Carry Out a Methods Improvement Program

1 **IMPROVING METHODS** is the quickest and easiest way to start cutting costs.

2 **PRINCIPLES** involved are: Eliminate, combine, change, simplify, and sell the personnel involved.

3 **PRACTICES** that virtually guarantee success are simple and are the same for a company-wide program or for a one-man campaign.

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COST REDUCTION has always meant just one thing to me — *elimination of waste.* Waste of time. Waste of energy. Waste of materials.

Waste steals profits and endangers wages. Make it easier for the operator not to make waste — and you have taken the first big step to *bear down on production costs.*

To eliminate waste, we must do things the right way. The right way of doing anything is an art. But unfortunately, we don't always do things the right way — because that means we must do some thinking.

When time is really vital, we learn to save it. Remember the horsedrawn fire engine? Motion economy and time-saving details were worked out to the *n*th degree in the firehouse. Pre-positioned harnesses. Sliding poles from upper floors. A superb example of a place for everything and everything in its place.

Why? Because the firemen had to get off to the fire in the quickest possible time. It could always be a matter of life and death.

Our problem is to generate similar interest and enthusiasm among our employees. The life of our company — and therefore our personal welfare — depends on reduction of waste. Fundamentally, we can sell our customer only the work that adds value to the product.

Frederick W. Taylor once said that the art of management is knowing exactly what you want men to do, and then seeing that they do it in the best and cheapest way.

Do you always know exactly what you want your men to do? If you do not have the facts, you cannot evaluate or measure the various factors in the job. And you cannot arrive at a correct solution. You do what's too often done. You make a flash improvement based on shop judgment.

Lord Kelvin put it like this:

"If you can measure that of which you speak, and can express it by a number, you know something of your subject. But if you cannot measure it, your knowledge is meager and unsatisfactory."

Exact information implies the use of measurement. No definite or permanent advance is ever made in any kind of work, whether with men, materials, or paper forms, until use is made of measurement. This is especially true of advancement of the human factor. It varies so widely that, unless we use measurement and abide by the results, there is no possibility of repeating the process accurately and efficiently at will, or of predicting and controlling the future conditions which assure that advancement.

To be sure that we do not make flash improvements, I find it necessary to follow a pattern. My pattern is a very simple one. I've been using it successfully for many years in my work simplification programs. It has five steps:

1. **Pick a job to improve.**
2. **Make a process chart.**
3. **Challenge every detail.**
4. **Work out a better method.**
5. **Apply the new method.**

Let us now discuss these five steps to methods improvement as well as we can in this short article.

1. Pick a Job to Improve

The things that need improvement are not always apparent. It is easy to walk by the same bad situation day after day without seeing it. Look for bottleneck jobs. Jobs that take too much time. Jobs where costs are high. Jobs that require chasing around for materials, tools, and supplies. Jobs, obviously, where the possibility of making substantial dollar savings, both now and in the future, is great.

There is a good discussion of this problem of picking the job to improve in the first installment of this Bear-Down-on-Production-Cost Series ("How to Organize for Cost Reduction," May, page 66).

2. Make a Process Chart

In order to analyze a complete process, it must be recorded detail by detail in the order in which it happens. Then you can successfully think about it.

We cannot make movies of every job, but we *can* use a "still-picture" technique. We can use a job breakdown in chart form. There are three such charts — flow process chart, multiple activity process chart, operator process chart. The first emphasizes *distance;* the second, *time;* the third, *individual motions* of the person doing the job.

These charts have been used many times to illustrate FACTORY articles. So I am going to describe only the flow process chart here. It is the simplest of the three, and the principles involved in its construction are the same for all three. Many firms, of course, prepare special forms for making flow process charts. While details vary, the basic elements remain the same. A good example is found on page 71.

The flow process chart is made by following men, materials, or paper forms through the entire process. It shows the route of the object followed from the beginning of the process to the end. First developed by Frank Gilbreth, and used by him in many phases of management work, its value has been definitely proved. To make such a chart:

1. **State the activity being studied**. Be sure you are really breaking down the job you intended to break down.

2. **Choose the subject to follow**. Stick with it. Pick a person, material, or paper form, depending on which goes through the entire process you are working on. When you have picked the subject, don't change. Each detail must be on that subject.

3. **Pick a starting and an ending point**. This is to be sure you cover the ground you want to cover, but no more.

4. **Write a brief description of each detail**. Step by step — no matter how short or temporary — every operation, every move, every storage, and every inspection must be indicated. To list every detail, make the chart on the job as you see it done.

5. **Apply the symbols**. The description determines whether to use the symbol for operation, transportation, delay, storage, or inspection.

6. **Black in the "do" operations**. Every job is made up of *make ready, do,* and *put away. Make ready* is the effort and time put into setting up equipment or machines, or getting materials with which to work. *Do* is the actual work done — usually that which adds value to the product. *Put away* is the clean-up following the *do.*

7. **Enter distance —** in feet, every time a transportation occurs.

8. **Add time, if required**. Often the time element is not needed in order to develop a better method.

9. **Summarize**. Add up all facts and put them in the summary block. The summary indicates total number of operations, transportations, delays, storages, and inspections. We have all had the experience of watching a specific job for 30 minutes or more and realizing afterwards that we had observed things which had never before been brought to our attention. *This is our key point.* While the chart is being made, each of those details is recorded in black and white, on the spot. No alteration can be made later.

To sum up, then, the flow process chart is a valuable tool because: (1) it breaks down the process into its simple, individual details; (2) the *make ready*, *do*, and *put away* elements are clearly indicated; (3) as a "still picture," the chart separates the job from its background and surroundings; (4) its condensed form enables us easily to visualize the process in its entirety; (5) through the mere act of making the close observation required to draw up the chart, ways and means of making improvements will be developed.

3. Challenge Every Detail

We now have a flow process chart of the present method. So we are ready to study it for possible improvement. Challenge every detail of the job. Put it "on the stand." Ask it pointed questions:

1. **WHAT?** What is done? What is the purpose of doing it? WHY is it done? These questions determine the value or useful purpose of doing the particular detail being considered. We want to know if it does what it is supposed to do.
2. **WHERE?** Where is it being done? Where is the best place to do it? WHY should it be done there? Where else could it be done? These questions are asked to be sure that, if the detail is necessary, it is done in the right place.
3. **WHEN?** When is the detail done? When is the best time to do it? WHY should it be done then? If the detail is necessary, we must be sure it is done at the right time. Should it be done at the same time as some other detail? Should it be done before — or after — some other detail?
4. **WHO?** Who does the detail? Who should do it? WHY should this person do it? Can people with lesser skills do the job? Be sure the right person is doing the work.
5. **HOW?** How is the detail performed? WHY is it done that way? Can we make it easier to do and safer both for the people who do it and for the equipment they use?

These questions are listed in definite order. Ask them in that order. If any question asked of a detail fails to bring a satisfactory answer, make a check mark or a note on your chart to help you develop a better method.

First challenge the whole job that is being studied. Why is it done? Then question each *do*, because every time you eliminate a *do*, you also eliminate the *make ready* and *put away* that go with it.

This questioning attitude develops a point of view that considers the good of the whole operation rather than that of any one department or individual. It eliminates useless and unnecessary work which adds no real value to the product. It brings to light the best type of operator and equipment needed. It determines where the work can be most economically performed. And it evens out the flow of work. By challenging each step, you often discover that a part of the work — sometimes the whole work — is not necessary at all.

Above all, get rid of *make ready* and *put away*. Concentrate on these two bugaboos. Every time work is done that doesn't bring the end-result closer, we have waste — waste of time, waste of energy, waste of material.

At the end of the challenging, you will have some unanswered questions concerning certain details. There may be several possibilities. So far, they are only possibilities. Now they must be worked up into a new method.

4. Work Out a Better Method

Again, we ask some searching questions. Can we eliminate? Can we combine? Can we change the sequence? Can we change the place? Can we change the person? Can we improve?

Can we eliminate? Too often we give a lot of time to studying operations for improvement possibilities without asking: "Why do we perform this operation?"

Dr. Lillian Gilbreth once said: "Entirely too many operations are studied that never should be done at all."

This first question should not be abandoned until every possible effort has been made to eliminate the operation. This is not an easy task, especially if the person or persons who are attempting to eliminate the operation are intimately familiar with it or have been doing it for some time. It is precisely for this reason that the viewpoint of the outsider is so valuable when new methods are being considered and the work of developing them is under way.

Ability to ask *why?* is often responsible for the outsider's success. He naturally asks *why?* at each step — and all too many answers boil down to "Well, we have always done it this way." If that is the only reason that can be given, it certainly should be questioned. A well-known production man once told me:

"If I find one operation in my plant has been done the same way for six months, I feel it should be questioned. If I find it has been done the same way for a year, I know damn well it is wrong."

The flow process chart enables you to take the outside viewpoint. It enables you to stand off a little way from the operation. It gives you a bird's-eye view. There is no better way to picture the whole integrated operation of a plant than to have complete process flow charts in front of you.

First and easiest of the symbols to challenge are the transportations and the storages. Whenever you see a part carried an appreciable distance, the question *why?* immediately suggests grouping of equipment to eliminate this travel.

Question every single handling. If handling is absolutely necessary, then look for (1) backtracking of work, (2) heavy

lifting or carrying, (3) trucking, (4) bottlenecks, (5) skilled operators doing the handling.

Then try to use all mechanical means possible. Keep material moving in one direction. Use proper loading, unloading, and stacking.

Can we combine? Don't overlook this opportunity for improvement. Whenever two operations can be combined, they are often performed for the labor cost involved in only one of them, or even less. Also, all transportations and storage between the operations are eliminated.

Combining operations often results in improving quality, may eliminate unnecessary inspections.

If operations cannot be combined, ask if it is possible to combine a transportation and an operation. Until recently most production men thought that if an object was being moved, say, from one conveyor line to another, the best they could do was provide a mechanical means of transportation. Even this good practice is now being questioned. Oftentimes a touch-up or finishing operation can be performed while moving from one location to another.

Many inspections can be combined with operations. When we inspect, it usually means taking the piece out of one container and returning it to another. Usually this follows or precedes an operation. By combining the inspection with one of the operations, you eliminate the extra handling.

Can we change the sequence? If parts of the job cannot be combined, perhaps you can do them in different sequence. The flow diagram or templet layout of the department or plant will help you decide. By changing the sequence of an operation, you may be able to eliminate backtracking. Sequence of operations is largely determined by the process — but often changes can be made with consequent saving.

Can we change the place? Why is it done there? Could it be done better some other place? Why not? Too often work is done in one place or department mainly because it has always been done there. Or because the building of little kingdoms has prevented its being moved elsewhere.

Can we change the person? Challenging with the question *who?* often results in the discovery that the operation could be done to better advantage by some other person. "Who inspects this item?" "The inspector, of course." "Why?" Perhaps the inspection could be done by the operator without a lot of rehandling. Stick to the question until it has been shown that no other person can do the detail better.

Can we improve? Finally, if no change in sequence, place, or person can be made, we ask this last question. Unfortunately, this is where many attempts to improve methods *start.* Many a departmental layout is made on the theory that, by taking a few of the key operations and putting them on more modern equipment, with slight rearrangement, a proper layout will result.

All this is merely shifting over all the bad methods to a new location — with some slight savings. If the job were done thoroughly, the return on the investment might be several times that secured through rearrangement alone.

To simplify work, then, *eliminate* unnecessary details; *combine* details when practicable; *change* for a better sequence, place, or person; *improve* all necessary details.

5. Apply the New Method

Before actually ordering any revision of the present method, check your proposal carefully. Be sure nothing has been overlooked. Review your plan with all supervisors who may be affected.

Two major problems must be considered in putting the new method into operation. They are the technical problem and the human equation.

The technical problem. Will it reduce costs? Will it increase production? Will it improve quality? The cost of installing the improvement must be weighed against any ultimate savings in operation cost. Is it a "good buy" for the company? Since new equipment is usually expensive, concentrate on better utilization of existing facilities.

Finally, present the plan in a clear and concise manner. Allow no doubt as to benefits to be derived. This is best done by using the process chart showing present and proposed methods worked out in detail.

The human problem. Every time a method is changed, workers are affected. Remember, there are two big difficulties in working with people.

First, people resist what they don't understand. To offset such resistance, explain and demonstrate, if possible. Solicit the ideas and suggestions of those working with you and for you. Second, people naturally resent criticism. Do not criticize. Be certain that your presentation does not imply criticism.

In working out the improved method, discuss the jobs with the workers involved. Tell them in advance of changes that may affect them. Explain *why*. Develop joint participation. This is all part of "selling the operator," and it is just as important as selling the boss.

A test or trial run is sometimes advisable. This, too, helps to sell the new way to the worker and insures against upsetting regular routines when total application is decided.

Do not overlook safety regulations and working conditions.

Follow through. Once the new installation is made, be sure maximum benefits are obtained. Keep the methods going — but be receptive to any *new* improvements that may develop.

Above all, be sure to give credit to those responsible for recommending a better method to improve your method. It means so much and costs so little.