles the actual pet food manufacturing, unloading raw materials, equipment maintenance and quality control. Teams make their own day-to-day job assignments. They have the right to hire new members and set their own goals.

The team works under the direction of a "coach" rather than a foreman. The coach is a member of the team. Status differences are minimized to facilitate interaction. All employees use a common entrance and there are no reserved parking places. The plant is even configured to make it easier for employees to get together during working hours.

The Topeka plant appears to have been a success. Industrial engineers had indicated prior to opening that 110 employees would be needed to staff the plant. With autonomous work groups, only 70 were required. Even more striking were improved yields, minimized waste and avoidance of shutdowns. Rejected batches are 92% fewer than the industry average. Unit costs are five percent less than at comparable plants. The combined cost savings have been estimated at about \$1 million a year. While there have been problems, most of these seem to have been caused by the anxieties aroused in middle managers (13).

The Topeka experience is certainly supportive of the autonomous work group method. And there are several other successful demonstration cases as well (4). There has not, however, been more rigorous, comparative research on the method.

### **State of the Art**

Autonomous work group methods are often confused with job design. The two do go together. It is difficult to implement autonomous work groups without also engaging in job design. But job design can be implemented without autonomous work groups. The latter is the broader, more comprehensive method.

The thing to remember about autonomous work groups is that they do not necessarily represent major organizational change. The term, "group," is not limited to employees who work on highly interdependent tasks. Any employees who share common norms are a group. The autonomous work group is essentially just a way of capitalizing on the interaction that already exists among workers. The method is much more usable than it may sound.

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## Survey Feedback

Survey feedback differs from other techniques of productivity improvement in that it is not expected to affect employee performance directly. Rather it is a device for crystalizing problems so that action is forthcoming. Employees first answer survey questions. Answers which suggest problems are then fed back to them in group meetings. Based on the discussion in the meeting, action is taken to correct the problems.

Organizations are normally structured as layers. People at one layer are linked to people at the next by one person, the supervisor they report to. While this makes good sense from a control point of view, it obviously restricts communication upward from the bottom layers of the organization. Feedback from these bottom layers converges on fewer and fewer people at higher levels. It is no wonder, consequently, that higher levels are often out of touch with employees and their work.

The core idea of survey feedback is to open upward channels of communication in the company. While a questionnaire survey is used, survey feedback is not a morale or attitude survey. It is not aimed at finding out about people. It is aimed at finding out what is going on. The goal is to crystalize awareness of problems.

### Methods

Three procedures are used in survey feedback. The first is the administration of a survey to all employees. The questions generally deal with objective "there and then" problems. Examples include: "Does your boss make assignments clear?" "Do you get recognition for a job well done?"

The questionnaire is either developed for the company or a standard questionnaire developed across companies is used. For example, twenty-four companies, including GE, Ford, Xerox, Prudential Insurance and Control Data, have put together a standard questionnaire. Called the Mayflower Group, its member companies exchange findings.

The oldest of these standard questionnaires is "The Survey of Organizations" administered by the University of Michigan's Survey Research Center (2). It stresses questions about managerial leadership, peer leadership, group process and organizational climate, which is the general atmosphere created by top management. It identifies problems in the relationships among people.

Open-end, nonstructured focus group interviews can also be used. These involve sessions with small groups of eight or so employees. They are especially useful in drawing employees out.

Whatever the thrust of the survey, the next procedure is to communicate the results back to employees. This is done in a series of meetings. The groups can be constructed in a variety of ways. Family group feedback calls for a work group made up of a superior and all the people reporting to him. Such groups are chosen for feedback if problems are located in the work group. Survey guided development starts with top management and proceeds downward. As feedback moves downward, ideas and suggestions are passed upward through the chain of groups. Such groups are chosen when problems are defined horizontally. Subordinate group feedback involves family group meetings without the superior. Such groups are chosen when problems might result in confrontation with the superior. Generally, groups receive data based on their own survey responses and, for comparison, the company as a whole.

The final procedure is to use the survey feedback to stimulate group discussion. The survey data creates awareness of problems. But group discussion is necessary to clarify the details of the problem.



There has as yet been little research evaluating survey feedback programs. While programs are usually received positively, there is little indication of whether actual job performance is affected. The state of the art has not advanced beyond using surveys as an end in themselves rather than as a means.

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## Selecting Behavioral Science Techniques

So far behavioral science techniques have been discussed individually and in order of their visibility in management publications and discussion. In actually deciding among these techniques, however, the supermarket executive should not be guided primarily by the visibility of a technique. Two other criteria are far more important. One is the extent to which a technique fits the operating environment of the supermarket. The other is the extent of the change management really wishes to make in existing operations.

The supermarket environment presents a formidable challenge to any management program. Operations are relatively loosely organized, work loads are highly variable, union practices can be restrictive. Nonetheless, it is felt that, with one exception, all of the techniques described here can be adapted to the supermarket environment. No doubt changes would have to be made in any given application, but each technique allows considerable latitude for such customizing. None of the techniques are rigid, fixed methods.

The one exception is the flexible scheduling technique. It assumes that management is indifferent to the precise time periods employees work. While such indifference might well hold for office or even warehouse employees, it does not fit the store environment. There is probably not enough latitude in store operations to permit such flexibility. Even so, this should not be taken as ruling out flexible scheduling altogether. Applications might be found, for instance, with night stocking crews that could vote to adjust their schedules according to season or some other factor.

The second criterion, the magnitude of change desires, is more restrictive. The fact is that three of the techniques should only be undertaken if management is really committed to major change. Job design, incentive systems and autonomous group programs are all intended to have a fairly sweeping effect on the work force. To use these techniques with the intention of making only small scale change would probably only frustrate employees.

It is thus wise to think about these techniques in terms of two options. Management may decide that simply fine-tuning existing work force activities is sufficient. If the problem seems to be that priorities are not being communicated down through the organization, then an objective-setting program is indicated. If the problem is that workers seem to be running into unforeseen obstacles in doing their jobs, then a survey feedback program is indicated. Or if the problems is that workers seem to lose sight of key aspects of their job, then a behavioral training program is indicated. For example, an objective-setting program could be used to improve store displays, survey feedback to facilitate daytime stocking activities or behavioral training to increase customer courtesy. These are illustrative of the sort of shift in focus for which these techniques are suited.

Alternatively, management may decide that broader, more fundamental changes in work force activities are required. Job design, incentive systems and autonomous work groups can be used to get workers to do things that they are not already doing or to work significantly harder at things they are already doing. Both attempt to create a strong pressure on the employee to change what he is doing or how he is doing it. If pay can be linked to the change, then an incentive program is probably indicated. If change must come from the employee, then job design is indicated. Or if climate among the workers blocks change, then some form of autonomous work group may be indicated.

Regardless of whether management opts for redirection or more basic change, however, behavioral science techniques must be selected on the basis of an overall strategy of productivity improvement. The sort of strategy required is the subject of the next section.

## The Market Investment Strategy of Implementation

The seven behavioral science techniques, and the specific versions of them, all seek to stimulate employee contribution to the business. The preceding discussion has indicated that the techniques vary in scope. But even more important for selecting techniques is the fact that none can be implemented with a cost reduction orientation. For the supermarket industry to make full use of behavior science techniques, implementation will require an entirely new *strategic* orientation. The key to implementation is a shift in productivity improvement strategy, a shift away from the industry's prevailing cost reduction strategy.

To see the alternative to a cost reduction strategy, it is necessary to turn not to the detailed features of supermarket operations but to the basic concept of productivity. Productivity is the amount of output produced by the input to a business. Cost reduction views this output as the result of the *conversion* of input. That is, input is converted to output through some process. There is a relationship between the two such that units of input are physically transformed into units of output.

Cost reduction not only rests on the premise of equipment substitutability, it is founded on a view of the business as a mechanical conversion process. An analogy may help to make this view clearer. A simple example of a conversion process is the automobile. Gasoline is converted into miles driven according to some relationship which depends on the weight of the car, etc. If a car gets 15 miles to the gallon, this ratio is the productivity of the car. One gallon of gas yields 15 miles. If we could cut back on each gallon with alcohol and still get the 15 miles, this would be productivity improvement.

A cost reduction strategy assumes that a business is a machine turning out some output. It seeks to get the equivalent of better gasoline mileage. Hence, productivity is commonly discussed in terms of conversion rates such as sales/payroll dollars or units/employee hours. Productivity improvement amounts to getting better sales mileage. You have to put fewer payroll dollars in to get where you are going.

This perspective seems very simple. It is simple. It is also potentially very misleading, for it obscures an entirely different way of looking at productivity.

The output of a business, particularly a service business like a supermarket, is better viewed as market demand. The business' output is what people buy. (Anything above this is not output but a cost of doing business). Inputs do not relate directly to output in any sense of mechanical conversion. Far from being mechanical, the relationship between input and output is one of consumer reaction.

**According to this view, productivity improvement results from decreases in the level of input which are not matched by reductions in output demand, or it results from increases in the level of input which are exceeded by increases in output demand.** Of the two, the latter is more viable. Reductions in input in a competitive market are likely to lower demand drastically. However, increases in input which the consumer desires are likely to raise demand. Consumers buy more or pay more because of the added input.

This perspective leads directly to a *market investment strategy* of productivity improvement. The key question becomes: If I invest X dollars more in labor, what will be the resulting increase in output demand? While this question appears novel in the context of discussing labor, it is similar to the way managers think about most other assets of the business. No one begins by asking how many dollars can we save from the advertising budget. The question is more one of what is the payoff of different levels of advertising. Or at least managers know that this ought to be the question. Yet the cost reduction strategy has blinded managers to this logic when it comes to employees.

Economists have contributed most to the oversight of the market investment strategy. Productivity, or real output per worker hour, is a yardstick of industry efficiency for the economist. It measures the rate at which an industry is replacing less efficient resources with more efficient resources. Economists are none too clear about the meaning of this measurement. The rationale for why the absorption of resources is best reflected by decreases in worker hours is left rather vague. Implicitly the logic seems to be that the substitution of equipment or know-how for employees reflects superior performance. In any case, the economist's "explanation" of productivity is only a demonstration that such substitution is or is not occurring in an industry. The primary economic determinants of productivity have thus been shown to include the labor-capital ratio, the age-sex composition of the work force, the education of the work force and regulatory costs. When the economist reports that productivity is declining, this should be interpreted to mean that factors such as these are presenting employee substitution in an industry.

Unfortunately, business people commonly interpret the economist's preoccupation with the real-output-per-worker-hour yardstick as justification for a cost reduction strategy. It is easy to forget that the economist is interested in evaluating the performance of industries, not in the management of the firm. Being in an efficient industry does not ensure the success of the firm. Nor does being in an inefficient industry ensure failure. The success of a cost reduction strategy for a particular business is really independent of the economist's concern with industry performance. The latter does not imply the former. Headlines about the "productivity crisis" do not mean that every business can profit from a cost reduction strategy. The individual business is concerned with its share of output demand rather than industry performance. This requires going beyond the economist's concerns to look at productivity from the point of view of market investment.

Another factor obscuring the market investment perspective is simply the fact that output/input rates are so widely used in measuring productivity. As noted above, the economist's use of this type of figure is intended for comparing industries, not for decision making. For the business, such figures are only meaningful from a cost reduction point of view. They tell you whether you are getting better mileage out of your employees. But, if the question is whether investing in labor will result in increases in output demand, output/input rates are of little help. The manager needs to think in terms of the relationship between input expenditures and sales response. A labor rate at a point in time does not tell the manager what some investment in labor would return. The fact that you get 15 miles to the gallon does not tell you what painting your car would add to its resale value. The point is that a market investment strategy necessarily involves more judgement and is harder to evaluate than a cost reduction strategy. These difficulties are no greater with employees than with any other part of the business, however. They are not in themselves a reason against attempting to follow a market investment strategy.

Once one removes the blinders imposed by the cost reduction view, the economist's focus on industry performance and the sheer salience of output/input ratios, the market investment strategy appears to be a most natural way of managing employee inputs. The main issue then becomes how employee inputs can be related more effectively to output demand. That is, what investments might yield a suitable return? It must be said that the neglect of the market investment strategy shows up here. Since most companies have applied a cost reduction strategy to employees, techniques geared to market investment have been slow to develop.

The seven behavioral science techniques described in this report provide a set of tools for a market investment strategy. Each technique is a logical means of directing the efforts of employees. The techniques at this point are fairly refined in terms of the procedures utilized. The one thing that has been missing in previous applications is to connect the techniques to an overall strategy. There has been a tendency to utilize the techniques as an end in themselves rather than as a means.

In the past these techniques have most often been employed for rather ill-defined purposes like reducing the resistance of workers, making them more satisfied for job oriented or improving communications. As might be expected, given the looseness of these objectives, this has produced a general feeling of dissatisfaction with the techniques. There are demonstrations that the techniques *can* work, and we have documented these. But, paradoxically, the consensus is that they cannot do much for most firms. This has led supermarket management to wonder if behavioral science techniques are really useful.

These techniques have evolved, however, to the point that they can be useful to most supermarket firms *if* they are approached as market investments. Such a strategy is the missing link in most applications. Behavioral science techniques are not ends, they are means. The techniques need to be undertaken with a clear idea of what the business' investment in them is expected to accomplish.

A market investment strategy therefore calls first of all for a specific statement of objectives. These objectives should specify (1) particular kinds of new employee input to the business and (2) the increase in output demand expected to result from these inputs. Market research might well be necessary in order to identify such objectives. Management must know what it is that the consumer would respond to by way of increased employee contribution. It is also necessary to analyze whether this is something which employees can feasibly do.

A simple example may help to make such objectives more concrete. Suppose that market research reveals that "shelf appearance" is important to consumers and that all stores in an area are about equal on this dimension. An objective might then be to improve appearance with the expectation of a ten percent increase in sales. A list of specific appearance factors could be arrived at through market research and an analysis of new activities that employees could perform.

Once a market investment strategy has been formulated in terms of such objectives, it is necessary to specify a means of getting employees to perform the necessary activities. Some aspects of this may be routine. All that may be needed is to instruct employees to do certain things. However, it will usually be necessary to channel the efforts of employees in some way. This is where behavioral science techniques come in. They provide ways of getting the employee to work toward the objective rather than to merely perform some limited activity because he is told to do so.

In the case of the "better appearance" store objective, employees might routinely be allowed more time for cleaning work stations, etc. But to really channel the employee's energy relative to such an objective a technique like job design might be used. Stockers, for instance, might be allowed to divide different sections of the store among themselves. Each employee would take responsibility on an ongoing basis for his section. The employees would be allowed to help define new ways that they might contribute to appearance. In conjunction with this they could also be given inventory accountability or feedback about sales in their section. The employee would thus be encouraged to internalize the objective and to structure his job around it.

The key to using behavioral science techniques thus lies in developing market investment objectives for utilizing employees. The utility of the techniques can only be seen by taking away the blinders of the cost reduction orientation.