VALUE WORLD

TECHNICAL PUBLICATION FOR

GMC TRUCK & COACH

VALUE ANALYSIS PROGRAM

INSIDE - GMC'S VALUE PROGRAM
How They Do It and Why.

ALSO:
The Vision Index
Keynote Address - NASS Conference
Encourage Initiative - Your Style Makes the Difference
ROI - Where to Concentrate
AT GMC
WE’RE JUST ONE THING.

Trucks are what we’re all about.
About the Cover:
GMC Value Analysis Program

Magazine for
AMERICAN SOCIETY FOR PERFORMANCE IMPROVEMENT
790 Broad Street, Newark, NJ 07102
and
NATIONAL ASSOCIATION OF SUGGESTION SYSTEMS
435 North Michigan Ave., Chicago, IL 60611
and
SOCIETY OF AMERICAN VALUE ENGINEERS
220 N. STORY RD., SUITE 114
IRVING, TEXAS 75061

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10th Annual
1978 Conference
AMERICAN SOCIETY FOR
PERFORMANCE IMPROVEMENT

Tempe, Arizona — September 21 and 22

$\text{Survival} = \frac{\text{People}}{\text{Change}}$

(L) HUGO LOPEZ Past President,
Indian Head Chapter, ASPI;
CENTER:
TOM O'CONNOR, ASPI President
and his wife, ELEANOR.
(R) MIKE RICHARDSON, Chairman
of the Board.

(PHOTO AT LEFT)

Session on "Development of a
Productivity Task Force —
The Beginning of Improvement

(PHOTO AT RIGHT)
DRIVING FROM A COLLEGE ORIENTATION, WITH MY FIRST BORN, ANDREA, WE DROVE THROUGH A DESOLATE AREA AND CAME UPON A CROSSROADS SIGN. TO THE EAST WAS POINTED — MARGARET — TO THE WEST — BRICK CHURCH.

THIS INFORMATION PROVIDED LITTLE IN THE WAY OF A GEOGRAPHICAL BEARING EXCEPT THAT WE WERE INDEED SOMEWHERE BETWEEN MARGARET AND BRICK CHURCH, NOT A HALF BAD PLACE TO BE.

MY IMAGINATIVE JUICES BEGAN FLOWING.

WONDER HOW THESE VILLAGES GOT THEIR NAME?

MAYBE, MARGARET WAS NAMED IN MEMORY OF A BELOVED CHICKEN WHO DEPARTED LIFE UNDER THE WHEELS OF A RUNAWAY CARRIAGE, AND BRICK CHURCH, PERHAPS ONE OF TWO CHURCHES IN THE GENERAL AREA, THE OTHER BEING CONSTRUCTED OF FRAME. AND ON IT WENT, MENTAL GYMNASTICS ON THIS SUN-SPLASHED PENNSYLVANIA AFTERNOON, WITH ANDREA, A CREATIVE JEWEL, GETTING THE BETTER OF IT.

INADVERTENTLY, MY THOUGHTS TURNED TO VALUE WORLD. A LOT OF CREATIVITY HAD GONE INTO DEVELOPING VALUE WORLD FROM NO MORE THAN A CONCEPT INTO A RESPECTABLE PUBLICATION. PERHAPS NOW WOULD BE A GOOD TIME FOR ANOTHER, MEANING A NEW EDITOR, TO BUILD ON IT.

MY FEELING IS THAT IT WOULD.

CONSEQUENTLY, WITH THIS ISSUE I WILL CONCLUDE MY ACTIVITIES AS MANAGING EDITOR. AND WATCH THE PROGRESS FROM MY BELOVED AERIE, A LITTLE WAYS NORTH OF MARGARET AND BRICK CHURCH.

ABOUT THE COVER:

GMC Truck and Coach Division is a great believer in Value Analysis as a discipline to achieve cost effectiveness. Story inside describes their philosophy.
KEY PROGRAM –
One of the highlights of the recent NASS Conference was an effective display of the Key Program—an instrument developed by NASS to aid Suggestion System Administrators and other high level management personnel in establishing and running a successful Suggestion Program.

Detailed info can be obtained by contacting:
National Association of Suggestion Systems
435 North Michigan Avenue
Chicago, Illinois 60611

1978 SAVE CONFERENCE FINAL REPORT –
The 1978 International SAVE Conference held in Indianapolis proved to be an outstanding success. While figures alone do not tell the whole story, here are a few significant indications of that successful effort:

- 38.6% Earnings
- Within 3% of Forecasted Expenses
- $2000 Contribution to the Value Foundation

Congratulations to Conference Chairman Eugene R. Smith and the Indianapolis Chapter.

COACHING WORK IN PROGRESS –
In the work planning process, the supervisor and employee agree on specific objectives for the employee, the results expected, and the criteria which will determine successful performance.

Next, the supervisor assumes the role of coach—the most beneficial relationship of a supervisor to an employee. In a supervisor’s day-to-day contacts with an employee while work is in progress, coaching means:

- maintaining good two-way communication.
- keeping up with what and how well the employee is doing.
- being available as needed for advice or instruction.

As the employee works toward his objectives, circumstances may change which will require amendments to the original work plan. The supervisor should then meet with the employee, lock at current information and circumstances, and develop a revised work plan.

While work is in progress, the supervisor (coach) can appraise performance most effectively—at the time it occurs—where feedback is immediate, specific, and job-oriented. Good performance can be given immediate recognition or necessary remedial action can be taken promptly, and where learning on the job is thereby accelerated.

The effective supervisor encourages the employee to fully utilize his skills, which in turn gives the employee a sense of accomplishment and personal growth.

Reprinted from PERSONNEL REVIEW

HONORARY LIFE MEMBERSHIP — INVEST
The Indian Value Engineering Society has announced that Thomas Ray King, Value World Editor and staff member at the University of Pittsburgh, has been named honorary life member.

Ashok Kr Sethi, President

REPROGRAMMING

THINK UP AND WRITE
A WHOLE NEW PROGRAM
GO SLOWLY
CHECK
YOUR CALCULATIONS
FOR ACCURACY
YOU ARE REPROGRAMMING
THE COMPUTER
IN YOUR HEAD
RETURNING
YOUR THINKING
READJUSTING
YOUR LIFE
FOR NEW IDEAS INPUT
BUT BE SURE YOU DO NOT
WIPE OUT MEMORY STORAGE
JUST CAREFULLY CORRECT
MISCALCULATIONS
AS YOU GO
ALONG...........................

Barbara Rogers
E. Williston, N.Y.
To Our Readers: This series is being written to assist you in becoming more professional. Each issue will highlight a technique for you to try in your daily activities. It has been said that "If you are not moving ahead, you are falling back; for there is no such thing as standing still."

Many techniques have been developed to assist the professional in accomplishing his specific task. The use of a technique depends on the particular individual — his work, and how imaginative he is in adapting the technique to his needs.

ABOVE — Informal rap session at NASS National Conference.
Group problem solving and information sharing processes are becoming vital tools in solving complex issues.
NOTE: At left, facing camera - JUDY CORBIN, VALUE WORLD Contributing Editor.

BRAINSTORMING

The synergism that occurs from group dynamics and team efforts is an established fact; leading to the truisms:
• Two heads are better than one
• One plus one can equal three.

Brainstorming is a special kind of group problem solving process and was developed in the late 1930's by Dr. ALEX F. OSBORN. The basic concept behind brainstorming is the separation of the mental creative and judicial processes.

Rules for Brainstorming

• Team Effort —
  Input from several backgrounds

• Force Ideas —
  Set Minimum Time
  Set Idea Quota

• Everything Goes —
  (Freewheeling)
  Turn Off Judicial Mind
  Turn On Creativity
  Don't Hold Back
  Go For Quantity Not Quality

• Jump On The Bandwagon —
  (Hitchhike)
  Modify or Expand Previous Idea

TRY IT!
The Anti-inflation Thrust of VALUE WORLD

by

Carlos Fallon

One of the major causes of inflation is too many people bidding up the price of too few resources. Better than taking the money away from the people or reducing their credit, is improving the production of goods and services, and that is exactly what the societies served by VALUE WORLD have been doing—helping industry improve the use of its human resources.

Performance Improvement or Error Cause Identification as some prefer to call it, regularly prevents the waste of millions of dollars in rework and recalls. Suggestion Systems clear a path for ideas to move freely anywhere in a modern plant, and the value disciplines, by means of face-to-face interaction among specialists, contribute to using the brains as well as the brawn of the entire work force. Increasing the usefulness of a company's human resources has been the systematic thrust of VALUE WORLD. The publication recognizes that there is much un tapped initiative, resourcefulness, and imagination in the modern industrial organization and it supports the activities that cause these essentially human qualities to bear fruit.

Where we have a human being operating a machine, we have limitations on what the machine can do, but there are no limits on the initiative, resourcefulness, and creativity of the operator. The hourly worker, operating the machine, may know more about the product of that machine than anybody else in the company. VALUE WORLD through the activities of its affiliated societies places this vast pool of mind-power at the disposal of industrial management; so that human resources are improved, at no additional cost to their product.

This fuller utilization of mind-power applies not only to hourly workers, but also to the most sophisticated specialists. A great part of the minds of these very bright people was declared "off limits" under the concept of "ideas from the wrong place." Many of humanity's brightest ideas have come from the "wrong place." The wheel is a prime example. The idea did not originate in the field of transportation. It came from "the wrong place." Potter's wheels existed long before wheels for carts or chariots.

The disciplines served by VALUE WORLD all open the door to "ideas from the wrong place." Every industrial buyer knows a designer who thinks he can buy better than a buyer, and every designer knows a buyer who thinks he can design better than a designer. Are we going to let all this wisdom go to waste? Truth is, everyone may have some good ideas in someone else's field of interest. Good ideas should be able to stand up anywhere, regardless of where they are supposed to originate. The organizations served by VALUE WORLD provide a variety of ways for sparking and harvesting insights into better products and services.

Why better products and services? We were writing about inflation. What is inflation if it is not the appalling deterioration of the buying power of our currency? That very currency which is the measure of our savings, our insurance, and our pensions. The buying power of the U.S. dollar is the measure of our future. That buying power is determined by the products and services that dollars can buy. That is why improving our products and services is important!

Maybe we should put our money into gold and diamonds. Gold and diamonds must be stored, safeguarded, and insured. They pay no interest or dividends. Later, when you turn them in, all you get are dollars. What for? Why, to buy products and services. That is what dollars are for, and that is one of the two great strengths of the dollar—the products and services it can buy!

The other great strength of the U.S. dollar is the unique banking system behind it—the Federal Reserve System with its twelve Federal Reserve Districts and thousands of member banks that support each other against multiple bank failures.

More than the price of gold, more than the budget deficit, more than fiscal and monetary policy, it is the performance, quality, and value of the products and services dollars can buy that determine the value of our currency, our savings, our insurance, and our pensions. The U.S. dollar is the best way to store wealth today; otherwise, the canny Swiss and the practical Japanese would not be buying it by the millions. Unlike gold and diamonds, it pays its owners for the privilege of owning it. It is up to the readers of VALUE WORLD to see that the dollar buys products and services as good or better than those bought by the Yen, the D-mark, or the Swedish crown. That is the anti-inflation thrust of VALUE WORLD.
GM Value Analysis Program

By

R. G. Otto
Purchasing Manager
GMC Truck and Coach
Detroit, Michigan

This article is written in response to a series of questions regarding why GMC Truck and Coach Division became involved in Value Analysis. Specifically, the questions were, “Why did GMC start a Value Analysis activity? What does GMC expect to gain from Value Analysis? How does the GMC program operate?”

The answers to these questions were included in a presentation given by GMC to GM’s corporate Purchasing Management in October, 1978. This presentation did not dwell on the Value Analysis methodology, but key on the power and potential of Value Analysis as an effective tool for managing cost. The presentation accentuated the profit, product and people benefits of Value Analysis and offered some insight on initiating and maintaining a Value Analysis activity. Also included was an overview of the GMC Value Analysis program.

The following are highlights of the presentation written cooperatively by Ms. K. A. Jokinen, H. A. Hohnstadt, J. R. Swank and myself.

Profit

Please take a moment to consider this statement. Through Value Analysis major improvements in our products can be accomplished at lower cost. Sound like “Motherhood and Apple Pie?” Perhaps it does but let me continue.

Companies with ongoing Value Analysis programs have been realizing returns on investment ranging from 5 to 20 dollars for each dollar invested in their programs. Joy Manufacturing published the fact that they achieve over 3.3% net profit after taxes from their Value program. General Electric reported cumulative savings in excess of $200,000,000 from their Value effort. John Deere, Fairchild and Lockheed published similar reports, and so the list continues.

These documented savings provided the incentive for GMC’s initial interest in Value Analysis. Return on investment, however, was not the only reason for our commitment to a Value Analysis program.

Product

In addition to the increased profit we have been discussing, Value Analysis results in product improvement.

The basic rules for Value Analysis require that product quality be maintained or upgraded. Value Analysis concepts key on function to cost relationships, follow a step-by-step job plan and identify viable alternatives to product design. Let me state categorically, Value Analysis does not cheapen the product.

Let’s take a trip in history to World War II when Value Analysis was conceived at General Electric under the authorship of Larry Miles. General Electric and many other companies were out of materials needed to meet wartime commitments. Mr. Miles, then in Purchasing, developed the theory that examination of functions was the key to identifying alternative ways to produce their products. By using this approach, complete redesigns were developed that not only performed the function of the original design but did it better for less.

Since World War II, the techniques and methodology of Value Analysis have undergone continual development and refinement, resulting in a program

Continued on p. 8
that is not only cost effective but also improves the reliability, serviceability, durability and salability of the product.

**PRODUCT**

V A = Product Improvement
- Reliability
- Serviceability
- Durability
- Salability

**People**

Now let’s consider the people side of Value Analysis. Traditionally, as an initial step of a cost reduction program, we as Purchasing people are asked to negotiate lower prices with vendors. This is effective to some extent but unfortunately, most of the cost is already "engineered" into the parts prior to our involvement. In most cases all we are working with is the vendor’s profit margin. Value Analysis, on the other hand, gives people from Purchasing, Engineering, Financial, Manufacturing, Quality and other departments the opportunity to use their expertise "upstream" where they can really influence costs.

The participants share in the development of the product as a task force team. Ground rules prevent the threat of "personal loss" or being put in a defensive position, resulting in an atmosphere of open communication and creativity. The synergistic effect which occurs within this environment is a major factor contributing to the success of the VA approach.

In addition to the profit and product benefits already mentioned, **Value Analysis is a people oriented program** which stimulates personal growth.

**SUMMARY ON POWER OF ANALYSIS**

Do we feel Value Analysis is powerful? You bet we do! As we stated earlier, Value Analysis provides an excellent return on investment that is measurable and auditable. Value Analysis improves product quality, serviceability, maintainability and all the other "ilities". It is a people program that promotes open communication and creativity and it is a management tool that offers decision makers well organized, well documented data.

**Ingredients**

As with "Motherhood and Apple Pie", time and ingredients are required to achieve ultimate success. Even with considerable assistance from consultants, the Society of American Value Engineers, the University of Wisconsin and General Motors Institute, our program at GMC required almost two years to develop. We changed direction several times as we moved from traditional cost reduction to a more dynamic, more profitable Value Analysis approach. Through trial and error, we discovered the benefits of Value Analysis are not immediately attainable merely by being familiar with the technology.

The first and most important ingredient required to implement a viable Value Analysis program is a commitment from divisional management, the General Manager and Staff. A Value Analysis program cannot survive as a departmental program. **The program must be divisional.** The General Manager and Staff are the "Value Management Team", responsible for decisions of the programs. This role requires more than involvement. It requires commitment!

The second ingredient is an understanding and appreciation for the Value Analysis technology by all levels of management. This is especially important when middle management is asked to support the time and manpower required for the task force teams. Without this understanding, it would not take long for task force team members to be given conflicting priorities, diluting the effectiveness of the program.

Let me digress for a moment to mention that most task force teams involve five VA trained people from various departments who have been carefully selected to match the project. The teams have specific time budgets and deadlines. Most teams have been completing their assignments in less than 20 hours over an 8 week period.

The third ingredient is an ongoing training program consisting of 40 hour workshops for potential task force team members. Proper training is an essential element of the program as significant adjustments are required in personal habits and attitudes.

Careful consideration must be given to selecting the people responsible for conducting the training program due to the psychological impact.

The fourth ingredient is recognition for contributions of the task force team participants. Obviously there is personal satisfaction derived by the task force team members when their recommendations are approved by the General Manager and Staff. However, other items; letters of commendation, plaques, banquets, and merchandise awards are also used as program incentives.

The fifth ingredient is a dedicated VA staff, responsible for administration of the program. This group identi-
GM Value Analysis Program
Continued from p. 8

Identifies potential projects and task force team members, assists task force teams with VA technology, tracks and reports progress of the overall program and conducts the Value Analysis workshops.

PROGRAM INGREDIENTS

- Divisional Commitment
- VA Technology
- Training
- Recognition
- VA Staff

Program Operation

With these five ingredients in place, the GMC program operates in an easy to understand, straightforward manner.

- New projects, task force teams and time budgets are submitted to the General Manager and Staff for approval.
- When approved, the task force teams are notified of their assignment and meet with a member of the VA Staff to launch the project.
- The teams then proceed with the study, applying the Value Analysis methodology. Additional people with specific expertise may be consulted as needed, such as vendors and materials engineers.
- Upon completion of the study, recommendations are presented by the task force team to the General Manager and Staff for approval.
- When approved, the project is reviewed with the responsible departments for implementation. At this point the task force team is disbanded but remains available to the implementing departments throughout the implementation phase.
- The Value Analysis Staff representative works with the implementing departments until the concepts become realities. The time involved to accomplish implementation is dependent upon the scope of the project which includes drafting schedules, complete testing programs and tooling requirements.
- After implementation, a final report is made to the General Manager and Staff using actual costs. The savings are then officially credited to the program.


departmental benefits

Up to now, we have been referring to the divisional aspects of Value Analysis. There are, however, specific departmental advantages that are applicable aside from the ability to influence design costs upstream.

Task force team members gain additional insight and information about the total product. They have more complete data available on materials, toolings and processes and can more effectively execute daily job responsibilities. In addition, communications and working relationships with other departments are enhanced.

Conclusion

Obviously, the material we have covered today has been condensed considerably, perhaps to the point of oversimplification. We have reviewed the philosophy of Value Analysis, identified its power and potential and clarified the essential ingredients of a viable program.

There is no doubt in our minds at GMC that Value Analysis is an effective cost management tool. In today's environment, Value Analysis may indeed be a plan for survival.

Value Analysis + COST MANAGEMENT

Departmental Benefits

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RGO:ch
Nov. 14, 1978
The Value Analysis Technique of the Vision Index

by

A. Rozairo

A. ROZAIRO Management Engineering Consultant, and Socio-Ecological systems research studies, planning and valuations. Associated as consultant with the Canadian Executive Service Overseas and has over twenty-five years experience based on exposure to several technologies, physical sciences and the social sciences. He is a member of the International Federation of Housing and Planning (HAGUE), a United Nations Consultant body.

VISION is an acronym for Value Integral of Systems Interactions Optimal Number. The innovation came up on a recent assignment, when this author originated VISION as an evaluation technique for the analysis of bids invited for the supply installation and commissioning of machinery and equipment for a water treatment works for the treatment of a supply of three millions gallons of raw water per day to a potable standard.

The VISION index technique is a method of analysis for project or bid efficiency measurement in situations of natural resource transformation; that is, where the natural resources have to be “changed in form, appearance, nature, disposition condition or the like”, according to Webster's dictionary definition of the word, transformation. The example mentioned in this paper relates to a change in the quality of raw water that is pumped up from a river for utilization as a city's drinking water supply.

The value analysis proceeded by evaluating the various sub-systems that comprised the total water treatment system.

The water system involved the salient treatment stages of A) Coagulation and mixing; B) Sedimentation; C) Filtration; D) Sterilization.

A system is defined here as one that involves the interactions of it's dominant capital divisions of: 1) Physical capital, which comprises the components of land; buildings, ancillary structures, machinery and equipment, materials, etc., 2) Human capital comprising the components of management technical and support skills involving the technological science physical sciences and the social sciences., 3) Financial capital components of investment, operations and maintenance funds. Each stage in the water treatment process is explored to yield value measurements in monetary terms; from which are derived indices. The sum of the indices of value derived gives the Value Integral of the Systems Interactions Optimal Number index.

The matrix arrangement of data relative to the two bids are noted as follows; each matrix element denoted by $a_{ij}$ represents a derived value index relative to the specific phase of the project described; and the relevant capital resource inputs. These indices are based on information extracted from the price analysis data from Bid I. Price analysis data from Bid II is developed by the same method to yield the respective value indices.

<table>
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<tr>
<td>Phase</td>
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<tr>
<td></td>
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<td>Coagulation &amp; Mixing</td>
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<td>Control</td>
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<td>$a_{21}$</td>
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This scheme is followed through with respect to project Phases B, Sedimentation; Phase C, Filtration; and Phase D, Sterilization, to give a comparative price analysis of the Bids involved.

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10
BOOK STORE

Special Announcement

1979 SAVE COMPENDIUM of VALUE
The 1979 SAVE Compendium of Value gathers together and presents by Subject Group Books, all the papers on value technology pertaining to each Subject Group, as published in the SAVE Annual Proceedings from 1963 through 1978. These are individual books for each Subject Group, as shown on this order form, containing exact reprints of the entire papers presented for each subject, taken from the SAVE Annual International Conference Proceedings. For Example: The Construction Book, No. 6, contains full reprints of over 60 papers presented on value technology in Construction.

Take advantage of this opportunity to augment your Library of Value Technology with a set of books dedicated to the particular Subject Groups of personal interest to you or your company. Send in the handy order form now, for immediate fast delivery of your Books.

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A detail discussion of the six steps of Manpower Value Planning—the lowest realistic cost of people for the performance of functions that will fulfill a purpose at a desired level.

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A systematic technique for analyzing and improving the effectiveness of an organization through better utilization of people—work procedures, management systems, motivation, communication, people development.

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A 39 page handbook presenting detailed discussions and worksheets, reference charts for each phase of Value Engineering Job Plan.

Bibliography of Value Technology
B. Higgins, 1973
A source of value technology information—technical books, papers, periodicals that cover a wide variety of value subjects.

Bibliography of the Value Analysis Library Resources Center
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The Value Analysis Technique of the Vision Index

Continued from p. 11

Assume that the price analysis of Bid I is as follows:

$A_1 =$ Amount representing the Operating Function

$A_2 =$ Control Function

$A_3 =$ Support Function

Where each amount, $A_1$, $A_2$, $A_3$, comprises the relevant contributing capital resource input cost; the value index for each total function, only is calculated in order to illustrate the method of derivation of the value indices.

If the estimated revenue from the services delivered is set at $C(A_1)$, and the estimated energy, operating, maintenance and ownership costs set at $E(A_1)$, all representing present value sums; a gross profit of $C(A_1) - E(A_1)$ is indicated.

This profit yield could be used as a measure of the effectiveness of the Operating function, in respect of Phase A thus:

\[
\text{Gross Profit Yield} = \frac{C(A_1) - E(A_1)}{A_1}
\]

The index $a_1$, reflects a functional efficiency value index representing the sum of the indices $a_1$, $a_2$, and $a_3$, shown in the matrix of value indices, relative to the various capital resource inputs contributing to the Operating function. Similarly, a functional efficiency value index is calculated in respect of the Control function and equal to $a_2$; and a functional efficiency value index, for the Support function which is equal to $a_3$.

Having calculated for Phase A, we proceed with this method for the Phases B, C and D respectively and obtain value indices, $b_1$, $b_2$, $b_3$, for Phase B; indices $c_1$, $c_2$, $c_3$, for Phase C and indices $d_1$, $d_2$, $d_3$, for Phase D. Therefore, for the salient, functional sections of Operations, Control and Support, we have a "value integral of systems interactions number, or VISION INDEX, which would be the cumulative index number $a_1$, containing the sum of $a_1$, $a_2$, and $a_3$. This is the cumulative, functional efficiency value derived in respect of Phase A and reflects the Phase VISION INDEX.

Similarly Phase VISION Indices, given by $a_1$, $a_2$, $a_3$, and $a_4$. In respect of Phase II, we compute in a similar manner and derive the relevant Phase VISION indices. These VISION Indices obtained for both Bids, are now compared in order to find out which bid reflects the better functional efficiency values. The sum of the Phase VISION Indices will give the BID VISION INDEX or simply the VISION INDEX.

In amplification of the VISION technique, we will use some monetary values in comparing three bids which, in order to facilitate calculations for our purposes, meet the specifications and have the respective bid prices analyzed relative to Operating function, Control function and Support function. To simplify matters further, we will assume that the total bid prices of each bid is equal to each of the other two bids. In other words, where we assume $1,000,000 as the total bid price for Bid I, the total bid price for Bid II is also $1 million. and the bid price for Bid III is $1 million for the total offer.

Price analysis in respect of each bid is given as follows:

<table>
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<tr>
<th>Operating Function</th>
<th>Control Function</th>
<th>Support Function</th>
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<tr>
<td>Bid I $400,000</td>
<td>$400,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Bid II $400,000</td>
<td>$300,000</td>
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<tr>
<td>Bid III $500,000</td>
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On the basis of estimated revenue from the services delivered and the costs incurred in respect of energy consumed, operations maintenance and ownership, assume we have calculated a risk-adjusted profit yield to reflect a present value in the light of a subjective or objective probability of $100,000. We can now derive the relevant value indices in respect of each bid; for Bid I, relative to the Operating function we have an index of $100,000 = 0.25$

Relative to the Control functions, the index is $100,000 = 0.25$

Relative to the Support function, the index is $100,000 = 0.5$

Therefore in respect of Bid I, the VISION index is the sum of the indices calculated above: $0.25 + 0.25 + 0.50 = 1.00$. In respect of Bid II, the VISION index is the sum of indices:

\[
\begin{align*}
$100,000 + $100,000 + $100,000 & = 0.25 + 0.33 + 0.33 = 0.91 \\
$400,000 + $300,000 + $300,000 & = 0.25 + 0.33 + 0.33 = 0.91
\end{align*}
\]

In respect of Bid III, the VISION index is the sum of the indices:

\[
\begin{align*}
$500,000 + $400,000 + $100,000 & = 0.20 + 0.25 + 1.00 = 1.45
\end{align*}
\]

Having derived the VISION index in respect of each of the three bids, we have a picture of the differences of functional economies between the three proposals put forward for carrying out a decision, before implementation of the project. The VISION index in respect of Bid III, calculated as equal to the value 1.45, reflects a maximum functional value index for the three bids being considered. We therefore have a manual computational technique, that gives a fair assessment of the functional value content of the competing proposals. 

\[\square\]
Discovering Our Untapped Potentials
NASS Keynote Address — San Francisco

by

Dr. Wilbur Carl "Bill" Christians

Dr. WILBUR CARL "BILL" CHRISTIANS delivered the Keynote Address at the NASS convention in San Francisco. We are bringing here the highlights of that message.

Dr. Christians is a specialist in creative leadership programs. He is president of Chriscom Enterprises, a California-based organization that provides motivational and inspirational Keynoters and Seminars for Industry and the Professions. He speaks out of a background in industry, government, ministry, and the media.

Bill is licensed by the California Board of Behavioral Science Examiners, has become widely known as Chaplain of the California State Senate, and has served in many capacities on state programs and panels for management seminars, employment selection, and military assignments. He has developed a number of self-testing devices which he uses along with his presentation.

Welcome to San Francisco! As you come here for your convention with its intriguing theme, "Gateway To Ideas," you are appropriately meeting within the shadow of the glorious Golden Gate. And there is an additional "gateway" experience that I hope you all share while you are here in this land of special beauty. When the fog is forming over the ocean, but is not thick enough to rise above the mountains, it often slips through under the Golden Gate in serpentine fashion, coming in as a long, gray snake that becomes two-headed as it splits in its movement toward the north end and the south end of the San Francisco Bay. This is a sight to behold, makes the front page of the newspapers, and is one of the super sights that can thrill us all.

For each of us in NASS, however, there is another thriller that I would like to call to our attention. Modern research has demonstrated conclusively that there are no necessary limits to our physical and mental abilities, which is another way of saying that all of us have great reservoirs of untapped potentials. In a recent meeting with several researchers and of students to increase their learning, I asked if there would ever be any necessary limits to athletic or learning abilities. One of the research team answered, "Never, it's all up here," pointing to his head as he spoke. Let's see what this might mean in several areas of concern Suggestion System Administrators.

Continued on p. 13
Discovering Our Untapped Potentials
Continued from p. 12

The Personal Area

If there are no necessary limits to our physical or mental abilities, this means that there is no necessary limit to how effective we can be in stepping up efficiency and in decreasing costs for our employers. Merely knowing this, however, does not make it happen. The next step involves learning to think more creatively, and that’s what we’re going to turn our attention to now.

Charles Nelson Riley (comedian and actor) told recently, of people who come to him and ask about some quick and easy ways to find success in acting. He commented that they often seem to think that success can be found out there in some agency, or up there on some screen, or some other place in some connection. He insisted, “It’s never out there; it’s always in here,” pointing to himself. In line with this thought is the teaching of Eliot D. Hutchin­son of Cambridge University. He describes the creative process in terms of four steps through which a person must pass: Preparation, Frustration, Insight, and Verification. Making important things happen usually begins with real preparation within ourselves, and one step in this direction can be taken as we look over the “Creativity Measurement Check List” and the “Helpful Hints” brainstorming strategy that will be found at the end of this article.

The Vocational Area

The unlimited possibilities that begin in our personal lives can bear fruit in our daily work. Anna Mary Robertson Moses (Grandma Moses) retired from farming at age 39 because she thought she was getting old. However, at 79 years of age, she began a professional painting career doing what is called “primitive art.” Numerous museums and galleries now exhibit her work, and countless commercial uses have been made of her unique products. One wonders how many people have failed to develop their greatest potentials.

Carol Channing, in describing her sensational career in “Hello Dolly,“ gave out some of her ideas for getting the most out of ourselves. She referred to the importance of using the subconscious mind as she said, “This is the amazing thing about creative work — when you put it down and take it up, time mellows it. It keeps on working.” Basically, she was encouraging people to gather the facts and feed them to the conscious mind. When we have accomplished everything possible in the top of our heads, let the subconscious take over, sleep on it, “Let it float.” Many times, when we wake up in the morning, the subconscious mind will say to the conscious mind, “Hey, you booboo, there was nothing to it. Here’s your solution. I figured it out while you were sleeping.”

When we think creatively about the work of NASS, one very exciting observation becomes clear. It relates to the creation of wealth. For background purposes, let’s recall as most of us know that everything in this modern world is dependent to some extent on a healthy economy. Now lesson number one in economics consists in learning that a free society can achieve a healthy economy only through the continued creation of new wealth. And how do we do that? Wealth is created in many ways such as digging into the earth to bring up raw materials, planting seeds in the ground to produce agricultural products, and reaching out into the seas to bring in a harvest of fish. These items are now more valuable than they were in their original location, and thus new wealth has been created. Wealth can also be created by manufacturing new products out of these raw materials. What is not quite so clear is the fact that the most important approach to the creation of new wealth is what we call fundamental research, namely, the invention of new ways of using the raw materials with the result that new materials and new products and new life styles are brought about.

Closely related to fundamental research in the creation of new wealth is the practical, on-the-job, common sense approach to problem solving which is at the heart of the Suggestion System philosophy. Mr. Paul Mehl, long-time economist for the Department of Agriculture, expressed to me the opinion that such activity is actually one form of wealth-creating activity. And I say to you that you ought to see your work in the challenging light of this truth — you are in the business of creating wealth when you carry out the principles of NASS.

The National Area

Within recent weeks, we have seen a creative search for solutions to what many have long considered insoluble problems. The Camp David meeting of the heads of state from Egypt, Israel, and the United States of America illustrates the fact that the creative work of humanity begins within the hearts and minds of individuals, moves forward through aggressive brainstorming, and reaches higher levels of accomplishment by translating dreams into realities.

Winston Churchill was a man who also exhibited ability to tap potentials that few dared to hope for. In the darkest days of Work War II, he drew on all of his energies and experience to weld diverse military forces and national interests into a single power that ultimately became invincible. It was largely his creative use of the English language that released the full potential of the Allied Forces. While the British were dying on the shores of Dunkirk, and falling from the skies over the channel, and suffering the onslaught of the bombing of London, Churchill’s works moved the entire free world as he said,

“This was their finest hour!"...."Never, in the history of human conflict, have so many owed so much to so few"....."I do not call you to a life of ease, but of blood, and sweat, and tears."
David. S. Noyes

DAVID S. NOYES graduated from the Marine Maritime Academy in 1965 with a Commission in the U.S. Navy and a B.S. degree in Marine Engineering. He has served in the Merchant Marine with American Export Lines and currently holds Unlimited Horsepower, Unrestricted Deep Sea Marine Licenses – both Steam Reserve and is attached to the Military Sealift Command at the Philadelphia Naval Base. Dave, his wife (Carol), and four boys live in Shillington, Pennsylvania.

Dave began employment with Carpenter Technology in 1968 as Plant Maintenance Engineer and, in 1973, was appointed to head the Suggestion Plan. He has received professional certification through the National Association of Suggestion Systems Certification Program, was appointed a member of the Board of Directors of that International Association in 1975, and a year later was elected to the position of Third Vice President. Dave has led national suggestion seminars in a number of states for the National Association of Suggestion Systems, and has addressed management groups across the U.S. He was elected to the position President of NASS in September of 1978 and has served as NASS’s International Membership Chairman. He was Chairman of NASS’ 35th National Conference held in September in San Francisco and is very much involved in promoting the suggestion field internationally.
Encourage Initiative
Your Style Makes the Difference

by David S. Noyes
NASS PRESIDENT

The greatest resource that any organization has is its people and their ability to visualize new and progressive ways of doing things. The nemesis of suggestion systems is resistance to change. Paradoxically, most people have a tendency to resist change yet the lessons of history prove that change must exist in order for progress to be realized.

The economic pressures confronting business and the consequent penurious attitudes of the insecure manager result in a fluctuating level of morale and productivity. He who recognizes that the economic implication of change requires the expenditure of funds to achieve success must plan a program of adequate budgeting and the building of a proper climate for creative thinking.

A viable suggestion system recognizes the incompatibility of the autocratic manager and the creative initiative of today's worker. A generally better educated individual than generations of the past, today's worker requires more than financial independence. This fact makes us recognize the necessity of effective communications and the need of management to focus on the creative ability of the work force and the understandable requirement of the average worker -- the need for recognition and self-esteem. A creative environment does not happen by chance. It takes cultivating, nurturing, and constant effort to maintain. The subordinate, placed within the organizational "ladder," is employed in either a climate of "initiative within structure" or "coping within structure." A creative environment fosters the former while the latter suppresses initiative and creative effort.

Today's worker needs to be stimulated on the job rather than allowed to perform without challenge. Job incentives are a useful tool in this regard and have their economic benefit; but they do not serve as a total substitute to worker challenge and job satisfaction.

Creativity can be defined as the ability to combine already existing elements or things into something that is new -- to make new and unique association among elements and/or things that are not normally associated. Obviously, if one's efforts are directed to associate within narrow, specifically defined boundaries, the ability to address potential beyond those prescribed is restricted. One is thus working within structure which inhibits tapping the genius of the human mind and the association, extraction, and implementation of creative thinking.

The pressures of business can cause feelings of insecurity. To a large extent, one's job security is predicated on performance and the latter is directly related to subordinate proficiency. He who restricts and closely controls an individual's work stifles initiative, suppresses creative thinking, and causes low morale. Feeling compelled to maintain a visible position with his peers, the insecure-- often times autocratic-- manager assumes the parent/child approach to the initiative of subordinates. The dynamic, creative subordinate will often act aggressively to this assassination of initiative which further trespasses on the superior's style. At odds with each other, the creative initiative of the subordinate is suppressed and the position of the superior strengthened since the latter continues to reign with a firm hand.

Conversely, the "leader" who oversees and guides, who is specific about the objective but provides adequate guidelines within the structural framework of the organization, builds a team whose common purpose is to enhance their personal security and that of the organizations. He who supervises within structure recognizes that employees have to cope with structure and the initiative it suppresses.

Assuming that the subordinate is competent, an over-controlling management style reflects insecurity. The insecure manager finds it is necessary to "watch every step" in order that no mistakes are made, to control in order that the final decision is his -- and often times with slight modification! Very often, in newly installed suggestion plans, ideas are declined because the supervisor believes the idea will reflect on him poorly in the eyes of his peers. It is the successful suggestion system which recognizes that the subordinate, providing he is competent on the job, is the true, knowledgeable expert. It is virtually impossible for an individual not performing a task to be able to perform it as well. All people face uncertainties on their job, they tend to prejudge and underestimate the worthiness of their ideas and abilities, and they face communication roadblocks and impasses. It is the progressive manager who works within structure -- who sets growth objectives for himself and his subordinates and who fosters a creative environment by encouraging open communication and positive thinking. It is the insecure manager who operates in a climate of structure and by so doing stifles the initiative of those with whom he is in contact.

The successful suggestion system is totally incompatible with the autocratic manager and will leave this type individual with many sleepless nights. Conversely, the manager who fosters a climate of open communication, who is not resistant to change, who encourages and assists in the development of others, and who uses the suggestion system in a positive way to achieve these goals, will be well rested.

Working as a team and attempting to correct conditions and situations that can be improved upon is fundamental to the progressive growth of any organization. The progressive manager will serve as captain and coach -- the autocratic manager will lose his ticket to the game!
R.O.I. — Where to Concentrate During The Next Five Years

by

F. Cecil Hill

F. C. HILL, Manager, Improvement Programs, Hughes Aircraft Company, Culver City, California. Mr. Hill has been affiliated with Hughes Aircraft in various capacities for the last 16 years. He has served in his present capacity as manager of the company’s improvement programs for the last 3 years. He possesses a BS in Business Administration and an MBA, and has taught Marketing and Management Classes at the University level for the past 10 years. He has served as a consultant to various governmental and educational organizations. He is now involved with developing and implementing productivity-improvement programs at Hughes. He is a Certified Manager of Human Resources and the Executive Vice President of the American Society for Performance Improvement. He has engineered and built an environmentally controlled commercial greenhouse for hydroponic growing and he develops real estate as a hobby.

How do we allocate our resources to achieve a maximum return on our investment? Today’s environment greatly complicates the decision making process, and a myopic view of R.O.I., itself can hinder our ability to take the most effective action.

The United States has undergone some very unsettling times during the mid 1970’s. Our classical economic formulae for prosperity, without inflation, are simply not working. Inflation has erupted in tandem with recession. We hear of “stagflation,” lack of confidence in the economy and monetary systems, fear of the future, increasing complexity and a myriad of other disquieting phenomena. Problems have not been restricted to “business.” Both financial and organizational problems also occurred in local governments, municipalities and school districts.

"Exploding government" has become a subject of many articles. The county of Los Angeles, for instance, has more than doubled the number of employees during the past decade, while the country population has dropped. California voters have passed “Proposition 13” to limit property tax. A newspaper describes two school districts, one in Oregon, and one in Indiana, which have simply run out of funds to pay teachers. Our voters indicate they do not want to invest in schools or municipal projects by rejecting one bond issue after another. The city of Lynwood, California is having to hastily borrow money to meet current payrolls. National economies are no longer independent, but are inexorably tied together by international economics and multinational companies. The deficit in our country’s balance-of-payments has become a source of continuous concern to all fiscal experts. The American dollar is in eclipse in relation to other currencies simply because other nations doubt our ability to control inflation.

The relative “productivity” of nations becomes obvious when statistics, products, and prices are compared. Data continue to verify that the U.S. is not increasing “productivity” at a rate equal to countries such as Canada, Germany, and Japan. At a meeting, an engineer who works for one of the best known hand-tool manufacturers in the U.S.A. related to a recent experience. His company obtained 2 sets of tools for evaluation from the major U.S. competitor, who carries two lines of tools. The competitor carries one popular line which has a reputation for being a very high quality tool. This line, sold under a trade name, is made in the U.S.A. and sells for much more than the other line. The second line is manufactured in Japan and sold under the company’s name. The two sets of tools were tested for quality, durability, and stress limits. The tools made in Japan were found to be far superior to those made in the U.S., even though they cost much less.

In many Business Organizations, managers are hesitant to lay out money for capital expenditures, even when current equipment is outdated and obsolete. They desire a high R.O.I. (Return on Investment) but are often not willing to make investment commitments. Economists indicate that a major economic problem is fear, by both business leaders and consumers.

Organizations, including those in both the public and private sector, are constantly reminded of increasing employee dissatisfaction and lack of dedication, with low motivation. All of the discussion, articles, seminars, and reviews have not eliminated the problems. On the other hand, the U.S.A. continues to have many of the basic assets upon which it has relied in the past, and our problems can be materially reduced by approaching them with the proper solutions. One approach is to specifically “invest” in those areas which have a potential for a real payoff.

We must be extremely selective in placing our dollar commitments to achieve a satisfactory R.O.I. However, we can often maximize our returns by broadening our concept of R.O.I. We can add an additional dimension to R.O.I. — that is, Return On Individuals. Obviously, our human resources are a major asset in which we have many dollars invested. Experience indicates that improved return on this asset can normally be accomplished with significantly less additional investment than that required for capital improvements. Higher return on individuals yields not only a verifiable financial return, but it promotes numerous desirable intangibles, such as positive employee attitudes. These benefits may be realized in any organization, whether profit-oriented or service-producing agencies.

There is no implication that management can ignore the capital requirements or hesitate to make the necessary capital outlays of the proper equipment and facilities. However,
where to Concentrate During the Next Five Years

Continued from p. 16

adding the dimension which emphasizes individuals, we can greatly improve our total returns. In fact, implementation of this increased "people" emphasis in tandem with conventional R.O.I. analysis normally leads to improved decisions on capital outlays.

We have traditionally attempted to "increase" productivity by "automating," or acquiring faster equipment with more capability. This approach can reach a point of diminishing returns, at which it may even become counterproductive. One company recently purchased some very exotic equipment with greatly increased capability (and greatly complicated innards.). It was found that repairs were extremely time-consuming and that it was simply not possible to maintain production without a veritable army of service people. The company eventually scrapped the new machines and, with the help of production employees, developed a more productive system which uses its older, semiautomatic equipment.

Many managers' fear of making commitments to acquire capital equipment has resulted from this total reliance on "bigger and better machinery" for increased productivity. Many have been disappointed by insignificant productivity increases after expensive equipment has been purchased. This is also true in government organizations, which often attempt to increase output through acquisition of equipment and machinery.

Studies and experiments indicate that underutilization of human resources has left most organizations with a large untapped reservoir of potential improvement. At a recent series of meetings of business and government personnel, each attendee was requested to indicate on a slip of paper the percentage of his/her capability that he/she was allowed to use for the employing organization. The average estimate was 60%, with a range of 20% to 95%. This group included management and supervisory people. A similar survey in a group of manufacturing and support personnel revealed even lower estimates. This latter group estimated that individuals were using an average of 40% of their capability, with the range of estimates from 10% to 90%.

All American organizations must develop major strategies to overcome this gross underutilization of our human assets wherever it exists. Of course, it is the People in organizations who accomplish our goals. Management must accept the responsibility for this nonuse of human resources and must be the catalyst in overcoming the problem. We have a tendency to rationalize away poor performance, low productivity, poor quality, and low morale as results of the decline of the national work ethic, low motivation, inherent laziness, ad infinitum. We simply shy away from acknowledging that we can materially influence the people who work in our organizations, and that we have a responsibility to do so. This inability to effectively use human resources stems from a number of causes, including inadequate managerial education, the wrong approaches being taught in management schools, personal insensitivity, and a myriad of other correctable reasons.

One major reason for many managers' wariness of efforts in the area is carry over from disappointing results of such efforts in the past. Many managers have tried and been disappointed by behaviorally-oriented programs, or other approaches, which were touted to be "the answer." Many such efforts, however, are confined to small sections of companies, and spread slowly, if at all, to the other areas. The "Hawthorne Effect" is often noted, followed by a rapid fading of momentum and enthusiasm. Managers have often taken too narrow a view of the potentials of such efforts, and implement efforts only when they are faced with problems. These narrow or "crash" efforts to overcome a special area's problems are normally helpful in the short run, but may even be counterproductive in the end. We often find that we are weary of any real effort in increasing behaviorally oriented R.O.I. because we have been sold so many unsuccessful programs by so many "experts" who have supposedly found a method for curing our ills in this area. Regardless of our reasons for not emphasizing human-oriented efforts, we cannot become discouraged with results to the point where we cease trying to find avenues to better utilization of our human resources.

Until management, whether the president of the corporation, the principal of an elementary school, or the supervisor of a line manufacturing group, accepts the responsibility for the results of employee's efforts, it is a part of the big "cop out." When we become fully committed to learning, or relearning, the operational modes of management which provide an environment for motivation and effective performance we will see turnaround in organizational effectiveness. We do not "motivate" people---we merely provide environment which allows them to use the intrinsic motivation they have brought to the job. Unfortunately, our organization structures and job designs often retard the tapping of employee motivation, rather than facilitating its use.

Our ability to apply sound management principles, plus our commitment to teaching and encouraging all levels of management to use these principles is critical to increasing our return on individuals. Certain basic truths and principles have been distilled from theory and practice during the years. If these truths are kept in mind at all times, and we take all actions based upon them, we will find that our human assets are much more effectively used. (The word "used" is indicated in the most positive sense.) We must invest both the time and dollars required to put in practice these "people" principles, which will help provide the environment that will facilitate optimal use of our human resources. This may include the costs of educating our management in the use of people-oriented principles, restructuring our organizations, acquiring new equipment and facilities, or committing funds for research into improvements.

Often the basic operating tenets are so deceptively simple that we may ignore them or merely assign them to the realm of trite cliches! We have learned that simplistic solutions are inadequate, and therefore may suspect a profound truisim if it is simply stated. Observation indicates that managers, as they remain in a position, traditionally move away from these basics, due to the normal job pressures and constraints. We slowly, but surely, become more isolated from day-to-day operations because we are so "busy." We are overburdened by crises, putting out fires, signing documents, responding to telephone communications, and an array of other "necessities."
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We tend to set ourselves up for the problems with which we’re all familiar. Typical situations are:

- “Workers in the procurement area are unable to acquire the right parts or obtain material in a timely manner because of difference in nomenclature, coupled with obsolete specification and catalogues.”
- “Supervisors seldom get a chance to review and improve operations because they spend 50% or more of their time expediting material or reconciling discrepancies in work instructions.”
- “Workers in a records area spend much more time researching and correcting input transmittals before information was acceptable for entry into the computer, but records were still inadequate.”
- “Employees in a manufacturing area were often unable to produce acceptable products because production equipment is poorly designed and required much repair.”

If we insist that each managerial decision we make is based on sound and proven principles, our organizations will be much more effective. These basics, if used as a starting point for all actions, will help us provide an environment which will increase the effectiveness of our employees. The application of these principles varies with situations, but are valid in most operations. It is normally easier to follow the courses of action prescribed by these principles whenever new operations are being set-up, or major organizational changes are being effected. However, managers should learn to integrate them into everyday actions and decision-making. Each requisite action discussed below is based on underlying principle.

1. Structure operations to encourage employees (regardless of their jobs) to use their talent, ability, and knowledge.

   **Principle of Utility:**
   Effort and interest levels depend upon the proportion of our inherent capabilities we use in accomplishing the job. It goes without saying that individuals possess varying capabilities and use them to different degrees. However human nature predisposes most of us to want to use those abilities which we possess. Any job which does not challenge the use of innate faculties tends to delimit our interest and the amount of effort we expend. An example case of neglecting the utility principle could be that of using the highly intellectual and well educated accountant to do bookkeeping. Also, using the fully competent timekeeper to repair time-clocks may provoke a similar reaction of disinterest. The use of the Technican who can repair time-clocks to merely apply suspense tags on improperly operating time-clocks elicits less than maximum response -- ad infinitum.

   Managers, clear through to the first line supervisor, should assess each assignment for which his/her workers are responsible in order to verify that the job does use the faculties of the workers to a degree which stimulates them to perceive output as “meaningful” work. We have often, in an attempt to “simplify” or “specialize,” broken jobs down into such simple elements that they present little in terms of challenge or meaningful work.

   This principle also requires that we **ASK the People Who Are Performing** the work how it should be done. Numerous occasions are noted wherein we ignore the knowledge and ideas of those who are performing the work which we wish to “improve.” There are many methods for obtaining this type of feedback from employees. The critical point is that we must allow them to use their ideas and abilities while making inputs into the process.

2. Allow employees to have some discretion and decision-making leeway as to **how** the job is accomplished.

   **Principle of Work Control:**
   The amount of control an individual has over the job directly affects his/her level of commitment to accomplishing the job.

   Production-line operations can, if caution is not used, lead to a production-line mentality. We often assume that work must be serialized and broken into its smallest components. This often precludes the performer having any say-so over how he/she does the job, because of necessity to interface with other operations, both time-wise and product-wise. Analysis indicated that we often **demotivate** people by having work broken down to the point where there can be no judgement or discretionary action by the “doer”. Consider a typical manufacturing situation. Engineers conceive and design a product, while planners decide how it is to be built. Line workers are to “build” the product, whether or not it is of a design that facilitates such “building.” Then, quality control is asked to decide whether the product is “acceptable.” When quality personnel determine that the product does not meet specifications, or that it meets specifications but does not work, they may go the fabrication area supervisor to “see what’s wrong.” The fab supervisor may very well point out that all operations are performed exactly as are called out by pertinent instructions. It is not unusual to find that the planning area has not programmed for optimum assembly operations. (Or pick any other possibility for less-than-optimal operations). In any event, the solution to the problems may have been very easily ascertained by checking with the assembler of the deficient subassembly. Often he/she could have told you that had he/she been allowed to help determine how the job was done, several operations would have been more logically placed in different order, eliminated, or supplemented.

   The two principles discussed to this point emphasize that we should:

1) **Use the Knowledge** of employees to improve operations, and

2) Let them assist with deciding **how** to accomplish the job most effectively.

Once employees know what is desired they exhibit real ingenuity in achieving the goal. The application of these principles does not preclude our acknowledging that there are some people who truly do not want work which requires additional decisions or thought on their part. These people are allowed to work in jobs which coincide with their performance.

Certainly, some caution must always be exercised to avoid implementing such changes too abruptly, or when attempting to implement them in areas where receptivity does not exist. Several points, if considered, lend in-
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sight into those areas which will benefit the most from emphasis on tapping employees’ abilities.

• Are employees mature enough to handle such responsibility? Employees range from those who see such actions as an attempt by management to “pass the buck, to those who perceive it as management’s recognition of their ability.”

• Are employees of the type which can function with detailed “cookbook” instructions?

• Can employees handle independence? Some impulsive people need restraint, while others require continuous confirmation by management of their actions.

• Do workers feel that their area of consultation or decision making is meaningful? If they don’t, they will perceive additional freedom to make decisions as “token,” and somewhat deceptive. They see it as efforts to trick them into thinking that they are being allowed to make significant decisions when in reality they are given this latitude only on meaningless decisions.

• Can they identify with organizational goals to the point where they are able to make decisions or submit ideas which benefit the organization, rather than a narrow segment of it, possibly to the detriment of other areas.

• Do employees feel that their inputs will be used? Many people working for a very strong or aggressive management will require considerable time to accept the fact that their input will have an effect on operations.

• Do employees have the experience and knowledge to make rational decisions? If not they can never make successful contributions, until they are given supplementary training or facts.

3. Communicate with employees - Principle of Communication:
The levels of involvement and effort depend upon the amount of information communicated to the employee.

Inadequate communication leads to inadequate understanding. Inadequate understanding usually forestalls effective accomplishment. We tend to fill in gaps in communication with assumptions. Those assumptions may be correct, but very often are not. Operating on fallacious assumptions can have devastating effects on the results of any effort.

The simple requirement to communicate with people is often one of the most abused. We in management usually assume that we are “good communicators.” In fact, we pride ourselves on our ability to concisely “get our ideas across.” Still, employees at all levels, management and supervision included, continue to indicate that they are hindered in operations because of a lack of information. People today are attuned to the know-it-now environment of TV and Mass communications which keep them abreast of all sorts of developments, particularly those that affect them. They expect organizations to also keep them well informed.

4. Recognize and acknowledge the effectiveness of those who work for you.

Principle of Recognition:
The output of an individual is affected in direct ratio to the amount of recognition he or she receives.

Our experience, as well as industrial psychologists, continue to emphasize that “recognition” is a major component of compensation. People seek much more than the financial payoff on the job, even though they may consider earnings the primary reason for working. The recognition still provides a significant satisfaction source and is a stimulus for performance. (This is especially true among young workers who tend to see work as merely a method of obtaining funds to purchase necessities and discretionary items.)

We can limit this desire for recognition to nonmanagerial or nonsupervisory employees. All individuals who contribute toward the organization’s goals benefit from such recognition. Adherence to this principle requires that managers and supervisors make time available for recognizing employees. It should take place in the normal conversation and interchange required to conduct operations, and it may occur in an “arranged” or more formal presentation.

Some large corporations even go so far as to have the company president spend several hours per month in infor-

mal coffee sessions at which he presents awards, based on performance. The first line supervisor initially makes a nomination to have an employee recognized. The nominations are reviewed by ascending management levels and presented at an appropriate level, up to and including the company president. Some company presidents even take time to review photos and learn the employee and supervisor’s names. The recipient and supervisor are greeted personally, and recognition plaque, or whatever, is awarded and an informal coffee hour follows. This has a profound effect on not only the general employee population, but also on every level of management down through the first line supervisor. The “Quality Circles,” which originated in Japan, also provide recognition in the Problem-Review Sessions which discuss problems and solutions with management.

We must carefully avoid the “you did a great job Charlie” line which is, often correctly, perceived as insincere. We must provide the recognition which comes from a sincere feeling that an employee has done a good job. This, of course, ties in closely with management’s philosophy of communications. The recognition may be a simple statement from a supervisor in evaluating an effort, an indication to the peer-group, or an accolade from higher management. The critical requirement is that management and supervision assure that this recognition is received in one form or another, as appears most appropriate for the operation and individual.

Of course, money can be used as a very effective form of recognition, by proper application of discretionary raises which are based on accomplishment. Properly used, money is one of the greatest forms of recognition.

5. Assign work in logical modules which tend to have a reasonable starting point and a stopping point which, in the mind of the doer, allows him/her to perform a complete “job” or “operation.”

Principle of Work Modules:
Work is more effectively accomplished if it consists of a “whole” job with a logical beginning and ending point.

Many people perform a very small part of a job in a serialized work process. The job, in itself, is often not
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functionally complete and precludes any real concept of just what worker's efforts contribute to a final product or a service. Whenever work is "simplified" to the point where the performers do not feel that they are performing a complete operation, they often assume that the effort is "unimportant." This phenomena, which results when people feel they have not completed a job, has been studied, and termed the Zeigarnick effect. Whenever employees are interrupted before "completion" of a job, or feel that their job is stopped at a point where the effort is not logically complete, they suffer from this effect. The effect tends to leave them frustrated or with a feeling of dissonance which reduces motivation, attention and output.

Numerous instances occur wherein workers, when given the opportunity, will take on many more "steps" in an operation, simply because they feel the need to do a "complete" job. Often this reallocation of responsibility to place work in logical modules greatly enhances both productivity and employee satisfaction. This approach, though contrary to the Frederick Taylor-type of work simplification ideal, actually puts jobs back together so they can be perceived as "jobs" instead of disjointed efforts which could probably be performed by someone of much less capability or, possibly, a chimpanzee. Also, producing work output in meaningful and logical "chunks" facilitates measurement and improves the "feedback" or evaluation of the effectiveness of work efforts as discussed below.

6. Organize operations to assure that, regardless of work type, the output of each job consistently goes to the same recipient or "customer."

Principle of Product Flow:
Work is more effectively accomplished when workers know who the recipient is and what this "customer" expects.

Each item, product, or service produced by a worker should, generally, go to the same recipient. This "customer" may be at the next step in a process, or a customer outside of the department or company. This mode of action allows the worker to develop an understanding and feel for what the recipient expects. If communications are encouraged, the customer may make vital suggestions as to how the product may be improved or give insight into the product's ultimate use. A feeling of personal obligation and accountability develops, which also greatly facilitates feedback, discussed below.

7. Set each job so that it provides each worker with immediate direct information on how well he/she is accomplishing the work.

Principle of Feedback:
Effective performance depends on immediate feedback which indicates how effective or acceptable the work is, in relation to specifications and goals.

Organizational structures and job designs have created many jobs in which the doer does not immediately know with certainty whether or not he or she is doing the job properly. This often is true in serialized work-flow operations where each worker contributes one small part of the product. (The "product" may very well be paperwork or a form which is progressively prepared or used in an operation.) The work moves through a series of such operations, and is "tested" or "approved" after the final operation, or at some other designated point. It may be some time before a worker who is responsible for problems is apprised of deficiencies, or often, they never know whether or not their work is acceptable or how it might be improved.

We often assume that low quality products are just inevitable without realizing that we have stripped jobs of features which indicate to workers that what they are doing is correct, or incorrect. Such jobs reduce the dedication, interest, and effectiveness of employees. Operations should be designed to allow the workers to know whether or not their work is meeting requirements. If this requires reassignment of functions, it is fully worth the effort. If it necessitates that we add a test operation or make available some standard against which products are verified, we normally find that the returns exceed the cost. We achieve greater interest and improved performance when the worker is able to assess his/her performance immediate-
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yield little return where technology is a limiting factor. Managers should initially concentrate such investment and efforts in those areas which have the potential for improvement. New operations or those being reorganized offer great potential. Since new approaches can be built in from the beginning, we must recognize that effort to enhance human performance in an organization is not an isolated low-level phenomenon, but must be considered in relation to the whole organization, its goals, people, and philosophy.

A high return may be realized in most organizations on proper investment made to enhance the performance of our "human assets." This area offers a great potential during the next five years, for the management that is willing to judiciously review the area, and make the necessary commitments and investments.

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