

▼ **Productive Work and Achieving Worker**

- At least in the developed countries, radically new approaches are needed
  - to the analysis, synthesis, and control of work and production
  - to job structure, work relationships, and the structure of economic rewards and power relationships
  - to making workers responsible
- We have to move from managing personnel as a "cost center" and a "problem" to the leadership of people.

▼ From the dimensions of management

- Business enterprise has only one true resource: people.
- It performs by making human resources productive.
- It accomplishes its performance through work.
- ▼ To make work productive is, therefore, an essential function.
  - Organizing work according to its own logic is only the first step
  - The second and more difficult one is making work suitable for human beings and their logic is radically different from the logic of work.
- The employee society

But at the same time, these institutions in today's society are increasingly the means through which individual human beings find their livelihood find their access to social status to community and to individual achievement and satisfaction.

To make the worker achieving is therefore, more and more important and a measure of the performance of the institution increasingly a task of management.

- Making the worker achieving implies consideration of the human being as an organism having peculiar physiological & psychical properties abilities limitations and a distinct mode of action. of the human resource as human beings and not as things as having—unlike any other resource: personality citizenship control over whether they work how much how well & thus requiring : responsibility motivation participation satisfaction thru achievement incentives rewards leadership status function

- Management, and management alone, can satisfy these requirements. For workers must be satisfied through their achievement in work & job

That is within the enterprise

▼ **The New Realities**

▼ Work and Its Ambivalence

- Work and Rest
- Work and Play
- "Work" and "Working"
- Work and Worker in Rapid Change

Both work and worker are in a period of rapid change. The changes that will dominate the rest of this century—and probably most of the next century as well—are the most radical changes since the beginning of the industrial revolution more than 200 years ago.

- The "Employee Society"
- The Shift to the Knowledge Worker

A larger and larger proportion of the manual labor force in all developed countries does not work with its hands, whether as skilled or as unskilled workers, but with ideas, concepts, theories.

- The Crisis of the Manual Worker
- "Hard Hats vs "Liberals"
- The Crisis of the Labor Union
- Managing the Knowledge Worker; the new challenges
- What is Productivity in Knowledge Work?
- And What is Achievement?
- The Segmentation of the Work Force
- The Fallacy of the "One Personnel Policy"
- The "New Breed"

▼ **What We Know (and Don't Know) About Work, Working, and Worker**

- Work and Working are fundamentally different phenomena.

The worker does, indeed, do work;  
Work is always done by a worker who is working  
But what is needed  
to make work productive  
is quite different from what is needed  
to make the worker achieving

The worker must be managed according to both  
the logic of work and  
the dynamics of working

Personal satisfaction of the worker without productive work is failure  
but so is productive work that destroys the worker's achievement.  
Neither is, in effect, tenable for very long.

▼ **Work**

- Work is impersonal and objective.
- Work is task. Work is a "something".
- To work, therefore, applies the rule that applies to objects.
- Work has a logic.

▼ **Work requires**

▼ **Analysis**

- Identifying the basic operations
- Analyzing each of them.
- Arranging them in logical, balanced, and rational sequence.

• **Synthesis**

We need principles of production which enable us to know how to put together individual operations into individual jobs, and individual jobs into "production."

The Gantt Chart is still the one tool we have to identify the process needed to accomplish the task. But the Gantt Chart tells us very little about the logic that is appropriate to given kinds of processes.  
When to use a certain process.  
The purpose of the process.

- Control

Work, precisely because it is a process rather than an individual operation, needs a built-in control. Work needs a feedback mechanism which both senses unexpected deviations and with them the need to change the process and maintains the process at a level needed to obtain the desired results.

- ▼ Working

- Working is the activity of the worker.
- It is a human being's activity and essential part of his humanity.
- It does not have a logic.

- ▼ It has dynamics and dimensions.

- ▼ Working has at least five dimensions.

- 6 Dimensions of Working

Working is the activity of the worker.

It is a human being's activity and essential part of his humanity.

It does not have a logic.

It has dynamics and dimensions.

Working has at least five dimensions. In all of them the worker has to be achieving in order to be productive.

No Dominate dimension among the six.

They are a true configuration.

Change rapidly as a worker's circumstances change

Hierarchy of Human wants:

Order is not of first importance, what matters is the insight that wants change. They are not absolute. The more a want is satisfied the less its satisfaction matters.

A want changes in the act of being satisfied as a want approaches satiety its capacity to reward and with it its power as an incentive diminishes fast. But its capacity to deter, to create dissatisfaction and to act as a disincentive rapidly increases.

The various dimensions of man at work change their character as they approach being satisfied.

pay: economic dimension leads to social/psychological dim

power & status leads to basis of eco demands.

Dealing with a configuration that is likely to defy analysis.

- ▼ Physiological—Machine Design and Human Design

- ▼ The human being is not a machine & does not work like a machine.

- ▼ Machines work best if (this is incomplete)

- they do only one task
- repetitively and
- if they do the simplest possible task.
- Complex tasks are done best
- run at the same speed,
- the same rhythm, and
- with a minimum of moving parts.

- ▼ The human being is engineered quite differently.

- ▼ For any one task and any one operation the human being is ill-suited.

- He lacks strength.
- He lacks stamina.
- He gets fatigued.
- Altogether he is a very poorly designed machine tool.

- ▼ Excels in coordination.
  - To act in harmonious or reciprocal relationship
  - Come into adjustment.
- Excels in relating perception to action.
- ▼ Works Best:
  - ▼ If the entire human body is engaged in work
    - muscles,
    - senses,
    - & mind
  - At a configuration of operations rather than a single operation.
  - ▼ If capable of varying both
    - the speed & rhythm &
    - attention span
  - fairly frequent changes in operating routines
  - ▼ To be productive the individual has to have control, to a substantial extent, over
    - the speed,
    - rhythm, and
    - attention spans with which he is working
- While work is, therefore, best laid out as uniform,
- ▼ Working is best organized with a considerable degree of diversity.
  - ▼ Working requires latitude to change...fairly often.
    - speed,
    - rhythm, and
    - attention spans
  - It requires fairly frequent changes in operating routines as well.
- ▼ Psychological—Work as Curse and Blessing
  - Curse (burden)
  - ▼ Blessing (need)
    - Extension of personality
    - It is achievement
    - a means one defines himself
    - measure his worth & his humanity
  - The task is still to make work serve the psychological need of man.
- ▼ Work as Social & Community Bond
  - Means to satisfy man's need for belonging to a group &
  - a Meaningful relationship to others of his kind.
  - ▼ Especially strong for:
    - Young not married
    - Older people whose children have grown up.
- ▼ Work: The Economic Foundation of the Worker's Existence
  - ▼ Conflicting needs of the wage fund & capital fund
    - ▼ The beneficiary of the capital fund is rarely the
      - contributor.
    - ▼ Comparative gains and sacrifices among different
      - kinds of workers.
  - ▼ Conflict between wage: as a means of living & a cost
    - ▼ Living Needs
      - Predictability
      - Continuity
    - ▼ Adequacy for:
      - The expenditures of a family
      - is aspirations
      - & its position in society & community

- ▼ Cost Needs
    - ▼ Appropriate to the productivity of
      - a given employment or
      - industry.
    - ▼ Flexibility to adjust easily to even minor
      - changes in supply & demand in mkt.
      - Competitive needs of the product/service
  - ▼ Wage is determined in the last resort by the consumer
    - without regard to the needs or expectations of
    - the worker.
    - see p 191M for various unsuccessful attempt to resolve
    - the problem.
  - ▼ Power Dimension of Working
    - ▼ The organization's member's will is subordinated to an
      - alien will (authority has to be exercised)
    - Jobs have to be: designed, structured, assigned.
    - Work has to be: done on schedule in a prearranged sequence
    - People are promoted or not promoted.
    - Authority is an essential dimension of work.
    - It is inherent in the fact of organization
  - ▼ The Power Dimension of Economics
 

In all modern organization there is what might be called a sixth dimension of working: a need for authority with respect to economic shares

    - ▼ A need for an authority to distribute the economic shares of
      - the revenue received from the outside.
    - ▼ Two power relationships
      - management & labor
      - between the various groups within the work force.
    - In all of them the worker has to be achieving in order to be productive.
  - ▼ No Dominant dimension among the five.
    - Each can—and should—be analyzed separately and independently.
    - ▼ But they always exist together in the worker's situation.
      - ▼ and in his relationship to
        - work and job
        - fellow workers and management
    - They have to be managed together.
    - Yet they do not pull in the same direction
    - The demands of one dimension are quite different from those of another.
  - ▼ Hierarchy of Human wants:
    - ▼ Maslow
      - Human wants form a hierarchy
      - As a want of a lower order is being satisfied, it becomes less and less important.
      - With a want of the next higher order becoming more and more important.
    - ▼ Maslow put
      - Economic at the bottom
      - Self-fulfillment at the top
    - But Order is not of first importance
    - What matters is the insight that wants are not absolute.
    - The more a want is satisfied the less its satisfaction matters.
  - ▼ A want changes in the act of being satisfied
    - ▼ as a want approaches satiety
      - its capacity to reward and with it its power as an incentive diminishes fast.
      - But its capacity to deter, to create dissatisfaction and to act as a disincentive rapidly increases.

- ▼ The various dimensions of man at work change their character as they approach being satisfied.
  - pay (economic) becomes part of the social or psychological dimension.
  - ▼ The opposite can also happen;
    - power & status can become the basis of economic demands.
  - Dealing with a configuration that is likely to defy analysis.
- ▼ The manager has to manage now.
  - ▼ Has to find solutions—or at least accommodations—which will enable him to
    - make work productive
    - and the worker achieving.
  - Has to understand what the demands are.
  - Cannot expect to succeed by continuing the practices of the last two hundred years.
  - Will have to develop new approaches, new principles and new methods—and fast.
- ▼ **Making Work Productive**
  - The key to productive work
 

The realization that work is general and generic and that skill & knowledge are in the worker rather than the work is the key to productive work.  
The first step toward making the worker achieving is to make work productive.  
The more we understand what the WORK itself demands the more can we then integrate the work into the human activity we call working (p199).
  - ▼ **Making Work Productive has to start with the end product.**
    - Because work is objective and impersonal.
    - ▼ It cannot start with inputs
      - Craft skills
      - Formal knowledge
      - Skills, information, knowledge, are tools

What tools is to be applied when, and for what purpose, must be determined by the end product.
    - The end product determines what is needed.
    - ▼ The end product also determines the
      - synthesis into a process,
      - design of the appropriate controls, and
      - specifications for the tools needed.
  - ▼ **Making work productive requires four separate activities**

Each having its own characteristics and demands.

    - Work and Process
    - ▼ Analysis
 

We have to know the specific operations needed for work, their sequence, and their requirements.

      - ▼ The typical industrial engineering approach
        - Identify the specific operations needed to produce a known end product.
        - Rational organization of the sequence of operations
 

So as to make possible the easiest, smoothest, and most economical flow of work.
        - Analysis of each individual operation
 

and its redesign so as to make possible its most efficient performance—including the provision of the appropriate tools, the needed information, and the required materials where and when needed.
        - Integration of these operations into individual jobs.
      - ▼ But this is not what the analysis has to be to be effective
        - ▼ The crucial first step
 

Defining the desired end product.  
What do we want to produce?  
What is the work itself?  
How can the end product be designed so as to make possible the easiest, the most productive, the most effective work?  
Why do we do this and why do we do that?—We have always done it. Geological strata of human errors.

- Work analysts have to participate in the design of product & process.  
Obviously the finished product cannot be engineered primarily to make work easier. Its basic specifications are set by the needs and values of the user and not by those of the producer. But within the restraints set by these basic specification ... see page 201.
  - The fourth step does not belong  
Laying out jobs is no longer analysis. Or rather, the analysis that is required is not that of work, but that of working. And while the industrial engineer has a role to play in this process, it is a totally different role from the one he plays in the analysis of the work (as will be discussed under The Responsible Worker)
- The manager needs to know that  
the logic of work analysis and  
the analysis of job structure  
are two different logics.
- ▼ Work analysis is not the whole job.
    - It is only the first step in making work productive.
    - ▼ Work analysis
      - ▼ Identifies
        - individual specific operations
        - their sequence, and
        - their interrelationships.
      - It deals with pieces.
      - ▼ It is not concerned with the process of production as a whole
        - with its structures,
        - its economy, or
        - its performance.
  - ▼ Requirements
    - Tools
    - Information
    - Materials
  - ▼ Synthesis of the individual operations into a production process
  - ▼ Production is the application of logic to work.  
The more clearly, the more consistently, the more rationally the right logic is applied, the less of a limitation and the more of an opportunity production becomes.
    - ▼ The definition implies:
      - ▼ There must be a small number of basic models, each with its own
        - constraints
        - requirements
        - characteristics
      - That the more closely a process of production can be designed according to one of these principles, the smoother, the more effective, and the more productive it will be.
  - ▼ Each system of production makes its own demands on management
    - in all areas and on all levels.
    - Each requires different competence, skill and performance.
    - One set of demands is not necessarily "higher" than another, but different.
    - Unless management understands the demands of its system of production It cannot truly make work productive.
  - ▼ Principle of production.  
See: "Excel Work Sheet"—  
See: "MacPlan Work Sheet"—

- ▼ The four known principle of production.
  - ▼ Unique-product production
    - ▼ Each product is distinct
      - Artist painting
      - Battleship
      - A big turbine
      - Skyscraper
      - The traditional way of building a house
      - Batch production in a job shop.
    - Organized around standardized tools
    - Typically works with standardized materials
    - ▼ Organized by homogeneous stages
      - ▼ Example:house
        - dig the foundation
        - Each of the stages by the inner logic of the product is an entity in itself
        - Properly organized, unique-product production does not go by craft skills but by stage skills. The model is the telephone installation man.
      - See Pages 205–212 for and extended discussion of each
  - ▼ Rigid mass production
    - End product is assembled out of standardized parts.
    - The material, tools and parts are standardized
    - Mass production assembles rather than makes.
    - The end product is also standardized and uniform.
    - See Pages 205–212 for and extended discussion of each
  - ▼ Flexible mass production
    - ▼ Example of Gothic churches
      - The distinguishing characteristics were added last.
    - ▼ diversity of end products
      - ▼ systematic analysis of products to find the pattern that
        - underlies their apparent diversity
      - assembled out of standardized parts
      - min # of std. parts
      - to make Max # of end components
      - burden of diversity shifted from manufacturing to assembly
      - See discussion of computerized Controls & True Marketing
      - See Pages 205–212 for and extended discussion of each
  - ▼ Process or flow production
    - process & product are one
    - ▼ Examples:
      - Oil refinery
      - Chemical industry
      - All transportation
    - only appropriate to industries with very high capital investment
    - See Pages 205–212 for and extended discussion of each
- ▼ What each Principle Demands
 

Each of the four principles has different characteristics and makes different demand. Each has its own costs. Each has its own vulnerabilities. Each has its own strengths.

Demands or requirements/limitations/characteristics of the principles

  - intensity of labor/capital
  - flexibility
  - unit cost
  - breakeven point

- volume requirements
- ability to operate under fluctuating output(qty)
- skill demands
- judgement demands
- management's first job
- time span of decisions
- importance of decision for the future
- management skills & organization
- work force & its management
- ▼ Different principle of production can work well in the same organization
  - but they must not be mixed
  - ▼ where they have been mixed there is
    - confusion
    - friction
    - inefficiency
- ▼ The General Rules
  - ▼ For advancing production performance & pushing back limitations
    - ▼ The limitations on production are pushed back further & faster
      - the more consistently and thoroughly
      - the principles pertaining to the system in use
      - are being applied
    - ▼ The systems themselves represent a distinct order of advance
      - from least to most advanced
  - ▼ Concerning the demands on management competence made by each system.  
Each management has to meet the demands of the system it ought to have according to the nature of its products and process, rather than those of the system it actually uses. Being unable or unwilling to apply what would be the most appropriate system results only in lack of performance; it does not result in lower demands on management, but inevitably increases the difficulties of managing the business.
    - ▼ The systems differ
      - not just in the difficulty of their demands
      - but in the variety of competences &
      - order of performance.
    - ▼ Mgt in moving from one system to another
      - has to learn how to do new things rather than
      - learn to do old things better.
    - ▼ The more we succeed in
      - applying consistently the principles of each system,
      - the easier it becomes
      - for management to satisfy that system's demands.
- It is of MAJOR IMPORTANCE in managing a business to know which system applies, to carry its principles through as far as possible, to find out which parts of production can be organized in a more advanced system, and to organize them accordingly and to know what demands each system makes on management.
- Where historical and technological obstacles have barred the organization of production in the appropriate system, see the steel industry example, it is a major challenge to management to work systematically on overcoming these obstacles. See page 205.
- A business using the wrong system has to satisfy all the demands that the appropriate and more advanced system would make on management. Yet it does not have the wherewithal to pay for them, for this can come only out of the increased ability to produce which the more advanced system provides.

- All four principle provide the foundation for both productive work and achieving worker.  
All are compatible with the dynamics of working or can be made compatible. Specifically the failure of mass productio to give the workier achievement is essentially poor engineering. It is eithe failure to understand the meaning of mechanization (see below) or it is failure to understand the difference between work and working (See the responsible worker)
- Managers need to:
  - Understand what principles of production are truly appropriate to the different stages of the production process they have to manage
  - Analyze the logic of each stage if they require different principle to be organized then they have to try to seperate these stages so they do not interfere with each other.

This organization, however, cannot be done by imitating what others are doing. It requires that management analyze its own work and its own production processes. It also requires that management understand the basic principle of production, their characteristics, their limitations, and their requirements.
- Must fit the economic characteristics of the business
- Controls and Tools
- ▼ Build into the process control: feedback to worker  
Work is a process, and any process needs to be controlled.
- To make work productive, therefore, requires building the appropriate controls into the process of work.
- ▼ The process of production needs built-in controls in respect to:
  - direction
  - quality
  - ▼ quantity it turns out
    - in a given unit of time &
    - with a given unit of working
  - ▼ standards
    - machine maintenance
    - safety
    - economy: efficiency with which it uses resources
    - exceptions
- Each work process needs its own controls
- There are no "standard" controls  
But all control systems have to satisfy the same basic demands and have to live up to the same overall specifications.
- ▼ Control the work not the worker
  - Control is a tool of the worker and must never be his master.  
It must never be an impediment to working.
  - The purpose of control  
Is to make the process go smoothly, properly, and according to high standards.
  - The first question to ask of the control system: minimum effort  
Whether it maintains the process within permissible range of deviation with the minimum effort.  
What is the minimum of control that will maintain the process?  
See "Controls, Control, and Management"
- ▼ Controls have to be preset
  - ▼ There has to be a decision as to the
    - desired performance
    - permissible deviation from the norm
  - Control has to be essentially by "exception"  
Only significant deviation from the norm triggers the control.
- ▼ Control has to be by feedback from the work done

- ▼ The work itself has to provide the information
  - If it has to be checked all the time, there is no control.
  - Inspection is not control.

But the control of the control system.  
It too has to satisfy the specifications of control, above all, the principle of economy
- ▼ The control itself has to be exercised where the malfunction is likely to occur
  - The control action may then be performed by the machinery itself.
  - What is important is what action to take
- ▼ The action be taken as a result of the working of the process itself and
  - at the place where the action is appropriate, that is, the place where the correction of the process, or a change in its direction is to be performed.
- A control system has to designate the key point at which control is to be built in.  
At what point in the system is there sufficient information to know whether control action is needed?  
At what point in the system is there scope for effective action?  
What part of the process requires continuous control?  
What part requires control only at specific stages?  
Where is preventive control needed, or at least control at a very early stage?  
And where is control essentially remedial?
- ▼ A control system can control only the regular process
  - It must identify genuine exceptions, but it cannot handle them.
  - It can only make sure that they do not clog the process itself.
  - A control system is a tool to enable men of average competence to do things which if tackled as unique events could only be done by exceptional skill, if not by genius. Exceptions can never be prevented but they can be eliminated from the work process. They can be handles separately and as exceptions. To make a control system take care of exceptions misdirects and undermines both the work process and the contro system.
- ▼ To design a control system one has to think through
  - ▼ what is routine & what is exception
    - ▼ 3 patterns of routine or input/output mix
      - ▼ standardized input & output (rigid & flex mass)
        - organize the routine flow
        - eliminate the exceptions to handle seperately
      - ▼ configuration of subpatterns
        - id the subpatterns & routinize them
      - ▼ unique events: too many patterns to devise a control system
        - ▼ think through and define the minimum standards which each
          - peice of work has to satisfy
        - ▼ what are the measurements by which the worker can
          - measure & direct himself
- ▼ Provide the appropriate tools or Fit the tools to the work
  - Different kinds of work require different tools.
  - Tool design, tool organization, and tool application are technical subjects rather than managerial ones.
- ▼ The basic managerial requirements of tool usage
  - ▼ A tool is best if it does the job required with
    - minimum effort
    - mimimum complexity
    - minimum power
  - ▼ Good assembly line tooling provides the worker with the simplest tool
    - where needed
    - when neded
  - Tools must serve the work  
The work does not exist for the sake of the tool.

- ▼ Tools are the bridge between work & working
  - They also serve the worker
  - They must be engineered for making both work and worker productive
- ▼ Management must understand what mechanization is and what constitutes proper mechanization.
  - All tools are mechanization.
  - All tools are an extension of man.
    - The either
      - Extend his
        - body (hammer) or
        - mind (multiplication table / computer)
      - Or they provide man with capabilities for which his body was not engineered (wheel / ax).
  - Must serve him in his double need of making work productive and worker achieving.
- ▼ Mechanization to be properly applied
  - must always extend the share of human capacity.
    - ▼ Dangers of mechanization being misapplied p226
      - making man part of a machine
      - divisive element in workgroup
      - The auto assembly line does both
- ▼ Automation (eg the phone system)
  - (telephone system) see POM
- ▼ Mechanization & automation are not the same things
  - ▼ Principles of Automation
    - Entire process is seen as a system. Everything is integrated
    - ▼ System is based on the assumption that
      - phenomena of the natural universe (as opposed to social)
      - fall into discernable patterns
      - and can be routinized on the basis
      - of the probability distribution
    - System controls itself through feedback
    - ▼ Human worker does not work he programs
      - the worker is discriminating.
      - his tool is judgement rather than manual or conceptual skill
  - ▼ Whenever mechanization reaches the point where
    - the worker is engineered to be a machine part
    - we can automate (p227a MGT)
    - Not necessarily the best answer
  - ▼ Automation is not an arrangement of machines.
    - It is not the ultimate in mechanization.
    - It is a basically different concept.
    - It can work perfectly without any machines.
    - Any work needs its tools. Any work, therefore, needs to be mechanized.
    - See "Why Automation Pays Off"—Frontiers of Management
- Beyond Manual Work
  - The most conspicuous area in which we need to organize as systematic work the application and acquisition of already existing knowledge is perhaps the development work in industry i.e. the work of converting new knowledge into marketable products or marketable services. see p230
  - Needs worker participation
- ▼ **Making the Worker Achieving**
  - ▼ **Worker and Working: Theories and Reality**
    - ▼ McGregor's Theory X and Theory Y
      - Theory X — the traditional approach to worker and working
        - Assumes that people are lazy, dislike and shun work, have to be driven and need both carrot and

stick.

It assumes that most people are incapable of taking responsibility for themselves and have to be looked after.

- Theory Y

Assumes that people have a psychological need to work and want achievement and responsibility.

Theory X assumes immaturity.

Theory Y assumes fundamentally that people want to be adults.

- ▼ The evidence for Theory Y and its weakness

- The GM contest—"My Job and Why I Like It"

Few

did not find something that made them like the job,

did not mention

some challenge in it,

some achievement and satisfaction,

some motivation.

- Not "permissive"—makes high demands on worker and manager.

- Maslow's Criticism

The demands are actually much higher than even Drucker had seen. The demand for responsibility and achievement may well go far beyond what any but the strong and healthy can take.

One has to replace the security of Theory X and the certainty it gives by another but different structure of security and certainty. There is need to provide by different means what commands and penalties do under Theory X. It cannot be simply substituted.

- ▼ Theory X and Y are not theories about human nature

- The same people will react quite differently to different circumstances.

- A great many people react rather than act.

The motivation, the drive, the impulse lie outside of them.

- The importance of job structure and work

It is not human nature but the structure of job and work that, in effect determines how people will act and what management they will require.

- What is the Manager's Reality

The question the manager needs to ask is not "Which theory of human nature is right?"

The question is "What is the reality of my situation and how can I discharge my task of managing worker and working in today's situation?"

- ▼ The Carrot and the Stick

- ▼ Why "the stick" no longer works.

Hunger and fear.

- Even where fear exists, it has ceased to motivate.

- Fear of being fired is a major factor in Japan's economic achievement.

- ▼ "Big Fear" and "Little Fears".

- The big fear still motivate where it is truly credible

The alcoholic worker—if told in unequivocal language that they will otherwise be fired and that potential new employers will be told of their problem.

- The "little sticks"

It is extremely foolish to try to depend on "little sticks," that is, whatever remnants of fear are still available. To be sure, any organization need disciplinary devices, but their role and purpose is to take care of marginal friction. They cannot provide the drive. If misused to drive, disciplinary devices can cause only resentment and resistance. They can only demotivate.

- ▼ The Overly potent carrot.

It has become so potent that it must be used with great caution. It has become too potent to be a dependable tool.

- The Myth of Antimaterialism.

- The demand for "much more" material rewards.

See the discussion on page 238. The demand for much more is obviously going to run ultimately into the finite limitations of the earth's resources and the need to preserve the environment.

This will mean an even faster shift from goods to services as carriers of satisfaction, and with it, from material-intensive to labor intensive (and especially knowledge-labor intensive) wants and

purchases.

... see page 238

It is precisely the rising level of material expectation that makes the carrot of material rewards less and less effective as a motivating force and as a managerial tool.

The increments of material rewards capable of motivating people to work has become larger.

... see page 239

- The manager must try to deemphasize the role of material rewards rather than use them as a carrot.  
see page 239
- And it toxic side effects.  
The more total income goes up, the more powerful does dissatisfaction over relative compensation become.  
There is no more powerful disincentive, no more effective bar to motivation, than dissatisfaction over one's own pay compared to that of one's peers.  
Once people's incomes rise above the subsistence level, dissatisfaction with relative incomes is a far more powerful sentiment than dissatisfaction with one's absolute income.
- This section needs to be completely entered
- ▼ From Master to Manager.
  - Theory X assumes a "master."
  - But in a society of organizations there are no masters.
  - The manager is not a master.
  - He is a superior, but a fellow employee.
  - Lacks the authority & credibility of a master.
  - Cannot survive a challenge.
  - It means that  
Neither stick nor carrot will actually work if used by a manager, no matter how well they used to work for the master of old.
- ▼ Can we replace carrot and stick?  
Can we replace the carrot of monetary rewards and the stick of fear with a new carrot and a new stick appropriate to the new managerial reality?
  - The long history of Theory X
  - Enlightened Psychological Depotism.
  - Why it Will Not Work.  
It requires univeral genius on the part of the ruler.
  - The work relationship has to be based on mutual respect
  - ▼ What Then Can Work.
    - It is not simply Theory Y
    - See the success Stories
- ▼ **Success Stories : Japan, Zeiss, IBM**
  - ▼ Japan
    - Industrial Engineering in Japan  
The industrial engineers in Japanese industry use the same methods, tools, and techinques as the Westerner to study and analyze work. But the Japanese industrial engineer does not organize the worker's job. When he has reached the point at which he understands the work, turns over the actual design of jobs to the work group itself.  
Actually the industrial engineer begins to work with the people who have to do the job long before he finishes his analysis.
    - Continuous Training: Zen vs Confucius  
The mechanism for making the worker take responsibility for  
job and tools  
is what the Japanese call "continuous training."
    - Lifetime Employment
    - But Flexible Labor Costs
    - To Each According to His Needs; the benefit system
    - The Godfather system

The chief banto—one main job:

- Manager development
- Manager selection
- Manager placement

In large organization— a network of godfathers

- Upward Responsibility
  - ▼ Ernt Abbe and the Zeiss Optical Works
    - Plant community organized the jobs and did the work
    - Training for improvement of skill, tool, process, and product
    - Feedback info for the worker
    - Job assured regardless of economic fluctuations
    - Ownership of the company turned over to a foundationThe employees were the sole beneficiaries
  - Benefits that really benefit.
  - ▼ The IBM Story
    - Enlarging the job. see discussion
    - Involving the production people with product design.
    - Salary & self determined output norms
    - Put people on jobs where they are best fitted.
    - Policy of stable employment
  - ▼ The lessons
    - These policies are neither panaceas nor are they likely to endure
    - What is The essence of these success stories?
    - Not permissive management but organized responsibility
  - ▼ **The Responsible Worker**
    - What does the worker—unskilled or skilled, manual, clerical, or knowledge worker—need to be able to take the burden of responsibility?
      - What tools does he require?
      - What incentives?
      - What security?
    - And what do manager and enterprise have to do to be able to ask the worker to take responsibility and to expect him to respond to this demand?
    - The Focus has to be on the JobThe job has to make achievement possible. The job is not everything; but it comes first.
  - ▼ The prerequisites of responsibility
- To enable the worker to achieve, he must therefore first be able to take responsibility for his job.
- It is folly to ask workers to take responsibility for their job when the work has not been studied, the process has not been synthesized, the standards and controls have not been thought through, and the physical information tools have not been designed. It is also managerial incompetence.
- ▼ Productive Work
  - The fallacy of "Creativity"  
"Free people from restraint and they will come up with far better, far more productive answers than the experts."The evidence:
  - The shovel
  - The physician
  - The experiences of those enterprise which were expropriated by governments.
- ▼ Feedback Information for self control
- We know that people can control and correct performance if given the information, even if neither they nor the supplier of information truly understand what has to be done or how.
- See the discussion of Emery Air Freight.
- The information the worker need must satisfy the requirements of effective information. See Control.

Controls, and Management. It must be timely. It must be relevant. It must be operational. It must focus on his job. Above all, it must be his tool. Its purpose must be self-control rather than control of others, let alone manipulation.

The real strength of feedback information—and the major reinforcer—is clearly that the information is the tool of the worker for measuring and directing himself.

- For Research Workers

Sitting down with the research scientists several times a year and saying, "Here are the things of significance this research group has contributed to the company during the last six and twelve months. And here are the impacts earlier research work has had on the company's performance during the last six and twelve months."

- ▼ Continuous Learning

- Continuous learning does not replace training.

There is need for workers, whether unskilled, skilled, or knowledge worker, to be trained for new skills.

Continuous learning does not replace training. It has different aims and satisfied different needs. Above all it satisfies the need of the employee to contribute what he himself has learned  
to the improvement of his own performance,  
to the improvement of his fellow worker's performance, and  
to a better, more effective, but also more rational way of working.

- ▼ A way to come to grips with two basic problems

- The resistance of workers to innovation

- ▼ The danger that worker will become "obsolete."

- "Engineers become obsolete within ten years"

The continuing improvement of his own skill and knowledge at his own job should be built into his daily work.

- Need not be organized as a formal session. But it needs to be organized.

- There is need for the continuing challenge to the worker:

"What have you learned that can make your job and the job of all of us more productive, more performing, and more achieving?"

What do you need

by way of knowledge,  
by way of tools,  
by way of information?

And how do we best prepare ourselves for  
new needs,  
new methods,  
new performance capacities?"

- ▼ Continuous learning is appropriate to

- Clerical work
- Manual work
- Knowledge work

- ▼ see p248

- wider vision
- continually increasing competence
- rising demands on oneself
- breakout, new learning curve, breakout
- focus on working of the plant

- ▼ Planning and Doing

- ▼ These three prerequisites are the planning for worker responsibility for

job  
work group and  
output.

- The "Worker as a Resource" in Planning

The prerequisites are therefore management responsibilities and management tasks. Management has to do the work and make the decisions.

But in all these areas the worker himself, from the beginning, needs to be integrated as a "resource" into the planning process.

From the beginning he has to share in thinking through work and process, tools and information. His knowledge, his experience, his needs are resource to the planning process.

The worker needs to be a partner in it.

Every attempt should be made to make accessible to the worker the necessary knowledge. He need not become an industrial engineer or a process designer, but the fundamentals of industrial engineering or a process designer.

- ▼ The confusion of planning and doing with planner and doer

- ▼ Planning and doing are different.

- require different methods
- require different approaches
- Planning won't get done if mixed with doing
- But planner & doer need to be united in the same person.

They cannot be divorced—or else the planning will cease to be effective and will indeed become a threat to performance.

- ▼ The planner is needed to

- ▼ Supply the doer with

- Direction and measurements
- Tools of analysis and synthesis
- Methodology
- Standards
- Make sure that planning of one group is compatible with that of other groups.
- The planner needs the doer as a resource and as his feedback control

- ▼ The need for clear authority

One more thing is needed to make responsibility acceptable to the worker: He needs to have the security of a clear authority structure.

- The worker has to know

what areas and decisions are beyond his power and beyond his purview and therefore reserved for a different or higher authority.

Management has to work out what the task is, what the objectives are, what the standards are. Again, the doer should be used as a source of information. But the job is management's.

- Organization stands under the threat of "common peril"

In an emergency situation which has not been anticipated and for which there are no rules. One person has to make the decision in such a situation, and fast, or everybody is endangered. Who this man is has to be known in advance, or there is chaos. And this person has to be able to say. "This needs to be done; you do it; this way." The survival of the group depends on his unquestioned authority.

Without it no one in the work group can feel secure

- ▼ Responsibility for Job and Work Group

- ▼ The worker and his group are responsible for

- Their own jobs
- The relationship between individual jobs
- Thinking through how the work is to be done.
- Meeting performance goals
- Quality as well as quantity
- Improving work, job, tools and process and their own skills.

- ▼ Worker responsibility for job and group will vary greatly with the

- kind of work to be done,
- educational skills, and knowledge level of the work force,

- cultures and traditions
- ▼ On job design and work group design
  - For a job is configuration.
 

It defies analysis. But it is easily accessible to perception. Particularly if feedback information is provided, the individual can normally work out his own optimal job design fairly fast and fairly effectively.
  - On work-group structure.
 

We now know that the work itself, whether heat-treating, selling furniture, or probing the molecular structure of a hormone, is a vital factor in job design and in work-group structure. But we do not know what job design and work-group structure correspond to this or that task or work. Work-group structure is a configuration of great complexity even though it is composed of a fairly small number of fairly simple elements. It resembles a kaleidoscope. Fairly small shifts drastically change the pattern. And the number of combinations and permutations is so large as to approach infinity.

In such a situation the only way to arrive at the right, the optimal solution is trial.
- ▼ Assembly Line and Job Enrichment
  - Job enrichment is not the answer. It is only the first step.
- ▼ Worker Responsibility and the "New Breeds"
 

Worker responsibility for job and work group is important for all kinds of workers in today's organizations. It is fundamental to a civilization in which three out of every four people at work are employees in organization.

But worker responsibility is particularly important for the three groups one might call "the new breeds"—though for different reasons.

  - The Rejected—The young manual workers.
 

These men and women arrive at work already rejected, already losers.

Need achievement to overcome their habit of defeat.
  - The "Pre-Industrials"
 

The recent immigrants from pre-industrial civilizations into modern city and modern organization
  - The Knowledge Workers
 

See discussion
- ▼ Saving the Supervisor
 

To make the worker responsible for his job and for that of the work group is also the best—and may be the only—way to restore the supervisor to health and function.

  - ▼ Caught in the middle—see page 280
    - In the modern industrial plant the supervisors is becoming the enemy.
  - ▼ As a resource for the worker and the work group.
    - ▼ Worker and work group, in order to take responsibility, have to have
      - ▼ an organized source of
        - knowledge
        - information
        - direction
        - arbitration
      - a channel of contact and information flow to and from various experts
      - discipline—correctional discipline should rarely be exercised.
  - ▼ But the proper role of the supervisor is not supervision
    - ▼ It is
      - knowledge
      - information
      - placing
      - training
      - teaching
      - standard—setting
      - guiding
    - ▼ It is not a easy role—old supervisors find it difficult—but it is a tenable role.
      - It no longer imposes a conflict of loyalties

▼ Plant and Office as Communities

Plant and office are more than just geographic locations. They are communities. To make workers achieving they must also take substantial responsibility for the work community.

- And as Power Structures
- The Needs and Limits of Governance

But not all decision within an organization are inherent in its purpose and mission or directly related to its performance.

Work community decisions are decisions that should be decentralized and lodged in the work community

- The Need for Leadership Opportunities

At the same time, these areas offer major opportunities for leadership, for responsibility, for recognition, and for learning. see discussion.

- Work-Community Activities

▼ The Self-Governing Work Community

- Is not "participatory democracy"
- The working teams are organized by management for specific operations and specific jobs.
- What matters is

that self-government of plant-community tasks be local self-government and that it put responsibility where the consequences of the decisions have to be lived with.

- From "My Workers" to "Fellow Employees" to "Fellow Manager"

...But there also is the task of building and leading organizations in which every man sees himself as a "manager" and accepts for himself the full burden of what is basically managerial responsibility: responsibility for his own job and work group, for his contribution to the performance and results of the entire organization, and for the social tasks of the work community.

▼ Employment, Incomes, and Benefits

Living in fear of loss of job and income is incompatible with taking responsibility for job and work group, for output and performance.

To accept the burden of responsibility, the worker needs a fair measure of security of job and income.

At the same time, however, the worker needs also mobility.

Every worker needs to be able to escape the wrong job.

Every worker needs to be able to move from a dying company or industry into one that grows or at least into one that has a chance of survival.

And the knowledge worker, especially the highly educated one, needs to be able to move where his skill and knowledge can make the greatest contribution. To leave knowledge skill underutilized is impoverishment of society and individual alike.

The economy also needs a fair degree of labor-cost flexibility, and so does every business. There is need for relating wage costs

- to the level of economic activity,
- to the other costs of an economy,
- to the profit requirements of the capital fund, and
- to productivity.

There is need to assuage the conflict between wage fund and capital fund. It cannot be eliminated. But there is need for some mechanism that establishes a tie between the two, both to make visible the worker's long-term stake in the capital fund and to enable him to understand the function of profit and profitability.

Managements have, by and large, not managed employment, incomes, and benefits. These are, however, areas of genuine managerial responsibility. These are management tasks.

▼ Job Security and Income Stability

▼ Resistance to Change and Job Insecurity

- Resistance to change, innovation, higher productivity
- Not inherent in human nature. See examples.
- Fear of Working self & others out of a job

- What is needed
  - Is not just the guarantee of income, but a system which actively and systematically provides work, that is, productive membership in society.
- ▼ The Situation in the west
  - Formal guarantee of jobs and incomes is the exception rather than the rule.
  - ▼ Yet increasingly have been built into the system.
    - Unemployment
    - Supplemental unemployment
    - Severance Pay
    - Seniority Rules in layoffs
  - Labor cost more fixed than in Japan
- ▼ American Job Mobility: Myth and Reality
  - There is considerable turnover in entrance jobs.
  - There is considerable turnover in top management.
  - In between, though job change is the exception rather than the rule.
    - among older workers, lower and middle management, and among professional and technical workers.
- ▼ The Shortcomings
  - Economically the developed countries have arrived at a high degree of employment security and income stability. And yet both "models" the American-European and the Japanese, have serious shortcomings.
- ▼ The American-European System
  - Income stability
    - But psychologically the fear persists. Income stability is least assured when the worker needs it the most (when children are small and parents are old).
    - There is also no true "system" but rather a confused mess of ad hoc improvisations. As a result the individual case is almost unpredictable.
  - ▼ Mobility
    - Union restrictions and demarcations.
    - The individuals fear of being out of a job remains
    - The headhunter but no such system for clerks and rank-and-file
- ▼ The Japanese System
  - "Modern" Japan
- ▼ The Rehn Plan (A Swedish Labor Leader)
  - This example shows that, even in a major economic shift, insecurity of jobs and income is not a very big problem. The fear is real and paralyzing.
  - Recognized the need to change industrial and economic structure
  - Had to shrink traditional low-technology and low-productivity industry.
  - Industries & companies are not being encouraged to maintain employment.
  - On the contrary, to anticipate any redundancy in employment.
  - At the same time to anticipate future needs additional workers and their skills
  - ▼ This info in feed to an Organization that
    - Underwrites the income of the redundant employee
    - It trains him
    - It finds a new job for him and places him in it.
    - If necessary it moves him to a new location and pays for the move.
- ▼ Summary: What's needed
  - To make explicit, overt, and visible the security that exists
    - We need to make explicit the actuality of high job security and even higher income stability. In the West we need also to build in the Japanese relationship between income assurance and the need for income security of different groups, especially with respect to stages in a family's life cycle.
  - ▼ Needed: Organized Placement

- ▼ The employer's duty to find jobs for redundant workers See page 291
  - Technological or
  - Economic change
  - The consulting firm
- ▼ Profits, Productivity, and Benefits
 

The job as a living is the worker's first concern with respect to the economic dimension of working. But there is also the apparent conflict between wage fund and capital fund, that is, between the worker's economic interest in wage and salary and the need of economy and enterprise (and ultimately of workers) for profits and productivity.

  - Business is becoming increasingly owned by the employee trustees.
  - ▼ This has had little impact on the hostility toward profit.
    - Rational behavior for the employee is clearly to maximize wage and salary income, even at the expense of his own share in profits. Primarily because profit is too small in relation to wage and salary.
    - Fair-weather plans which pay out only in periods of profitability Create frustration and resentment when profits no longer go up but down.
  - It is a basic fallacy to treat profit as income.
  - Profit is capital fund, that is, savings. Only if used to build a capital fund for the worker can it have meaning. Only then can the function of profit even be understood.

Wherever profit as a capital fund has been structured as an employee benefit, the impact has been great. In some cases the resistance to profit has almost disappeared.

Link profits with the size of a person's pension

- ▼ In the benefits area the individual employee builds up his capital fund.
  - He needs certainty with respect to his expectations and provision against risk. Individual certainty can be provided in many benefits areas on the basis of a probability distribution, that is, at fairly low cost per individual.
  - ▼ Areas
    - Risk of survival. There is need for a retirement provision.
    - Health Care
    - Job and Income Security
  - These benefits which can be provided for out of fluctuating profits. In any one year the contribution to a retirement fund, a health plan, or a job and income maintenance fund can fluctuate. What matters is tht the provision be adequate over a three to ten year period, that is, that low contributions in one year be compensated for by higher contributions in another, more profitable year.
- ▼ Making "Benefits" Benefits
 

But to be effective, benefit plans, however generous, will have to be restructured.

- ▼ Almost no benefit plan anywhere in the world was planned, designed, thought-through.
  - The Japanese system
  - The Western system
  - Both systems have made the worker, in effect, the major recipient of profits , that is, the major recipient of, and conduit for, the capital fund.
- ▼ Yet neither system is adequate to either
  - ▼ the needs of the worker or
 

One basic weakness of the Western system is that it lacks selectivity. Every group in the work force gets the same benefits whether they truly benefit the group or not. As as result, no group gets in full the benefits that would meand the most for it. And every group gets benefits which it does not truly need and therefore does not greatly value, but for which it pays, of course, one way or another.

    - Think that benefits are "free"
    - Designed to "hurt" the enterprise

- Not tied to the performance of the enterprise—or at least, not in visible form  
What is needed, however, are plans that have a "floor" of contributions actually determined through fluctuating from year to year according to the company's profits and productivity. But there needs to be no "ceiling".  
Extraordinary profitability or productivity might make possible sizable increases in benefit levels without creating a permanent burden.
  - the needs of enterprise and economy.
  - ▼ What Benefits Should Be & Should Do
    - Structured to give the worker the most for the money.
    - ▼ The financing arrangement
      - ▼ Floor
        - Financed on a fluctuation basis
      - Decide on size of the benefit package then allow the groups to choose what best serves it needs
      - The Administration of the benefits should be made a responsibility of the work community.
    - ▼ Worker the world over have shown two strong preferences as incomes went up.
      - Preference for leisure over more cash income.
      - Benefits
- ▼ **"People are Our Greatest Asset"**
  - ▼ Known but not practiced  
What explains this resistance, this unwillingness to learn from such eminently respectable and successful examples as, for example Zeiss and IBM?  
  
The reasons for the reluctance of managers to face up to the problem of making the worker achieving.
  - ▼ The Confusion of Authority with Power
    - The Lesson of Decentralization
    - The Demands on Management
  - ▼ The Leadership of People  
Finally, to make the worker "achieve" demands that managers look upon workers as a resource rather than a problem, a cost, or an enemy to be cowed. It demands that managers accept responsibility for making human strengths effective. And this means a drastic shift from personnel management to the leadership of people.
  - ▼ The Traditional Approaches to managing people (This needs to be entered later)
    - ▼ Welfare Paternalism
      - The Krupp Example
      - Personnel Management
      - People as a Cost and as a Threat
      - Summary  
Managing means making the strengths of people effective. Neither the welfare approach, not the personnel management approach, not the control and fire-fighting approach address themselves to strength, however.  
  
People are weak; and most of us are pitifully weak. People cause problems, require procedures, create chores. And people are a cost and a potential "threat." But these are not the reason why people are employed. The reason is their strength and their capacity to perform. The purpose of an organization is to make the strengths of people productive and their weaknesses irrelevant.
  - "Our Greatest Resource Is People"
  - ▼ The Practices of People Management
    - ▼ Building responsibility and achievement into job and work force
      - There need to be objectives for every job  
Set by the man who is to attain the objectives, together with his manager.
      - The work itself has to be made productive  
so that the worker can work at making himself achieving.
    - ▼ The worker needs the ... of responsibility.
      - demand
      - discipline

- incentive
  - ▼ The manager must treat people as a resource to himself
    - Look to them for guidance regarding his own job.
    - Demand of them that they accept it as their responsibility to enable their manager to do a better and more effective job himself.
    - Build upward responsibility and upward contribution into the job of each of his subordinates.
- "What do I do as your manager, and what does your company do that helps you the most in your job?"  
 "What do I do as your manager, and what does the company do, that hinders you the most in your job?"  
 "What can you do that will help me, as your manager, do the best job for the company?"
- ▼ Place people where their strengths can become productive.
    - ▼ Elaborate selection procedures
      - Fallacy of selecting "comers"
    - ▼ Yet placement is left to chance.
      - No two people have the same configuration of strengths and weaknesses.
      - Placement is the best way to optimize.
      - The nonperformer should not be allowed to stay in the organization.
  - The Leadership of People
 

These practices are the first steps they move manager and management beyond personnel management and toward the leadership of people.
- ▼ **Components of Worker Achievement: Practices**
- ▼ Job has to make achievement possible
    - ▼ Worker has to have responsibility for his job:
      - ▼ Job design & work group design
        - #of modules,
        - sequence
        - speed
        - rhythm
      - Think through how the work is to be done
    - ▼ Meeting performance goals
      - quality
      - quantity
    - ▼ Improving:
      - Work
      - Job
      - Tools
      - Processes
      - Their own skill
    - Local & community governance
    - ▼ PREREQUISITES (foundations) of responsibility:
      - 1. productive work (See above)
      - 2. immediated feedback info on his perf against standards
      - ▼ 3. CONTINUOUS LEARNING (NOT A REPLACEMENT FOR TRAINING)p248
        - wider vision
        - continually increasing competence
        - rising demands on oneself
        - breakout, new learning curve, breakout
        - ▼ to deal with
          - 1. obsol
          - 2. resistance to innovation.
      - focus on working of the plant

- ▼ What have you learned
  - ▼ that can make your job & the job of all of us
    - more productive,
    - more performing,
    - more achieving?
  - ▼ What do you need by way of
    - 1 knowledge
    - 2 tools
    - 3 info ?
  - ▼ How do we best prepare for new
    - 1 needs
    - 2 methods
    - 3 performance capacities
  - 4. clear authority structure
  - Worker should part. in design of the prereq
  - ▼ To Accept the burden of responsibility:
    - ▼ need a fair measure of job & income security
      - a system which actively & systematically provides work that is productive membership in society
    - mobility to escape the wrong job
    - ▼ benefits needs:
      - benefits that benefit the individual
      - retirement provision
      - healthcare
    - ▼ funded out of profits
      - ▼ related to the performance of the business
        - productivity
        - profitability
        - a "floor" on contribution
        - but no "ceiling"
  - ▼ Demands on management
    - managers plan
    - set objectives
    - think through priorities
    - think through assignments
    - set standards
    - manager take resp for his own work and perf
  - Look upon the worker as a resource rather than a problem
  - Place people where their strenghts are productive (most important)
- ▼ **Notes**
  - ▼ **Automation**
    - ▼ Practice of management
      - ▼ Automation is primarily a system of concepts
        - There is a basic pattern of stability and predictability behind the seeming flux of phenomena
      - ▼ The nature of work
        - ▼ It focuses on the process, which it sees as an intergrated and harmonious whole
          - It does not focus on:
            1. skill as the integrating principle of work
            2. the product as the organizing principle.
          - ▼ Its aim is to arrive at the best process
            - ▼ The process that will produce
              - ▼ the greatest variety of goods
                - with the greatest stability

- at the lowest cost
- with the least effort
- Note:
  - Indeed the less variety and fluctuation there is in the process, the greater may be the variety of goods that can be produced.
- ▼ Concept of control
  - ▼ To maintain the equilibrium between
    - ends and means
    - Output and effort
  - ▼ Requires
    - What is significant to be pre-established and
    - that it be used as a pre-set and self-activating governor of the process
  - ▼ The mechanics of control
    - Can be quite simple
  - ▼ What is essential
    - ▼ there always be a control built into the process which maintains it either by
      - eliminating what the process cannot handle
      - adjusting the process so as to make it produce the planned result
- ▼ After this conceptual rethinking
  - ▼ Mechanization of those operations that are repetitive in character become both possible and economical.
    - ▼ A machine can be used
      - to feed material into another machine
      - to change the material's position in the machine
      - to move it from one machine to the next
    - All materials handling can be mechanized
      - Which contributes the bulk of unskilled repetitive work under mass production.
    - Changes in machine settings and
    - Changes in routine judgements
      - This machine has become too hot or this tool bit too blunt
  - ▼ Mechanization is not, however, automation
    - Mechanization is only the result of automation and it is not essential to it.
    - ▼ Techniques, tools and gadgets
      - are thus in automation, as in every technology, specific to the task and determined by it.
      - do not constitute automation
      - Nor does automation consist in their application
      - Its technical aspects are results rather than causes
  - ▼ Automation is a concept of the organization of work
    - It is therefore as applicable to the organization of distribution or of clerical work as to that of industrial production.
  - ▼ Automation and the worker
    - ▼ Will require tremendous numbers of highly skilled and highly trained people
      - Managers to think through and plan
      - ▼ Highly trained technicians and workers
        - to design the new tools
        - to produce them
        - to maintain them
        - to direct them
    - This is likely to be the major obstacle to the rapid spread of these changes
  - The impact on the size of the organization—variable
  - ▼ Capital requirements
    - Investment per production worker may rise
    - Investment per employee may go down
    - Investment per unit of output may remain the same or increase somewhat

- ▼ The demands on management
  - Will demand many more managers
  - Will extend the management area
    - Many people now considered rank-and file will have to become capable of doing management work. The great majority of technicians will have to be able to understand what management is and to see and think managerially.
  - ▼ On all levels the demands on the manager's...will increase
    - responsibility and competence
    - vision
    - capacity to choose between alternative risks
    - economic knowledge and skill
    - ability to manager managers
    - ability to manage worker and work
    - competence in making decisions
  - Will demand the utmost in decentralization, in flexibility and in management autonomy
  - Impact on the number of jobs
    - 19075520
- ▼ Management: Tasks, responsibilities, practices
  - ▼ Mechnaization & automation are not the same things
    - ▼ Principles of Automation
      - Entire process is seen as a system. Everything is integrated
      - ▼ System is based on the assumption that
        - phenomena of the natural universe (as opposed to social)
        - fall into discernable patterns
        - and can be routinized on the basis
        - of the probabality distribution
      - System controls itself through feedback
      - ▼ Human worker does not work he programs
        - the worker is discriminating.
        - his tool is judgement rather than manual or conceptual skill
    - ▼ Whenever mechanization reaches the point where
      - the worker is engineered to be a machine part
      - we can automate (p227a MGT)
      - Not necessarily the best answer
    - ▼ Automation in not an arrangement of machines.
      - It is not the ultimate in mechanization.
      - It is a basically different concept.
      - It can work perfectly without any machines.
      - Any work needs its tools. Any work, therefore, needs to be mechanized.
      - See "Why Automation Pays Off"—Frontiers of Management
  - ▼ The frontiers of management—Why automation pays off
    - Has paid for itself within three years and often much faster
  - ▼ The main benefit of automation lies, in eliminating—or at least minimizing—the costs of not doing
    - ▼ Good quality is cheap; it is poor quality that is expensive
      - ▼ Yield=the percentage of finished products that come up to acceptable quality standards
        - ▼ Only the tip of the iceberg
          - Where in the process, things went wrong
          - How much time and money has already been spent in earlier stages to fix problems
          - How many pieces have been taken off the line and scrapped as substandard without ever reaching final inspection.
      - ▼ These costs are hidden in the conventional accounting figures in...
        - overtime
        - overhead
        - scrappage

- overstaffing
- and so on
- Even in well-managed “high-quality” plants they often run as high as 1/3 of total manufacturing costs, sometimes higher.
- Automation builds quality standards and quality control into every step of the process
- Automation spots and advertises a deficiency in quality the moment it occurs and at the place it occurs
- Quality saving alone are likely to repay the costs of automation within two or three years
- ▼ The second major economic benefit also lies in a cost of not doing: the cost of “downtime”
  - In an automated process, production changes can be built into the process
- ▼ An entirely new capacity to generate revenue
  - The reduction—or elimination—of downtime often gives a plant an entirely new capacity to generate revenues
  - It enable it to turn out an optimally profitable product mix and to serve more profitable markets.
  - The most advantageous manufacturing system for the small plant
- ▼ Manufacturing people will have to develop new and more appropriate measures of costs
  - Some measurement of the expected benefits
  - Some estimate of the return on the investment in automation
  - The cost of poor quality and downtime can be actually dug out of the available cost data
- ▼ Determining what additional revenues automation might make possible requires a little more
  - A conventional market study
- ▼ To estimate the benefits of automation also requires a change in the way most managements still look at
  - the manufacturing process and its cost structure.
  - From: cost per piece produced
  - To a focus on the total costs of the manufacturing process
- ▼ **Managing workers—source Inc magazine & Practice of management**
  - ▼ What:
    - ▼ People who are frequently dissatisfied
      - and thereby driven to improve their performance.
  - ▼ How
    - ▼ Hire good people
      - ▼ Criteria
        - Top 50%
    - ▼ Demand high performance
      - Not minimum acceptable, not average,
      - Nothing gives more pride of workmanship and accomplishment
    - ▼ Pile on information
      - The workers should be able to guide his own performance
    - ▼ Encourage the development of management vision
      - Assume responsibility for peak