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DEPARTMENT OF DEFENSE



AD-A225 197

**TOTAL QUALITY MANAGEMENT
(TQM)**

*Process Action Team
Course*

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Prepared For:
The Office Of
The Secretary
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Prepared By:
Booz • Allen & Hamilton Inc.
Human Resource Management Practice
4330 East West Highway
Bethesda, Maryland 20814

90 07 10 008

TABLE OF CONTENTS

Module 1	TQM Review	1-1
Module 2	Process Improvement Model	2-1
Module 3	Understanding Quality Improvement Requirements	3-1
Module 4	Learning the Process	4-1
Module 5	Generating and Selecting Solutions	5-1



Course Objectives

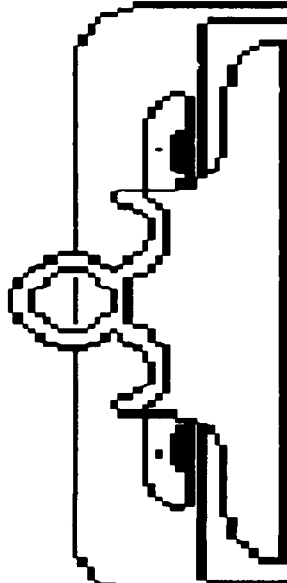
Upon completion of this course, the participant will be able to:

- Describe the start-up procedures, roles and responsibilities and member roles
- Apply the Process Improvement Model in PAT assignments
- Conduct activities to understand the scope and requirements for quality improvement
- Study the process using TQM tools and techniques
- Generate and select solutions through the use of methodologies and decision techniques

Course Objectives

MODULE ONE

TQM REVIEW

Module One Objectives

Upon completion of this module, the participant will be able to:

- Identify and explain key TQM concepts and principles.
- Summarize how the TQM infrastructure and its components (particularly PATs) fit into an organization.
- Describe key functions of an ESC, QMB, and PAT.

TQM Review

The purpose of this module is to provide participants with a brief review of major TQM concepts and principles. It also presents an examination of an organization's TQM infrastructure. If you need additional information, please refer to the student manual, Total Quality Management (TQM) Awareness Seminar that was provided for the Awareness Course.

Key TQM Concepts and Principles

- Principle aspects of the TQM concept
- Common themes of TQM experts
- TQM emphasis on process
- Shewart (Plan, Do, Check, Act) Cycle
- Progression of American management styles

TQM Review

A discussion of the principle aspects of the TQM concept, common themes of TQM experts, TQM emphasis on process and the progression of American management styles is briefly reviewed in this module.

TQM is a concept not a program or a slogan.

TQM brings together all other quality efforts:

- Model Installation Program
- Suggestion Program
- Industrial Improvement Program
- Personnel Demonstration Projects
- Gainsharing Programs.

These efforts were identified in Appendix A of Booz, Allen's training manual Total Quality Management Awareness Seminar, Revision 5, November 15, 1989. Please refer to this document for further information.

Key TQM Concepts and Principles*Principle Aspects of the TQM Concept***DOD TQM Definition:**

Total Quality Management (TQM) is both a **philosophy** and a set of **guiding principles** that represent the foundation of a **continuously improving** organization. TQM is the application of **quantitative methods** and **human resources** to improve the material and services supplied to an organization, and the degree to which the **needs of the customer** are met, now and in the future. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a **disciplined approach** focused on continuous improvement.

TQM Review

This definition is further reinforced by supporting statements from the Secretary of Defense.

Reference:

DOD 5000.51G (Draft). Total Quality Management Guide, August 1, 1989.

There is no universal definition of TQM. However, several TQM experts agree that several components must be present and working in order for TQM to be achieved. The following section summarizes these major points.

Reference:

A-132 OMB Advisory Circular (revision). President's words on TQM. See its definition of TQM. Bold print in DoD definition is OMB common points.

Key TQM Concepts and Principles*Common Themes of TQM Experts*

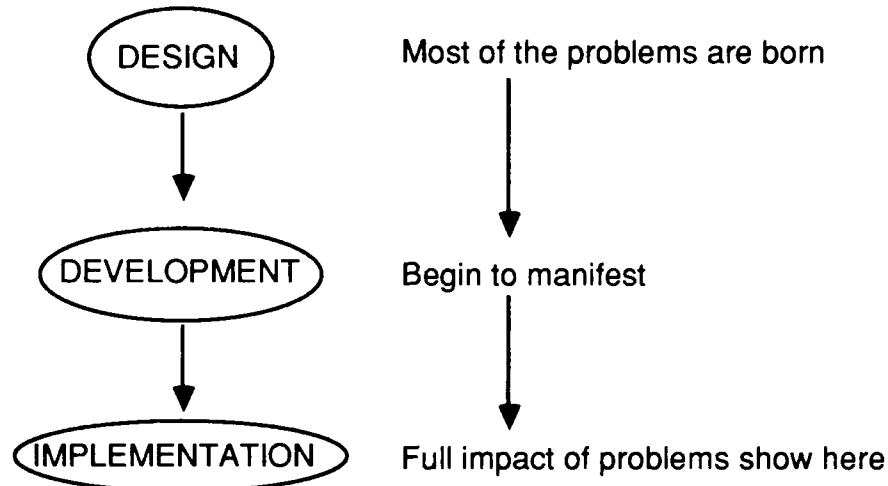
- Customer defines quality
- Customer is located internally and externally
- Management creates the quality culture.
- Management provides for system improvements.
- Quality becomes prevention-based
- Statistical thinking is used to study processes
- Team approach to problem-solving
- Continuous improvement
- Education and training are vital.

TQM Review

There are many authorities responsible for the quality revolution in the U.S. and abroad. Three of the most well-known and practiced concepts are those of Deming, Juran and Crosby. Though different in approaches, all advocate the quality path to productivity.

Key TQM Concepts and Principles*Emphasis on Process***CONTROL****NOT IN CONTROL****TQM Review**

- In a process, some item, information or person is acted upon in order to be changed. The resulting change, or outcome, is the reason the process exists.
- A process is in CONTROL if it is stable or predictable. Managers need a stable system as a basis for prediction to make improvements.
- A process that is NOT IN CONTROL is the responsibility of management. A change in method, operator expertise, or equipment may be needed to stabilize the process.
- In addition to being in control, the process must be able to consistently produce within the customer's specifications. If a process does not produce within the specified requirements, then management has to alter the process or modify the specifications.
- The way you improve a process is to reduce variation of critical characteristics (bring it into control) or move the average to a higher or lower level to meet specifications and customer needs.

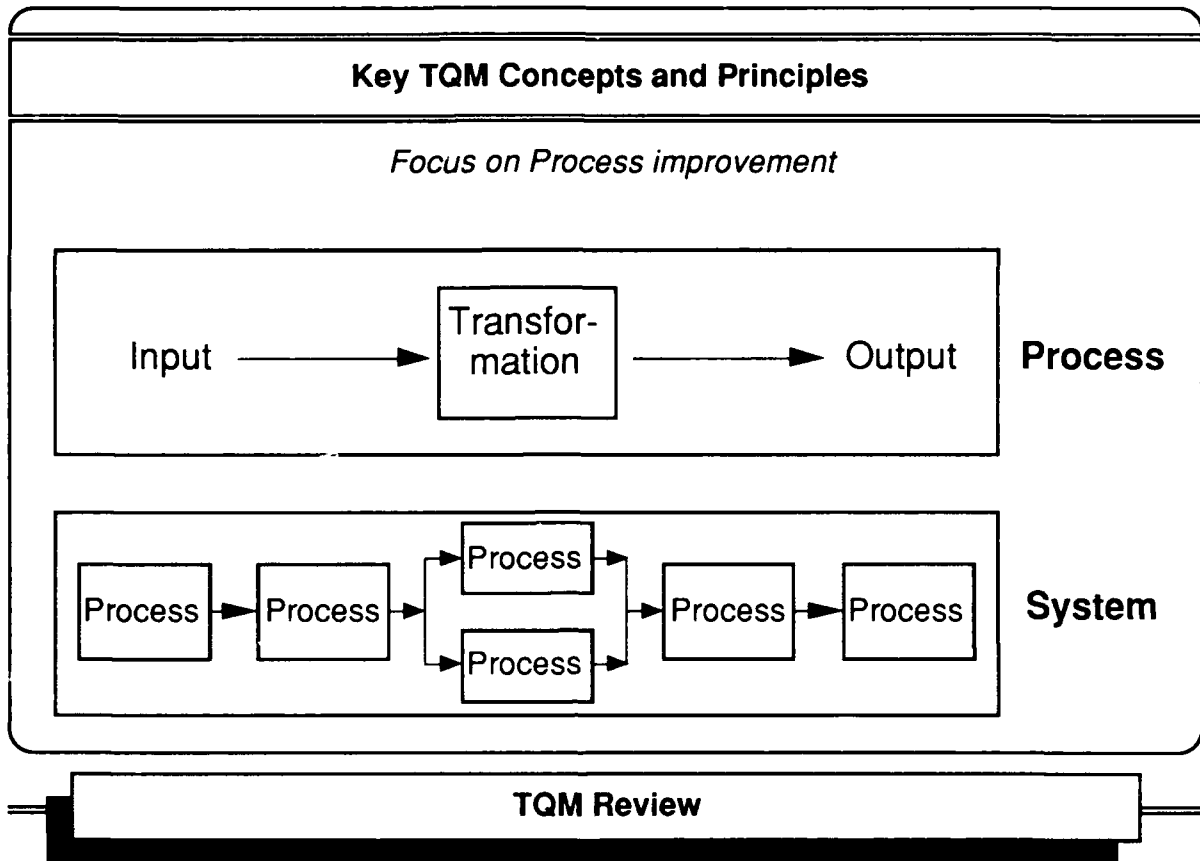
Key TQM Concepts and Principles*Emphasis on Process***TQM Review****Process Management:**

- Quality Management builds in quality throughout the process with an emphasis on prevention, rather than inspection.
- The inspection method considers quality 'after the fact' and not as part of the process.

Reference:

Adaptation from

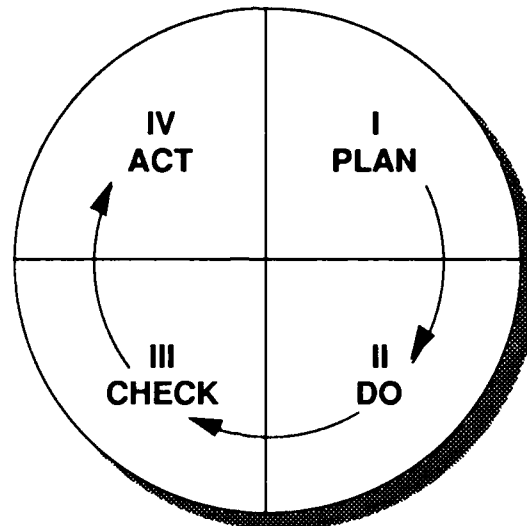
Deming, W. Edwards (1986). Out of the Crisis, MIT Center for Advanced Engineering Study: Cambridge, MA.



- To appropriately manage the improvement process, it is important to understand the distinction between a process and a system.
- A *process* consists of *inputs*, a *transformation* of the inputs (through machines, methods, materials, labor, information, or environment), and a desired outcome or *output*.
- A *system* is a complex *collection of processes*. Inherent in a system is the transaction process for handling communication and interaction between and among the individual output processes of the system. The more output processes there are in a system, the more critical and complex becomes the transactional process.

Key TQM Concepts and Principles

- Remember that the PDCA cycle focuses on *process improvement*.
 - It is important to *distinguish and isolate a "process" from the "system"*. By focusing on a single process, you can identify the inputs, outputs, and variables of the process.
 - Be sensitive to the *interrelationships* among processes within a system, because every process is part of a system.
- *System improvement* results by steadily improving individual processes and improving the transaction process that handles interaction.

PDCA Cycle*Managing Process Improvement***TQM Review**

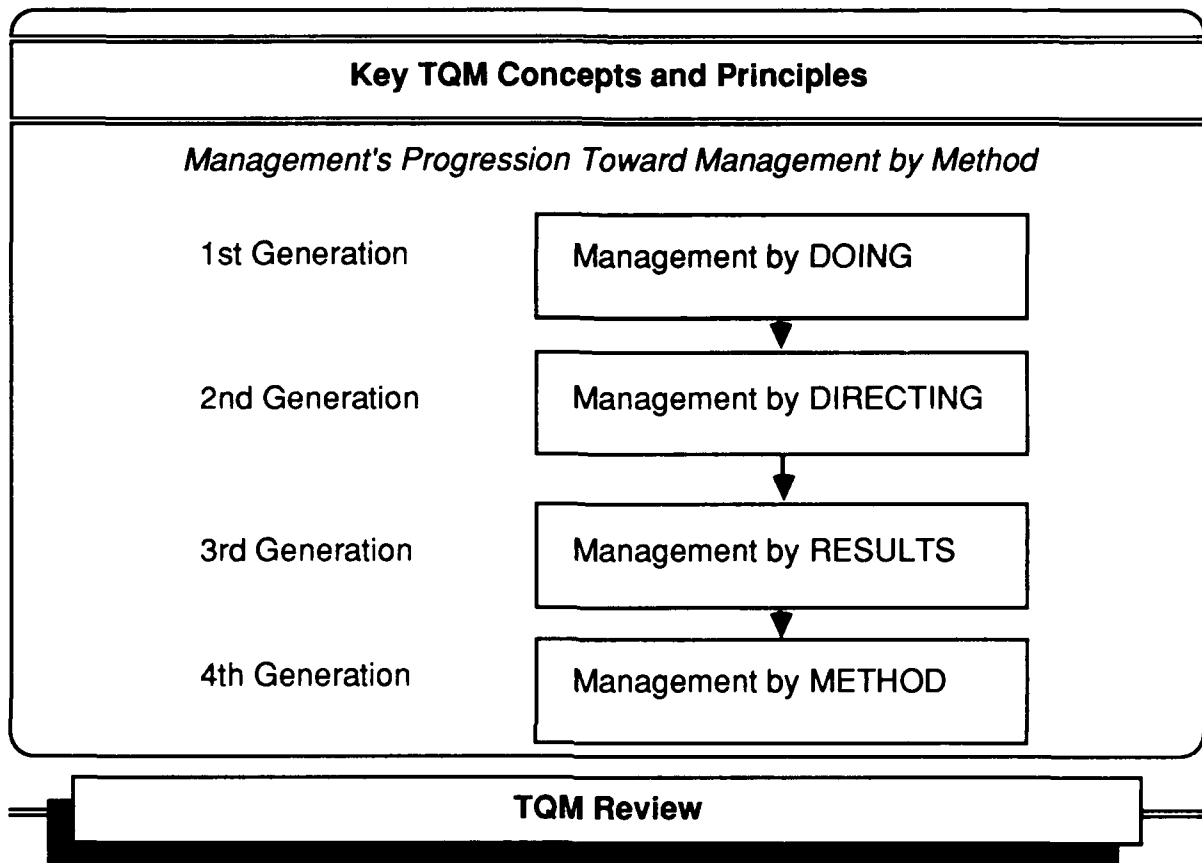
- The PDCA Cycle is a four-step scientific method for managing continuous process improvement.
- The first step is to "Plan" a change. Planning includes:
 - Analyzing the status quo
 - Developing operational definitions
 - Identifying measures of merit
 - Baselineing
 - Identifying target improvement areas
 - Determining key questions.

This step requires knowledge of the subject matter, the customer needs, and the process.

Key TQM Concepts and Principles

- The next step is to "Do" or test the change, preferably on a small scale. This step includes:
 - Validating the process description
 - Identifying potential causes
 - Establishing process measures
 - Developing a data collection plan
 - Collecting data
 - Testing your hypothesis.
- The third step is to "Check" or study the results – what did we learn. Quantitative methods are used to analyze the data. The resultant information is used for planning and predicting.
- The final step in the Shewhart Learning Cycle is to "Act." Action options include:
 - Adopting the change
 - Experimenting again with different environmental conditions and/or people to extend the boundary of knowledge.

NOTE: The management style commonly used today practices the "Plan/Act" or "Act" steps only. As a result, the organization does not benefit from the learning and verifying steps, "Do" and "Check".



American management styles have progressed through the years:

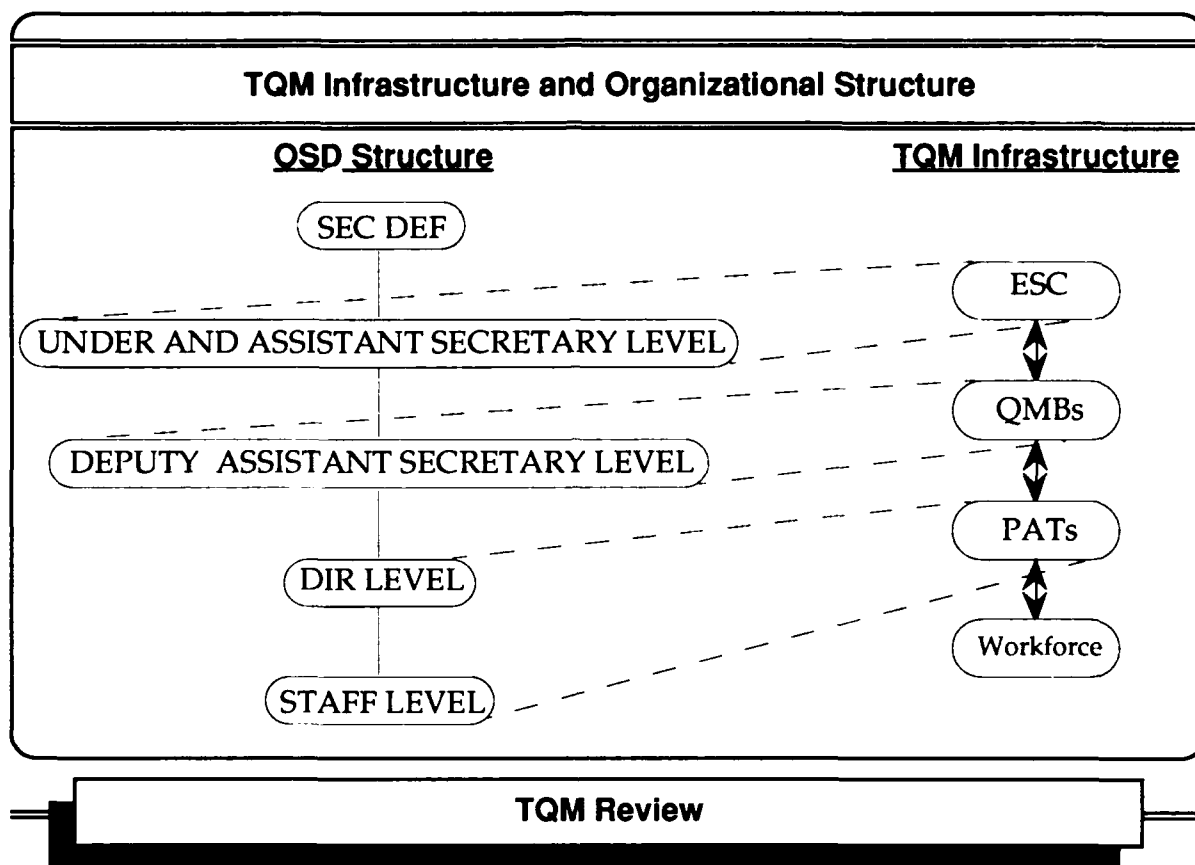
- The first generation of management adhered to *management by doing*.
- The second generation of management adhered to *management by directing*.
- The third generation of management, the most widely used management style in the U.S. today, is *management by results* (also known as Management by Objectives) which provides a systematic hierarchy of control and accountability.
- The more effective management style that will take us into the 21st century is *management or rather, leadership by method*.

The major points of departure are the shifts in emphasis:

- manager does the work
- manager tells how to do the work
- manager sets arbitrary standards

- manager establishes what needs to be done and ensures that the process (i.e., the how) is optimized.

TQM Review



- The above graphic shows how the TQM infrastructure is imposed on the organizational structure of the Office of the Secretary of Defense (OSD). This infrastructure provides a conduit for increasing cross-functional teaming arrangements to accomplish study, thinking, and decision making about quality improvement in all aspects of the organization's activities.
- The TQM infrastructure is designed to work cross-functionally with the OSD organizational structure. During TQM implementation, ESCs, QMBs, and PATs serve to accelerate investigation of problems and get process improvements supported by top leadership. The infrastructure promotes an "ad hoc" climate (not an ad hoc approach, however) that encourages making improvements and provides easier access to top management to gain their support for process improvement. This "ad hoc" climate is an interim condition that has the potential to achieve high levels of continued success if it is supported and encouraged by top management and implementers. It is important to have a TQM infrastructure is compatible with an organization's hierarchical structure.

TQM Infrastructure and Organizational Structure

Functions of the Executive Steering Committee (ESC)

- Develop philosophy, constancy of purpose, and guiding principles
- Focus on critical processes that affect customer satisfaction and/or major cost
- Identify an "owner" of each critical process
- Resolve organizational and functional barriers
- Provide resources, training and rewards
- Establish criteria for measuring outputs/customer requirements
- Measure progress vs. goals.

TQM Review

An Executive Steering Committee is composed of senior managers in an organizational unit. Their main purpose is to identify and prioritize improvement issue areas. Examples of individuals who would be on an ESC are:

- Deputy Secretary of Defense
- Deputy Undersecretary for TQM
- Undersecretary of Defense Acquisition
- Undersecretary of Defense Policy
- Other assistant secretaries
 - Comptroller
 - Force Management and Personnel
 - Health Affairs
 - Legislative Affairs
 - Public Affairs

Infrastructure and Organizational Structure

The committee represents the top level leadership of an organization. Each ESC members will be trained in TQM concepts and consequently, will seek to avoid the traditional temptation to assign more staff to "fix" a problem or to let time clarify uncertainty. The ESC has a regular meeting schedule (usually bi-monthly) whose sole topic is **quality and process improvement**.

TQM Infrastructure and Organizational Structure*Functions of the Quality Management Board (QMB)*

- Identify processes in assigned issue area
- Prioritize processes by improvement potential
- Develop improvement plans, methodology, and metrics to measure progress vs. goals
- Establish Process Action Teams when appropriate
- Provide Process Action Teams with training and resources
- Track and report progress and provide help if necessary
- Help remove barriers.

TQM Review

QMBs are normally organized around cross-functional issues. For example, the Naval Air Engineering Center (DON) has established QMBs around the functional areas of: Business Management, Engineering Products and Services, Human Resource Management, and Base Operations and Support, to name a few. QMBs study the issue area to identify improvement opportunities. QMBs have the responsibility and authority to change processes that affect the improvement opportunity.

Membership on QMBs should be representative of all the organization's functions. Board members are individuals at the:

- Assistant Secretary level: Directors, Managers, Supervisors
- Deputy Assistant Secretary level: Directors, Managers, Supervisors

Process Action Teams (discussed next) are chartered by the QMBs to study and select an improvement solution for a specific process. Usually, a QMB has more than one Process Action Team under their direction.

TQM Infrastructure and Organizational Structure*Functions of the Process Action Team (PAT)*

- Apply a structured performance improvement methodology to deal with specific process problems
- Identify improvement changes based upon a root cause
- Recommend and pilot test a solution and measurement system for the process improvement
- Collaborate and support the QMB.

TQM Review

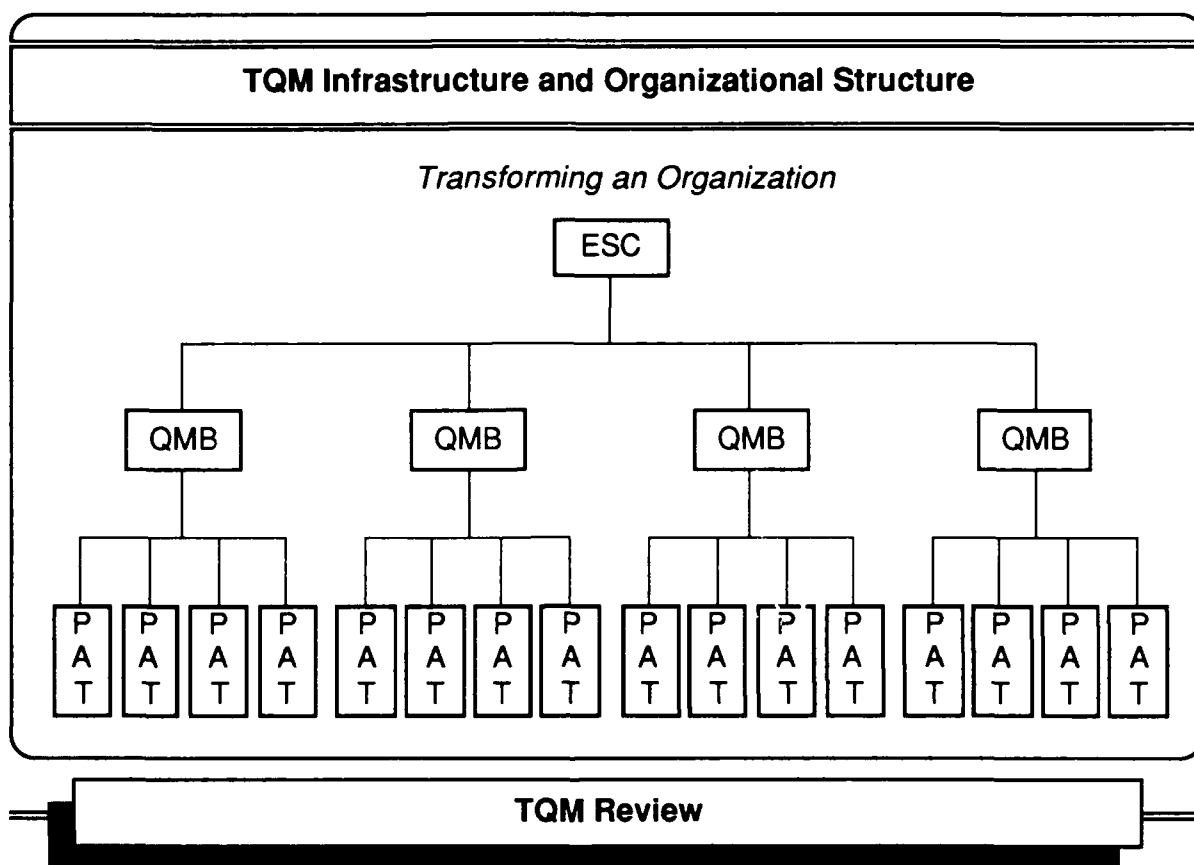
The purpose of a PAT is to generate ideas for process improvements in order to gain improved productivity. A PAT studies a specific process, uncovers a root cause, pilot tests their solution and collaborates with the QMB on the potential outcome(s) of their study. The roles of the QMBs and PATs are complementary in that QMB members are drawn closer to the process of how work gets done and the PAT members are drawn closer to the larger purview of QMB responsibilities. Ultimately, the QMB is responsible and authorized to bring the improvement effort into reality.

Examples of individuals who would be on a PAT are:

- Directors and Assistant Directors, Managers, Supervisors
- Action personnel
- Any level of personnel who are involved in doing the process.

Examples of PATs in OSD are:

- Source selection



Though PATs are only one dimension of quality leadership, they are, nevertheless, an important one. The success or failure of projects have a great impact on the organization because they are highly visible efforts. Therefore, you have to clearly understand where PATs fit into the overall quality effort and know how to use them properly. The graphic above shows where PATs fit into an organization-wide transformation strategy.

Whether you are involved in a pioneer project or part of a later expansion effort, your project is part of something very big, very long lasting, and very important to your organization. PATs plant the seeds of TQM in the organization. PATs are chartered to improve a work process that an ESC and QMBs have identified as important to change. The team studies this process methodically to find permanent solutions to problems. To do this, team members can use the tools and skills described throughout this manual. A purpose equally if not more important in the long run than their focus on improvement is the widespread education of TQM.

Participant Exercise**THAT WAS THEN****THIS IS NOW**

- What have you done to improve quality since awareness training?
- Have you seen TQM activity in your work place?

TQM Review

This module has presented a brief review of material presented in the Awareness Course. The Awareness Course was developed with the objective of making OSD employees aware of TQM concepts. If, perhaps, you were not as successful in implementing changes, (i.e, TQM process improvements) in your organization as you had originally hoped, it is the goal of this course to teach you more specific skills to enable you to successfully implement TQM via the Process Action Team.

As discussed in Module One, this course will discuss the roles, responsibilities and activities of the Process Action Team. The next module contains material and exercises related to the beginning activities of the PAT: Understanding Process Requirements.



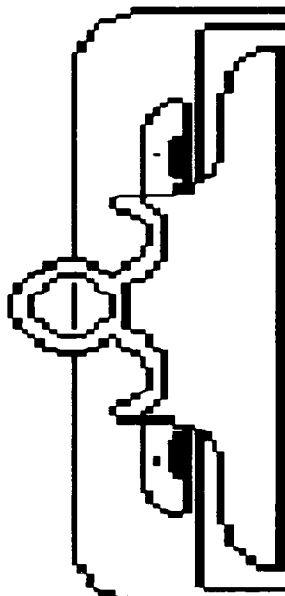
TOTAL QUALITY
MANAGEMENT

Process Action Team Workshop

MODULE TWO

PROCESS IMPROVEMENT MODEL

Module Two Objectives

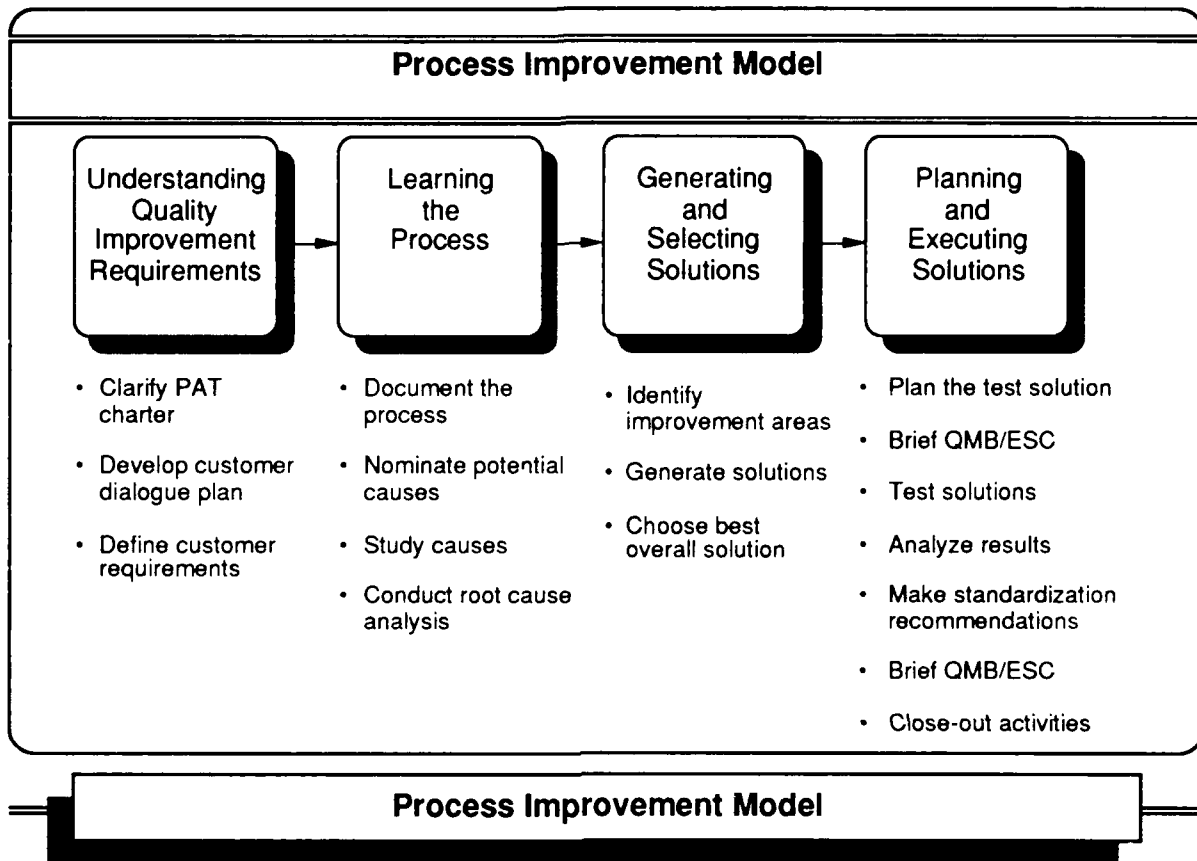


Upon completion of this module, the participant will be able to:

- Identify and explain the Booz, Allen Process Improvement Model
- Summarize how the the case study is structured and how it will be used in this course.
- Distinguish between a PAT and a committee.
- Describe the roles of individual team members and basic administrative procedures.

Process Improvement Model

The purpose of this module is to provide participants with an understanding of the Booz, Allen Process Improvement Model which will be used to guide the participants through problem solving. Participants will also be introduced to the case study, its structure and how it will be used throughout the course. Finally, an overview of several leadership roles and the team's administrative activities.



Case Study Introduction

For the duration of this class you will be asked to imagine you are a member of a PAT. A case study will be used to simulate the activities that usually occur within the lifespan of the PAT. As you work your way through the case study, you will experience, to some degree, what an actual team goes through in solving a process problem.

Process Improvement Model

As a PAT member, you will be addressing a real problem, drawn from actual data and experiences of several federal organizations. The improvement opportunity involves an upper executive correspondence support system; something most knowledge workers have used.

There is a cycle of events used to move through the process improvement steps. The events are:

- The conceptual framework will be provided in the preliminary lecture and description, prior to each round of case study activity.
- Tasks or questions will be assigned by the instructional staff. It will be up to each PAT (the class will be divided into several groups of five to act as a team) to interpret the best way to answer the question or perform the tasks involved.
- Background data will be distributed to each PAT to support the tasks and questions.

Case Study Introduction

- Report outs and discussions will occur after each PAT has interpreted its task and conducted the appropriate case work. The reports will be presented to the whole class - usually requiring the preparation of visual aids. The report outs provide the opportunity for different teams to discuss different "solutions."
- Norm data or standard set of information will be provided to bring all PATs to a common starting point for the next phase of the Process Improvement Model. Norm solutions are not necessarily the "correct" or only answer, but rather a typical answer - typical of what PATs develop with similar quality problems and background data.

There will be a series of case study activities assigned, each following the cycle described above. The activities will help the PAT understand the true nature of the quality problem. For the purposes of this class, your PAT will only have 5 days to accomplish what may take an average of 6-10 months to complete.

Designate members for the following roles:

- Team leader--rotate the role of leader after each exercise.
- Customer Requirements Recorder--a permanent individual who will detail the needs and values of the customers on a master list.

Case Study Introduction:

A major federal Agency (like Energy, DoD, Treasury, OMB...) faces a problem in responding to Congress and other agencies which need or demand information or decisions. The Agency has received some external complaints that its correspondence response time is too slow. There have been many more internal complaints among the executives and the Secretary. A third group of complaints comes from the authors or preparers of the responses for the Executive or Secretary-level offices.

The Organization has a typical federal structure:

Level 0	Secretary/Deputy Secretary	SEC
Level 1	Under Secretary (A, B, & C)	US
Level 2	Deputy Under Secretary (A, B, & C)	USD
Level 3	Deputy Assistant Secretary (A, B, & C)	ASD
Level 4	Directors (A, B, C, D, E & F)	ASD
Level 5	Support Activity/Offices (A, B, C, D, E & F)	Activity/Office

Case Study Introduction

An Executive Steering Committee (ESC) was established to deal with external issues and to investigate organizational goals. It established a Quality Management Board (QMB) to deal with the Overdue Correspondence problem.

Warm-Up Exercise*Exercise*

Objective: To learn organizational approaches to problem solving.

Purpose: To describe how your organization identifies and solves problems.

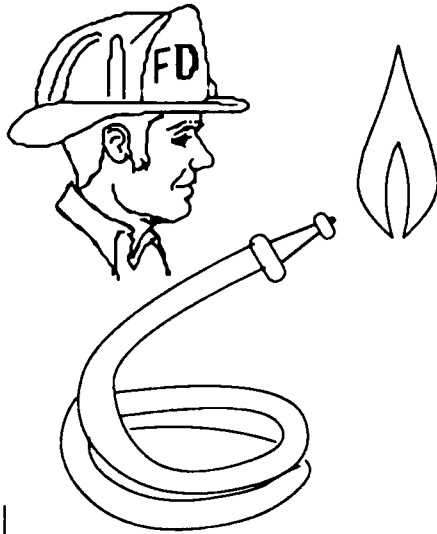
Process Improvement Model**DIRECTIONS:**

In a group, discuss problems you have seen solved in your organization. Describe, as best as you can:

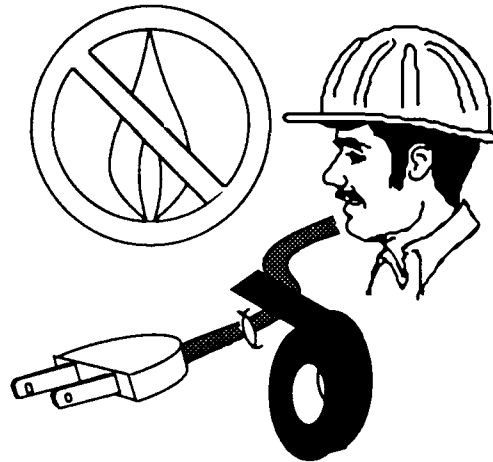
- How the problem was solved
- What type of group was formed
- Your role or role of others
- How long it took to solve
- What the results were
- The approach
- Reaction of workers

Be prepared to discuss your experiences with the class.

Differences Between a PAT and a Committee



Committee



PAT

Process Improvement Model

Understanding the differences between the traditional approach to analyzing and solving problems and the TQM method is important to understanding why you are here. A comparison of the two approaches follows:

COMMITTEE

Solve problems as they arise

Homogeneous set of High
Level Personnel

Mission

Members

PAT

Quality improvement of a root
cause

Heterogeneous set of Process
Owners (Supervisors,
Non-Supervisors); facilitator

Differences Between a PAT and a Committee

COMMITTEE

PAT

Analyze and remove symptom
(not necessarily root cause)

Process

PDCA Cycle with pilot testing

Usually "Standing"

Term

Disband after implementation

Communicates with superior
when assignment

Link to
Organization

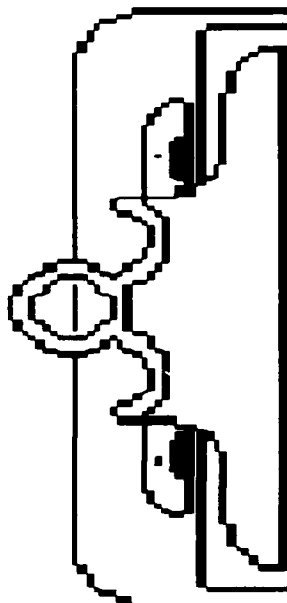
Communicates with ESC and
QMB when necessary

The instructor will now break the class into PATs. Your first activity will be to name your PAT.

Future Case study materials will be provided as needed.

MODULE THREE

**UNDERSTANDING QUALITY
IMPROVEMENT REQUIREMENTS**

Module Three Objectives

Upon completion of this module, the participant will be able to:

- Describe the characteristics of a well-written PAT Charter
- Develop a Customer Dialogue Plan to identify and collect information on customer requirements
- Analyze customer data to establish customer requirements and the criteria/standards used by the customer to define quality.

Understanding Quality Improvement Requirements

The purpose of this module is to provide participants with the requisite knowledge and practical methods to review and comment on a PAT Charter, develop a Customer Dialogue Plan and identify customer-based quality standards. All three activities will assist the PAT in scoping and defining the requirements for a process review. The results of these initial efforts will contribute greatly to the subsequent effectiveness of the PAT. Participants are reminded that a PAT has to spend a great deal of time initially to get a thorough understanding of what they have been chartered to do. Also, during this time, the team members are also getting to know each other and beginning to learn how to work together. For this reason, no attempt should be made to hurry through this initial activity.

Booz, Allen Process Improvement Model

Understanding
Quality
Improvement
Requirements

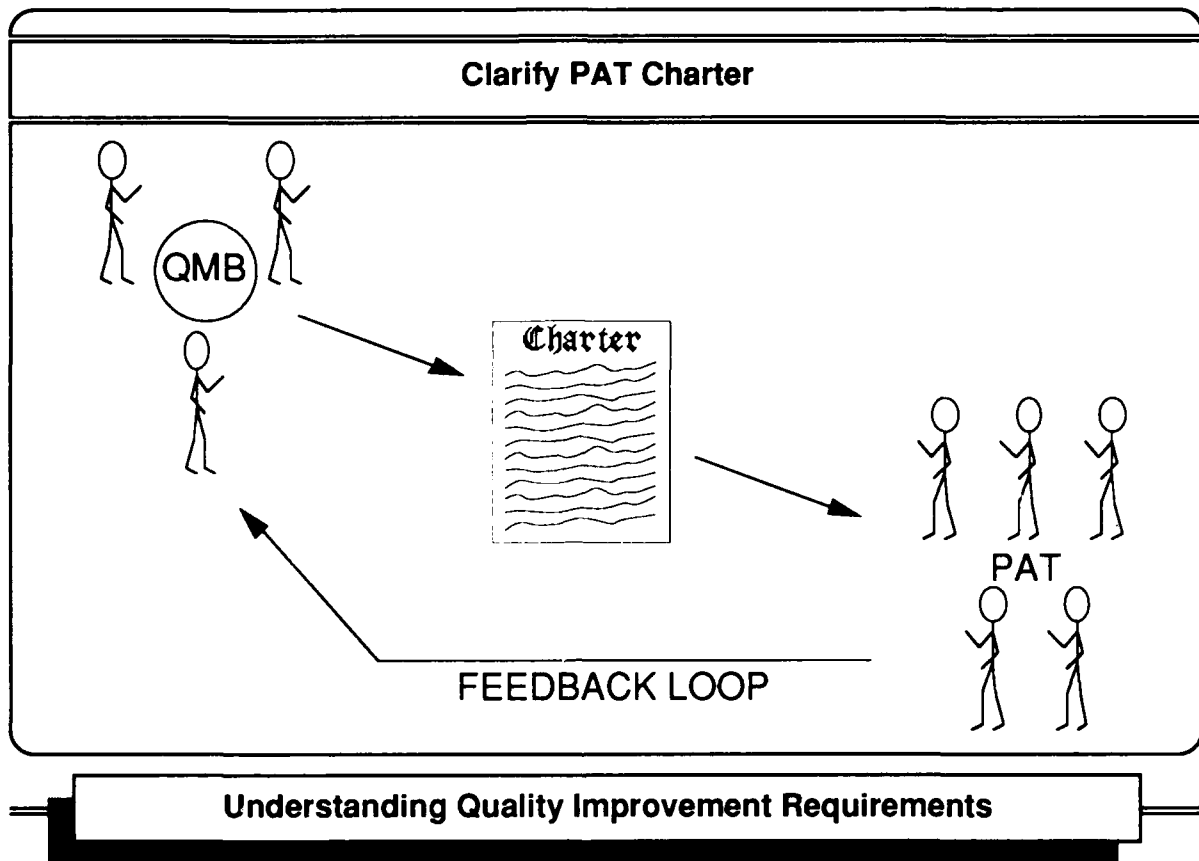
Learning
the
Process

Generating
and
Selecting
Solutions

Planning
and
Executing
Solutions

- Clarify PAT charter
- Develop customer dialogue plan
- Define customer requirements

Understanding Quality Improvement Requirements



The PAT's initial activity is to review the QMB's Charter which outlines what is expected of the PAT. The Charter includes an outline of the PAT's mission and supporting information to guide the PAT's action. The PAT team should study the reasons given by the QMB for investigating the problem area and determine whether the memo provides sufficient clarity to allow the PAT to begin work.

Clarify PAT Charter

The Charter document should include the following ELEMENTS:

1. Strategic goal
2. Problem statement
3. Customer requirements
4. Specific process description
5. Project goals
6. Success factors.

Understanding Quality Improvement Requirements

All members of the PAT should have a clear understanding of the Charter. Considerable discussion should be devoted to establishing a common understanding of terminology. If elements of the Charter are unclear and/or incomplete, the PAT should document these problems and seek a meeting with the QMB to clarify and/or re-define problem areas of the Charter. This dialogue between the QMB and PAT is the beginning activity for establishing the partnership necessary for achieving process improvement.

Clarify PAT Charter**ELEMENT DETAILS:**

1. Strategic goal
 - Vision
 - Contribution to organization's TQM mission
2. Problem statement
 - Specific problem
 - Delineates boundaries
 - Differentiates between system and process
 - Defines interrelationships

Understanding Quality Improvement Requirements

The QMB is responsible for preparing the PAT team for its work. The QMB should define a *Strategic Goal* or vision to describe how the project will support the organization's overall improvement efforts. For example, "The Agency's quality goal is to be the foremost model of inter-agency cooperation and be recognized as the leader in responsiveness. Your process action team's improvements will contribute significantly to our success."

The second element is the *Problem Statement* which assigns the PAT a specific problem to study and delineates the boundaries of the project. Remember the PAT team needs to focus on process improvement not system improvement. It is important to distinguish and isolate a process from the system. By focusing on a single process, you can identify inputs, outputs, and variables of the process and manage the improvement process. Every process is part of a system and you need to be sensitive to the interrelationships among processes within a system.

A process consists of inputs, a transformation of inputs (through machines, methods, materials, manpower, information or environment) and a desired outcome or output.

Clarify PAT Charter

A system can be defined as a complex collection of processes. Inherent in a system is the transaction process for handling communication and interaction between and among the individual output processes of the system. The more output processes there are in a system, the more critical and complex the transactional process.

Clarify PAT Charter**ELEMENT DETAILS:**

3. Customer requirements
 - Operational definitions
 - Measures of merit
4. Specific process description
 - Define functional start and end
 - Define levels of responsibility

Understanding Quality Improvement Requirements

An assessment of known *Customer Requirements* is a third element. The QMB should provide a listing of proper terminology and definitions of customer needs and satisfaction requirements in terms of operational definitions and measures of merits. The PAT will conduct an in-depth review of these requirements as part of their Charter review. More will be presented on operational definitions and measures of merits later in this module.

The QMB should also provide a *Specific Process Description* to provide the PAT with as much information as possible. The PAT should be expected to improve one process, but might be required to study several processes in order to understand the proper linkage of upstream and downstream functions. The QMB should also provide the data used to determine the Problem Statement and focus of the project.

Clarify PAT Charter**ELEMENT DETAILS:**

5. Project goals
 - QMB expectations
6. Success factors
 - ESC/QMB expectations
 - Customer expectations

Understanding Quality Improvement Requirements

Project Goals are the QMB expectations for the project. The goals should indicate the desired effects of the change in context of how it will impact the customer. Keep in the mind that ultimately, the QMB will make the decision to implement the necessary changes.

Success Factors are the criteria that the QMB or ESC will use to gauge the success of the process improvement effort. Moreover, the measures of merit outlined by the QMB and later refined by the PAT will be standards for assessing the effectiveness of proposed improvements.

Case Study 1-1**Clarify PAT Charter****Understanding Quality Improvement Requirements**

Develop Customer Dialogue Plan

Quality is defined by customer needs

- Converse with the customer to learn what they need
- Structure data collection effort with a Dialogue Plan

Understanding Quality Improvement Requirements

The second activity in understanding process requirements is to collect data on customer needs. The TQM philosophy stresses the importance of measuring quality in terms of customer requirements. Using the scientific methodology in data collection efforts is another tenet. The PAT should learn the importance of various steps in the process through structured interviewing. The interview questions should be discussed in some detail and several sample interviews should be accomplished to refine both the interview questions and the methods used to conduct the interviews. More will be covered on this later in the module. This activity will help the PAT gain knowledge of the desired quality of the product and develop customer-based standards for the process.

Develop Customer Dialogue Plan

"Needs" information should be collected in the following categories:

- Customer satisfaction
- Customer values
- Customer perceptions of strengths and weaknesses of process.

Understanding Quality Improvement Requirements

Each PAT must gather information on the customer requirements to decide how success will be measured. An investigation should begin with the level of customer satisfaction. Is the process satisfying the customer? The PAT should search for a link between what makes the customer satisfied with the process output. Second, the customer needs to be questioned on the valued components of the product. What does the customer value? This information will help the PAT eventually streamline the process steps. A final category is feedback on strengths and weaknesses. The customer should be asked what the process does best and worst.

Develop Customer Dialogue Plan

The Customer Dialogue Plan should include the following components:

- I Target Sources (Who)
Identify customers in key areas, junctures, and specific job types
- II Interview Protocol (What)
Design questions to gather meaningful data and information expressed in terms ready for analysis.
- III Technique (How)
Choose the most appropriate method for collecting data
- IV Results
Develop ways to quantify and analyze data to assist in translating the data collection results into Quality Criteria.

Understanding Quality Improvement Requirements

Each component will be discussed in the subsequent pages.

Develop Customer Dialogue Plan*1. Target Sources*

Choose personnel who form a "snapshot" of the customer requirements:

- Key functions
- Key junctures
- Various levels of responsibilities
- Internal and external

Understanding Quality Improvement Requirements

The PAT should review the documentation provided by the QMB on the process description. Following this, the team should analyze the organizational structure to identify personnel in the process chain who represent key functions and junctures at various levels of responsibilities. Personnel should be chosen by who can help develop a "snapshot" of the customer relationship(s) with the process. This can include both external and internal customers whose work depends upon what the process produces.

Develop Customer Dialogue Plan*// Interview Protocol*

Structure is important in all phases of the interview design. The same questions or topic areas should be addressed to each applicant. Standardization will help the PAT in the analysis of the data.

- Focus on three categories:
 - Customer satisfaction
 - Customer values
 - Customer perceptions of strengths and weaknesses of process
- Design questions to differentiate between perceptions and reality
- Train interviewers
- Pilot interview protocol.

Understanding Quality Improvement Requirements

An interview protocol is necessary to guide the review of customer requirements. Ask yourself, what type of data will help you understand customer needs? Design questions to gather meaningful data and information expressed in terms ready for comparative analysis. Focus on generating responses that include quality standards, benefits or values, and performance assessment. Scoring guides for all questions make the results more reliable and easier to analyze. Questions should be open-ended and terminology should be clearly defined. Also, the possibility of obtaining perceptions and factual information should be taken into account. The PAT should hone the questions to differentiate between personal opinions/judgements and reality. In addition to verbal responses, customers should be asked for reference materials.

The interviewers should be trained to ensure compliance with the structure of the interview process. Variability in conducting the interviews will decrease the validity and commonality of the data. Consistency can be obtained through training and practice. Moreover, the questions should be piloted to verify, clarify, edit and proof the material. This activity will help the PAT assess the effectiveness of the questions and resultant data, and gain valuable interviewing practice.

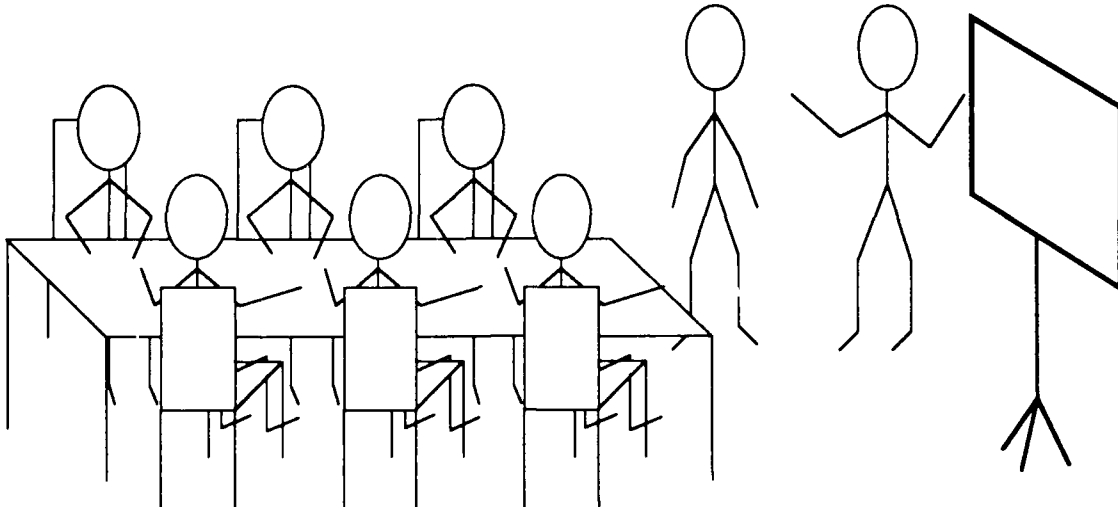
Develop Customer Dialogue Plan*III. Techniques*

There are three recommended methods to obtain the customer's needs. Interviewing techniques include:

- Focus groups
- Personal (one-to-one) interviewing
- Surveying.

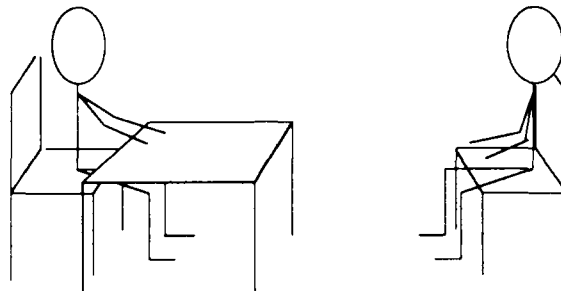
Understanding Quality Improvement Requirements

Once the PAT has designed an investigation plan, team members need to determine the most appropriate method of data collection. All data collection plans have to consider sampling techniques that will factor bias. The PAT should acquire the assistance of a capable statistician to help in the sample design. Each technique will be detailed in the subsequent pages.

Develop Customer Dialogue Plan*III. Techniques:
Focus Groups***Understanding Quality Improvement Requirements**

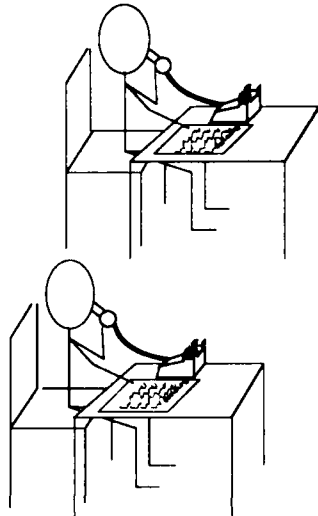
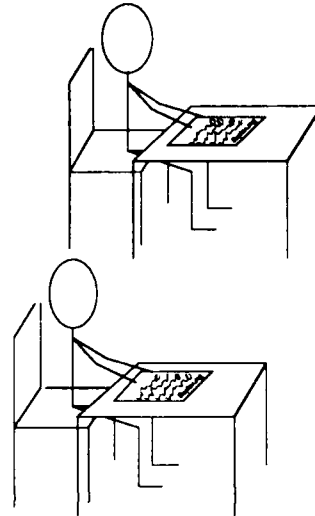
Focus groups enable data collectors (PAT team members) to hold a discussion with a cross-section of process customers. Membership in a focus group should depend upon a person's relationship to the topic area rather than the relationship to the organization. For example, if a PAT team is studying the recruitment system for attracting women, their focus group members should represent a group of women of the target age and demographic background that they are interested in learning about.

Focus group discussions usually begin with well-stated limitations on their scope. The facilitator of these discussions needs sensitivity and experience to encourage broad participation while keeping the discussion on target. Careful and intelligent note-taking and analysis make a critical difference in the effectiveness of the discussions. Usually, a focus group should consist of approximately 10 people.

Develop Customer Dialogue Plan*III. Techniques:
Personal (one-to-one) Interviewing***Understanding Quality Improvement Requirements**

The personal interview allows for a wide latitude of individual responses to your interview protocol beyond what might be possible from a focus group. It is highly appropriate when the selected interviewees (customers) are experts. Explanations should be probed and expanded in this type of information gathering to gain comprehension of the full range of thinking behind the answers. In order to conduct personal interviews effectively, the interviewers (PAT team members) need to practice their interview techniques.

Personal interviews fit well in initial data collection efforts to obtain both qualitative and quantitative information in-depth from a small number of experts. In addition, this activity will enable the PAT to establish a positive and constructive customer dialogue.

Develop Customer Dialogue Plan*III. Techniques:
Surveying***Telephone surveys****Written Surveys****Understanding Quality Improvement Requirements**

In general, if you want to reach a large sample of any customer population, surveys are the most economical. For in-depth response to a limited number of topics, a telephone survey may be used. This method is primarily advantageous in rapidly obtaining answers to open-ended questions from a moderately large number of respondents. For this reason it may be an economical substitute for focus groups in doing qualitative research about customer views of quality products and processes. It is also possible to obtain ratings and comparative rankings of products from other similar functional organizations or departments.

One disadvantage to this method is the limited amount of time you can expect respondents to allow for answering questions on the telephone. In addition to the "Customer Dialogue Plan" preparation for the interviews, telephone interviews may require attention to sampling methodology if the sample results will be used to make inferences about a large population which respondents are intended to represent.

For a large sampling, written surveys may be the most economical. This technique is especially appropriate for obtaining rankings and ratings of quality products and processes using structured formats and response scales. Written surveys are

Develop Customer Dialogue Plan

less applicable than other methods of qualitative research, although they may include open-ended questions that may be subjected to content analysis in tabulating the survey results.

Several disadvantages with written surveys are their limited length, differential response can undermine sample representativeness when typical response rates hover around 40% or less, and the time it takes to prepare, administer and tabulate the data. Nevertheless, when telephone or one-to-one interviews are not feasible and a large population of responses is required to develop your customer definitions/measurements, the written survey technique is recommended.

Develop Customer Dialogue Plan*IV. Results*

- Conduct content analysis of interview data
 - Develop answers to your questions
 - Identify trends or patterns
 - Discriminate between facts and attitudes
- Combine interview data with QMB data collection findings
- Establish list of Quality Criteria or attributes for defining customer requirements.

Understanding Quality Improvement Requirements

From the initial data, identify the Quality criteria or attributes that your team will use to determine if the process is currently meeting customer requirements. The standardized questions should produce responses that can be aggregated into trends or patterns. While conducting the analysis, the PAT should analyze the data to differentiate between facts that help measure quality and attitudes which help measure satisfaction. Be cautious in using perceptions to appraise process functions. Quality Criteria are the types of things the team would want to monitor or measure, e.g. time of processing, days overdue, frequency of actions, length of activities, etc. Translating the raw data into a list of Quality Criteria will require clear guidelines, group discussion, and group decision-making to draw the appropriate conclusions.



Case Study 1-2

**Develop Customer
Dialogue Plan**

Understanding Quality Improvement Requirements

Define Customer Requirements

The list of Quality Criteria generated through analysis of collected data will enable the team to define customer requirements to support the system and meet the QMB's goals. Two types of measures are operational definitions and measures of merit:

- **OPERATIONAL DEFINITIONS** -- a description of a Quality Criteria (attribute) in terms of what is considered acceptable by the customer (**MEASURE OF MERIT**).

Understanding Quality Improvement Requirements

The needs of the customer should represent the process goals. After gaining a more thorough understanding of the quality improvement requirements through the customer dialogue, the team can now develop operational definitions and measures of merit. This activity will calibrate the process in terms of baseline or benchmark measurements.

In the knowledge work area, definitions of quality are more difficult to identify. For example, what is a good operational definition of a quality policy paper. Even more difficult is what measures of measure of merit will be used to determine if the policy is a good one. You will have to wrestle with these difficulties as you work through the case study.

Define Customer Requirements*Operational Definitions*

Establish a link between the Quality Criteria (necessary attributes in producing a quality product) and a satisfaction level (quantifiable measurement) that meets customer requirements.

- Convert the Quality Criteria into an operational definition statement with a measure of merit or standard.

Quality Criteria

Deliverable should not be late

Operational Definition

Deliverable should not be received 1 (one) day after the deadline

Understanding Quality Improvement Requirements

The Quality Criteria should provide sufficient information to conduct this activity. Operational Definitions are not subjective but specific quantifiable descriptions of basic product attributes. Understanding a measure is not the same as defining a measure. For example, "comfortable" is an understanding and "The office has standard florescent lighting, unstained carpet that is less than three years old, quiet enough to not hear telephone conversations of the person working next to you, and has a temperature of 85 degrees" could be an operational definition. The measure of merit are acceptable customer requirements, in this case: three years old and 85 degrees.

A second example of the conversion process: The Quality Criteria is a person requesting information is given the information in a timely manner. This might be operationally defined as a person requesting the information is given the information in less than five minutes on the first call with only one extension transfer.

A third example of the conversion process: The Quality Criteria is phone calls must be "processed" "on-time". A definition for "on-time" must be developed. Does "on-time" mean within seconds, minutes or hours?

Define Customer Requirements

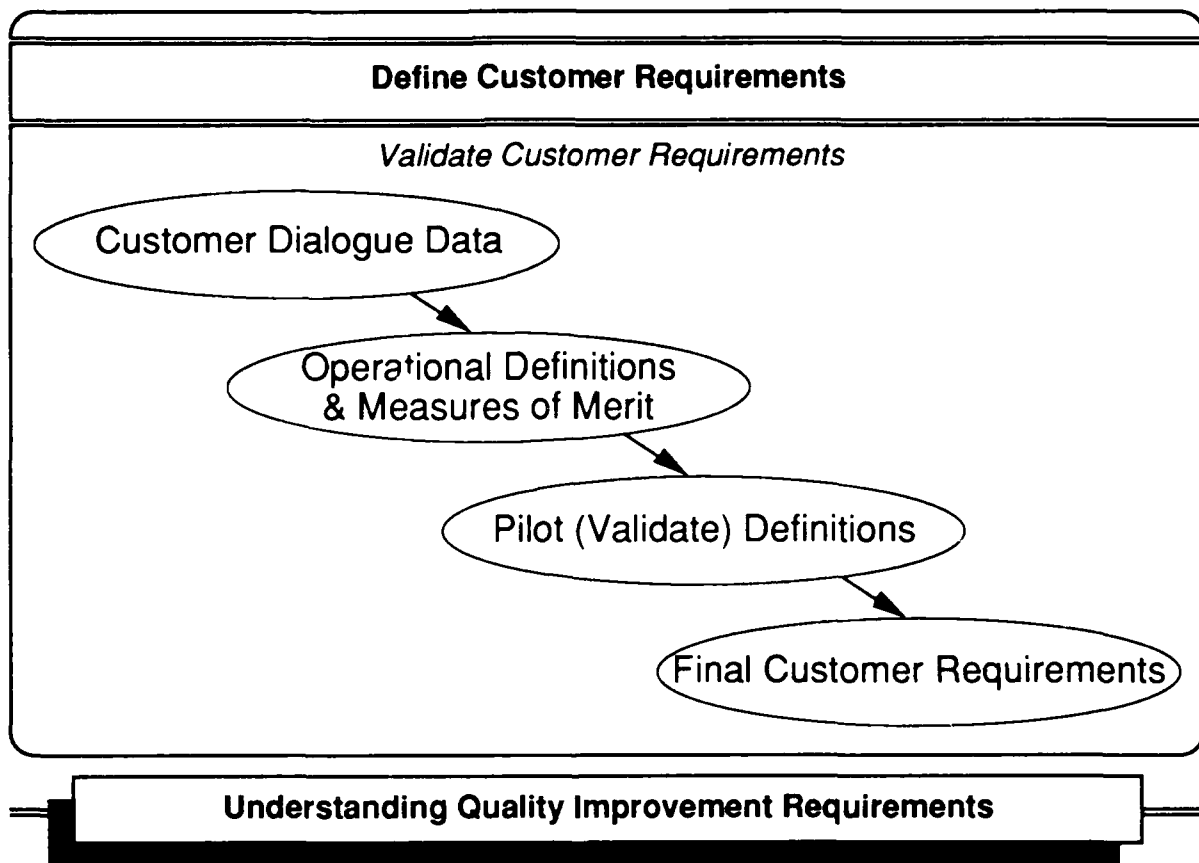
Also, a more detailed description of the process should be written for "process". Does process mean that a phone call is answered, transferred or returned?

A final example that is applicable to a knowledge-worker environment is: The Quality Criteria is a memo sent to headquarters reads well and requires minimal clarification. This might be operationally defined as a document is written at reading level of 12th grade and follow-up dialogue is limited to 5 items or less.

Case Study 1-3

Define Customer Requirements

Understanding Quality Improvement Requirements



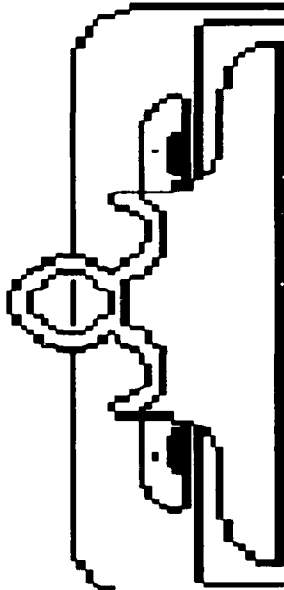
Obtaining feedback on the team's conclusions will ensure that the PAT will be using effective and appropriate measures for evaluating process improvements. Subject the operational definitions and measures of merit to field testing at the level where the process work is accomplished to validate your conclusions. It is important to develop accurate measurements to allow for realistic comparisons of the baseline or benchmark customer requirements and the process capability. The PAT should accomplish the validation activity through direct interviews rather than sending out for comments.

In summary, the PAT has defined and detailed their charter, has developed a customer dialogue plan and analyzed customer data to establish customer requirements and the criteria/standards used by the customer to define quality. The PAT is now ready to learn the process which is the focus of Module Four.

MODULE FOUR

**LEARNING THE
PROCESS**

Module Four Objectives

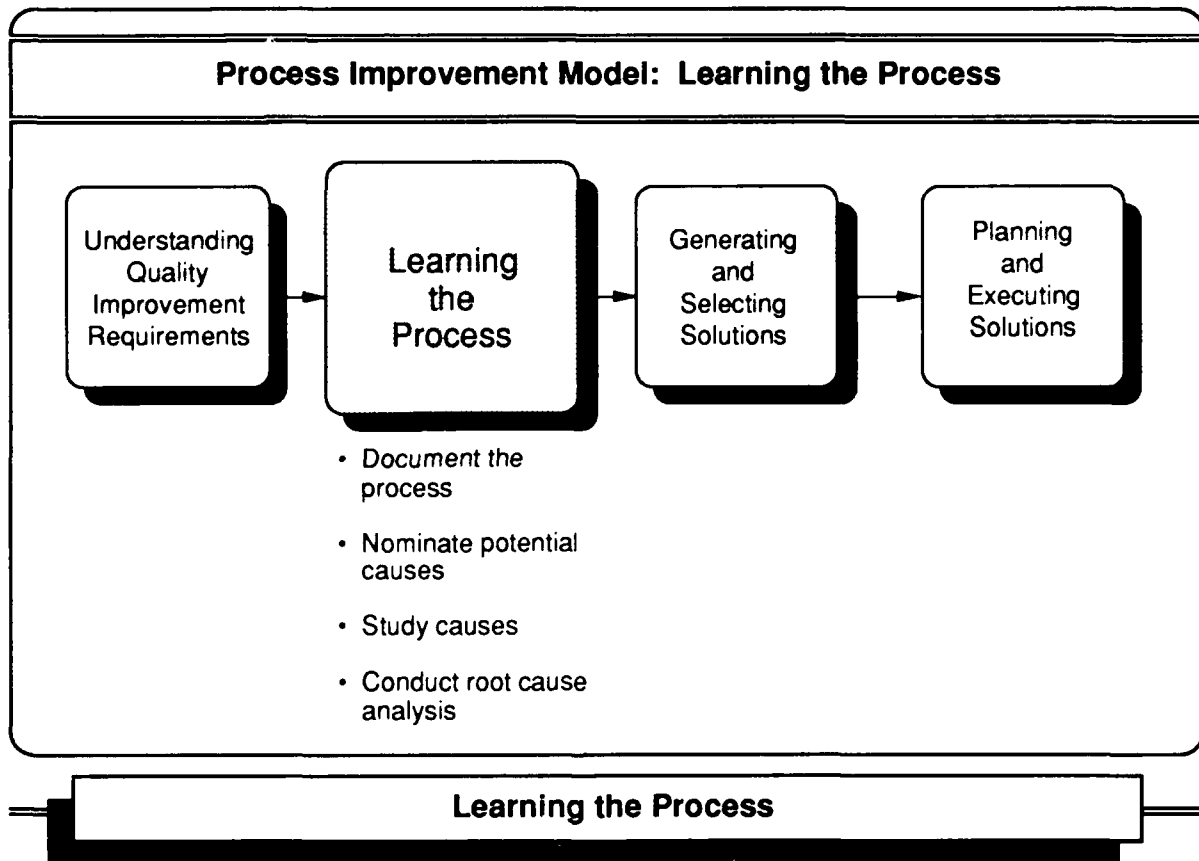


Upon completion of this module, the participant will be able to:

- Describe the four steps in the learning phase of the process improvement model.
- Document a process, using flow charting techniques.
- Nominate potential causes, using cause and effect diagramming.
- Develop a plan to study causes.
- Analyze data to discriminate symptoms from root causes.
- Conduct a root cause analysis.

Learning the Process

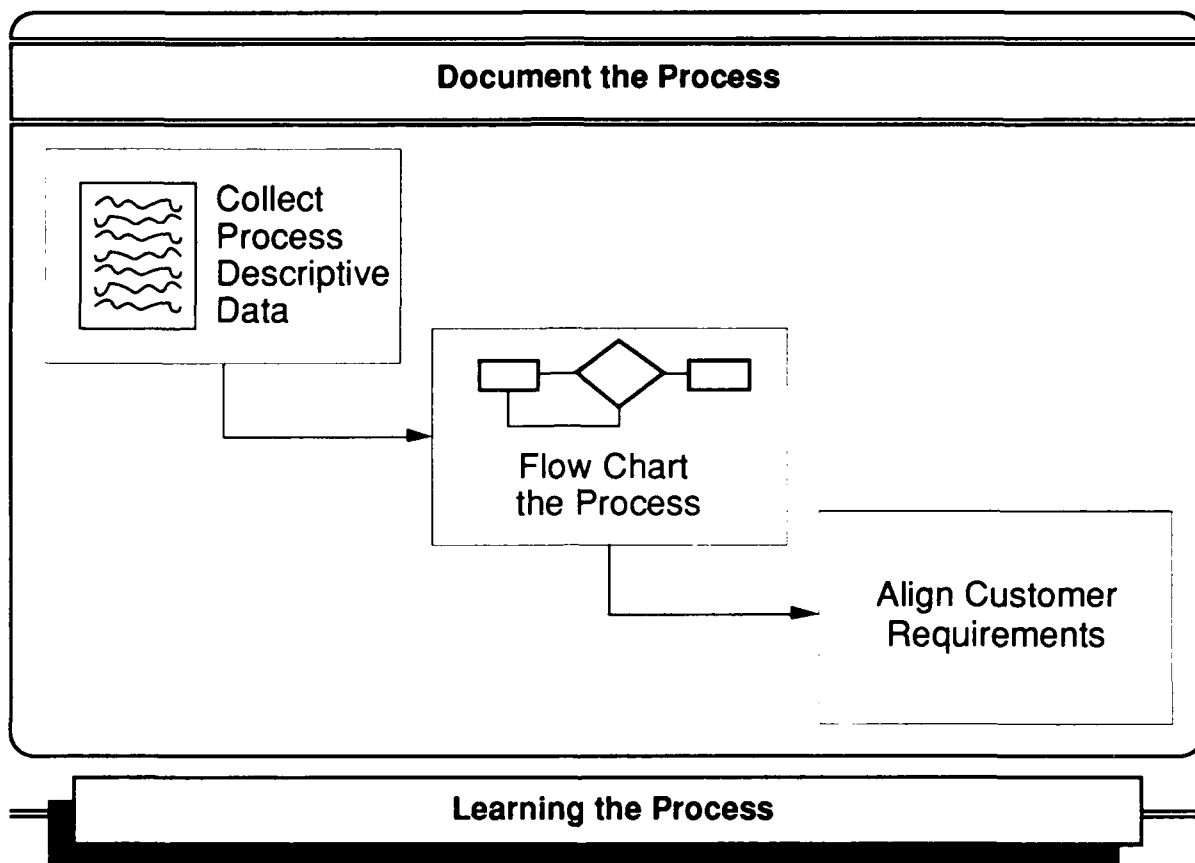
- This module describes Phase III, Learning the Process, of the process improvement model.
- Upon completion of this module, you will be able to describe the four major steps in the learning phase, and apply the concepts in a practical process improvement experience.



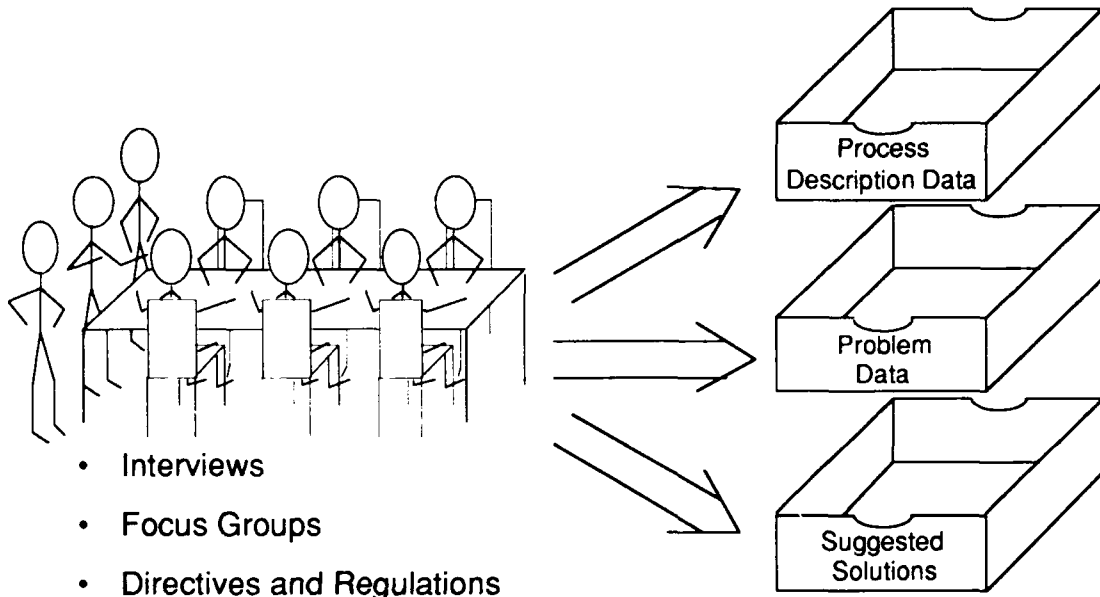
- Learning the process is critical to the process improvement cycle. Though time intensive, this phase provides the foundation for generating and selecting solutions which attack root causes.
- The first step is to document the process. Flow charting the process clarifies the current operation of the process and provides a baseline for improvement.
- After documenting how the process currently operates, the next step is to identify potential causes of problems in the process. Cause and effect diagramming is a useful tool for generating a group list of potential causes.
- The third step is to study or validate potential causes to discriminate between symptoms and root causes. The steps for studying the causes are:
 - Develop a study plan.
 - Collect the data.
 - Analyze the data.
 - Repeat the learning process (with a refined focus area based on the data analysis).

Learning the Process

- The final step is to conduct a root cause analysis. First, generate a list of root causes based on the study data. Then, conduct a root cause audit to determine where root causes impact the process. The root cause analysis will provide the foundation for generating and selecting solutions.



- The first step in learning about the process is documenting the process as it currently operates.
- Documenting, or *baselining*, the process ensures that each member of the PAT understands how the process operates, and that the process will be measured in its operating state.
- It is critical that the process be documented as it "is," not as it "should" operate. Later in the process improvement cycle you will document the optimal flow. An accurate documentation of how the process currently operates will allow you to identify improvement opportunities by identifying gaps between the optimal flow and the current flow.

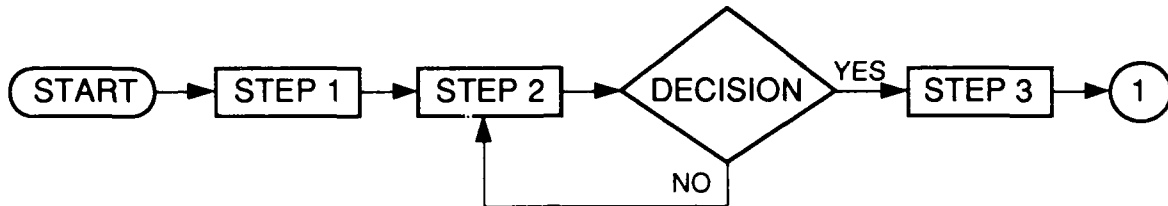
Collect Process Descriptive Data**Learning the Process**

- The first step in documenting the process is to gather information about how the process operates. There are a number of methods available to collect the data, including interviews and focus groups. You also need to check directives and regulations to determine how they impact the process.
- It is important to gather data from a variety of perspectives. Talk to the people directly involved in the process, and also to customers and suppliers. It is your role as a PAT to reconcile the different perspectives to document what "is."
- As you talk to people, you may find it difficult to limit the discussion to "pure" descriptive data about the process. You may hear about all the problems with the process and suggested solutions to improve the process. Remember, you are attempting to document the process as it currently operates. Problem data or suggested solutions may taint an accurate process description. However, as long as you have your audience captured it is best to capitalize on the situation to gather other data for later use.

Learning the Process

- To manage the data collection and interpretation process, you may find it useful to *categorize* the data as follows:
 - Process descriptive data
 - Problem data
 - Suggested solutions.

Categorizing will allow you to quickly access the descriptive data to document the process, while archiving the other data for later use.

Flow Chart the Process

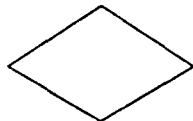
A flow chart is diagram of the steps in a process and their interrelationships.

Learning the Process

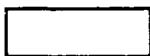
- After collecting process descriptive data, the next step is to flow chart the process.
- A flow chart consists of a few geometric symbols (rectangles, diamonds, etc.) connected by arrows that indicate the direction of flow of the process.
- A symbol may represent:
 - The beginning or end of the process
 - A process step
 - A decision point
 - A reference to a subprocess or continuation of the process
 - Any aspect of the process (for example, inspection or transportation).

Flow Chart the Process*Creating a Flow Chart*

- **Flow charts do not need to be complicated.**
- **As few as four symbols can be used to create a good flow chart:**

**Learning the Process**

- The following four symbols are the basic symbols needed to create a flow chart:



Activity Symbol: Indicates one activity, or step, in the process.



Decision Symbol: Indicates a point at which the process branches.



Terminal Symbol: Identifies the first or last step in a process. Usually contains the words "start" or "stop," or "begin" or "end."



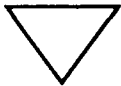
Connector: Indicates that the process continues elsewhere. You can use this symbol to continue a process on another page or to reference a subprocess diagrammed on another chart.

Learning the Process

- Other symbols that may be used include:



Transportation Symbol



Storage Symbol



Document Symbol

R

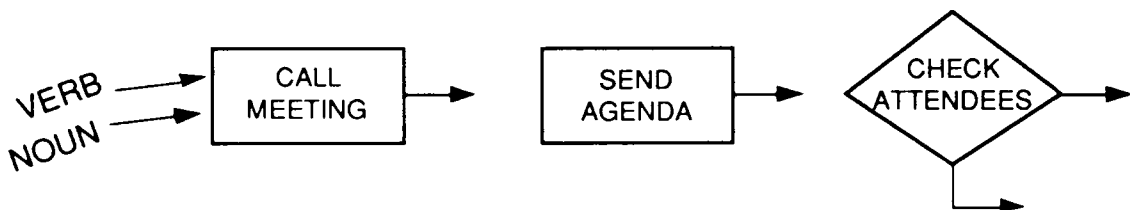
Rework Symbol

D

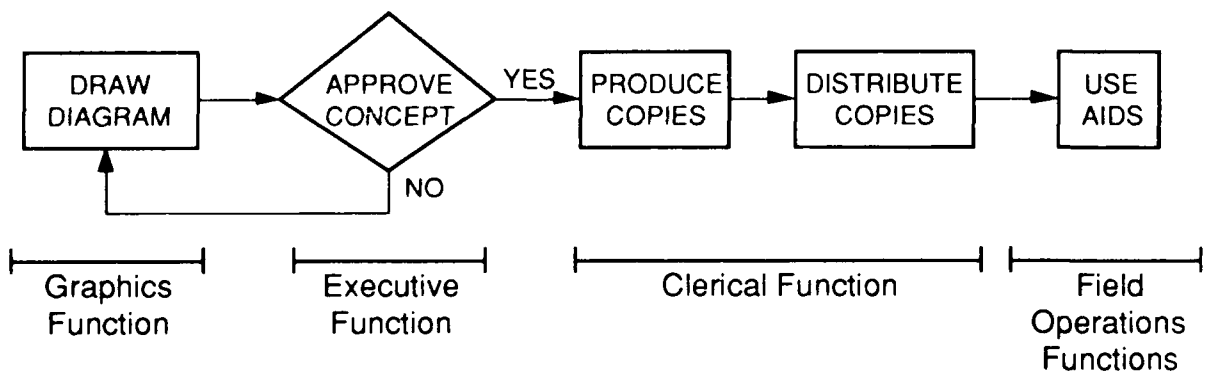
Delay Symbol

CONVENTIONS

1. Use the verb noun rule.

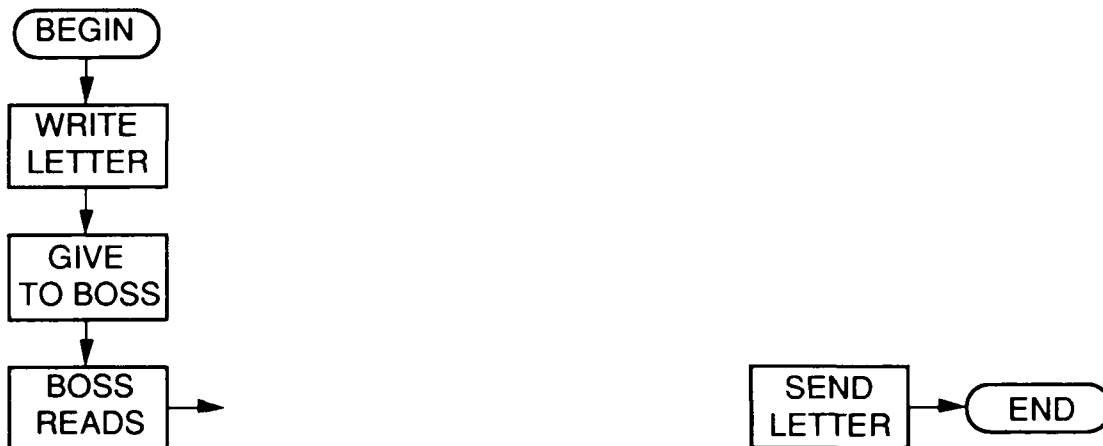


2. Focus on process, not functions. Large processes often pass through the organizational functions of departments.



Flow Chart the Process*Quick Flow Chart Exercise*

FINISH THIS CHART:

**Learning the Process**

- Some items do not keep the same order each time
- Some steps do not occur every time
- Sometimes new ideas generate new approaches.

HINT: Begin with a process flow worksheet, then chart it.

Flow Chart the Process*Process Flow Worksheet*

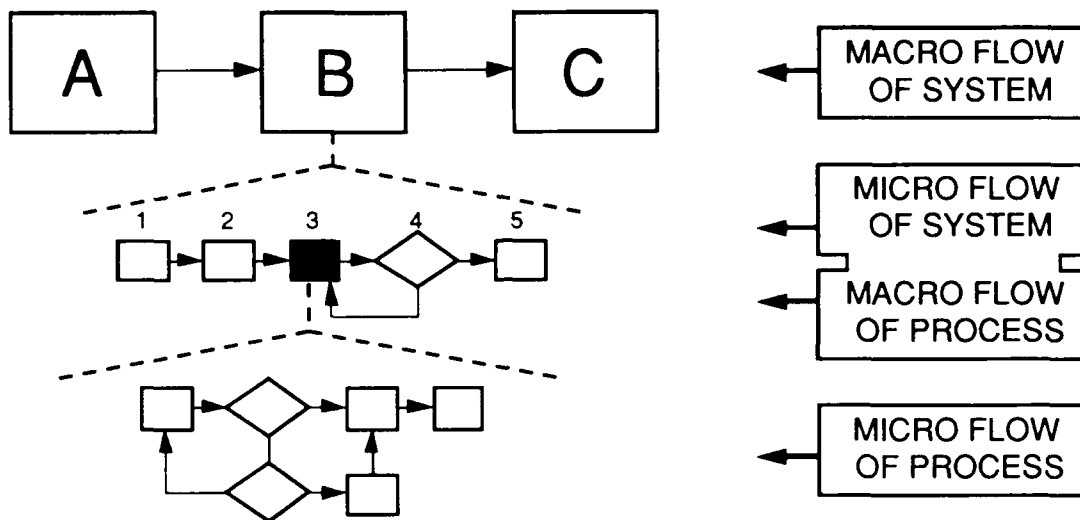
#	Step Description	Symbol	#	Step Description	Symbol

Learning the Process

- Do not begin charting a process flow by drawing the flow chart.
 - Processes are often more complex than anticipated and beginning with the flow chart can be messy and frustrating.
 - Listing the steps of the process first makes flow charting easier.
- Begin creating your flow chart by using a process flow worksheet like the one shown above.
 - Write down the steps in the process in the order in which you think of them.
 - After listing all steps, assign a sequence number to each. Write these numbers in the left column of the worksheet.
 - Then, using the right column, assign a flow charting symbol to each step.
- After completing the process flow worksheet, sketch the flow chart.

Flow Chart the Process

A System is a Series of Processes



Learning the Process

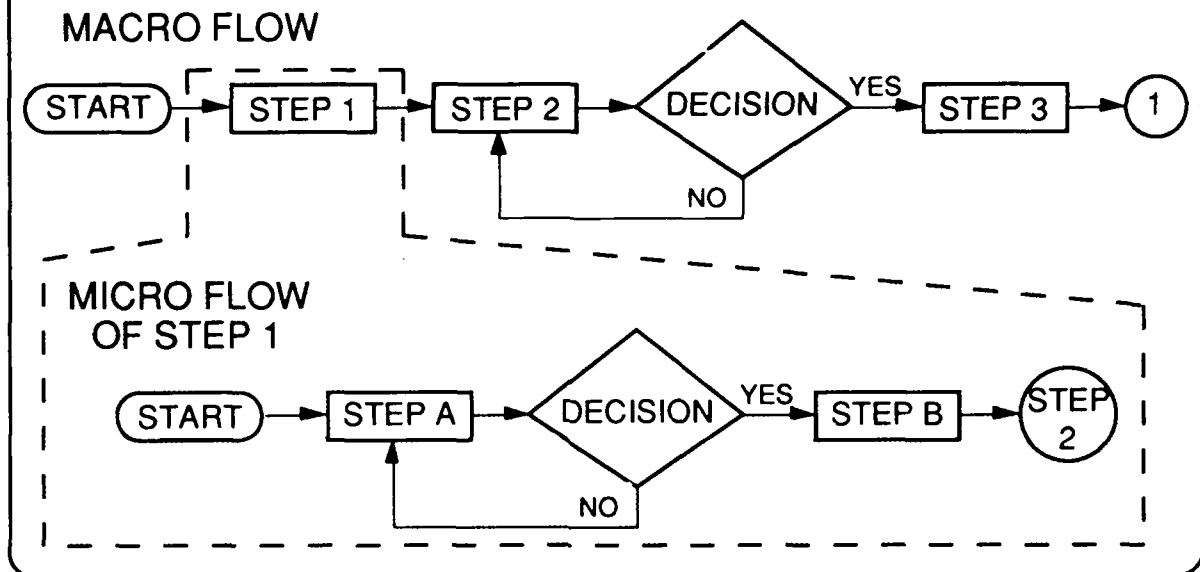
Macro-Micro Quiz:

Questions:

1. The "Big Picture" would a (?) diagram?
2. The workers procedures would a (?) diagram?
3. The middle managers view would be a (?) diagram?

Answers:

- a. macro system
- b. micro system
- c. macro process
- d. micro process

Flow Chart the Process*Macro and Micro Flow Charting***Learning the Process**

- It often is beneficial to begin the flow charting process by charting the major, or high-level, steps in a process. This type of flow chart is called a *macro flow chart*.
 - Macro flow charts help you determine and sequence the high-level steps in a process without becoming immediately involved in the detailed procedures.
 - Macro flow charts also help simplify each chart, making them easier to follow.
- Charts of more detailed, or low-level, procedures in a process are called *micro flow charts*.
- Each major step in the macro flow chart should be represented in a micro flow chart.
- A highly complex task may have more than one layer of micro flow charts.

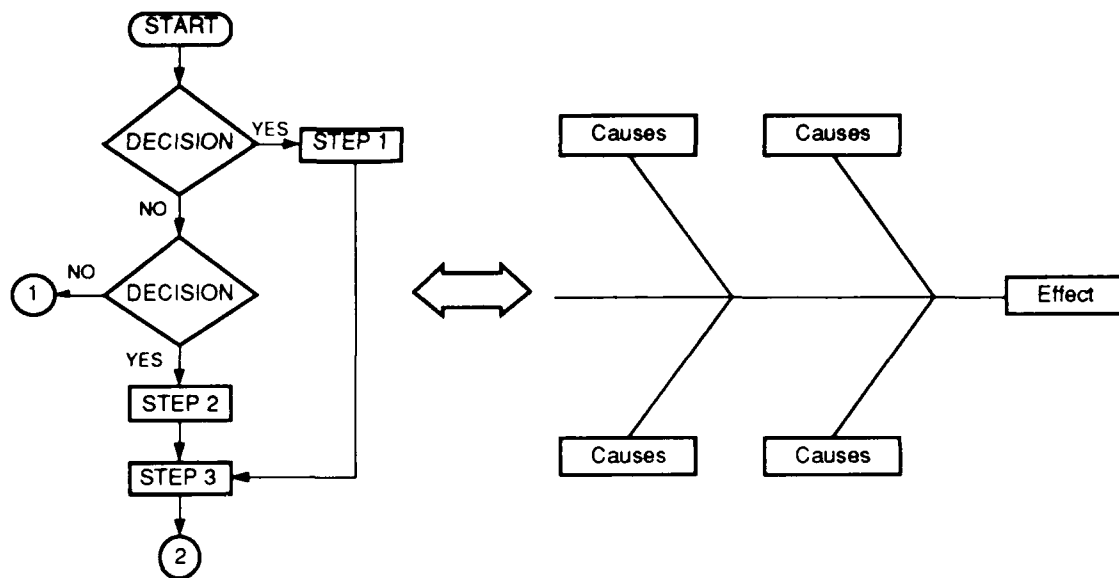
Align Customer Requirements

Customer Requirements	STEP A	STEP B	STEP C	STEP D
CR 1	•		•	
CR 2		•		
CR 3		•		
CR 4			•	•
CR 5	•	•		
CR 6	•	•	•	•

Learning the Process

- The next step in documenting the process is to align customer requirements to the process. Ask yourself, "where are customer requirements *currently being met* in the process?"
- It may be helpful to use a matrix to align the customer requirements with the process steps.

Case Study 2-1**Flow Chart the Process****Learning the Process**

Nominate Potential Causes**Learning the Process**

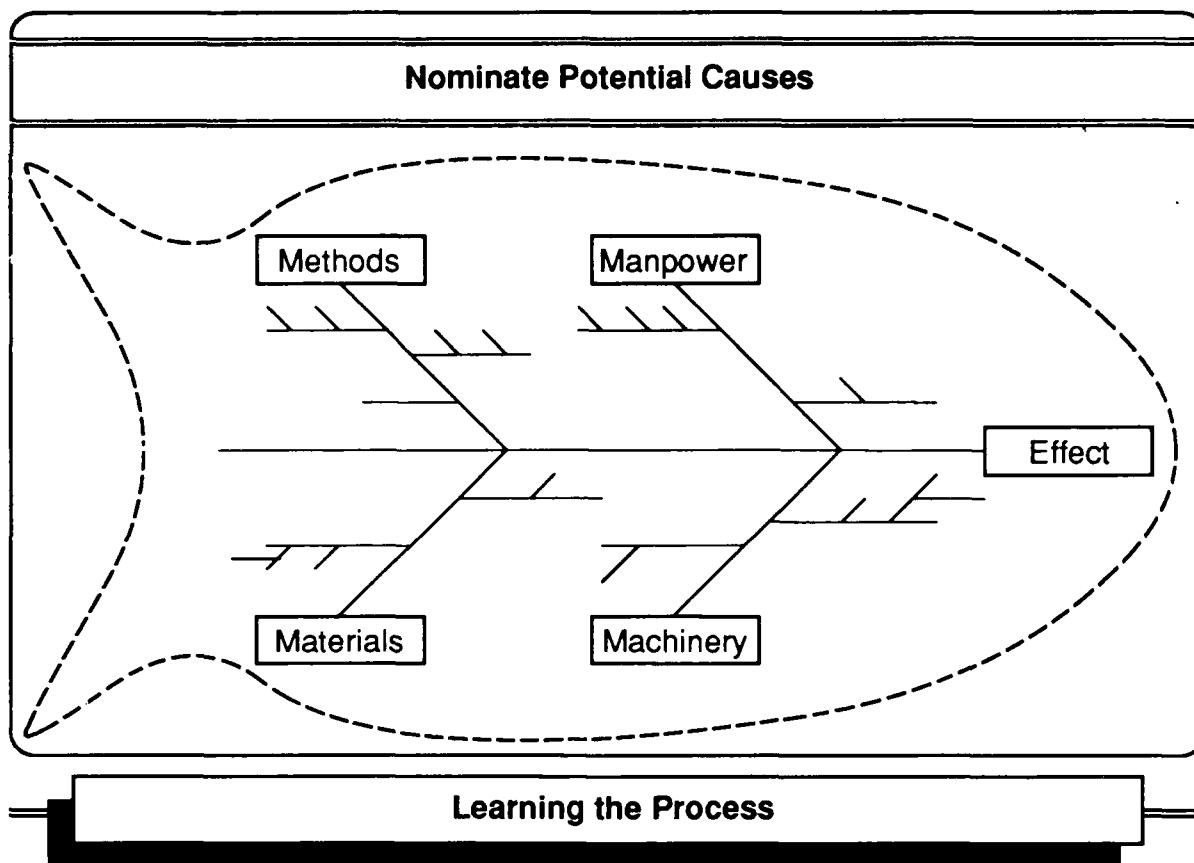
- After documenting the process, the next step is to nominate potential causes for an effect or problem.
- Flow charts can be used to identify effects to be analyzed through cause and effect diagramming. Examine the flow chart for complex looping arrangements, dead ends, and other indications of process inefficiencies. Then develop a cause and effect diagram.

Nominate Potential Causes***CAUSE AND EFFECT DIAGRAM:***

A graphic representation of the relationships between some "effect" and the possible causes of that "effect."

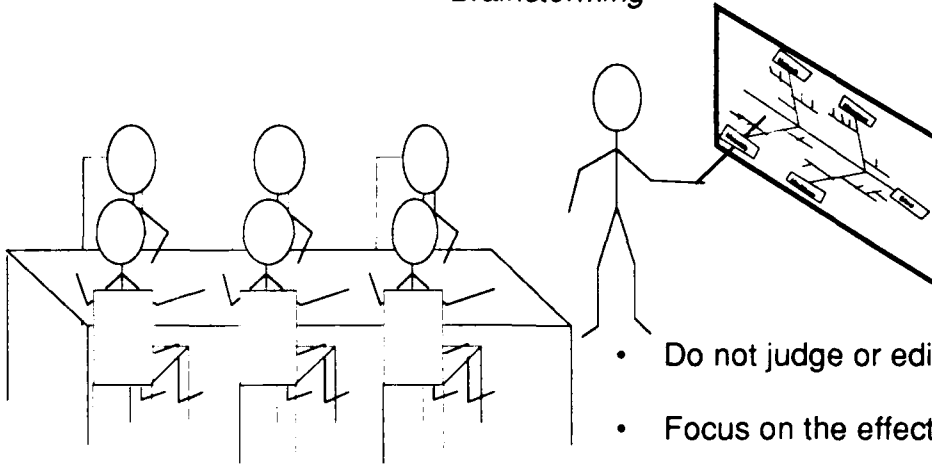
Learning the Process

- The cause and effect diagram is a process analysis tool used to nominate possible causes for some "effect" or problem in a process.
- The cause and effect diagram also illustrates the relationships between the possible causes and the effect.
- The *effect statement* (description of the effect being studied) should be an unambiguous, unsuggestive description of a problem or situation.



- The cause and effect diagram sometimes is called a fishbone diagram because its branching pattern resembles the skeleton of a fish. It also is known as an Ishikawa diagram, after Kaoru Ishikawa, a quality authority who pioneered its use in identifying causes of work process variation.
- By illustrating the relationships between some problem or effect and its possible causes, the cause and effect diagram aids in:
 - Analyzing complex interactions
 - Identifying specific potential causes of a problem
 - Generating potential solutions to a problem.
- Methods, Manpower, Material, and Machinery -- or the four Ms -- are major categories of possible causes often used in a cause and effect diagram. Any category may be used, however. Four categories often used in administrative areas are Policies, Procedures, People, and Plant -- the four Ps.¹

¹ G.O.A.L., The Memory Jogger: A Pocket Guide of Tools for Continuous Improvement, (Lawrence, MA: G.O.A.L., 1985), p. 21.

Nominate Potential Causes*Brainstorming*

- Do not judge or editorialize.
- Focus on the effect statement.
- Encourage the involvement of all team members.

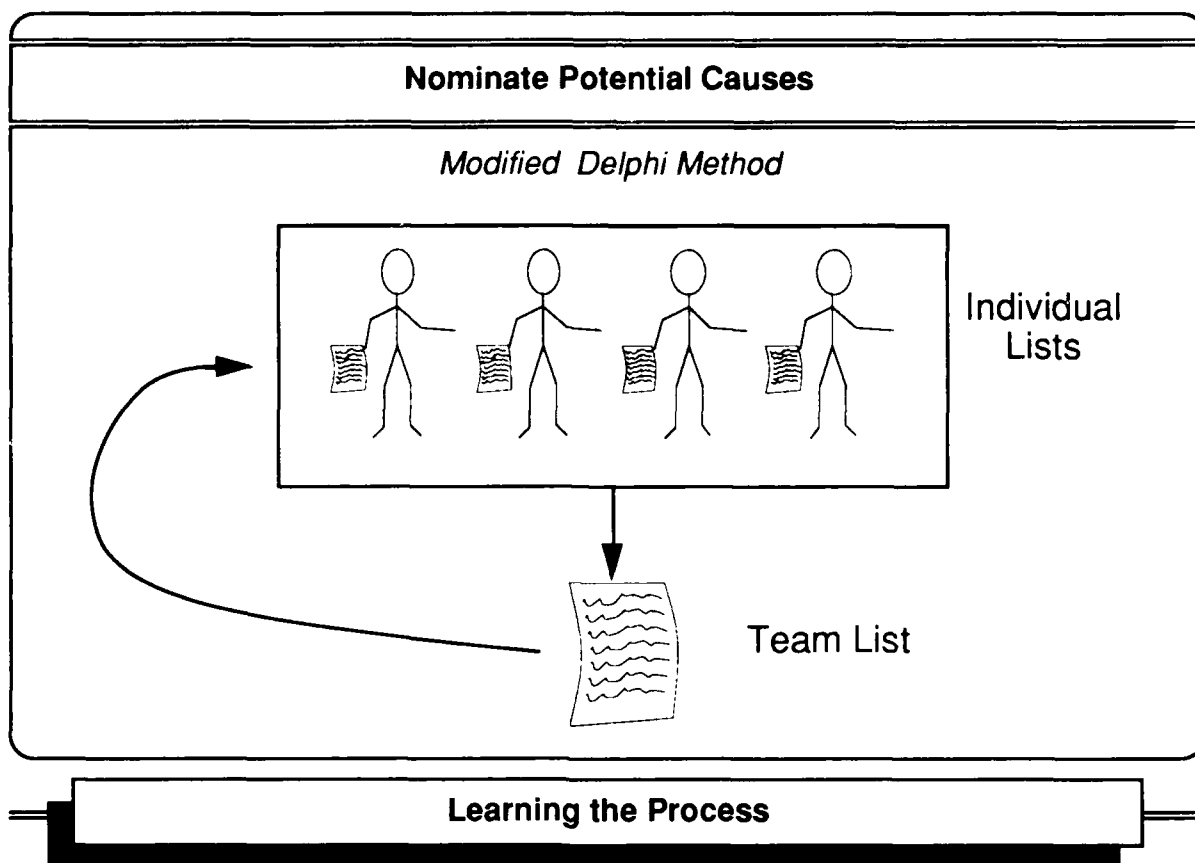
Learning the Process

- Cause and effect diagramming is combined with brainstorming to:
 - Generate a large number of potential causes
 - Encourage cooperation among people involved with a process
 - Utilize the knowledge of all people involved with a process
 - Focus attention on a specific problem
 - Structure discussion to stimulate thinking and encourage creativity
 - Increase knowledge of a process.
- There are a number of group brainstorming techniques, including the modified Delphi Method, Nominal Group Technique, and free-form brainstorming method. These methods offer varying degrees of structure. More mature groups can use brainstorming techniques with less structure. Regardless of the level of structure, successful brainstorming sessions are characterized by these attributes: a non judgmental atmosphere, focus and full-team involvement.
 - *Non judgmental atmosphere.* The session should focus on ideas, not people. The team leader should discourage personal judgment and criticism of

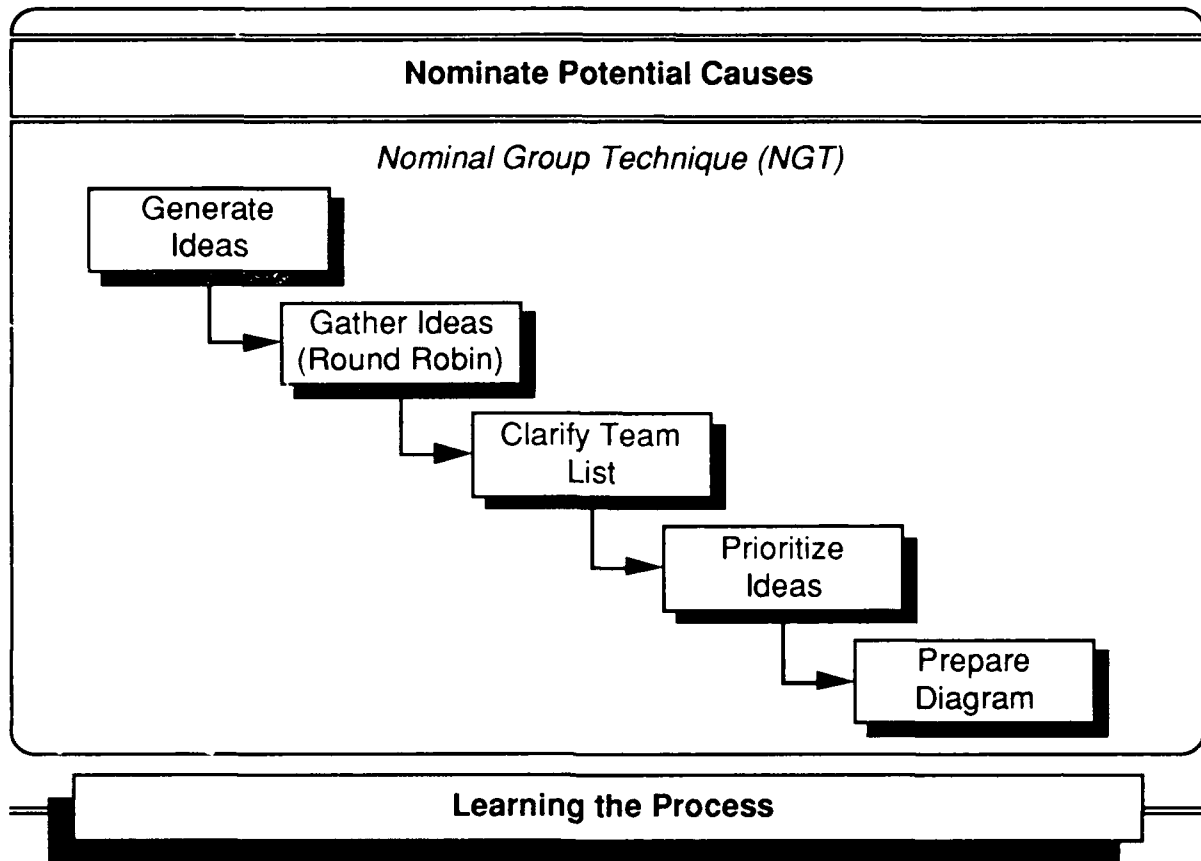
Learning the Process

other's ideas. With controversial issues, more structure may be required to achieve a non judgmental atmosphere.

- *Focus.* However, the leader should ensure that all suggestions are within the scope of the effect statement.
- *Full-team involvement.* All team members should be encouraged to participate. Newly formed groups or groups with mixed ranks (civilian and military), may require more structure to reduce intimidation.



In the modified Delphi method, each member of the group lists, by category, causes for the identified problem and submits his list to the group leader or facilitator. The group leader redistributes the lists so that group members are exposed to the ideas of others. Each member submits another list based on his reaction to the list of his peer. The group leader redistributes the lists several more times and collects all of the lists. He then creates a cause and effect diagram from the group input and calls a meeting to discuss and finalize the diagram.

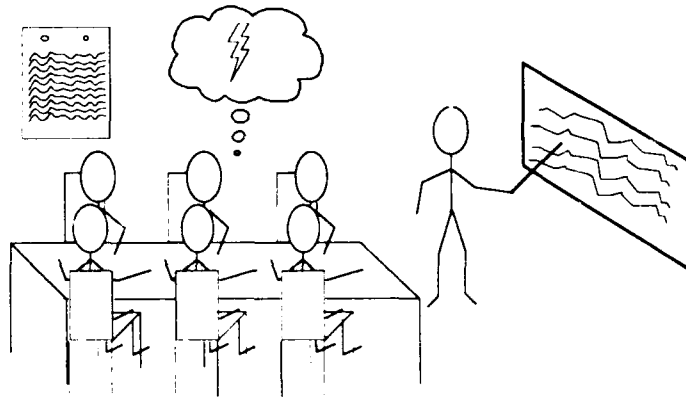


- The Nominal Group Technique (NGT) is a five-step process for generating ideas and reaching consensus. When used with cause and effect diagramming, the five steps are as follows.
 1. *Generate Ideas.* Each member of the group lists, by category, potential causes for the identified problem.
 2. *Gather Ideas (Round Robin).* Each member in turn reads one idea from his list while the group leader or facilitator writes the idea on a flip chart. Group members take turns reading ideas until all ideas have been posted on the flip chart.
 3. *Clarify Team List.* Group members collectively review the combined list for omissions, overlap, and need for clarification.

Learning the Process

4. *Prioritize Ideas.* The group leader distributes to each member from five to nine "voting cards." The number of cards distributed depends on the number of ideas generated by the group. On these cards the group members write the ideas that they feel are most important and rank the selected ideas by order of priority.
 5. *Prepare Diagram.* The leader prepares the cause and effect diagram based on the results of the voting, and the group discusses the diagram and potential next steps.²
- NGT may be useful when discussing highly controversial issues or when a team has reached an impasse. It is also useful in minimizing the intimidation factor found in groups with mixed ranks.
 - NGT is a useful brainstorming technique because:
 - Produces many ideas/solutions in a short time
 - Focuses on problems, not people
 - Opens the lines of communication within a group
 - Ensures participation
 - Tolerates conflicting ideas
 - Captures creative ideas.

² Scott Sink, "Using the Nominal Group Technique Effectively," National Productivity Review, Spring 1983, pp. 173-176.

Nominate Potential Causes*Free-form Brainstorming Method*

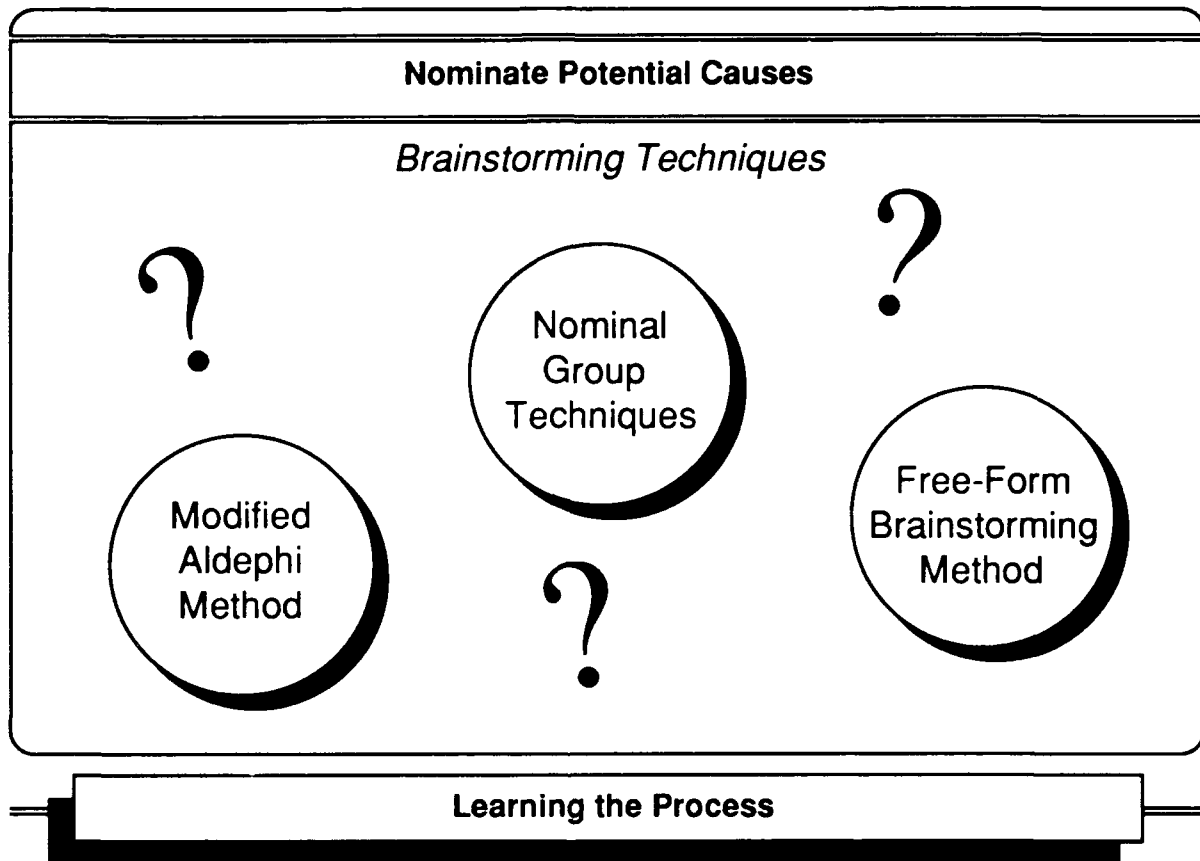
- Allows PAT members to be creative.
- Doesn't restrict participants' ideas.
- Can excite the group.
- Equalizes involvement.
- Can create original solutions to problems.

Learning the Process

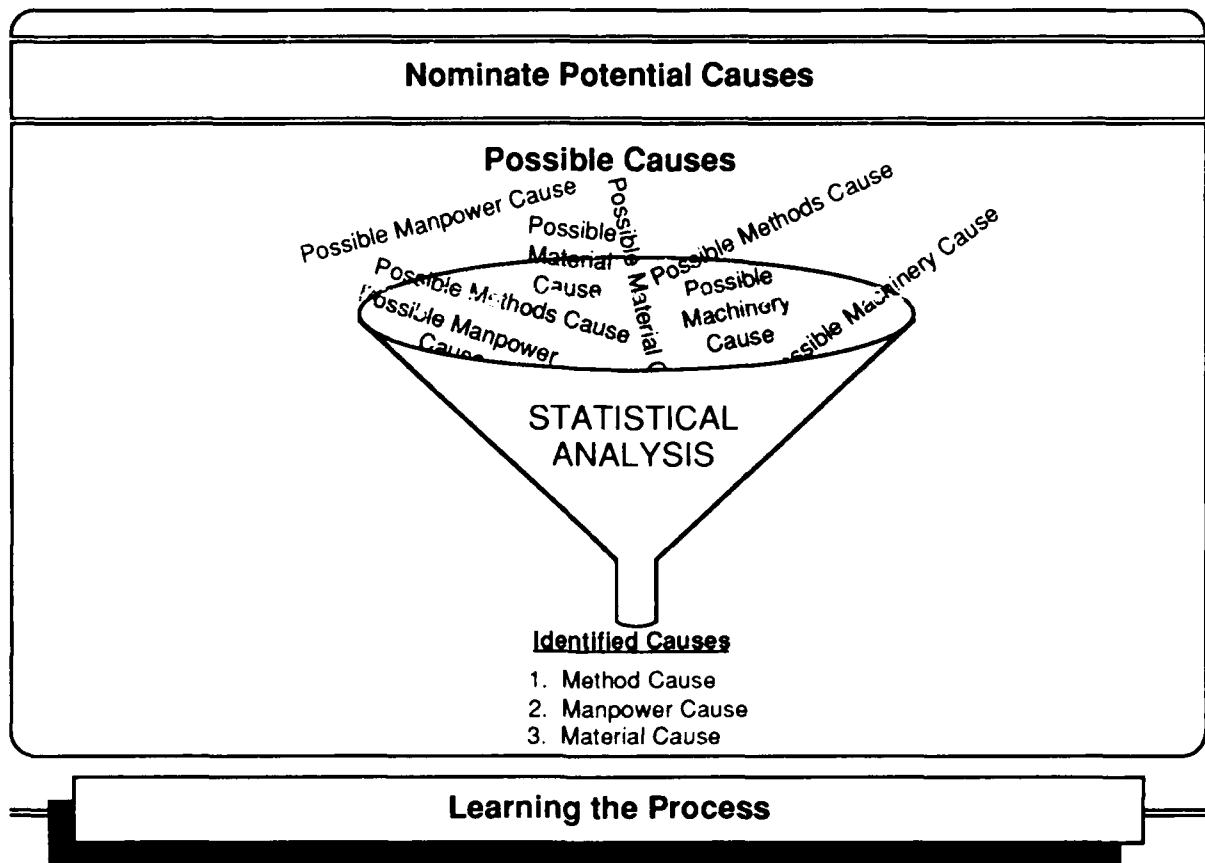
- The free-form brainstorming method involves an open flow of ideas and stresses spontaneity and volume of ideas. No order is imposed on idea generation. Group members offer ideas as they think of them, and the leader writes each idea on the cause and effect diagram when it is suggested. Validity of ideas is not discussed during this session; members are encouraged to voice any idea, no matter how absurd it may seem.
- Listed below are guidelines for running a free-form brainstorming session:
 - Review the topic and define the subject of the brainstorm. Focus on the effect statement.
 - Give everyone a minute or two of silence to think about the question. In a DOD context, pressure is part of all jobs. A quiet moment is often welcomed by PAT members.

Nominate Potential Causes

- Invite all members to call out their ideas.
- Enforce the ground rules.
- Limit discussion at this point.
- Have one PAT team member should write down all ideas on the flipchart, pausing only to check accuracy. Make sure to pick a member who has legible writing and make sure that the ideas are written so that the whole group can easily scan them.

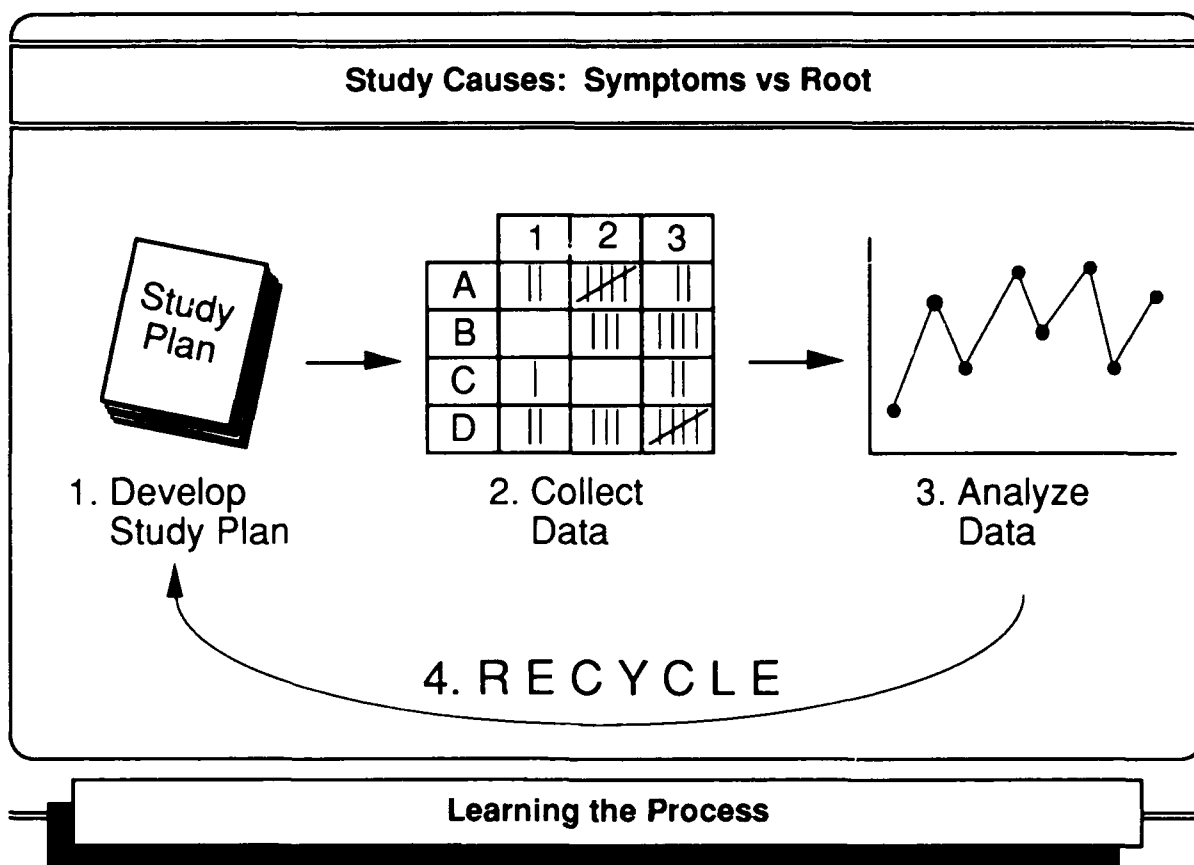


- The better brainstorming technique for cause and effect diagramming is the free-form method; however, group maturity determines which technique to use. Many factors may inhibit the success of a brainstorming session.
 - Members of recently formed groups often are not comfortable with sharing "creative" ideas.
 - A dominant group member may inhibit others.
 - A judgmental group member may inhibit creativity.
 - Timid group members may not offer ideas.
 - Argumentative members may disrupt the generation of ideas.
- The group leader or facilitator must evaluate the group and determine its maturity. Only mature groups should use the free-form method.



- It is important to understand that cause and effect diagramming generates only possible causes for an effect. An idea offered by a group member is a nomination for a potential cause that may be chosen for further study.
- The next step will be to study the nominated causes to differentiate between symptoms and root causes.

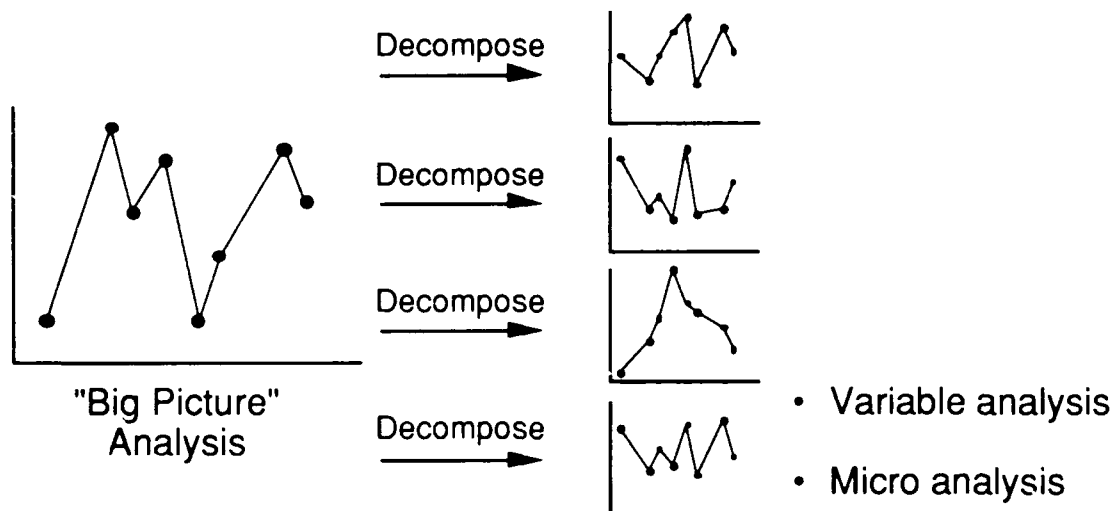
Case Study 2-2**Cause and Effect Diagramming****Learning the Process**



- Cause and effect diagramming provides a list of potential causes. The next step is to study causes to discriminate symptoms from root causes.
- The study process includes four steps:
 - *Develop Study Plan* to ensure appropriate and consistent data
 - *Collect Data* in accordance with plan
 - *Analyze Data* to identify trends and correlations, prioritize problems, and determine causes of process variation
 - *Recycle* learning process in a refined focus area to approach root causes.

Develop Study Plan

Identifying the Unit of Analysis



Learning the Process

- The first step in developing the study plan is to determine **what to study**--the unit of analysis.
- Usually, the **first unit** to consider is the entire process--the **"big picture."** For example, study the **cycle time** through the process to establish a baseline.
- Often, it may be difficult to discern the source or cause of variation in the "big picture" analysis. **[You may need to break up your analysis to isolate different variables and their impact on the process.]** For example:
 - Different offices may use different methods that impact the performance of the process. You may need to break out the analysis and study each office separately to collect useful information about causes.
 - Different types of packages or products may require different procedures. It may be useful to study each type of package separately to more readily discern causes.

Develop Study Plan

- You should also consider *micro* analysis of the process steps to determine *where* the causes are most evident.

Develop Study Plan

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Learning the Process

- After defining the units of analysis, develop a plan to delineate the data collection and analysis objectives and methods. The plan should include:
 - Questions or objectives to be addressed by the study (what you want to find out or test)
 - Data collection and analysis activities (for example, monitor/track process; review log sheets; interview selected representatives; conduct focus group; assess data for trends, correlations, or variation; compare averages).
 - Data collection and analysis tools (for example, check sheet, survey, interview guide, pareto chart, run chart, control chart, histogram, scatter diagram).
 - Sampling plan, including sample size and characteristics. It is not always possible to study every item, so the PAT must determine how to select a representative sample. There are statistical methods to develop sampling plans which are beyond the scope of this course. For sophisticated sampling

Develop Study Plan

plans, consult a statistician.

- Data sources such as logs, historical records, interview documentation.
- Expected outcomes or hypotheses that you plan to test.
- Measurement definitions to ensure uniformity in data collection.
- The PAT should also determine when to collect the data. The time of day, day of the week, and month may be significant to the demands on the process under review. The PAT members should be able to map out any calendar cycles that are associated with the process. Often, the best time to observe a process is when it is under stress. The PAT may need to return to the flow charting step to determine when to collect data on the process.

Develop Study Plan

Problem	Week				Total
	1	2	3	4	
A					13
B	<del> </del>			<del> </del>	15
C					5
D					8
Total	12	7	8	14	41

Check Sheet: Simple form that supplies factual data about how often certain events happen.

Learning the Process

- Each study plan should be accompanied by the appropriate **check sheet formats**. The formats should be designed as part of the planning process.
- Check sheets are a simple and effective way to collect the data needed for process analysis.
- Check sheets often are the starting point of a problem solving effort. The data collected from check sheets provide the baseline for effective process analysis.
- Check sheet data provide concrete facts from which we can look for trends and discover patterns that will allow us to improve the process. Without these facts, we must rely on opinions and subjective personal impressions about how often things happen and how important they are.
- The effectiveness of a check sheet often is determined before the form itself is even designed. The check sheet will be a valuable tool only if managers can determine exactly what they want to measure.

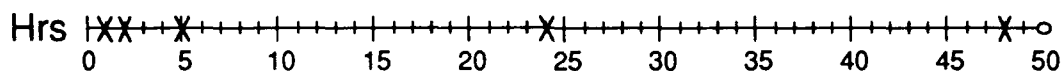
Develop Study Plan*Constructing a Check Sheet**Step 1*Define the Observation
Parameters*Step 2*Define the
Time Period*Step 3*Design a Clear and
Effective Form*Step 4*Collect the
Data Honestly**Learning the Process**

- *Step 1: Define the Observation Parameters* so that everyone involved in data collection knows what they should be recording. Data will only be meaningful if all personnel have the same criteria for recording a "check." When we define parameters, we also ensure that the data will be useful. For example, the parameter "record each time a problem occurs" will not produce as useful data as the parameter "record each time problem A, B, or C occurs." The former parameter will tell you how often problems occurred, while the latter will tell you how often each specific problem occurred.
- *Step 2: Define the Time Period* during which data will be collected. The period can range from hours to weeks or even longer. The period should be long enough to gain a representative sample.
- *Step 3: Design a Clear and Effective Form* that all personnel can understand and use. The columns and rows should be clearly labeled and there should be enough space to collect the data.

Develop Study Plan

- **Step 4: Collect the Data Honestly** to ensure the integrity of the results. Most likely, no one will intentionally introduce inaccurate data. However, people must be strongly encouraged to record events as they actually happen, not as they "usually happen," or how they think they will happen in the future. Remember, you are using check sheets to eliminate the use of subjective opinions and judgments. Recording the data as the events actually occur is necessary to ensure valid, objective data.
- Solidify measures:

For example, how long to type a revised 1-page paper.



1. According to Secretary: 8 minutes
2. According to Action Officer: 40 minutes
3. According to Director: 2 hours
4. According to Executive Clerk: 5-8 hours
5. According to Executive Assistant: 1-2 days
6. According to Signatory: 1-2 1/2 days.

Develop Study Plan

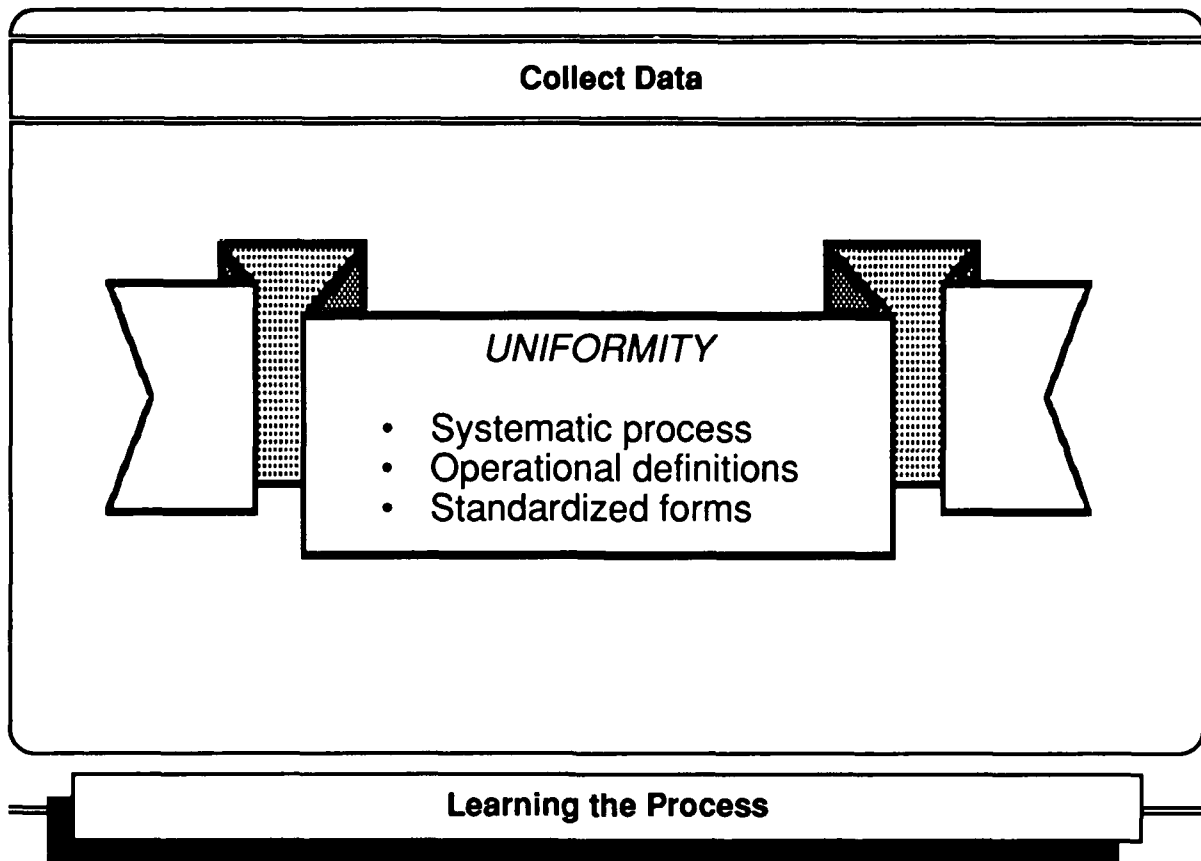
<i>PURPOSE</i>	<i>ANALYSIS TOOL</i>
• Prioritize Problems	➔ Pareto Chart
• Determine Distribution of Data	➔ Histogram
• Identify Correlations	➔ Scatter Diagram
• Identify Trends	➔ Run Chart
• Determine Common and Special Causes of Variation	➔ Control Chart

Learning the Process

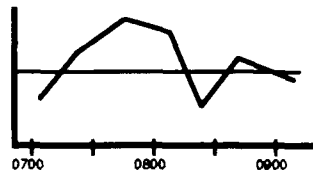
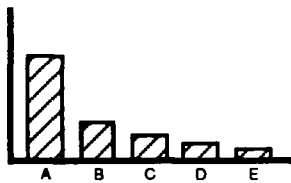
- There are a number of tools available to assist in the analysis of the data. This chart identifies different purposes of analysis and the tool that can be used for each purpose.
- The use of each of these tools will be described in the analysis step.

Case Study 2-3**Identifying Units of Analysis****Learning the Process**

Case Study 2-4**Developing Study Plans****Learning the Process**



- The validity of analysis depends upon the uniformity of the data collection process. To ensure uniformity, the data collection process must be systematic; measurement parameters must be operational defined; and data collection forms must be standardized.
- Uniformity should be built into the study plan and carried out in data collection.

Analyze Data

- Identify problem areas
- Determine types and sources of variation in a process
- Identify and monitor trends
- Determine relative importance of problems to be solved
- Determine distribution of data
- Identify correlations
- Monitor process improvements
- Assess impacts

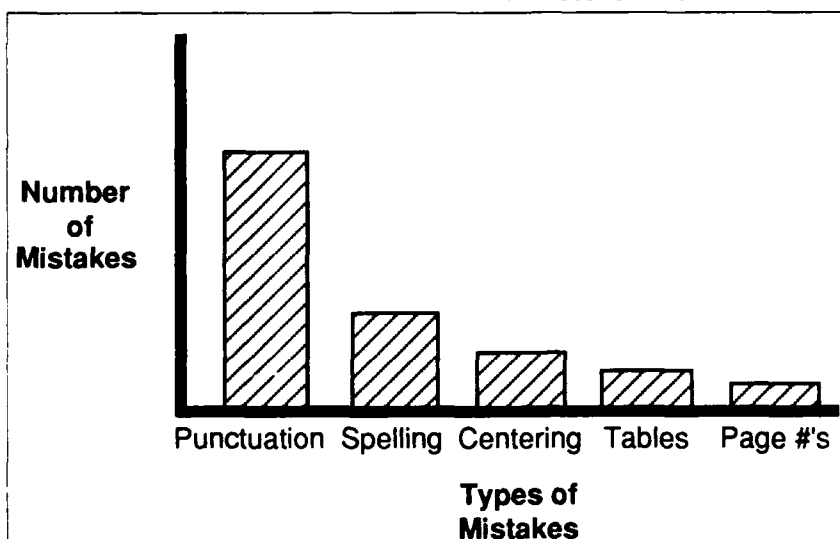
Learning the Process

- Rigorous planning and data collection alleviates the need to rely on instinct or intuition, and provides the PAT with the facts necessary for data based decision making.
- Analysis tools assist in organizing large amounts of data to:
 - Identify problem areas
 - Determine the types and sources of variation in a process
 - Identify and monitor trends
 - Determine the relative importance of problems to be solved
 - Determine the distribution of data
 - Identify correlations
 - Monitor process improvements
 - Assess impacts.
- The analysis step must begin with a *review of any anomalies* that occurred in the data gathering process that might call into question the validity of the data. These anomalies include any unexpected conditions and observations that would

Analyze Data

influence how the process might need to be changed. Properly planned data gathering usually includes several pilot efforts to minimize anomalies and refine data gathering procedures. However, this preliminary effort does not always prevent some unexpected influence or contamination from distorting the data collected.

- If the data are influenced by an anomaly, the PAT has only two choices: collect new data or accept the contaminated data and make a judgment on their implications. In any written report, the anomaly should be clearly explained.
- Because the results of the data gathering may contradict intuition and previous experiences, analysis is the step that holds the greatest danger of PAT members being victimized by their experience. Follow the data and not your instinct!

Analyze Data**Pareto Chart**

A Pareto chart is used to:

- Prioritize problems.
- Analyze different groupings of data.
- Measure the impact of changes.
- Break down broad causes into subcauses.

Learning the Process

- The Pareto chart is a special form of a vertical bar graph that displays the relative importance of all problems or conditions.
- The chart is constructed using data from a check sheet, brainstorming, or other data collection instrument.
- A Pareto chart is used to:
 - Prioritize problems, that is, to identify which problems require the most attention through the use of different measurement scales (for example, frequency or cost). Remember, the most frequent problems are not always the most costly. In our example above, we constructed a Pareto Chart from the data found in a check sheet to prioritize the problems.
 - Analyze different groupings of data (by product, machine, shift, etc).

Analyze Data

- Measure impact of changes made in a process, (before and after comparisons.) After improving our word processing process, we could compare the results with our original chart above.
- Break down broad causes into subcauses. The purpose here is to find the real causes, so you can cure the cause, not the symptom.

Analyze Data*Application of The Pareto Principle*

- The Pareto principle, or the 20-80 principle, states that 20% of the causes – the "*vital few*" – produce 80% of the results. The other 80% of the causes are the "*trivial many*," which produce only 20% of the results.
- As applied to the analysis of a process, the Pareto principle states that 20% of the problems are responsible for 80% of the cost of rework.
- If the Pareto principle is not evident, refine your unit of analysis, change the measurement scale, or reaggregate your data.

Learning the Process

- Vilfredo Pareto (1848-1923), an Italian sociologist and economist, developed the Pareto principle. He originally used the principle to illustrate that 20% of the population controlled 80% of the wealth.
- Applying the Pareto principle to process analysis indicates that not all problems contribute equally to the cost of poor quality. We can achieve dramatic process improvement by correcting the 20%, the "*vital few*" problems that cause the bulk of the costs, and not wasting time and resources attempting to correct the other 80%, the "*trivial many*."
- Pareto charts help us improve quality by presenting process problems in order of their importance.
- The Pareto principle may not always be evident in the bar chart. This situation signals that you need to take another look at the data.
 - *Reaggregate the data.* You may need to collapse categories or rearrange your data so that the Pareto principle appears.

Analyze Data

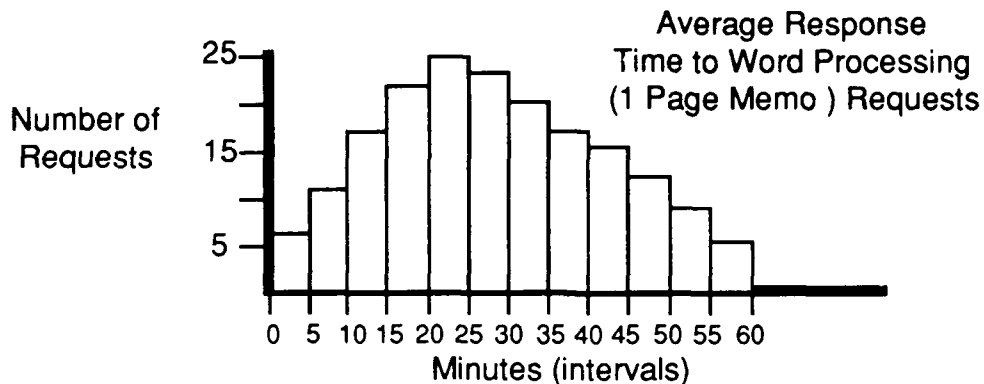
- *Select another measurement scale.* Often the most frequent problems are not the most costly. Analyze your data using different measurement scales.
- *Refine the unit of analysis.* There may be more than one process at work. Reinvestigate the process to determine if you need to distinguish among processes and refine your unit of analysis.

Analyze Data*Benefits of Pareto Charts*

- We use Pareto analysis to distinguish the "vital few" from the "trivial many." This knowledge allows us to efficiently use our resources by attacking those problems with the greatest impact on the process.
- Pareto charts eliminate reliance on guesswork by providing quantitative information that allows us to determine which problems must be corrected.
- Pareto charts promote unity of effort by clearly illustrating which problems are most serious.

Learning the Process

- Without Pareto analysis, managers often rely on guesswork and "instinct" to determine which problems are serious. They then take action to solve those problems that they have judged to be most serious. Action based on guesswork and instinct often results in a significant waste of time and resources to correct a problem that in reality has very little impact on the process.
- A Pareto chart illustrates the "vital few" problems that are most severe. This information allows us to concentrate our improvement efforts on the problem areas where we can have the greatest impact.
- Without Pareto analysis, people often are split on which problems are most critical. Pareto analysis promotes unified effort by quantitatively stating which problems are most critical and must be addressed.

Analyze Data*Histogram*

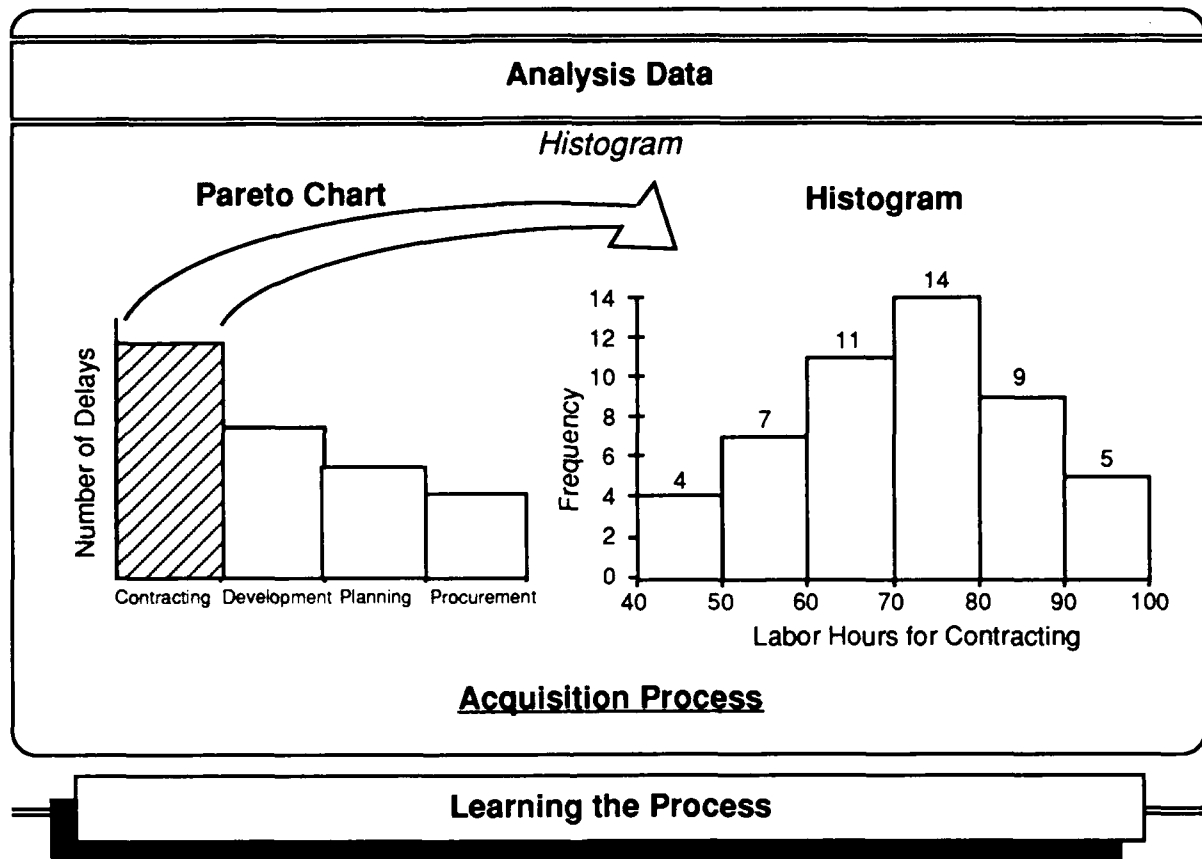
- Reveals the amount and distribution of variation within a process.

Learning the Process

- A *histogram* is a vertical bar graph that depicts the distribution of a set of continuous data. It is a tool that helps keep track of variation by providing a "snapshot" of a process that shows:
 - Spread of measurements
 - How many of each measurement there are.
- In interpreting the data, it is often useful to superimpose a curve over the traditional bar graph. This curve may be used to determine how normal the distribution is.
- The histogram is similar to the Pareto chart in two ways: both display in bar graph form the frequency with which certain events occur, and both chart one variable only. However, there are two main differences between these tools.
 - The Pareto chart can show comparison criterion measurements for process characteristics (qualitative data), for example, meetings, phone calls, and computer problems.

Analyze Data

- The histogram shows variation along a measurement continuum (quantitative data, for example, time, temperature, weight, length) for one process characteristic.



- Both a Pareto chart and histogram can be used to study the acquisition process for contracts under \$1,000,000.
- As shown in the example above, you can create a Pareto chart to show the number of delays within each of four phases of the acquisition process (for instructional purposes, let's say planning, development, contracting, and procurement). Charting attribute data with a Pareto chart helps to prioritize where to attack problems.
- After prioritizing the problem areas, you can develop a histogram to show the distribution of labor hours within the targeted area (contracting). The histogram will provide you with information about the variation of labor hours within the contracting process.

Analyze Data**Peakedness**

Measure of variability - how tall and skinny the distribution is

Skewedness

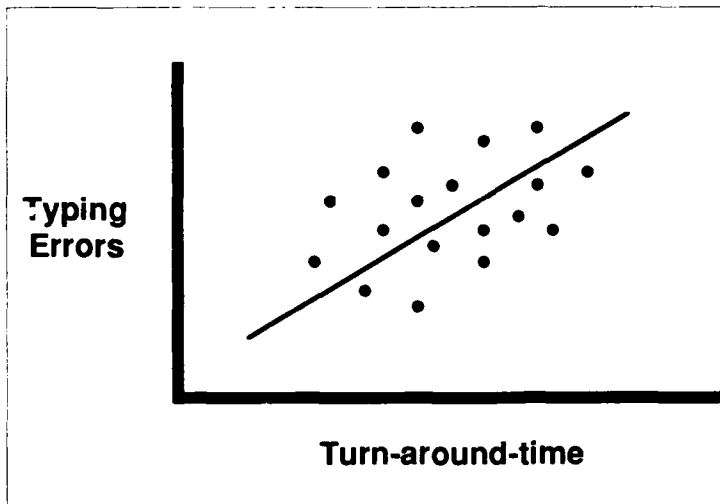
Measure of variability - how symmetrical the distribution is

**Learning the Process**

- The shape of the histogram tells you about the nature of the variability that exists within the process and helps to identify the source of variability. *Variability* is the distance from the mean.
- There are two types of variability:
 - *Peakedness* tells you how much variation exists. The more peaked the graphic, the smaller the variation and standard deviation. A wide graph has a greater standard variation and is less stable.
 - *Skewedness* tells you how symmetrical or normal the distribution is. A distribution may be skewed to the left or to the right.

Analyze Data

- Three questions can be answered by a quick look at the pattern of the histogram:
 1. Is the process producing a bell-shaped curve?
 - If yes, then the process appears normal and stable, and variations are generally due to random causes.
 - If not, then special causes are influencing the variations.
 2. Is the process centered?
 - The process is well centered when the average of the histogram and the specification midpoint are close together.
 - The process needs some adjustment when the average of the histogram and the specification midpoint are far apart.
 3. Is the process capable of meeting the specification?
 - The process is capable of meeting the specification if the spread of the graph falls within the specification limits.
 - The process is not capable if the spread falls outside the specification limits.

Analyze Data*Scatter Diagram*

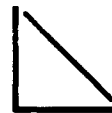
- Used to study the possible relationship between one variable and another.
- Tests for possible cause and effect relationships.

Learning the Process

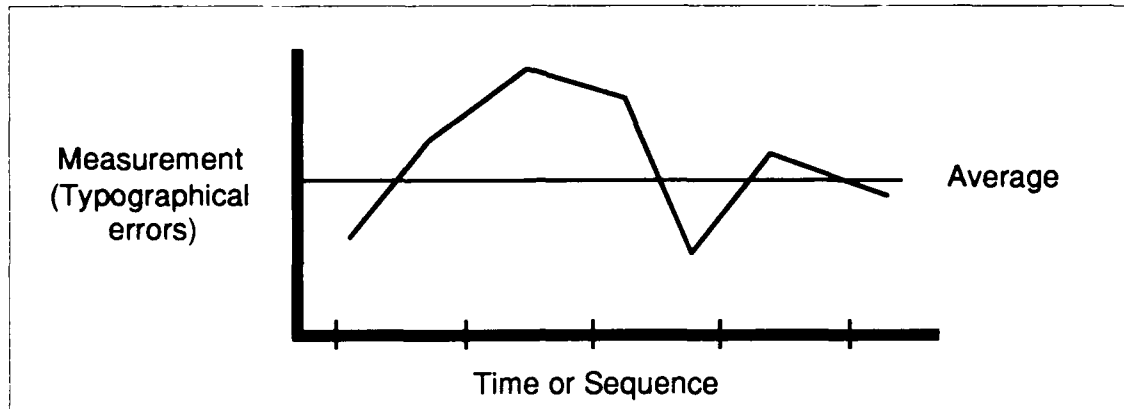
- A scatter diagram is used to:
 - Show the relationship between two variables.
 - Detect a pattern as two variables change over time.
 - Examine a possible cause and effect relationship.
- A scatter diagram can be used to test the strength of the relationship between two variables, but it *cannot be used to prove that one variable causes the other*.
- A scatter diagram differs from a histogram and Pareto chart in that two variables are studied in a scatter diagram while only one variable is studied in a histogram or Pareto chart.
- The above example demonstrates a relationship between turn-around-time (cause) and typing errors (effect).

Analyze Data*Interpreting a Scatter Diagram*

- POSITIVE
- NEGATIVE
- NONLINEAR
- NONE

**Learning the Process**

- A scatter diagram is used to test the strength of the relationship, or *correlation*, between two variables.
- The direction and tightness of the plotted points or cluster indicates the strength of the relationship between the variables. The more the cluster resembles a straight line, the stronger the relationship between the variables. A straight line would mean that every time one variable changes, the other changes by the same amount.
- A "line of best fit" estimates the shape of the plotted points. It is usually determined mathematically, but for our purposes, plotting the line by "eye" is adequate.
- There are four types of correlations that characterize the strength of a relationship: positive, negative, nonlinear, and none.

Analyze Data*Run Chart*

A run chart is used to:

- Illustrate trends over time.
- Understand the basic characteristics of a process.
- Focus attention on truly vital changes in the system.

Learning the Process

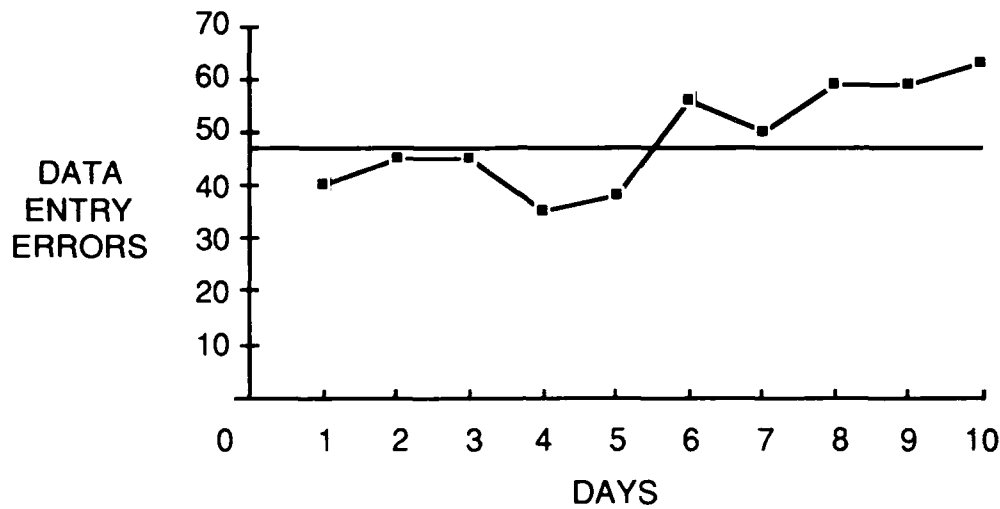
- The run chart is a simple chart of process measurements graphed over time, with an average plotted.
- This type of chart is used to:
 - Illustrate trends over time.
 - Understand the basic characteristics of a process.
 - Focus attention on truly vital changes in the system.

Analyze Data*Run Chart Patterns*

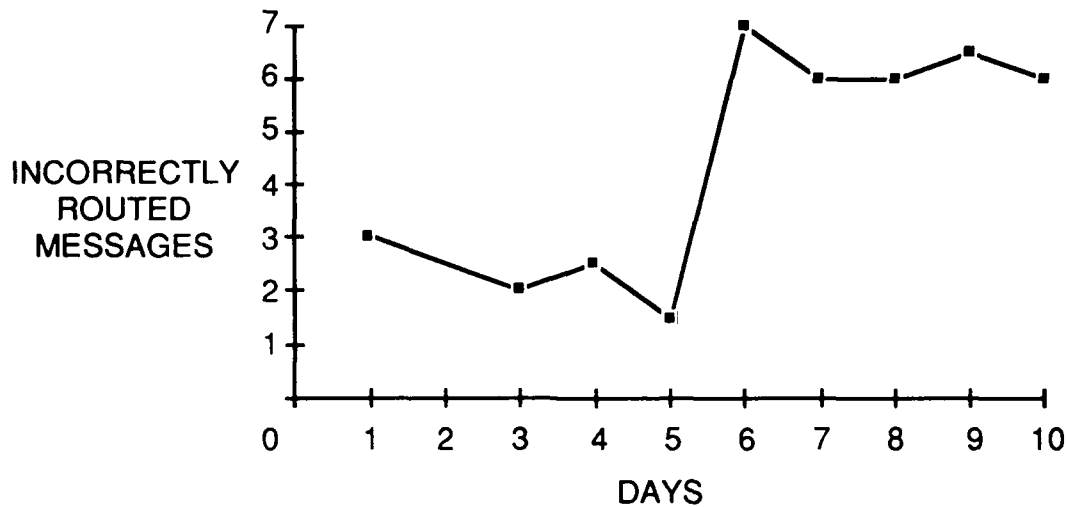
- Trend
 - Shift in Level
 - Cyclical Pattern
 - Bunching
 - Two Groups, Shift in Level
 - Interaction Between Groups

Learning the Process

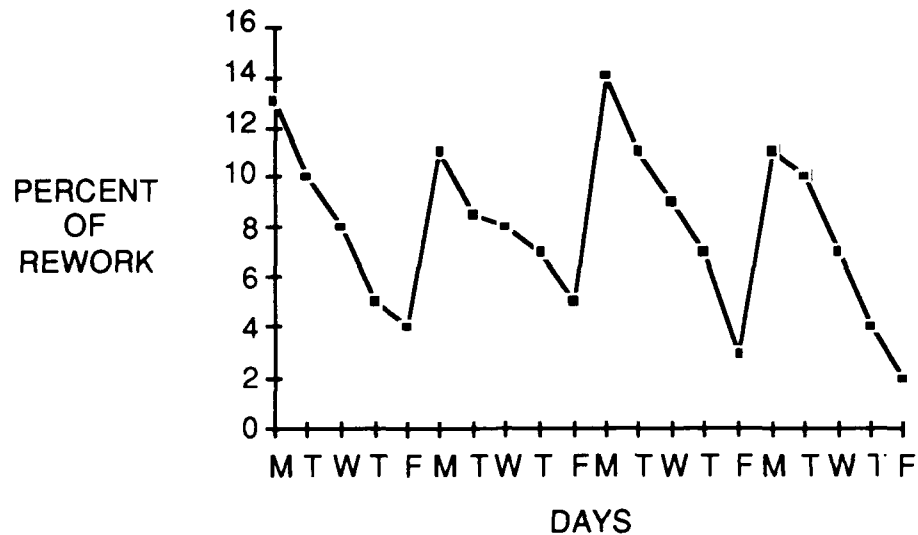
- Run charts are useful analysis tools because they graphically depict trends and patterns over time. Listed above are the types of patterns you may see.
- Familiarity with the processes you control will allow you to detect the reasons for run chart patterns and take corrective action. Interpreting a pattern requires knowledge of the process.
- More than one factor may affect a pattern.

Analyze Data**TREND****Learning the Process**

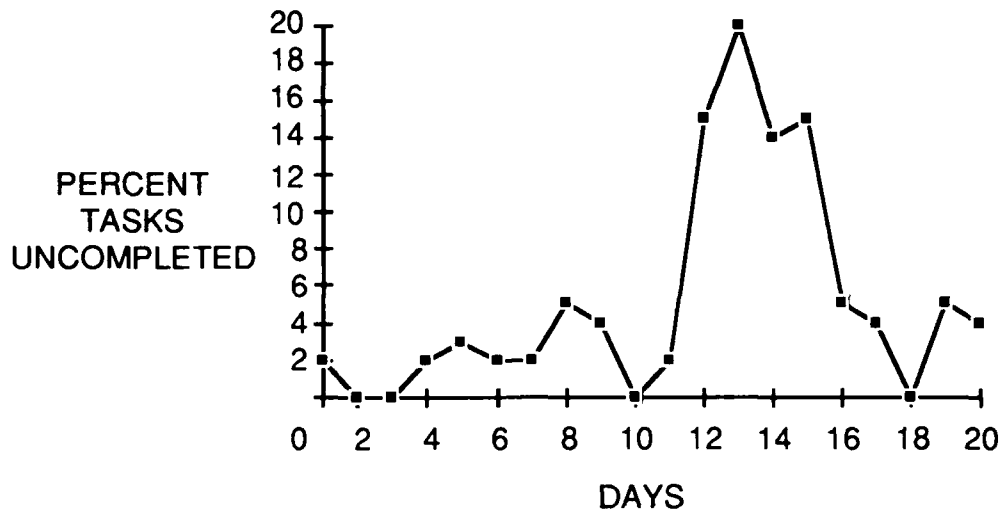
- This run chart represents the number of data entry errors made per day in a large data entry pool and illustrates a *trend*.
- You should note the "Rule of Thumb": A trend or run is a consecutive number of points (7 or more) consistently increasing or decreasing, or above or below, the central line.
- A reason for the trend starting at day four might be an unforeseen increase in workload resulting in more errors due to more processing and personnel fatigue. The trend may also be due to operators who are drifting back into poor data entry techniques or equipment that is slowly coming out of adjustment.

Analyze Data**SHIFT IN LEVEL****Learning the Process**

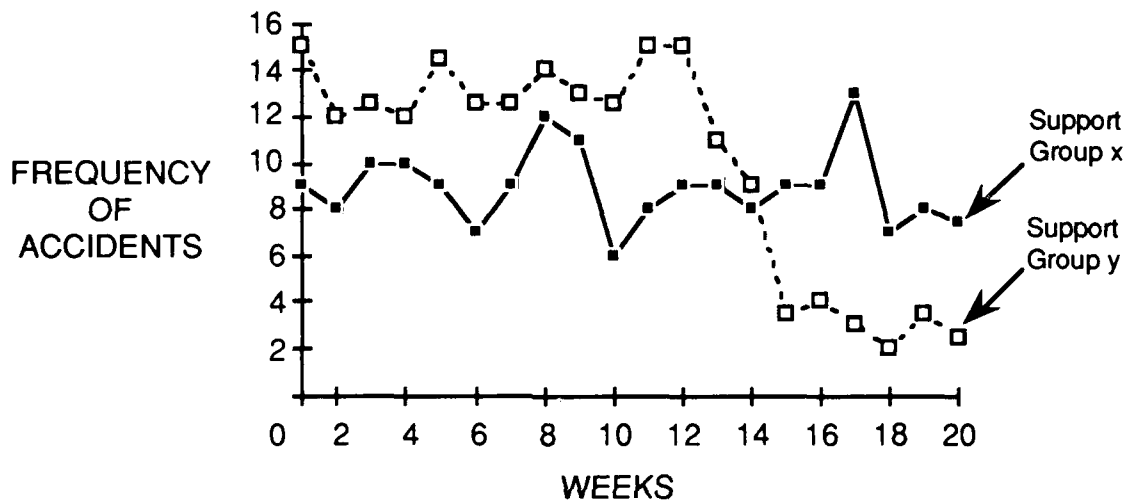
- This run chart shows the number of messages incorrectly routed per day in a DoD communications function.
- The pattern shown is a sudden *shift in level*. Shifts indicate that something that has strong influence on the process has been changed so that the process moves from one level to another.
- One interpretation of the pattern could be that new and inexperienced personnel were put on duty on day five. Other reasons for the sudden shift may include a breakdown in equipment, breakdown in techniques being taught, or a different management policy.

Analyze Data**CYCLICAL PATTERN****Learning the Process**

- This chart shows the percent of rework per day for a real property maintenance function.
- It is an example of a *cyclical pattern*, a consistent pattern of repeated high and low points that recurs periodically.
- There can be many reasons for this pattern. Note that this cycle is related to the days of the week.

Analyze Data**BUNCHING****Learning the Process**

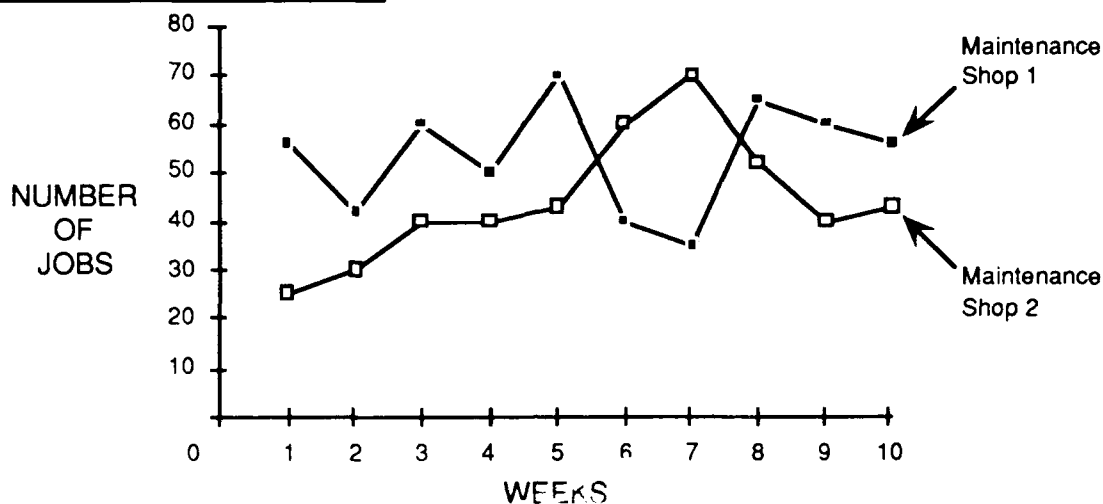
- This run chart shows the percent of tasks uncompleted in a contracting shop over a 20-day period.
- This chart is an example of *bunching* and indicates that a special event has occurred for a short period of time. The process itself has not shifted because it came back down to its original level.
- One interpretation might be that liberal leave was granted during the time period in which the bunching occurred. Therefore, work that normally would have been completed was left unfinished. Another reason might be that some of the equipment needed to complete the work was scheduled for maintenance between days 10 and 18.

Analyze Data**TWO GROUPS,
SHIFT IN LEVEL****Learning the Process**

- This example shows a *comparison of two groups showing a sudden shift in level*.
- This comparison shows the frequency of accidents between two military base support organizations of similar size and that have similar jobs. It is important that the two groups be as similar as possible when making comparisons. For example, you would not want to compare the accident frequency between a personnel shop and a squadron of pilots because the results would not be meaningful.
- Note the sudden shift in level in Support Group y. One of the reasons for the sudden drop in accidents might be that the supervisors of Support Group y initiated a safety program. A run chart comparing similar groups can illustrate the results of corrective action on one group in comparison with a control group.

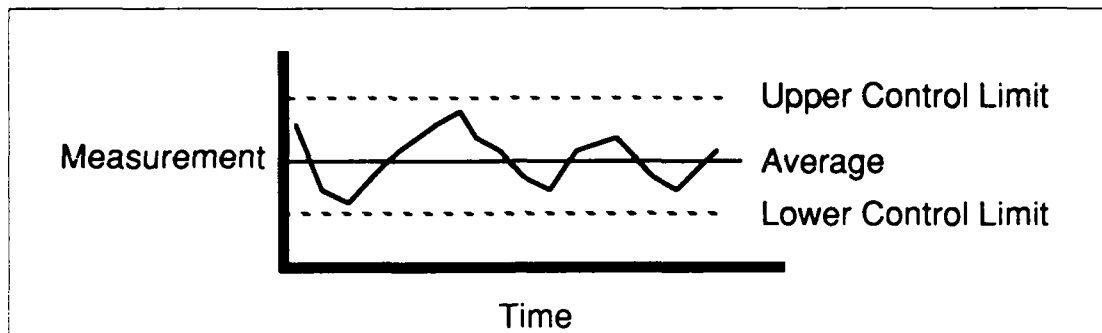
Analyze Data

INTERACTION BETWEEN GROUPS



Learning the Process

- This run chart shows *an interaction between two groups*. Interactions occur when the lines representing two or more samples cross each other.
- Again, it is important to compare similar groups that can interact. Although you could compare similar activities of dissimilar and related offices, such as a contracting office and a DoD health care agency, it is likely that any "interaction" shown on a run chart would be meaningless.
- If this example compares two maintenance shops that performed the same function at the same location, the interaction might indicate that Maintenance Shop 2 took over Maintenance Shop 1's work between days 5 and 8.

Analyze Data*Control Chart*

- Determine sources of variation:
 - Common causes
 - Special causes.
- Determine control/stability of system.

Learning the Process

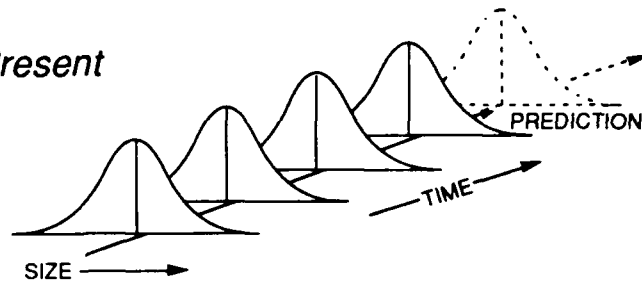
- Control charts are an economical way to evaluate when action should be taken to correct variations in the process.
- The control chart is a run chart with statistically calculated upper and lower control limits plotted (upper control limits (UCL) and lower control limits (LCL)). The limits are calculated by running a process untouched, taking samples, and plugging the sample average into the appropriate formula.
- A control chart is used to determine how much variation is in a process and the types of causes: common or special. Common and special causes will be discussed later in the module.
- A system is in statistical process control (SPC) if there are no special causes. Control doesn't necessarily guarantee the desired results, it only means the process is consistent (it could be consistently bad).

Analyze Data

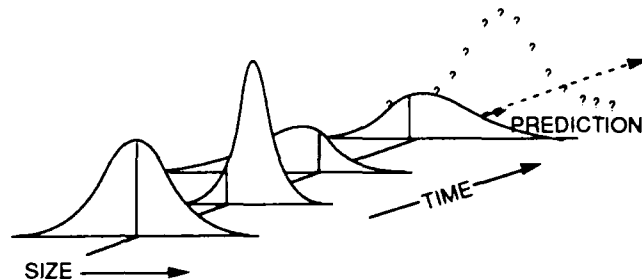
- If a system is in control, but not capable of meeting specifications limits, then management must do one or both of the following:
 - Improve the process
 - Renegotiate the specifications.
- Remember:
 - Control limits are data made (what the process is able to do).
 - Specifications are man made (what the process should do – customer requirements).

Analyze Data***Common Causes Only Present***

The process output forms a distribution that is stable over time and predictable.

***Special Causes Present***

The process output is not stable over time and is not predictable.

**Learning the Process**

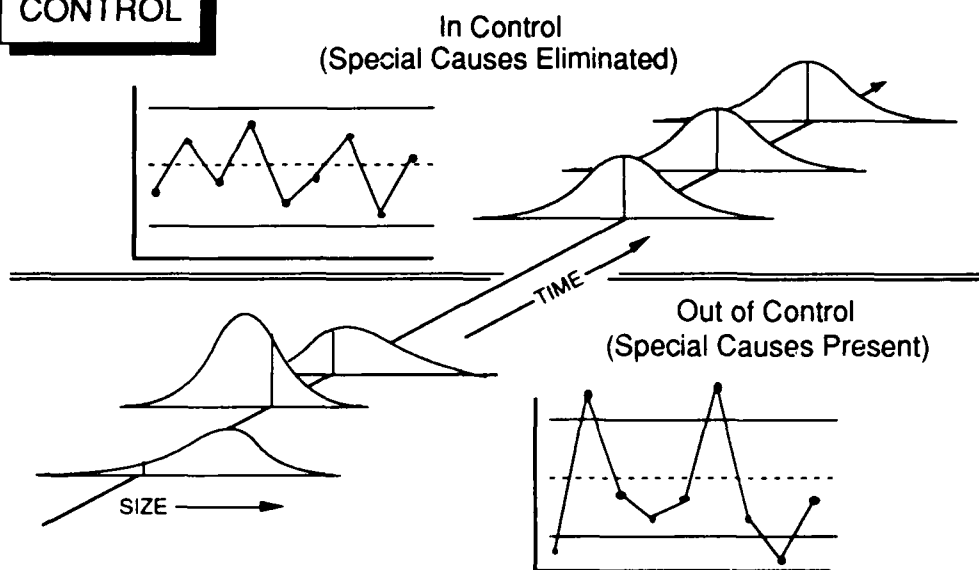
- Because every process contains variation, no two products or services are alike. For example, the time required to process an invoice could vary according to the people involved, the reliability of the equipment used, the accuracy and legibility of the invoice, the procedures used, and the volume of other work in the office.
- To manage a process and reduce variation, you must track variation back to the source. The first step is to make a distinction between common and special causes of variation.
- *Common causes* are the many sources of variation that occur in a process due to randomness or pure chance. While individual measured values are different, they tend to form a pattern that can be described as a distribution. An example of a common cause might be that even a good typist will on the average make a number of typing errors. The typist can control making errors, but cannot eliminate them because they are random.

Analyze Data

- *Special causes* are factors that are considered unusual and that can be eliminated. These factors are not random and cannot be described by a distribution. An example of a special cause would be that a good typist suddenly made many errors because the machine being used was malfunctioning. The machine can be repaired, thus special causes can be eliminated. Unless all the special causes are identified and corrected, they will continue to affect the process output in unpredictable ways.

Analyze Data

CONTROL



Learning the Process

- A process is in *statistical control* when the only source of variation is common causes. Recall that control charts are used to signal special causes of variation so that the appropriate action can be taken to eliminate them.
- A process in control is *stable* over time and *predictable*. After eliminating special causes and bringing a process under control, you may then assess its capability of meeting customer needs.
- Consider the typing example. You track the number of errors in memos and find that the process consistently produces between two and eight errors per memo. You may want between zero and five errors, but the process is in control because the output is stable and predictable over time.

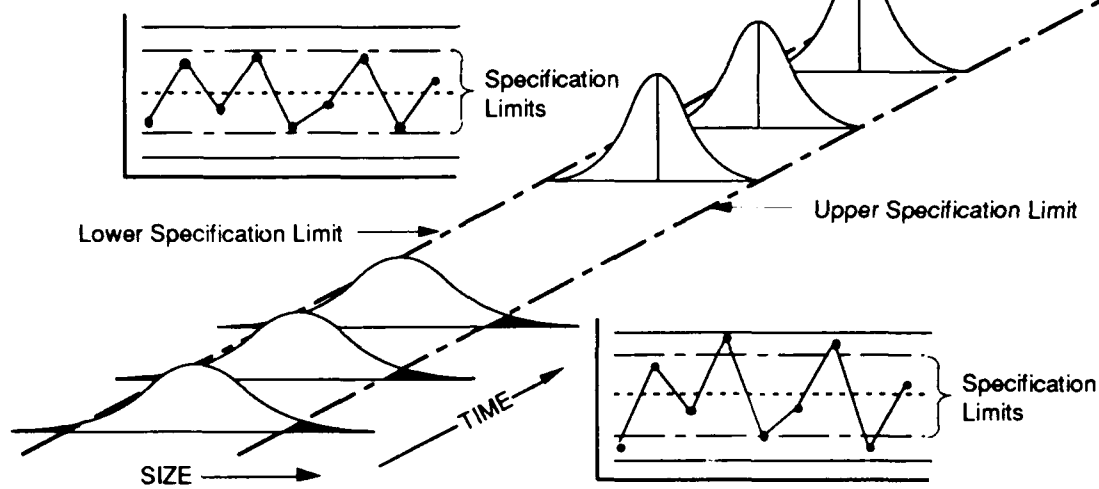
Source: Continuing Process Control Capability Improvement, Ford Motor Company, September 1985.

Analyze Data

CAPABILITY

In Control and Capable

(Variation From Common Causes Reduced)



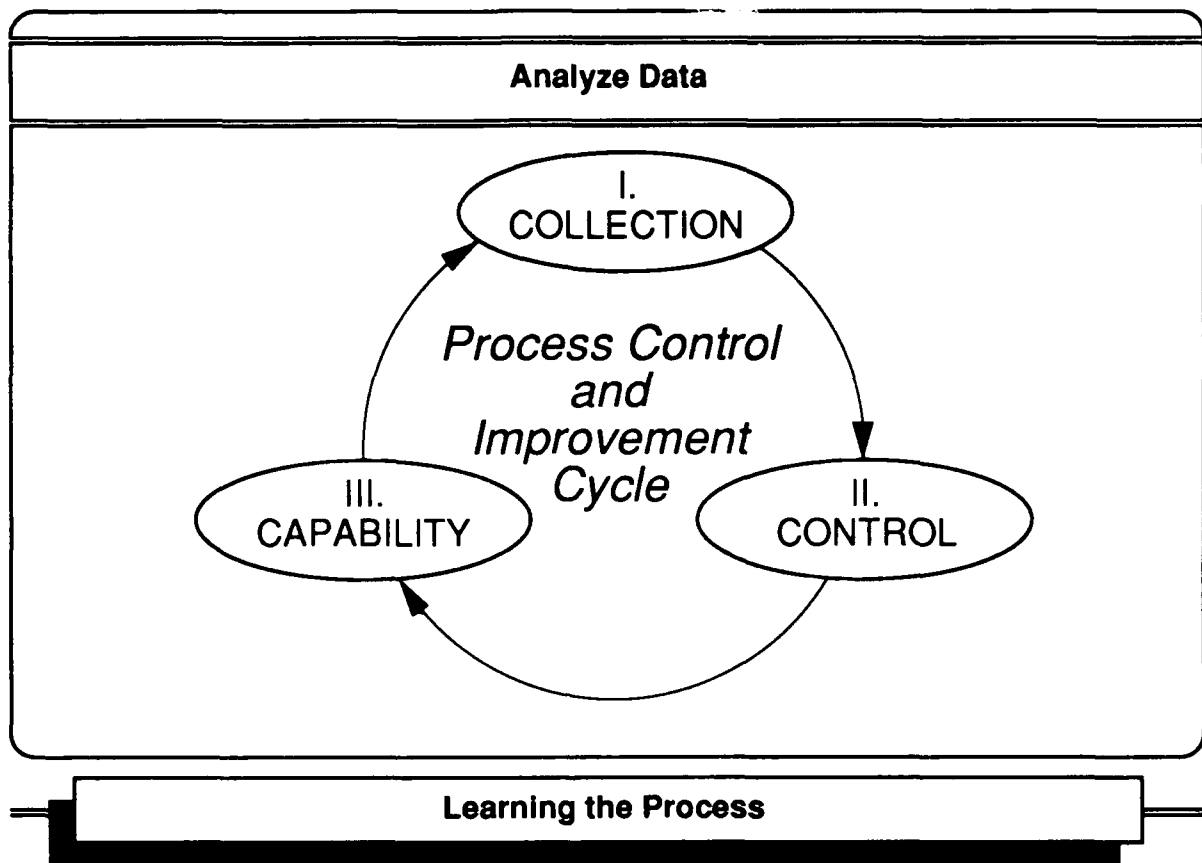
Learning the Process

- *Process capability* is determined by the total variation that comes from common causes. It is the best statistical performance that can be reached after all special causes have been eliminated and represents the best performance of the process itself.
- If the typist has the machine repaired, then a special cause for errors has been eliminated. She or he can control random errors through diligence. Statistically, errors will still be made because they are random (common cause), and the average errors made by the typist over time represent the best that can be done - i.e., the process capability is the best that can be accomplished.
- Process capability is often thought of in terms of the proportion of output that will be within the customer specification limits.
- Management action is required to reduce the variation from common causes and increase the process' ability to consistently meet specifications.

Analyze Data

- Note that specification limits differ from control limits. Control limits are calculated based on the variation within the process, while specification limits are based on customer needs.

Source: Continuing Process Control Capability Improvement, Ford Motor Company, September 1985.

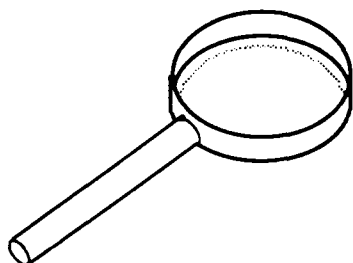


Process improvement using control charts is an iterative process of data collection, process control and process capability.

- **Collection.** The steps in the data collection phase include:
 - Run the process
 - Collect the data
 - Plot the data on a graph.
- **Control.** The steps in the process control phase include:
 - Calculate trial control limits based on the data from the output of the process.
 - Draw the limits on the chart as a guide to analysis. Remember that the control limits are reflections of the natural variability of the process, and are not specifications limits.
 - Compare the data to the control limits to determine if the process is in control.

Analyze Data

- If there are special causes, study the process to determine the source and eliminate special causes.
- After taking local action to eliminate special causes, collect further data and recalculate control limits.
- *Capability.* The steps in the process capability phase include:
 - Assess process capability after all special causes have been eliminated and process is in control.
 - If variation from common causes is excessive and the process cannot consistently produce within customer requirements, investigate the process.
 - If necessary, take management action to reduce common variation and improve the system.
- For *continuous process improvement*, gather more data, work to reduce process variation by operating the process in control and continually improving process capability.

Analyze Data*Final Tips and Reminders***LOOK FOR:**

- Patterns which indicate special causes
- Prioritize subcauses as defined by Pareto principle
- Relationships between variables

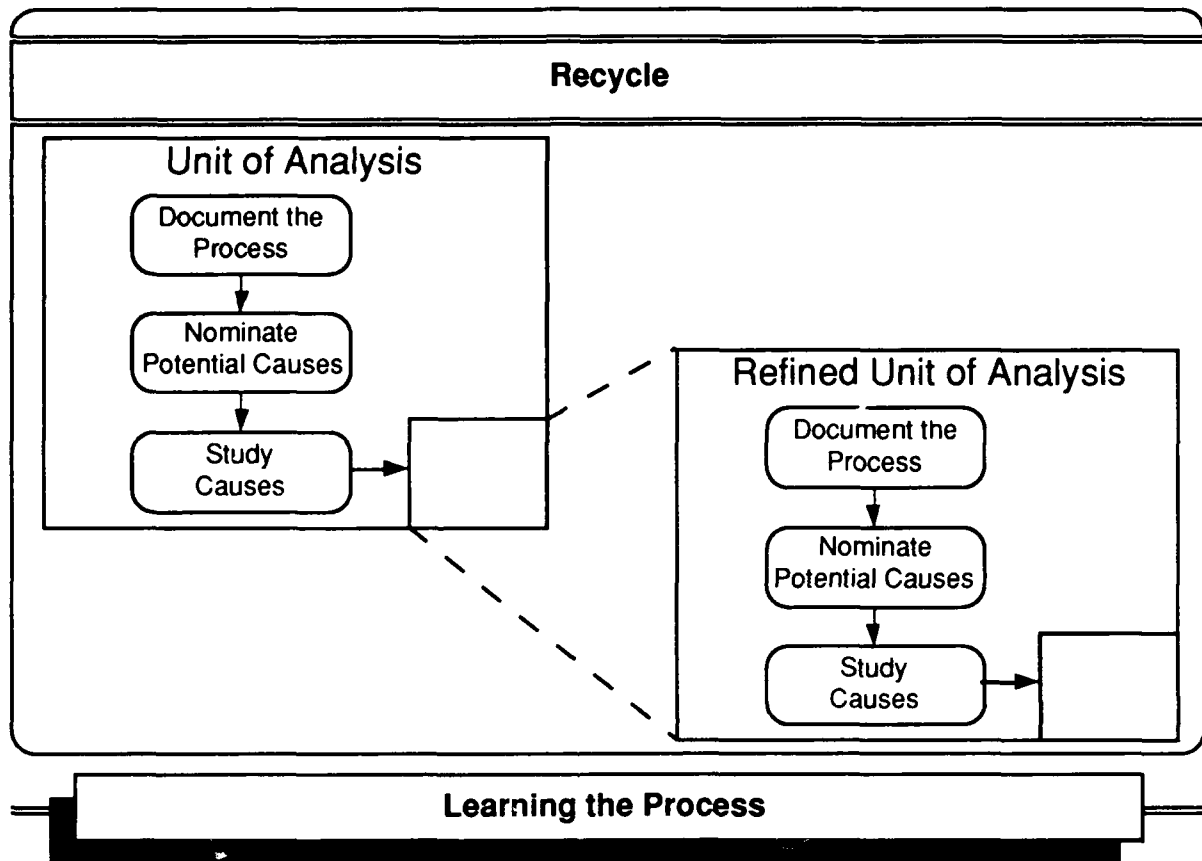
Learning the Process

- As you analyze the data, remember that you are searching for root causes. First, you need to understand the process. Then you need to look for causes of variation.
 - Look for patterns in run and control charts which may indicate special causes, or a process out of control. Determine next steps for investigating the causes.
 - Search for the Pareto principle to find priorities or subcauses. Remember that the Pareto principle may not always appear, and you may need to conduct further analysis.
 - Look for relationships among variables. For example, if you select office and type of package as two of your units of analysis, you may want to investigate how the two are related. Your analysis may find that Office A processes package type Y more quickly than type Z, but Office B processes package type Z more quickly than type Y. Investigate the cause for the differences.

Case Study 2-5

Analyze Data

Learning the Process



- As you continue through the learning phase, the next step is to recycle in a refined unit of analysis. First, based on previous data analysis, determine next study steps and the refined focus or unit of analysis.
- Next, you may need to go back to documenting the process to develop a micro flow chart. Then, nominate potential causes using a cause and effect diagram. It may not always be necessary to document the process and nominate potential causes. In some cases, you can proceed immediately to the study step.
- As you study the causes, continue to look for root causes. Repeat the learning phase until you approach root causes (the next section describes how to identify root causes).

Case Study 2-6**Recycling:
Micro Flow Charting****Learning the Process**

Case Study 2-7**Recycling:
Cause and Effect Diagramming****Learning the Process**

Case Study 2-8**Recycling:
Developing a Study Plan****Learning the Process**

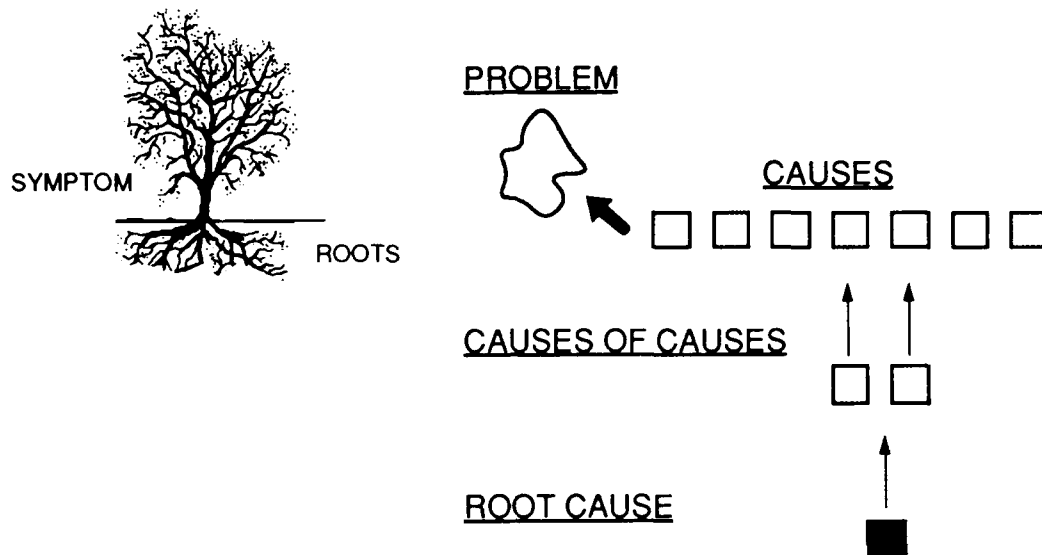
Case Study 2-9

**Recycling:
Analyzing Data**

Learning the Process

Root Cause Analysis

Discriminating Root Causes from Symptoms



Learning the Process

- It is important to distinguish between root causes and symptoms, so solutions attack the source of the problem, rather than "fight fires."
- To test for a root cause, keep asking "What is the cause of causes of the problem?" When you are no longer able to identify further "cause of causes", you have probably reached a "root cause".
- For example, the problem is poor project performance. People say the cause is the overworked staff. Overwork is caused by low staff to project ratio. Low ratio is due to poor budget preparation by staffing officials.

Poor Project Work
 Overworked Staff
 Low Staffing
 Poor Staff Budget Preparation

NOTE: Often you will find root causes in both the system of work and the policy area.

Root Cause Analysis

BEWARE OF "DISGUISED SOLUTIONS"

POSING

AS

PROBLEM OR CAUSE STATEMENTS

Problem: Not enough **training**Cause: **Budget** insufficient to support operations**Learning the Process**

A true problem statement allows for more than one possible way to solve it. For example, workers confuse "legislative precedent" with "legislative requirement".

Good Problem Statements" are:

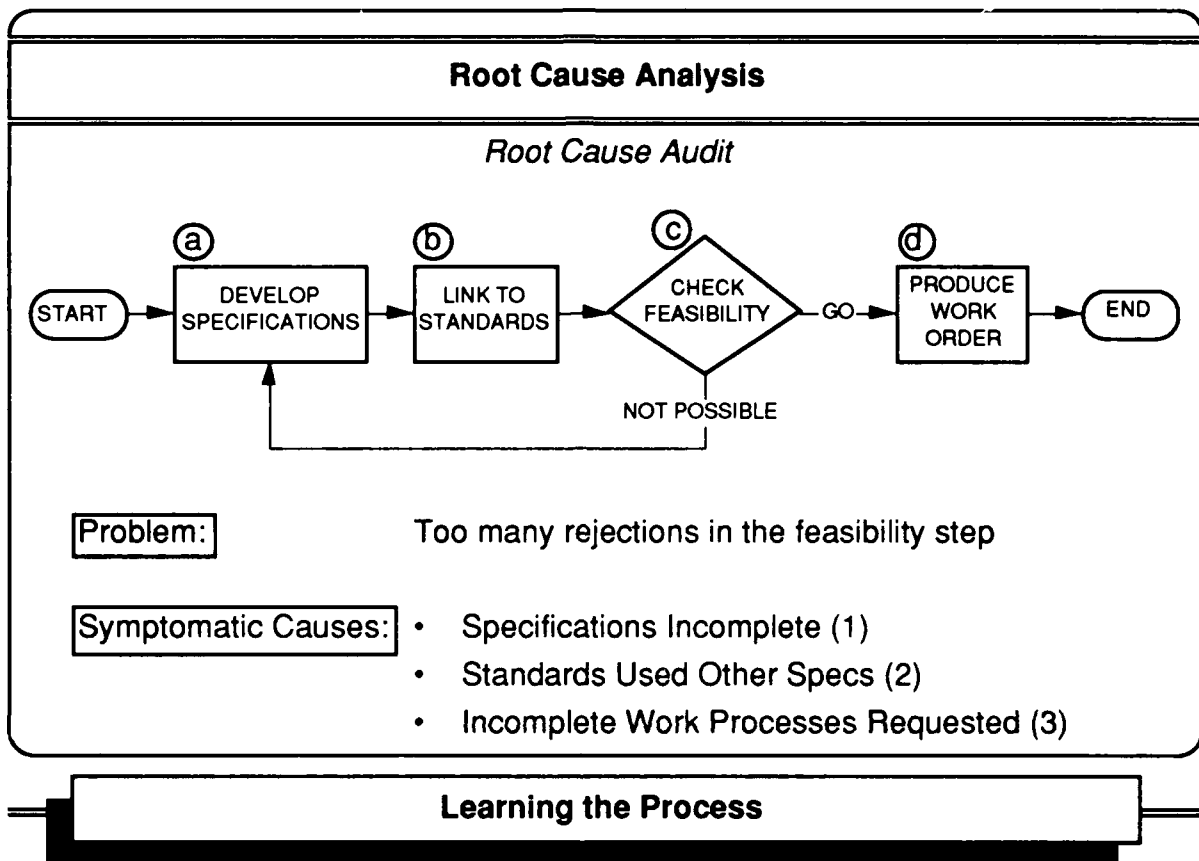
- Statement of fact
- Provable

Cause Statements:

- Can be reduced through several layers of causes
- Can go beyond what worker controls directly
- May have root cause in policy decisions
- May be implicit challenges to basic assumptions about how work should be structured.

Beware of:

- Blaming vs. cause statements
- Misapplied training--making training bear burden of system problems.

**Cause of Causes:**

- Requirements not fully known by specification writer
- Overlapping standards make it hard to pick correct one
- Standards spell out **both outcomes and methods** to use.

Root Causes:

- Over-reliance on standards to specify work order needs.

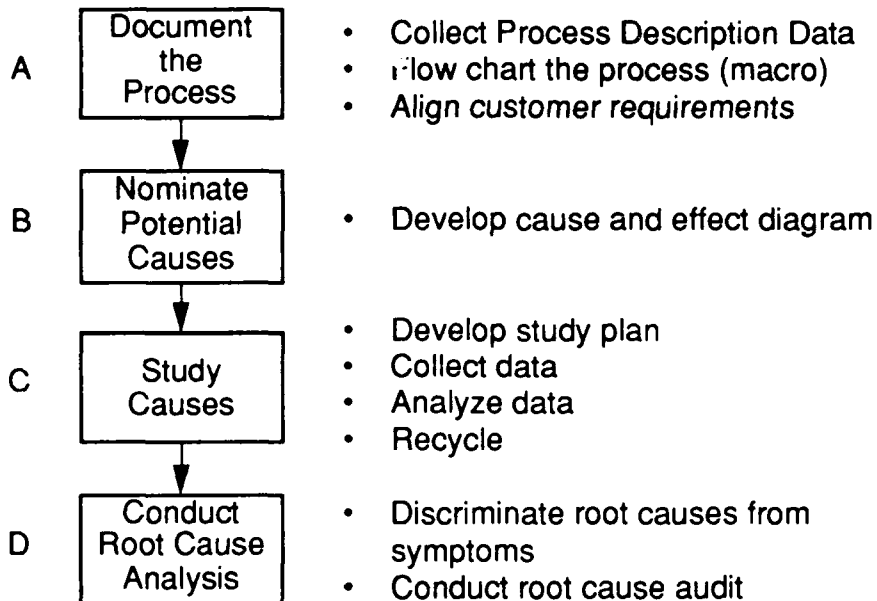
Impact of Root Cause:

- Impacts by having writer invoke a standard which introduces extra steps into the work order being generated.
- Adds costs to the product wanted
- Adds time to the whole system.

Case Study 2-10**Root Cause Analysis****Learning the Process**

Case Study 2-11**Root Cause Audit****Learning the Process**

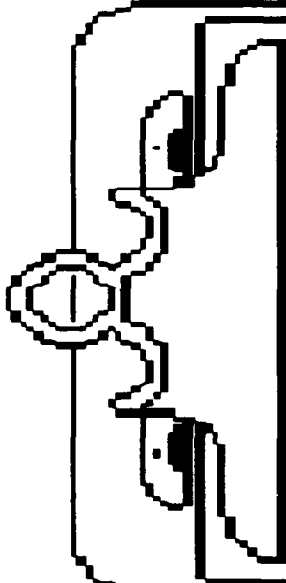
Phase II: Learning the Process



Learning the Process

MODULE FIVE

**GENERATING AND
SELECTING SOLUTIONS**

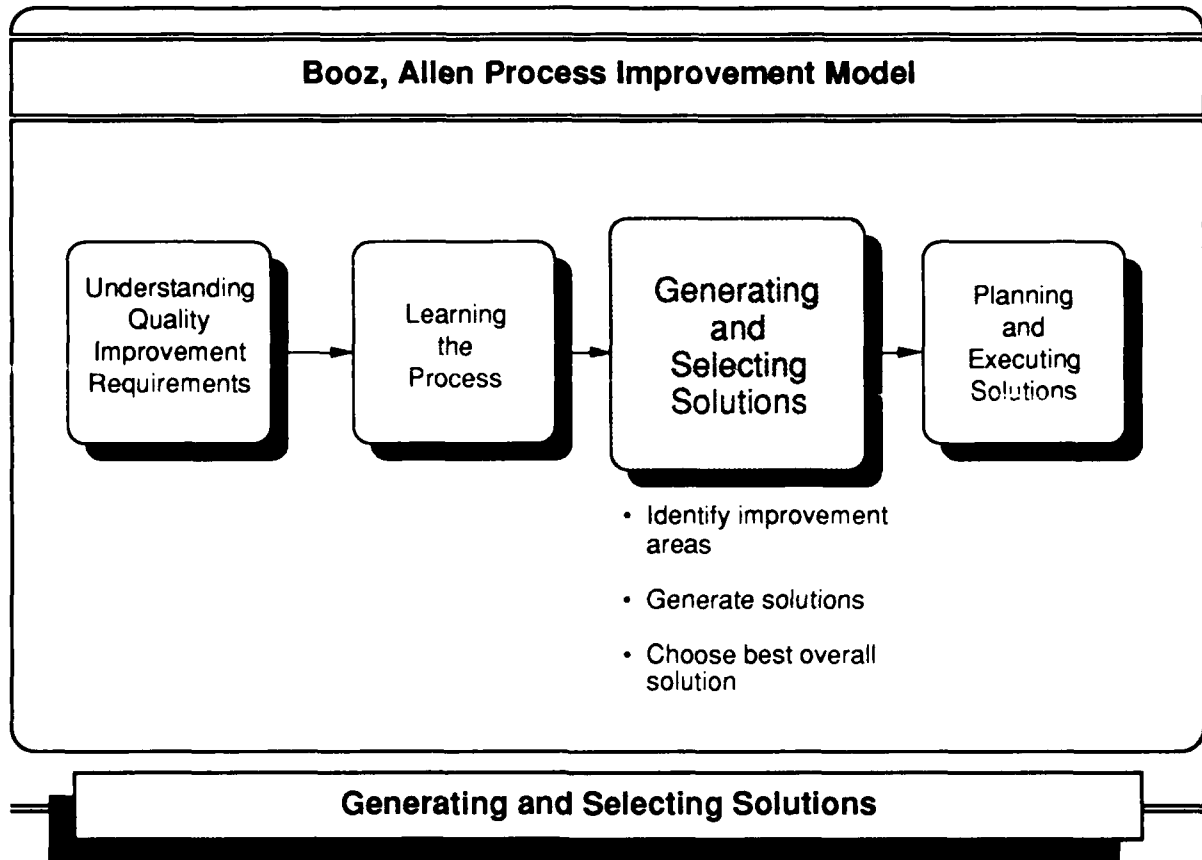
Module Five Objectives

Upon completion of this module, the participant will be able to:

- Analyze a process as it is currently working; differentiate between value-added and nonvalue-added steps.
- Develop a value-added flow diagram.
- Develop an optimum process flow diagram, incorporating root cause audit data and customer requirements, to identify improvement areas
- Determine goals and criteria that the solutions must meet and identify constraints to implementing solutions.
- Select the best solutions to implement from identified improvement areas.

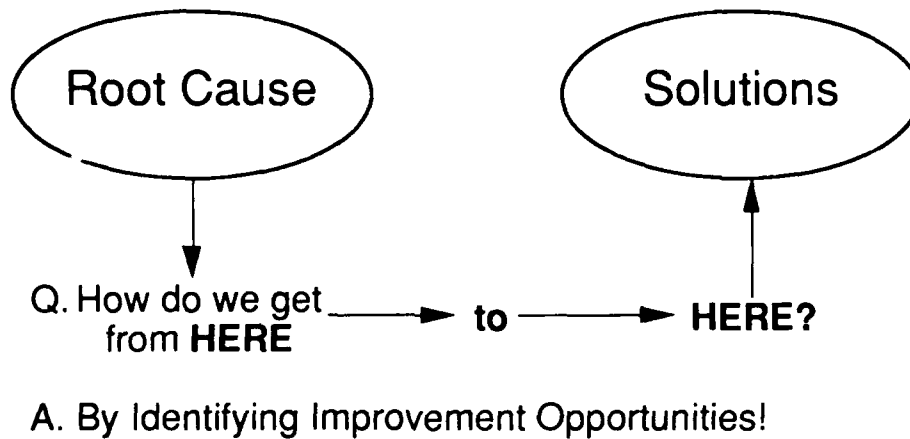
Generating and Selecting Solutions

- This module describes the steps involved in Phase III, Generating and Selecting Solutions.
- Upon completion of this module, you will be able to describe the major steps in the generating and selecting solutions phase and apply the concepts in a practical process improvement experience.



After identifying the root causes of a process problem, the next activity is to generate and select solutions.

- **Identify Improvement Areas:** This step encompasses developing a value-added flow diagram and an optimum flow diagram in order to identify improvement areas.
- **Generate Solutions:** This step involves using the brainstorming technique to generate possible solutions to the improvement area identified previously. Additionally, goals, criteria and constraints are identified to be used when evaluating the solutions generated.
- **Select Best Solution:** The proposed changes are narrowed down by critiquing each solution and evaluating it against the goals, criteria, and constraints the PAT identifies. Finally, the best solutions are selected using the multivoting technique.

Develop a Value-Added Flow Diagram**Generating and Selecting Solutions**

The first step in Phase III, Generating And Selecting Solutions, is to develop a value-added flow diagram. To eliminate root causes, the PAT must identify areas of the process that can be improved. Identifying areas for process improvement is accomplished by making the transition from looking at the way activities are currently performed to the way the activities "should be" performed.

One way the PAT can make this transition is by analyzing the current process and identifying the activities that add value to the process and those that do not. The term "value added" refers to the activities that are essential for producing the required outputs. One way to identify value-added activities is to determine what happens to the output if a given activity is not accomplished. For example, if the activity of filing a copy of all correspondence were no longer performed and did not change the output, it would not be a value-added activity.

Develop a Value-Added Flow Diagram

A "Value-Added" Step"

- Is critical to producing what the customer requires
- Is what the customer "pays" you to do
- Contributes directly to the transformation of the input to the output the customer requires

Generating and Selecting Solutions

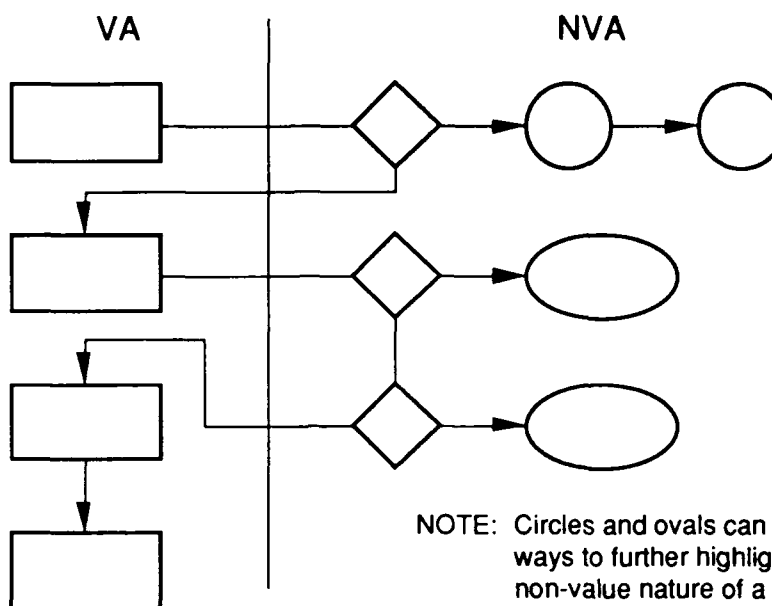
- A value-added flowchart distinguishes between steps that add to costs and low quality (the "improvement opportunities"), and steps that directly contribute to providing what the customer wants. It is based on the theory that any process consists of two types of steps.
 - *Value-Added steps.*
 - Add value to the outputs.
 - Essential for producing the required outputs at the current level of technology. (Test: output cannot be made without this step.)
 - *Nonvalue-Added Steps.*
 - Do not add value but only add cost--waiting, approvals, sign-offs, tracking...
 - Not essential for producing the required outputs at the present level of technology.
 - Filled with unproductive work
 - Work due to system or process errors or omissions.

Develop a Value-Added Flow Diagram

Key: Does customer want to pay for the step?
Does it meet customer requirements?

Nonvalue added steps exist to deal with the errors, omissions, defects, waste (such as time waiting for approval or signature), storage, etc. These steps involve correction of errors, rework, scrap and disposal.

- Notice how obvious the improvement opportunities are. Also, the causes to high costs and low quality can be easily seen.

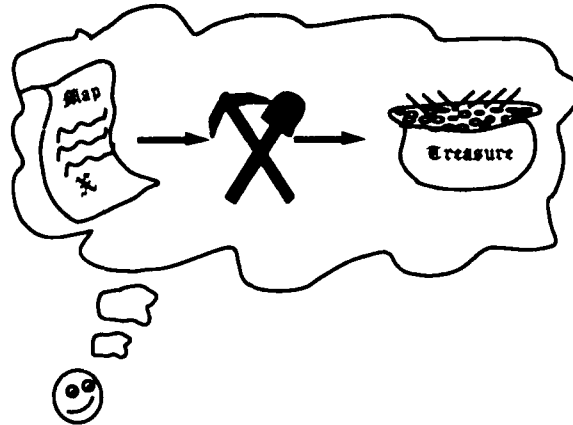
Develop a Value-Added Flow Diagram**Generating and Selecting Solutions**

- The following principles apply in constructing a value-added flowchart.
 - Divide the page into two columns, i.e. value added (VA) and nonvalue-added (NVA). The NVA column is much wider than the VA column, in order to accommodate the many NVA steps often found in processes.
 - Refer to the flow chart developed in the learning phase to serve as a baseline. Use the customer requirements collected in Phase I to help determine "value."
 - The NVA steps that lead to other NVA steps are shown as a hierarchy from left to right across the page in the NVA column.
 - Steps in the NVA column cause poor quality, high costs, customer problems and dissatisfaction. They also add to worker frustration, low morale and loss of pride in work.

Develop a Value-Added Flow Diagram

- Often, one NVA step will lead to another NVA step. For example, inspection leads to finding defects, defects lead to rework. Checking documents leads to finding errors, errors leads to correction.
- VA steps can only be joined together when no NVA processes exist between VA steps. Otherwise the VA steps flow via the relevant NVA steps.
- The ideal or optimal process appears in the VA column.
- The following guidelines should help the PAT distinguish between value-added (VA) activities and nonvalue-added (NVA) activities.
 - If the activity supports a customer requirement, it is VA.
 - If the activity is necessary to produce an output, it is VA.
 - If the activity is performed in anticipation of possible errors, it is NVA.
 - If the activity is the result of an error, it is NVA.
 - If the activity corrects an error, it is NVA.

Case Study 3-1**Develop a Value-Added
Flow Diagram****Generating and Selecting Solutions**

Develop an Optimum Flow Diagram*Envisioning The Optimum Process***Generating and Selecting Solutions**

Step 2 in the process of generating and selecting solutions is to develop an optimum flow diagram.

An optimum process is one that meets the following criteria:

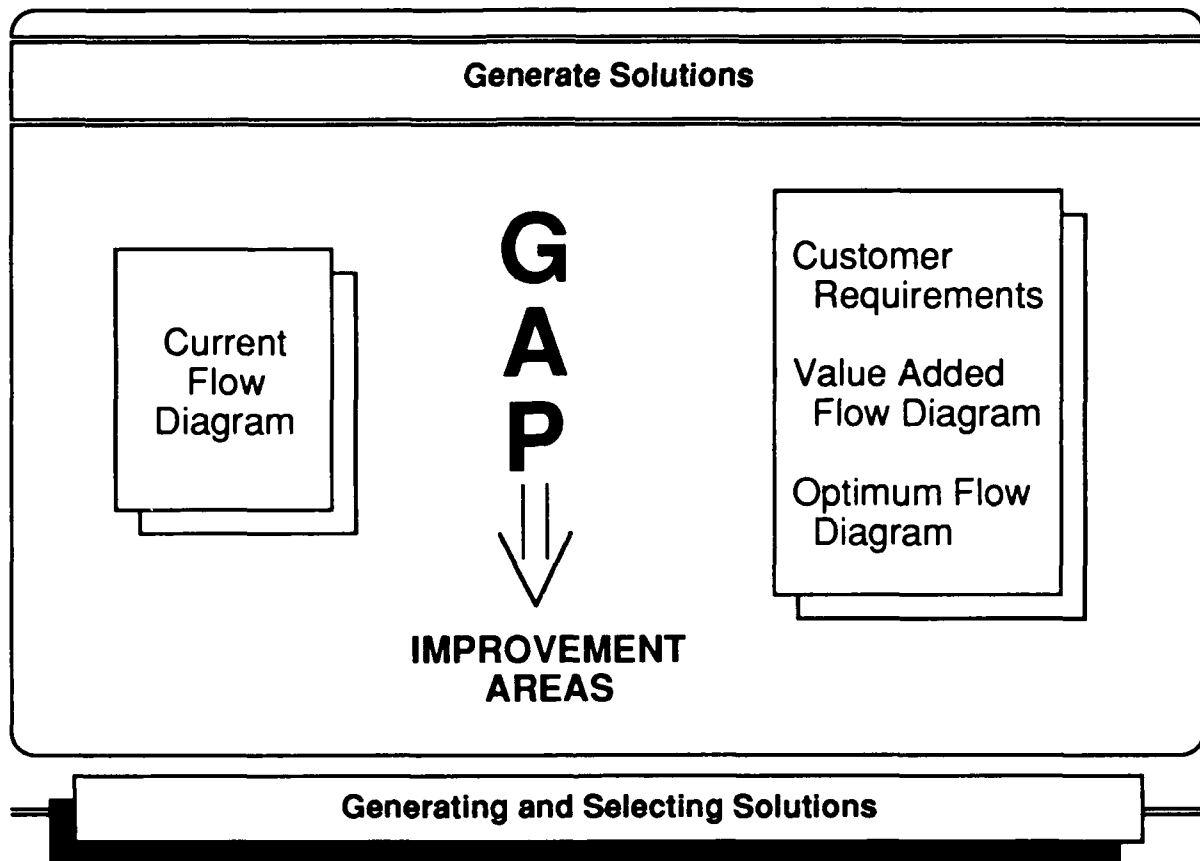
- The process contains the minimum number of steps.
- Quality is built into each step in process.
- The desired quality is always achieved.
- The process is linked to the organization's strategy.
- Customer requirements are addressed throughout the process.
- The process fits within its parent system.
- The process is economical in time, resources, and energy.

At this point, PAT members may say, "Why develop a value-added flow diagram and an optimum flow diagram? This seems repetitive." The answer is that the value-added flow diagram is a tool used to develop the optimum flow (other tools include root cause audit results and cause effect diagram results).

Develop an Optimum Flow Diagram

The value-added diagram documents nonvalue-added activities which signal improvement opportunities. The optimum flow diagram provides a vision of how to get from the way the process currently working to how the process should work.

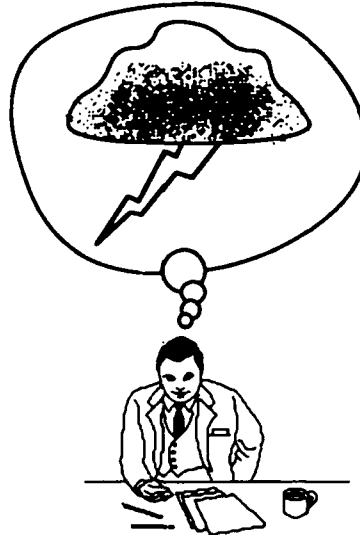
Case Study 3-2**Develop an Optimum
Flow Diagram****Generating and Selecting Solutions**



Identifying improvement areas is a difficult activity because there are really no "right" or "wrong" answers.

- PAT members must work together to develop a list of improvement areas. This is accomplished by comparing the current process flow diagram with information the PAT has already collected (i.e., the customer requirements list, the value-added flow diagram, the optimum flow diagram). The gap between these two flow diagrams is where the PAT can identify improvement areas.
- Once a specific improvement area has been identified, the PAT must generate solutions so that the current process flow will more closely resemble the optimum process flow. This can be done by using the brainstorming technique.

Case Study 3-3**Identify Improvement Goals &
Generate Solutions****Generating and Selecting Solutions**

Identify Goals, Criteria, and Constraints*Identifying Goals and Criteria***Generating and Selecting Solutions**

The third step in the process of generating and selecting solutions is to identify goals of, criteria, and constraints to the ultimate solution. The information generated in this step will help the PAT evaluate the solutions it generates and select the best solutions to implement.

The PAT must brainstorm to:

- Define the characteristics of an "ideal" solution
- Identify the criteria the solution *must* meet to qualify as a real solution.
- Identify desirable criteria (*wants*).
- Write a statement of the goals and desired outcomes of the solution.

Identify Goals, Criteria, and Constraints

What is a Goal for Process Improvement?

- A GOAL is not a method (disguised solution)
- A GOAL can to identify by asking:

"No matter how we decide to improve this process, the thing we have to achieve is ...?"

Generating and Selecting Solutions

In process improvement it is important to know why you are trying to improve the process.

"No matter how we decide to improve this process, the thing we have to achieve is ...?"

Eg. 1 ... Earlier policy information to authors of executive correspondence. (GOAL)

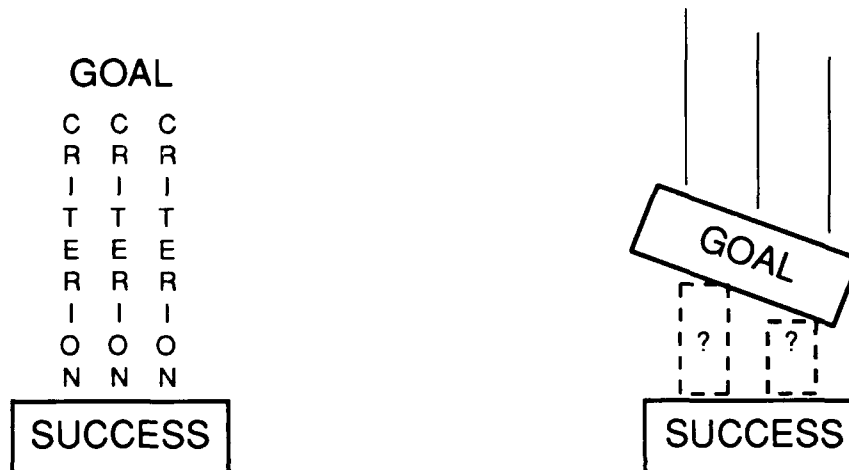
Eg. 2 ... A way for authors to prioritize conflicting inputs. (GOAL)

Eg. 3 ... To provide best data available for research-based answers. (GOAL)

Identify Goals, Criteria, and Constraints

What is a Criterion in Process Improvement?

Criteria support a goal and define success.

**Generating and Selecting Solutions**

Often we work hard not knowing what today's success really is.

The criteria tell us when we are done improving in this round of improvement.

For example,

Goal: Provide earlier policy information to authors of executive correspondence.

Criterion: Information must be given to authors in 2 days

Criterion: Policy information must reflect decisions of signatory/secretary within last 30 days.

Criterion: Information must be able to travel with package if necessary to educate others in chop chain.

Identify Goals, Criteria, and Constraints*Identifying Constraints*

- Determine available resources (monies and manpower).
- Identify policies and procedures (both formal and informal) that determine the feasibility of the solution.
- Identify training requirements.
- Consider the history of the people and functional units involved in the process change.

Generating and Selecting Solutions

In addition to identifying goals and criteria, the third step includes determining the constraints that may interfere with successful implementation of each proposed solution. Identifying constraints to successful implementation of solutions is a critical activity. The PAT will use this information when evaluating each of the alternative solutions.

- *Determine available resources (monies and manpower) .*

The PAT can gather information from the QMB or ESC, or ask managers in the functional areas it is studying to help provide this information.

- *Identify policies and procedures.*

The PAT should identify policies and procedures that may have an impact on the feasibility of implementing solutions.

Identify Goals, Criteria, and Constraints

- Identify training requirements.

The best way to identify training requirements is to conduct a personnel skills inventory. In conducting a skills inventory, the PAT should ask the question, "What skills do employees have and what skills do they need to do their jobs?" Training requirements also can be identified by informally interviewing personnel, supervisors, or managers or speaking with the Personnel and Training Departments.

- Consider the history of the people and functional units involved in the process change.

The PAT should discuss any factors that may influence the success of solution implementation.

Case Study 3-4

Identify Goals, Criteria,
and Constraints

Generating and Selecting Solutions

Select Best Solutions

- Changes should be the most simple to make and maintain.
- Changes should address root causes.
- Changes that would increase the amount of work or complexity in the process should be avoided.
- Fix obvious errors with obvious solutions right away.

Generating and Selecting Solutions

Step four in the Phase III is to select the best solution(s) to implement. The PAT must evaluate each of the proposed solutions **based on goals, criteria, and constraints previously identified** and one or several solutions that could be implemented. You should remember:

- *Changes should be the most simple to make and maintain.*

The PAT should discuss all possible implications of the proposed solutions. How will the solution affect other processes? How much training will employees need to effectively implement the modified process?

- *Changes should address root causes.*

If the process change will not help to eliminate a root cause, it should not be chosen. It may not be possible to eradicate a root cause. Limiting its negative effect is important to pursue.

Select Best Solutions

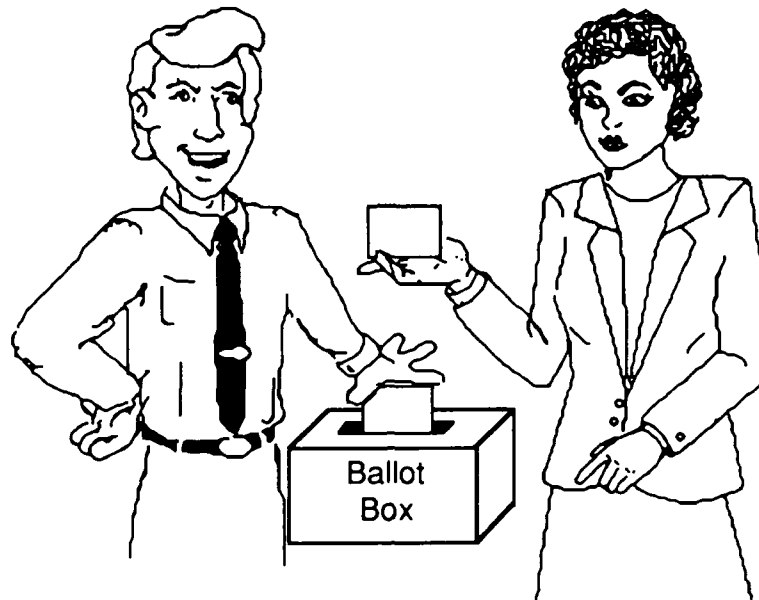
The last step in Phase III generating and selecting solutions, is following up on the selection of the selected solutions. The PAT should:

- Determine which process changes should be implemented immediately which need further modification.

Information from the evaluation of alternative solutions should help the PAT identify those process changes that need modification and those that should be implemented.

- Identify other people and functional units that should be involved in further actions.

The PAT should begin to compile a list of the people and cross-functional units that may be involved in solution implementation. People involved in the processes are an invaluable source of information for identifying and eliminating barriers to successful process change implementation, identifying and locating additional resources, and identifying and obtaining commitment from employees interested in taking an active role in the implementation of solutions.

Select Best Solutions**Generating and Selecting Solutions**

One group process technique that is useful for selecting the best solutions from among those of equal value is *multivoting*. Multivoting is a technique used to select the most important items from a list with limited discussion and difficulty.

To use multivoting, follow these steps:

- By writing solutions numbers on a sheet of paper, each PAT member chooses several solutions that he thinks should be implemented. (Each member should be allowed to choose a number of solutions equal to one-third of the total number of items on the list.)
- Tally the votes.
- To reduce the list, eliminate those items with the fewest votes. Because group size affects results, in groups with 5 or fewer members, cross off items with only 1 or 2 votes. In groups with 6 to 15 members, eliminate anything with 3 or fewer votes. If the group is larger than 15, eliminate anything with 4 or fewer votes.
- Repeat as necessary until you have a list of prioritized solutions.

Case Study 3-5**Select Best Solutions****Generating and Selecting Solutions**

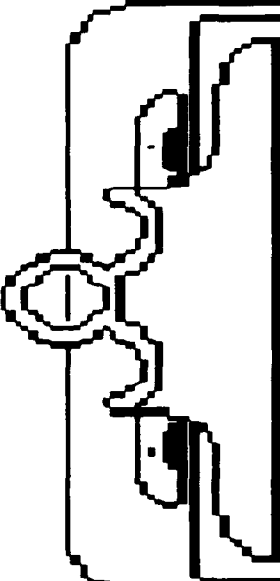


TOTAL QUALITY
MANAGEMENT

Process Action Team Workshop

MODULE SIX

PLANNING AND EXECUTING SOLUTIONS

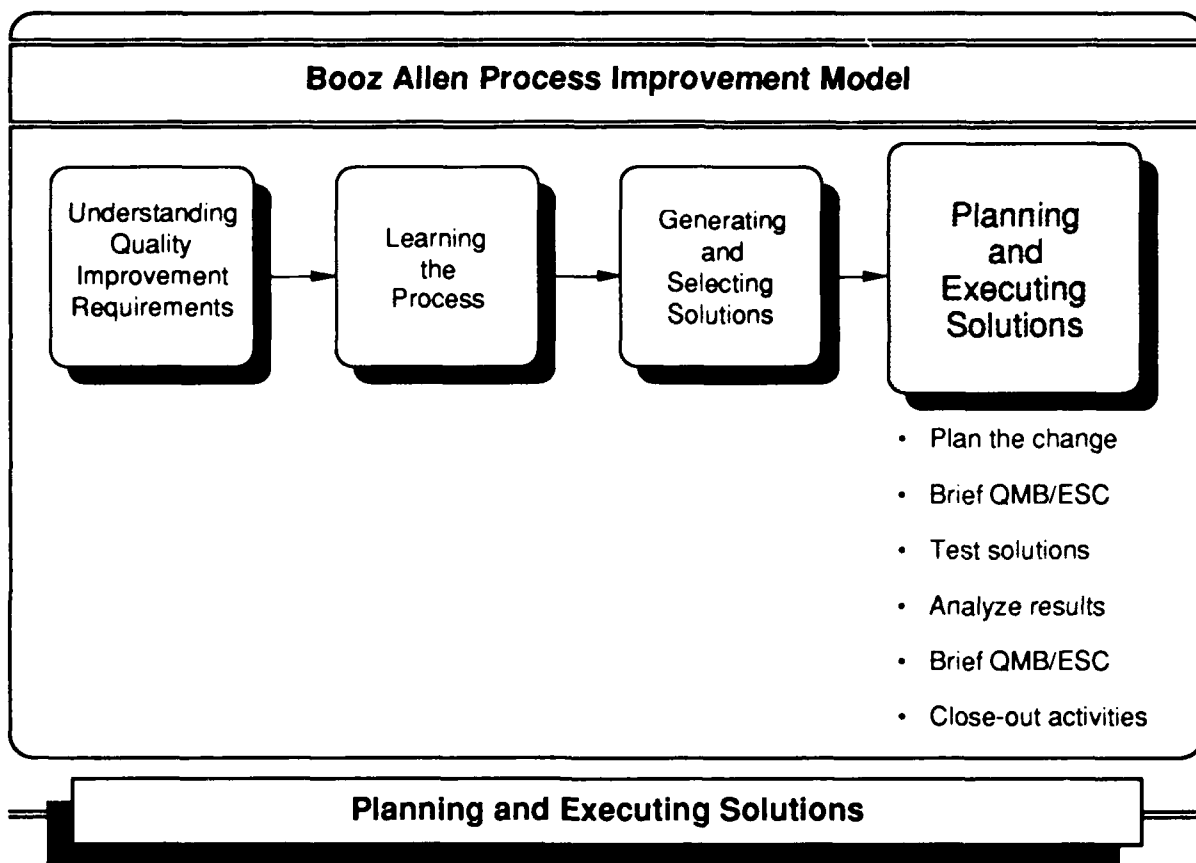
Module Six Objectives

Upon completion of this module, the participant will be able to:

- Prepare a test plan.
- Test the recommended solution.
- Make standardization recommendations organization wide.
- Prepare briefings for ESC/QMB.
- Conduct close-out activities.

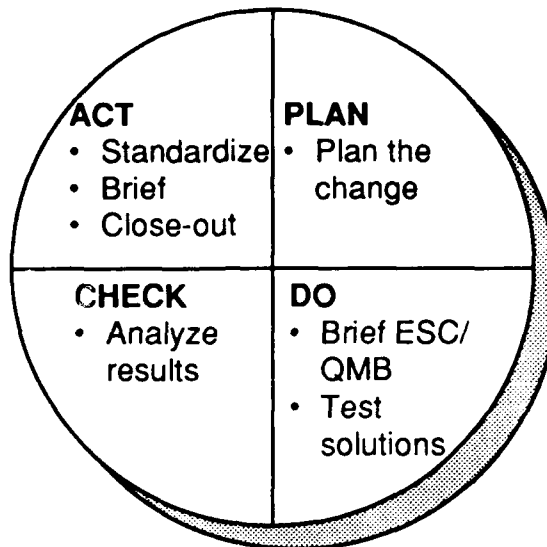
Planning and Executing Solutions

- This module describes phase IV, Planning and Executing Solutions, in the process improvement model.
- Upon completion of this module, you will be able to describe the major steps in this phase, and apply the concepts in a practical process improvement experience.

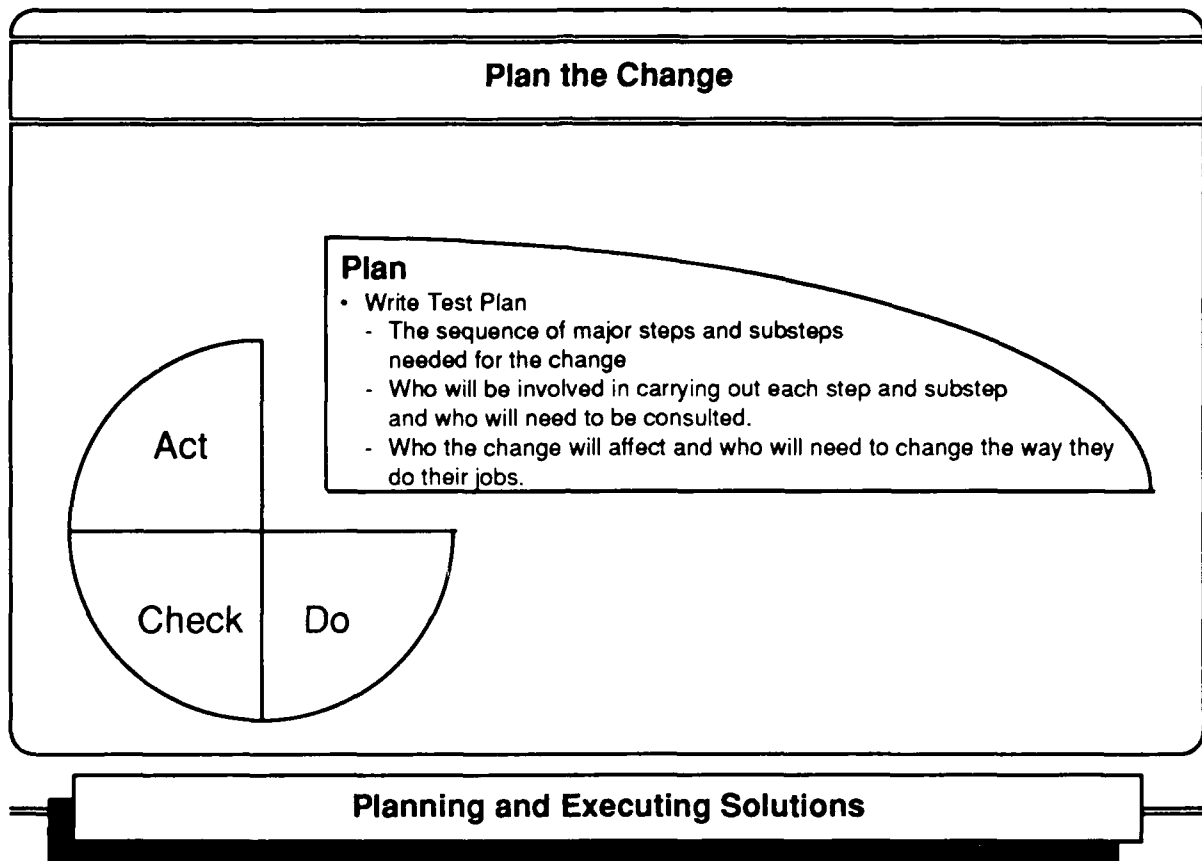


After choosing the best overall solution from the proposed alternative solutions, it is time to plan and execute the recommended solution (or change).

- The first step is to write test plan. A test plan incorporates all ideas and recommendations on how the recommended solution will be tested.
- After preparing a test plan, the PAT presents the plan to the ESC/QMB to obtain approval to test the solution.
- The third step is to actually conduct and monitor the test.
- The fourth step is to analyze the results from the data collected and from there proceed to step 5 which is developing recommendations to standardized the process change organization-wide.
- The final steps are presenting the standardization recommendations to the ESC/QMB and eventually performing close out activities.

Planning and Executing Solutions**Planning and Executing Solutions**

Using the PDCA cycle in planning and executing solutions will assist PATs in smoothly implementing changes.



Planning for change plays a key role in determining a project's success. Unfortunately, the management style commonly practiced today uses a "Plan/Act" or sometimes "Act" cycle that does not benefit from the learning steps ("Do, Check") in the PDCA cycle. The key elements of planning are looking ahead, anticipating the resources and training necessary for a successful project, and anticipating potential problems and solutions. Though these steps add time up front, careful planning increases the probability of success and saves time in the long run.

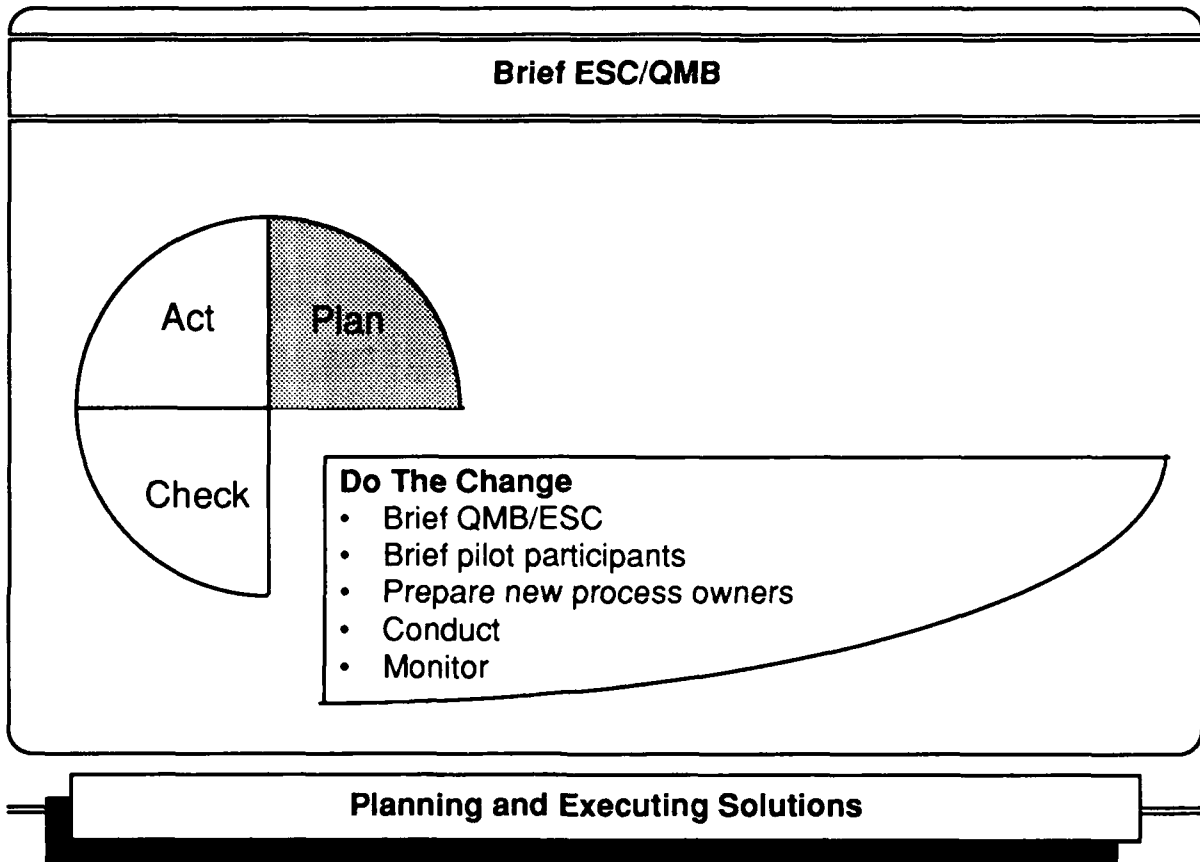
To implement a solution, the PAT needs to prepare a **TEST PLAN**. In writing a Test Plan, the PAT needs to consider:

- The sequence of major steps and substeps needed for the change
- Who will be involved in carrying out each step and substep and who will need to be consulted.
- Who the change will affect and who will need to change the way they do their jobs.

Plan the Change

- How you will know when each step is completed.
- What might go wrong in implementing the plan and what side effects might develop.
- What to do about unexpected problems.
- The level of resources necessary to carry out the change.
- How the PAT will know if the recommended solution is being implemented as expected.

Additionally, identifying barriers and aids helps teams plan for change. Barriers obstruct change and aides promote change. For each barrier recognized, the team must identify at least one corresponding aid. Once barriers and aids are identified, the team can make plans to make maximum use of the available aids to overcome the barriers to implementing the chosen solution.



Every team, sooner or later, will be asked to make a presentation to mark key milestones in its project. At this point, the PAT needs to present its Test Plan to the ESC/QMB to obtain approval to test the solution.

Other examples of when it may be necessary for a PAT to give a presentation are:

- When the PAT has documented the causes of a major quality or productivity problem
- To make interim progress reports
- To obtain approval to test the solution
- To brief test site participants
- When a solution has been tested and proven successful
- To make final recommendations at the conclusion of a project.

Brief ESC/QMB

A presentation may be one of two types: persuasive or explanatory/instructional.

A persuasive presentation is designed to sell, convince, change views or attitudes, or get action.

An explanatory/instructional presentation is designed to orient individuals, introduce new information, or teach or update an audience already familiar with the project.

There are three key guidelines for giving a presentation to the ESC/QMB.

- Involve all team members in the presentation.
- Keep the length to approximately 30 minutes.
- Allow time for questions and answers.

After the team presentation the ESC/QMB usually responds in one of the following ways:

- Proceed with the test.
- Do not proceed with the test.
- Revise the plan and re-present to ESC/QMB.

Case Study 4-1**Making An ESC/QMB Presentation****Planning and Executing Solutions**

Do the Change

What is a "Test"

An experimental implementation of a
chosen solution for process improvement.

1. Experimental: short term, limited exposure
2. Implementation: enough to see if the solution solves the problem without creating new or worse ones.
3. Chose solution: usually not more than 1 solution at a time.

Planning and Executing Solutions

- This is the "DO" portion of the PDCA Cycle.
- The data chosen and monitoring systems used prepares for the "check" portion of the PDCA Cycle.

Do the Change

What will be going on during the test:

- Training test site participants, if necessary
- Collect data on process per change plan
- Monitoring key points to determine if change is proceeding as expected
- Resolve unexpected problems

Planning and Executing Solutions

Once the PAT has planned for the change and received approval to test its proposed solution, the team is ready for the next step, which is actually testing the solution. The objective of this step is to confirm that the effect of the problem and its root causes have been decreased and the solution is improving the problem.

For most situations, pilot testing using a sampling technique can give a PAT good insight into the target population, without the difficult task of collecting data from the total target population. If the sampling is properly done, the sample members will be representative of the target population, and the results obtained from analyzing the sample data will be generalizable to the target population.

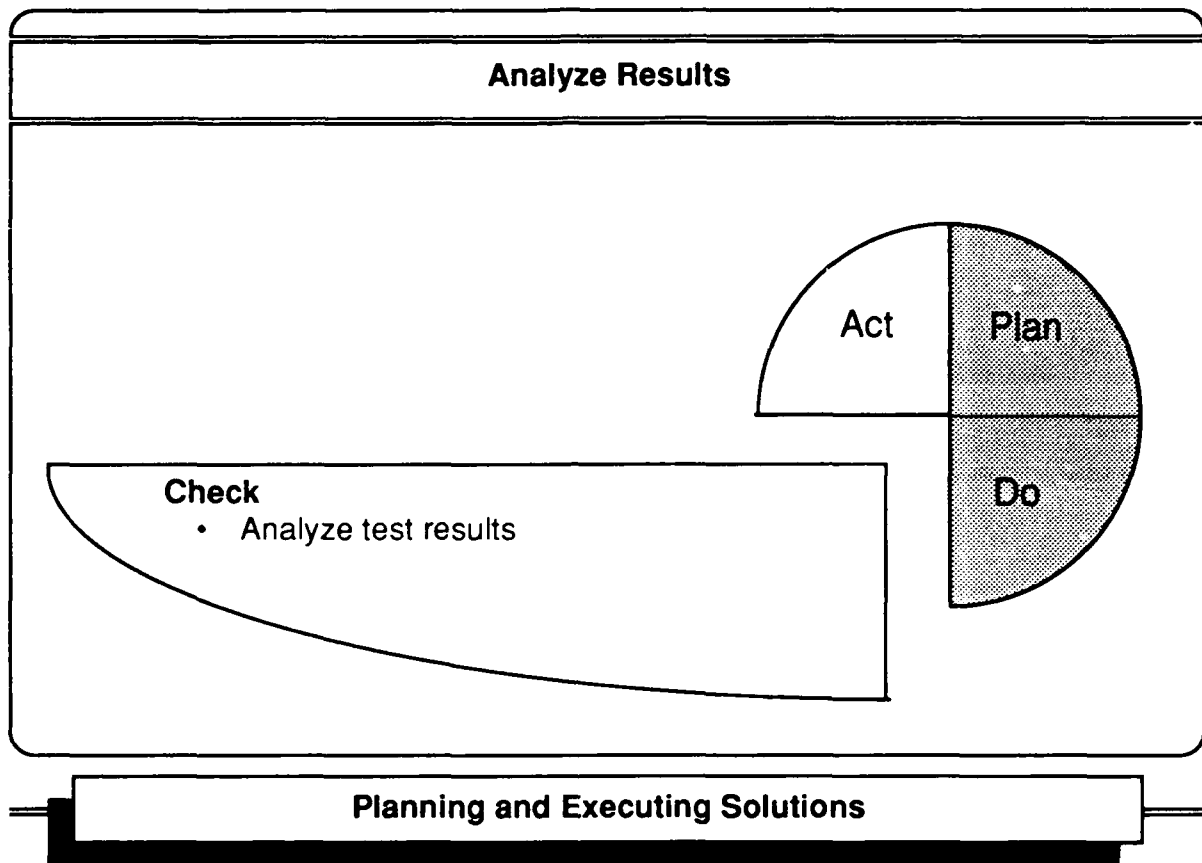
The PAT needs to secure commitment and support from the top management and staff of the chosen test site. In addition the pilot participants must be motivated and willing to contribute to the PAT's problem-solving efforts. **Commitment to success is critical. If participants are not ready to pledge their active support, then the pilot project should be implemented elsewhere.**

Test the Solution

The PAT will need to do the following to gain support of test site participants:

- Present to the test site managers and staff how the process will be tested according to the Change Plan.
- Explain the derivation of the solution and the goals of the pilot test.
- Explain the roles of the individual PAT members in the implementation effort.
- Stress to the test site participants that the PAT is evaluating the performance of the process and **not** specific individuals.

Preparation should include either formal training or on-the-job training for pilot participants whose jobs change or require additional knowledge. During the testing, the PAT should provide support where necessary and ensure that the test site participants are *executing the methods and procedures as detailed in the Change Plan*. The PAT also should collect data to determine if the change is proceeding as expected as well as to determine the effectiveness of the solution. "Before" and "After" Pareto diagrams ("double Paretos") should be constructed to make this comparison.



At this point in the PDCA cycle the PAT needs to analyze the progress and effectiveness of the test as outlined in the Change Plan.

The objective of this step is to confirm that the root cause of the problem has been reduced. The key activities of this step are to:

- Confirm the effects of the solution.
- Compare the problem before and after the test, using the same indicator.
- Compare the results obtained relative to the target.
- Assess whether the results meet or exceed the target and, if the results do not meet the target, address the causes.

Analyze Results

A test is considered successful if the following conditions have been met:

- Root cause has been eliminated.
- Process is under statistical control or has been improved, streamlined, or error proofed.
- Solution is generalizable throughout the organization.

Tools that can be used to analyze the data are:

- Paretos
- Histograms
- Run charts
- Control charts

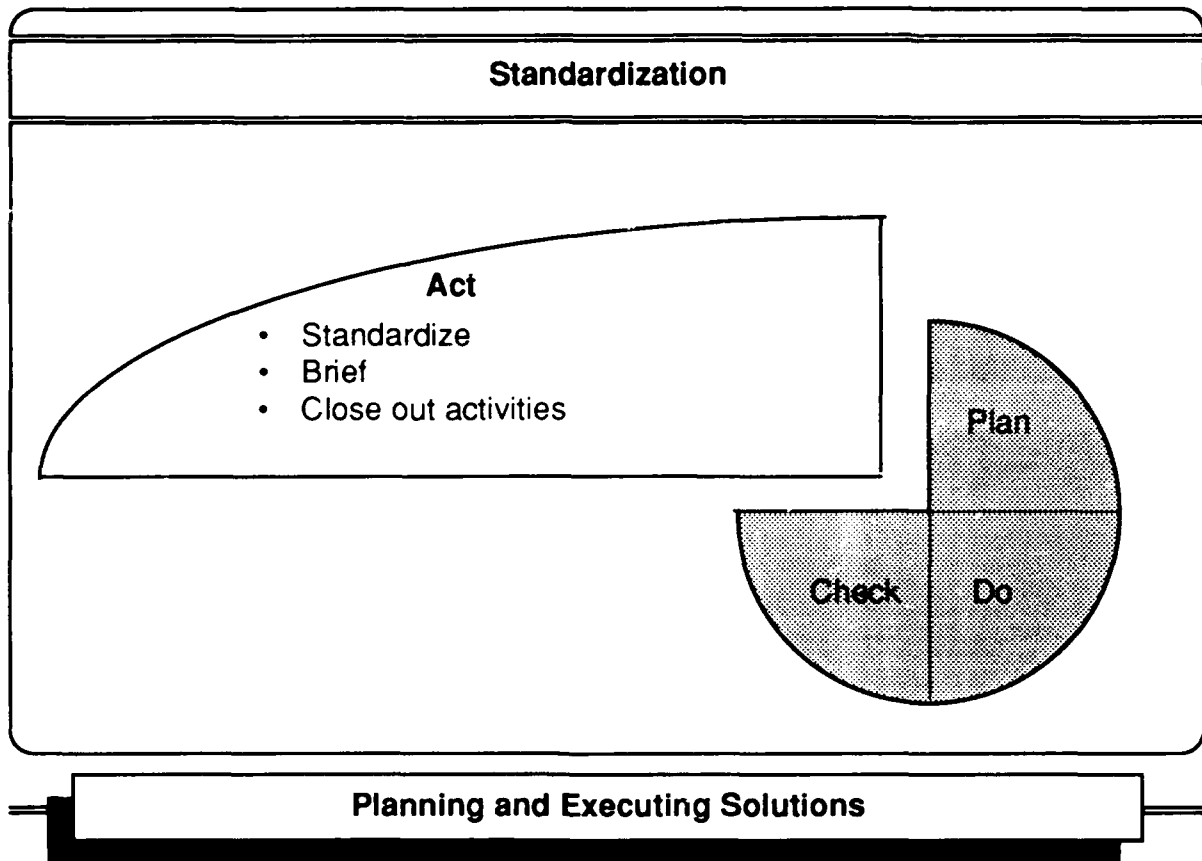
After analyzing the data, the PAT should ask the questions:

- "Should the change be adopted or does the solution require further examination to substantiate an organization-wide implementation?"
- How applicable are the test results to the entire organization?"

If the data indicate that the solution or Change Plan did not achieve the predicted results, the PAT should re-work their analysis and experiment again. Repeating the Plan, Do, Check part of the PDCA cycle is not uncommon.

If the data are consistent with the PAT hypothesis, the PAT can move to the next step, which is to refine or standardize the solution to error-proof procedures. The PAT needs to determine the "generalizability" of solution. How applicable are the test results to the entire organization? The answer to this question is partially dependent upon the sample population utilized in the pilot testing. If the results predict success under similar conditions, the PAT is ready to recommend a solution for organization-wide adoption.

The lessons learned from the pilot test should indicate improvement areas. Incorporate this feedback before seeking to institutionalize the process improvements.



You have now reached the final phase of the PDCA cycle. The first three phases, Plan, Do, and Check have been completed. The fourth phase, ACT, involves a series of recommendations on how the changes should be implemented throughout the organization.

The objective of this step is to ensure that the problem does not recur. Once the data collected from the test have been analyzed and indicate that the solution has been successful and generalizable organization-wide, the team begins to standardize its system for improvement. The key activity of this step is to ensure that the solution becomes part of daily work. This activity is accomplished by creating or revising the work process and training employees in this new process.

Activities performed by the PAT during this step are:

- Designing a revised process flow chart
- Developing a method to ensure that the solutions will become part of daily work

Standardization

- Instituting periodic checks with assigned responsibility for monitoring the solution
- Determining who is capable of performing the next steps. (An Action Plan).

Note that the PAT will present the results of these activities as *recommendations* for the ESC/QMB to evaluate and act on.

Brief ESC/QMB on Results of Pilot Test

A Final Presentation should be Organized as Follows:

- I. INTRODUCTION
- II. PROJECT DESCRIPTION
- III. TEST RESULTS
- IV. CONCLUSION

Planning and Executing Solutions

The PAT's final presentation to management (either a QMB or an ESC) determines its activities and level of participation because during this presentation the PAT offers recommendations for standardizing the process organization-wide.

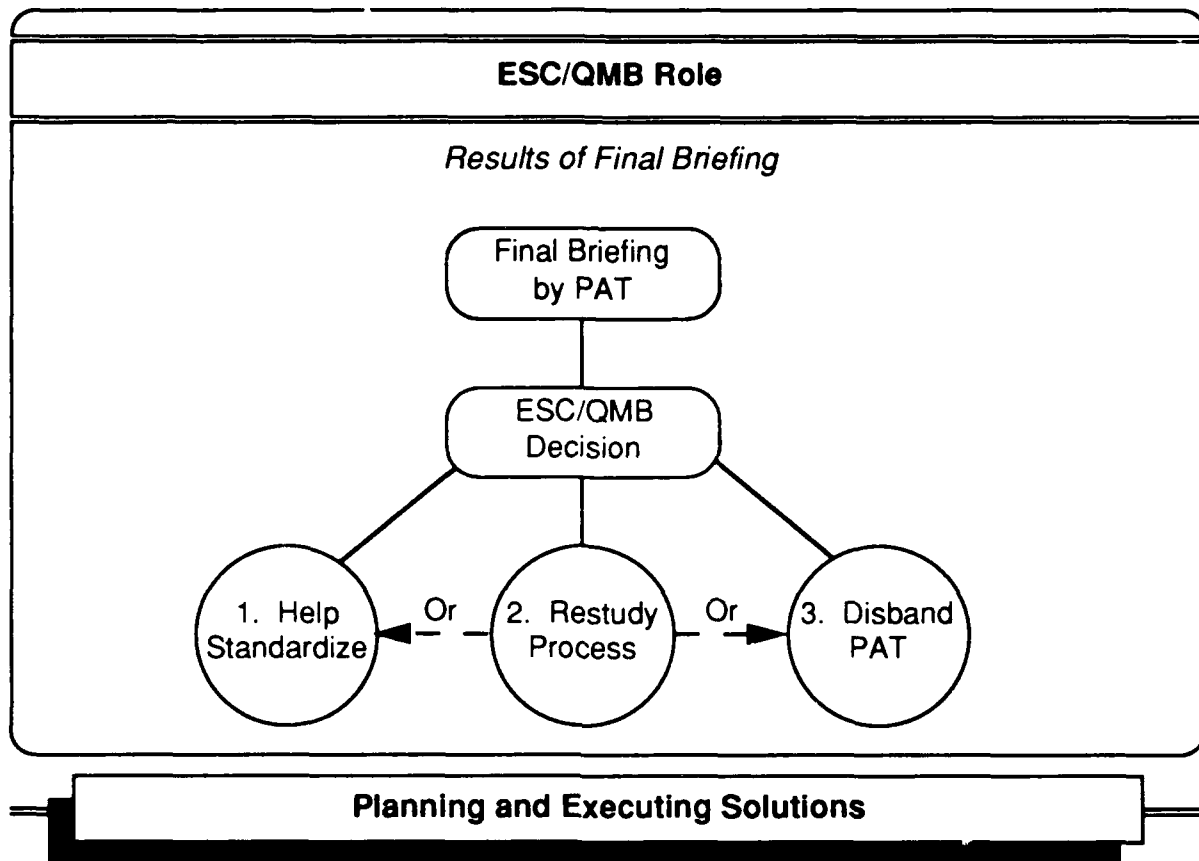
The PAT's final presentation should be organized as follows:

Introduction - Includes the derivation of the PAT's mission statement and project goals, and a brief statement of the successful process change.

Project Description - A quick summary of the team's previous presentation that explained the methods, activities, and results that convinced your PAT to seek support for a pilot test.

Test Results - The analysis and achievements resulting from pilot testing and a summary of the lessons learned.

Conclusions - Recommendations for standardizing the process improvements organization-wide.



After the recommendations for standardization are presented, **the PAT's role is technically over**. At this point, the ESC/QMB will decide to do one of three things:

1. Ask the PAT to continue to help refine the standardization plans and help implement the solution organization-wide.
2. Ask the PAT to restudy the process and its conclusions and re-present their findings at a later date, resulting in either #1 or #3. This could occur more than once.
3. Disband the PAT, implying that the ESC/QMB will take over and standardize the process organization wide without help from the PAT.

Option number one will be discussed fully while option number three will be covered in the close-out activities section of this module. If the ESC/QMB requests the PAT to restudy the process and re-present their findings (option two), the PAT will eventually be asked to help standardize or disband (options one and three).

Assist ESC/QMB in Standardizing Process Organization-Wide*PAT Potential Responsibilities*

- Fine tune recommendations
- Oversee implementation
- Interface with process owners
- Monitor changes
- Document progress
- Train and empower employees

Planning and Executing Solutions

Helping to standardize the process organization-wide is the most important PAT activity after identifying the solution. Remember, having a solution to a problem doesn't solve the problem until the solution is acted on!

When assisting with standardizing the process throughout the organization, the first activity the PAT may engage in is finalizing and fine-tuning the standardization recommendations and turning the recommendations into a plan. The PAT can offer the content knowledge of the process while management can help tailor the recommendations to respond to various idiosyncrasies of other organizational units. Also, management can contribute their knowledge of how resources (monetary and manpower) will dictate the roll-out of the plan.

The PAT can also oversee the implementation and interface with the process owners to help establish the process change. The experience gained from the pilot test will help the PAT/management team anticipate and overcome obstacles. Each PAT member may be responsible for helping individual organizational units.

ESC/QMB Role

A PAT member may also act as a liaison between management and the process owners to ensure productive, two-way communication. In addition, the PAT member can assist in monitoring changes and documenting progress.

The PAT also assists in transferring knowledge and all responsibilities to the process owners. The PAT or individual members should act in concert with the training department to develop on-the-job training (OJT) aids for the new process owners. Also, the responsibilities for process monitoring should be fully transferred when the individuals involved in the new process are capable of performing the duties. This training and empowerment should institutionalize the learning process and infrastructure mechanisms. Thus, the role of the process owners will shift from basic orientation to continuous process improvement and the "seeds" of continued growth will be planted.

Close-Out Activities

- Team Review and Evaluation
- Team Recognition

Planning and Executing Solutions

The PATs final responsibility is to recognize and bring their improvement projects to closure. Because most PATs have a definitive life-cycle, they must be prepared to make a smooth transition through the final ACT phase of the PDCA cycle. Each PAT has the responsibility of supporting institutionalization of process improvements and promotion of follow-on PAT efforts in the organization.

The objective of this step is to plan resolution of any remaining problems and to evaluate the team's effectiveness. What was done well? What could be improved? What could be done differently?

At this time, a team usually performs a "self-critique" on how well it did.

Close-Out Activities*Team Review and Evaluation*

Team review and evaluation can be accomplished by completing a survey or evaluation sheet:

- I. Internal workings
 - Summarize structure and maturation of interaction/group dynamics
 - Describe your PDCA process
 - Catalogue tools and techniques
- II. Value to continuous process improvement
 - Identify other problems uncovered but not analyzed
 - Advice to other PATs (lessons learned)
 - Benefits on organizational level
 - Benefits on group level
 - Benefits on individual level

Planning and Executing Solutions

Self-evaluation is a management support system for exchanging an informal evaluation of team and individual performance. Documenting the PAT's experiences will enable lessons learned to be transferred, systematic or continuous improvement of PATs, and identification of new improvement opportunities.

Each member should assess the Charter document and its implementation to identify avenues for improvement. The evaluation should be separated into two sections. The first section, "Internal workings," should concentrate on the mechanics of the PAT. This feedback will help determine the operational effectiveness of the team and the impact of external assistance or interference. The topics should include:

Meetings: number, efficiency

Personal: individual growth, relations

Group dynamics: team behavior

Management : clarity of goals, extent information sharing, procedures, assignments, participation, conflict resolution

Preparation/training: comfort and competence levels

Close-Out Activities

The second section, "Value to continuous process improvement," focuses on the lessons learned and the benefits to the organization, group, and individual. Each member should list other problems that might have surfaced but were not analyzed. A thorough examination of personal and team lessons learned should be written to help prepare and advise other PATs. Finally, each member should discuss his perception of how the PAT experience affected the organization, team participation, and self-development.

This self-evaluation should not be postponed because members might need to use this information on a new assignment. A survey or evaluation sheet should be designed to meet the needs of each PAT and the organization. Informality of the evaluation should be stressed to encourage as much honesty as possible.

Close-Out Activities*Team Recognition*

Rewarding team and individual achievement is important to recognize contributions of individuals and to promote the success of PATs. Vehicles of recognition include:

Team/Individual

- Appreciation letter
- Certificate
- Finished project display
- Pictures of members
- Small gift

Promotion

- Monthly letter, posters, flyers
- Presentation

Planning and Executing Solutions

Each PAT should establish criteria for rewarding team and special efforts. For example, the entire team should receive a memento to remember its productive group experience. An appreciation letter, certificate, finished project display, pictures of members, or a small gift are appropriate forms of recognition that will enable members to share their feeling of pride with coworkers. Special effort awards should recognize members for innovation, risk taking, and team building. The group should evaluate and choose the types of recognition to suit the needs of the group. Nonmonetary awards should be used only to avoid unnecessary competition for monies.

Another vital close-out activity is publicity. Promoting the success of a PAT will help stimulate employee participation in other organizational units. It is important to publicize the success stories to spread the good news and to build a positive image of teamwork. Educating and exposing other employees will increase the understanding of PATs. In addition to a monthly letter, poster, or flyer, the PAT could conduct presentations for other organizational units to gain recognition for its efforts as well as to provide first-hand information on how to cross traditional organizational barriers. Another outcome of publicity might be the identification of new improvement opportunities by in other employees.

Close-Out Activities*Final PAT Member Responsibilities*

- Advocate of process change
- Identify and remove barriers
- Share new skills

Planning and Executing Solutions

Each PAT member should become an advocate of accepting process change and should seek to encourage others to take action on other process problems. Each member should help identify and remove barriers within his own group to enable implementation to succeed on a permanent basis. Moreover, each member should plant the seeds of a continual process improvement perspective by sharing his new skills: interpersonal, teambuilding, problem solving, communication and self-development.

A portion of the PAT could become temporary members on another PAT to share lessons learned. The PAT could present their insights to larger audiences in a special forum as another example. Consequently, new PATs can avoid similar start-up pitfalls. Moreover, non-PAT employees can witness first-hand examples of success in empowering the workforce which can increase the participation level of PATs. Assisting others in learning these skills is the basic building block of transforming the workforce. Continuous improvement through these efforts will become everyone's responsibility.

Close-Out Activities*Class Discussion*

- How will you probably incorporate things learned in this course?
 - PAT related
 - Normal duties related
- What things are most valuable?

Planning and Executing Solutions



Course Summary

Now that you have completed this course, you should be able to:

- Apply the Process Improvement Model in PAT assignments
- Conduct activities to understand the scope and requirements for quality improvement
- Study the process using TQM tools and techniques
- Generate and select solutions through the use of methodologies and decision techniques
- Design and execute a plan for pilot and organization-wide implementation.

What will you do when you return to your work site that will incorporate things learned in this course?

Course Summary

**OSD TQM PROCESS ACTION TEAM COURSE
PARTICIPANT COURSE EVALUATION**

THE PURPOSE OF THIS EVALUATION IS TO PROVIDE YOU WITH THE OPPORTUNITY TO EXPRESS YOUR REACTIONS TO THE COURSE. THERE ARE ALSO SEVERAL STATEMENTS DESIGNED TO HAVE YOU RELATE THE CIRCUMSTANCES THAT LED TO YOUR ATTENDING THE SEMINAR. PLEASE GIVE THIS EVALUATION YOUR BEST QUALITY EFFORT.

USE THE SCALE BELOW FOR RESPONDING TO THE EVALUATION
STATEMENTS. ENTER THE NUMBER IN THE SPACE PROVIDED:

**STRONGLY
DISAGREE**
1

DISAGREE
2

**SLIGHTLY
DISAGREE**
3

NEUTRAL
4

**SLIGHTLY
AGREE**
5

AGREE
6

**STRONGLY
AGREE**
7

READ EACH STATEMENT CAREFULLY BEFORE RESPONDING!

1. I had TQM awareness training prior to this Process Action Team course. 1.____
2. I have done additional study on TQM since awareness training. 2.____
3. I have completed additional formal TQM training since awareness training. 3.____
4. TQM concepts have been introduced in my work area. 4.____
5. I have been involved in TQM activity in my work area. 5.____
6. I would like more training in TQM. 6.____
7. The participant manual was very useful during the seminar. 7.____
8. I intend to use the participant manual as a reference source. 8.____
9. The visual aids used in the course were effective. 9.____
10. The case study used in the course was effective. 10.____
11. The course was well planned and organized. 11.____
12. The pace of the course was well suited for the material presented. 12.____
13. Course instructors were readily available for participants. 13.____
14. The amount of lecture given was appropriate for the course material. 14. ____
15. There was ample opportunity to ask questions. 15.____
16. The participant exercises reinforced major course objectives. 16.____
17. The facilities for the course provided a good environment for training. 17.____
18. I had adequate notification that I was scheduled to attend this course. 18.____
19. Instructions on how to get to the training site were adequate. 19.____

CONTINUE ON BACK

Each of the following modules was effectively presented:

20. Module 1 TQM Review	20._____
21. Module 2 Booz, Allen Process Improvement Model	21._____
22. Module 3 Understanding Quality Improvement Requirements	22._____
23. Module 4 Learning the Process	23._____
24. Module 5 Generating and Selecting Solutions	24._____
25. Module 6 Planning and Executing Solutions	25._____

Please indicate your government pay grade (GS, GM etc. plus level):_____

You are encouraged to make comments about the Process Action Team course in the space provided below.

COMMENTS:

OPTIONAL:

NAME:_____ TITLE:_____ OFFICE:_____

TOTAL QUALITY MANAGEMENT (TQM)

Process Action Team *CASE STUDY*

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PREPARED FOR:
THE OFFICE OF SECRETARY
FOD DEFENSE

PREPARED BY:
BOOZ • ALLEN & HAMILTON INC.
HUMAN RESOURCES MANAGEMENT PRACTICE
4330 EAST WEST HIGHWAY
BETHESDA, MARYLAND 20814

PREPARED THROUGH:
THE OFFICE OF
PERSONNEL MANAGEMENT
CONTRACT NUMBER OPM-87-9038

Case Study Exercises

Table of Contents

<u>Exercise</u>	<u>Contents/Norms</u>
1-1 Clarify PAT Charter	Commissioning Memoranda Agency Background Information--QMB's Agency Organizational Chart QMB Study of the Problem--Results Case Study 1-1 Questions for PAT Macro Flow Diagram of Correspondence System
1-2 Customer Dialogue Plan	Customer Dialogue Planning Questions Customer Dialogue Plan Norm Answers
1-3 Define Customer Requirements	Customer Dialogue Results--Interviews • Office Heads' Quality Requirements • Exec & Staffs' Quality Requirements • External Customer's Quality Requirements
2-1 Flow Charting the Process	Focus Group Results--Directors • Steps needed to produce drafts for signature • Process Problems, Suggestions Offered Focus Group Results--Authors / Action Officers • Process Problems, Suggestions Offered Process Flow WORKSHEET Customer Requirements MATRIX • Norm Sample and matrix • Blank matrix Macro Flow Diagram--The Devel. Response Process
2-2 Cause & Effect Diagramming Fishbone, Ishikawa Diagram	Cause and Effect Diagram (CED) Shell
2-3 Identifying Units of Analysis (What should be measured)	Norm List of 5 measures (units of analysis)
2-4 Developing Study Plans	Study Plan WORKSHEETs (5) Sample Study Plan WORKSHEET (1) Correspondence Control Cover Sheet Sample Norm Study Plans for each of 5 Measures (units of analysis) Norm Check Sheets for gathering data for each measure (unit of analysis)

2-5 Analyzing Data--Part I
--Cycle Time

Analysis Tasks (3) for Cycle Time Data provided
Cycle Time **Data Sheet** (Filled in Check Sheet)
Control Chart--Cycle Time for Overdue Packages

--Process Steps

Analysis Tasks (5) for Process Steps Data provided
Process Steps **Data Sheet**
Bar Chart/Pareto Chart--Time Through Each Step
Control Chart--Time Through Step J

Norm Answers to Analysis Tasks (8)

Interim Brief Instructions and Agenda

2-5 Analyzing Data--Part II

--Directorates

Introduction to Part II--Rechartered to study
Directorate A's Draft Development Process

Interview Results--Directorate A Personnel

- Notes on Directorate A's Draft Devel. Process

Interview Results--Correspondence Control Office
Administrators

- Sources of Dir. A's variation--Process Data
- Problems, and Solutions Offered

Analysis Tasks (3) for Directorates Data Provided
STEM-AND-LEAF PLOTS

Directorate **Data Sheet**

Bar Chart--Time to Process Delayed Packages by
Directorate [Directorate Graphic 1]

Control Charts:

Time in A [Graphic 2]
Time in B [Graphic 3]
Time in D [Graphic 4]
Time in E [Graphic 5]
Time in C [Graphic 6]
Time in F [Graphic 7]

Stem-and-Leaf Plots Norms:

Directorates A through E

Norm Analysis Tasks Answers

2-6	Recycling: Micro Flow Charts	Norm Micro Flow Charts of Each Step in the "Develop Response Process" and the "Review and Approve Process"
2-7	Recycling: Cause & Effect Diagramming	Cause & Effect Diagram (CED) Shell Norm Data for Arms of the CED--Causes for the "Delays in Directorate A"
2-8	Recycling: Developing A Study Plan	Document Review Results: Directorate A Delays Pareto Chart--Types of Delays in Directorate A Study Plan WORKSHEET -- Types of Rejection by Director (1) Sample Study Plan WORKSHEET (1) Norm Data: Types (Reasons for) Rejection Norm Study Play for Types of Rejection Norm Check Sheet for Types of Rejection Study
2-9	Recycling: Analyzing Data	Types of Rejection Data Sheet Pareto Chart--Types of Rejection
2-10	Root Cause Analysis	"Poor Style" Panel Results--Style Experts and Authors Norm Cause & Effect Diagram for "Poor Style" Norm List of Root Causes of Poor Style Norm Top Four Root Causes
2-11	Root Cause Audit	Root Cause Audit WORKSHEET
3-1	Develop a Value-Added Flow Diagram of Current Process	Value-Added Flow WORKSHEET
3-2	Envisioning an Optimum Flow Diagram of the Process	Optimal Flow WORKSHEET
3-3	Generate Solutions	Generate Solutions WORKSHEET (Summary)
3-4	Identify Goals, Criteria, and Constraints	Goals, Criteria, and Constraints WORKSHEET
3-5	Select Best Solutions	[List of PAT's Selected Solutions Derived through Team Consensus or Decision-Making processes]
4-1	Making an ESC/QMB Presentation of Findings and Proposed Test Plan	Test Plan Development GUIDE Tips on Putting Together the Presentation Presentation Critique Sheet (2)

TOTAL QUALITY MANAGEMENT (TQM)

Process Action Team *CASE STUDY*

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BOOZ • ALLEN & HAMILTON INC.
HUMAN RESOURCES MANAGEMENT PRACTICE
1725 JEFFERSON DAVIS HIGHWAY
SUITE 1100
ARLINGTON, VIRGINIA 22202-4158

**PLAN OF INSTRUCTION
FOR
TOTAL QUALITY MANAGEMENT
(TQM)**

Process Action Team

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Prepared For:
The Office of the
Secretary of Defense

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Prepared By:
Booz • Allen & Hamilton Inc.
Human Resources Management Practice
4330 East West Highway
Bethesda, Maryland 20814

CS 1-1

CS 1-2

CS 1-3

CS 1-4

CS 1-5

CS 2-1

CS 2-2

CS 2-3

CS 2-4

CS 2-5

CS 2-6

CS 2-7

CS 2-8

CS 2-9

CS 2-10

CS 2-11

CS 3-1

CS 3-2

CS 3-3

CS 3-4

CS 3-5

CS 4-1

TQM

Process Action Team Workshop

Case Study 1-1

Clarify PAT Charter

Scenario: Workers who have been selected to sit on a PAT team are meeting for the first time. The QMB has communicated their expectations to the team facilitator in the form of a memo. The memo is the PAT's "Charter Document".

Instructions

1. Read and discuss the QMB Memo and Background information.
2. Develop a team response to Case Study 1-1 questions.
3. Generate a list of outstanding issues that require further discussion with the QMB.
4. Make a rough flow chart of the system from the Background Information.
5. Present results to the class.

Activity: Clarify Charter document prepared by the QMB.

Objective: Use lecture guidelines on "Charter elements" to analyze a sample document.

Materials Needed:

- QMB Memo
- Background information
- Case Study 1-1 questions

Output:

- Answers to Case Study 1-1 questions
- List of outstanding issues

Thursday

From: QMB

To: Process Action Team Members

Re: PAT Commissioning Memorandum

1. You have been selected to help improve the controlled correspondence process. Your team has been established to help solve the problem of delays.
2. The Agency faces a problem in responding to Congress and other agencies which need or demand information or decisions. The Agency has received some external complaints that its correspondence response time is too slow. There have been many more internal complaints among the executives and the Secretary.

A third group of complaints comes from the authors or preparers of the responses for the Executive or Secretary-level offices. Several common author complaints include:

1. Reports are sent back for rewrite with a single comment like: "Not written well enough."
2. Some reports are reworked "to death" in the chain.
3. Many reviewers want to add new material that conflicts with existing material.

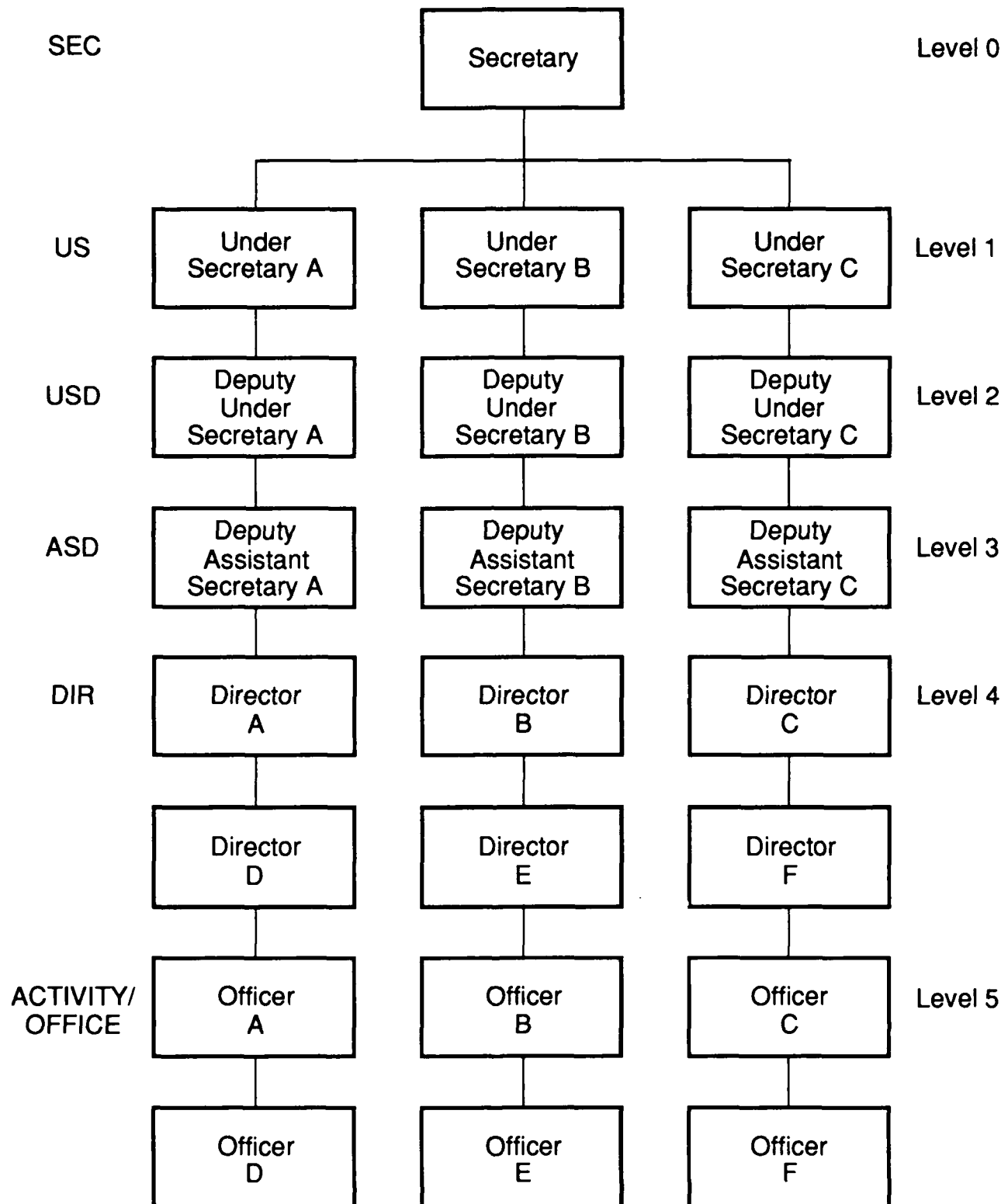
The Executive Steering Committee (ESC), prompted by the overdue correspondence problem, established a Quality Management Board (QMB) to deal with the Correspondence Control System in the Agency.

3. We are also supplying you with the background information we have developed.
4. Please coordinate your study activities and implementation of changes to the process with this QMB. The QMB will provide you with needed authorizations, resources, and further guidance.
5. Determine if the composition or training of the PAT are adequate for the task. Advise the QMB if additional people or training is needed.
6. You are all expected to meet weekly for the next quarter. Further commitments of time will be arranged as needed. All communications with the QMB should be through your chairperson, Dr. Elisabeth Mary Espiranta.
7. We look forward to your observations and improvement recommendations.

Attachments:

- a. Organizational Chart
- b. QMB Data Collection Results

Organizational Structure



BACKGROUND INFORMATION

QMB Data Collection Results

Study Area: The Correspondence Control System

Study Activity: Interviews with selected personnel involved in the correspondence system

Study Results: Process Description Data

The following is a description of the Agency's process for moving controlled correspondence (correspondence with assigned due dates for replies or action).

1. The mail or courier comes into the mail room (Office A). The mail room determines the priority of response that is needed using the following basic system used by Office C to track controlled correspondence:

Direct reply to external customer by Directorate	10 days
Respond to internal memo by Executive	10 days
Respond to external memo by Secretary	4 days
Prepare reply for Secretary signature (non-coordinated)	4 days
General Action Item	10 days
Prepare reply for Secretary signature (coordinated)	3 days
2. The appropriate Directorate in the Agency is selected based on a Key Word List that helps the Mail Division send correspondence to the right people. The key words used are submitted periodically to the Mail Division from the offices in the Agency.
3. Office C maintains an automated tracking system of the controlled correspondence (Office of Administrative Support Services).
4. Office C sends hardcopy printouts of its correspondence control status log to all Directorates, Secretariats, and offices. Secretariats get the report daily, others weekly.
5. Some offices have their own internal electronic tracking system to monitor their own due dates.
6. Once sent to the correct Directorate office, it is up to the Director to assign the appropriate Actions Officer/Author to develop a response. The Director also provides any guidance or input for developing the response.
7. If the Directorate reroutes the responsibility to another Directorate, their action has to be reported to the correspondence control office so tracking will not be lost.
8. Offices can request extensions in order to accommodate any large research or coordination efforts needed. Extension requests are made through the Correspondence Control Office (Office C).
9. Most response packages are drafted in the Directorate for subsequent review by other offices or agencies with whom the package needs to be coordinated. Most packages require a Secretary-level signature and major coordination with other offices or

agencies. The coordination is managed by the assigned Directorate who is responsible to use the comments and input of those reviewing the draft package. A few packages need a direct reply from the Directorate. The Directorate must determine which of these three procedures must be used for the assigned package.

10. Conflicting views by reviewers providing coordinated input can consume large amounts of time.
11. Offices outside the Agency often cause major delays with response packages needing coordinated inputs.
12. The action office assigned to respond must make changes to the package based on the input received through coordination with other offices or agencies.
13. If significant late changes will be made to the package, the action office is responsible for advising any offices or agencies which provided input.
14. Very rarely are packages forwarded for final signature of executives without the coordinated concurrence of all parties on the content of the package.
15. After the action officer finishes initial coordination, he/she prepares multiple copies of the package. Henceforth, all development must be reflected and kept updated on each copy.
16. When the mail division (Office A) gets one of the packages, it holds it and updates the correspondence control logs used for tracking the response package through the system.
17. The Directorate reviews the assembled master package and forwards it to the Executives in the Review and Approve Response process.
18. Mail division updates log when it is forwarded to the Executives for approval and signature.
19. The executive support staff of the Reviewing Executive will review the package for format and style, then the Executive Assistant reviews it for content, and then, either forwards it or sends it back to the Action Directorate (via Mail Directorate) for revision.
20. The appropriate Secretary-level office review the package and either forwards it or sends it back to the Action Directorate (via Mail Directorate) for revision.
21. The appropriate Secretary-level executive signs the package (if not continuing up to the Agency Secretary for signature) and either forwards it or sends it back to the Action Directorate (via Mail Directorate) for revision.
22. After signature, the Mail Directorate updates logs, saves file copy.
23. If needed, the Mail Directorate also sends an information copy to the Upper Secretariat level for retention.

Study Results: Process Results

1. Sixteen percent (16%) of Directorate A's controlled correspondence is chronically overdue.
2. Major rework occurs on almost every package going to the Secretary for signature (93%).
3. Supervisors believe the authors apply the wrong techniques or write poorly.
4. It takes an average of eighteen days (mean) to get a response completed for overdue packages.

CASE STUDY 1-1 QUESTIONS

DIRECTIONS:

Develop a team response to the questions. Use the lecture guidelines on "Charter elements" to help formulate your answers. Be prepared to present your answers to the class.

- A. What is the QMB expecting of your PAT?
- B. What process are you expected to work on? What is its input and what is its output? Who is its primary customer?
- C. How will you define or determine your success as a PAT?
- D. Make a list of any other any information needed from the QMB.

Case Study 1-1
Clarify PAT Charter

NORM
DATA

NORM QMB MEMO

From: QMB

To: Process Action Team Members

Re: PAT Commissioning Memorandum

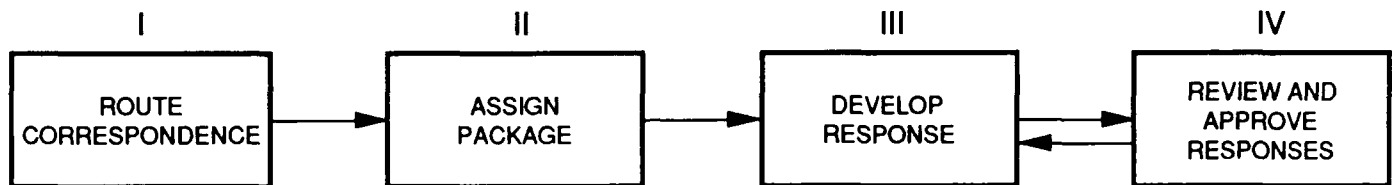
1. The QMB currently understands the Correspondence Control System as having four (4) Macro (major) processes:
 - (1) Rout correspondence process,
 - (2) Assign package process,
 - (3) Response Development process, and
 - (4) Review and Approve Responses process.
2. You have been selected to help improve the Response Development process.
3. Attached are the background items the QMB has developed.
 - (a) The ESC and the QMB believe the key customers to the Response Development Process are the reviewers in the Review and Approve Responses process.
 - (b) For these customers, a package presented to them for signature will be approved when it satisfies the following demands:
 - Political insight is evident in the response package to the ultimate reader (user) in the outside (internal) agency.
 - The response is understandable from the outset, and presents its major points immediately in a powerful or commanding manner.
 - The response is timely--allowing the executive reviewers the opportunity to comment prior to sending the response to the agency for which it was written.
 - The response indicates some knowledge of the needs of the ultimate customer--from the ultimate customer's point of view.
4. The measure of the improvements we are seeking is a 25% reduction in the delays within your Directorate's Response Development process as our quality target for this round of improvements.
5. As you know, the Agency's quality goal is "to be the foremost model of inter-agency cooperation and to be recognized as the federal leader in responsiveness and creative cooperation." We believe that a critical path we have to follow involves having the most responsive correspondence system among the major federal agencies. Your process action team is vital to our success.

6. We expect your PAT to develop and document a thorough knowledge of the RD process--a knowledge of the immediate and root causes of its quality problems, especially those that contribute to the delays in the Agency's replies to other federal agencies or officials. Recommend improvements and implementation suggestions. Identify who should be involved in planning and implementing the changes, how monitoring should occur, and how evaluation of the changes should proceed.
7. Please coordinate all your study activities and proposed process improvements with the QMB and your director. The QMB can provide you with authorizations, resources, and further guidance. Please determine if the composition and training of the PAT is adequate for beginning the task. Advise the QMB of your immediate resource requirements.
8. Your director expects you to meet weekly during the next quarter. Your participation in the PAT has already been approved by your supervisors. Please plan the redistribution of your work, and any support needed to ensure the continued quality of your assignments with your supervisors. Funds have been set aside for temporary assistance, if that is needed.
9. An improvement budget has been allocated to support the PAT's training data-gathering and analysis work. The Team Leader, Dr. Natalie Fredericks, will also manage the budget and provide technical leadership. The Process Facilitator, Ms. Jan Smith, will assist the team in developing its analytic approaches, improvement team skills and process documentation. These leaders will be in contact with you soon to arrange the first PAT meeting. Further commitments of any other resource person's time will be arranged as needed with the QMB. All communications with the QMB will be through your QMB representative, Dr. Elisabeth Mary Espiranta.

Attachments:

- a. Organizational Chart
- b. QMB Data Collection Results
- c. Macro Flow Diagram

Correspondence Control System (Macro Flow Diagram)



TQM

Process Action Team Workshop

Case Study 1-2

Customer Dialogue Plan

Scenario: The PAT has received its charter and is ready for its first experience in studying the process. Since the customer represents the source of end requirements, the PAT agrees that these individuals must be heard from first.

Instructions

1. Develop Customer Dialogue Plan using the following questions:

- A. Who do you consider the most important internal customer(s) of the response development process? How many do you think you need to talk to? [sample]
- B. Who supplies the customer(s)? What is supplied?
- C. How will you identify the customers' requirements? [activities]
- D. What questions will you ask of your internal customers? What information or data will you need? [data sources]

- E. How will you validate (or prioritize) the things the customer "wants?" What analytic tools, aids or techniques will you need? [analytic tools or aids]
- F. What answers (hypotheses) do you expect to each of your questions (#4 above)? [expected outcomes]

Activity: Design a Customer Dialogue Plan.

Objective:

- Design an interview protocol consisting of questions to ask customers
- Understand requirements to produce quality product
- Develop organizational skills

Materials Needed:

- Format (refer to the Student Manual)
- Case Study 1-2 Questions
- Normed QMB Memo

Output:

- Sequenced list of key questions to ask customer
- Selection of interviewing technique

NORM DATA

Case Study 1-2
Customer Dialogue Plan

Suggested Answers to Case Study 1-2 Questions

- 1. Who do you consider the most important internal customer(s) of the response development process? How many do you think you need to talk to? [sample]**

The Reviewer who will be signatory

- 2. Who supplies the customer(s)? What is supplied?**

- 3. How will you identify the customers' requirements? [activities]**

Review rejected and accepted samples of past drafts with him so the customer can identify and explain which of the requirements were met or not in the samples.

- 4. What questions will you ask of your internal customers? What information or data will you need? [data sources]**

Do you expect to add comments to most packages you review?

Do you absolutely require a fully-finished correspondence reply or a draft of the reply?

Do you review for "acceptable content" or for style which represents your views and preferences?

How do you know what the external customer needs?

How do you convey the needs of the customer to the author while the response is still being developed?

Would you be willing to promulgate your stylistic expectations?

- 5. How will you validate (or prioritize) the things the customer "wants?" What analytic tools, aids or techniques will you need? [analytic tools or aids]**

- 6. What answers (hypotheses) do you expect to each of your questions (#4 above)? [expected outcomes]**

I expect most responses to only require a signature because it is an acceptable response.

I review for both content and executive-style that properly reflects the Agency.

My past dealings with the external customers gives me the insight into their intentions and needs.

The response must look like final copy when reviewed and needs to be ready to go out

the door, if signed.

Previous reviewers' inputs need to be in the response (non-signatory executives). Whenever I talk to my staff, I convey what we know about the different external customers. I expect my staff to pass it to the authors as appropriate.

TQM

Process Action Team Workshop

Case Study 1-3

Define Customer Requirements

Scenario: The PAT has completed a series of interviews, focus groups and surveys with its customers. After analyzing and organizing the data, the team is ready to translate its findings into measurable customer requirements.

Instructions

1. Analyze raw data findings provided. You may use previous data too.
2. Develop list of customer requirements.
3. Develop quality criteria which represents your customer requirements.
4. Convert quality criteria into operational definitions.
5. Ensure a measure of merit is included in each statement.
6. Present results to class.

Activity: Convert customer data into:

- Customer requirements
- Quality criteria
- Operational definitions

Objective:

- Develop quality criteria from raw data findings
- Define operational definitions from quality criteria

Materials Needed:

- Customer dialogue results
- Normed QMB memo and findings (Case Study 1-1)
- Sample of customer requirements converted to operational definitions.

- Output:
- Quality criteria
 - Operational definitions of customer requirements in terms of measures of merit

Customer Dialogue Results

Target Audience: Office Heads who participate in reviewing coordinated drafts for comment

Technique: Personnel Interviews

Results:

- P1. Be in final form: The package must be complete--contain all parts and appearances of a package ready to be signed and sent out to the external customer
- P2. Must have reasonable recommendations: Where recommendations are called for, each must be supported by facts and rationale. Recommendations of "no change" or "no action" must also be substantiated.
- P3. Must be logical: The structure and logic of the presentation must be immediately obvious to the reader.
- P4. Be timely: The package will be on my desk with enough lead time to allow me to read, comment and have a corrected copy back in my hand for signature by the assigned due date.
- P5. Must be factual: The conclusions must be obvious and flow directly from the facts presented.
- P6. Have a note attached explaining the contents.
- P7. Show currency of thought: Demonstrate knowledge of the most current requirements, laws, policies or events pertinent to the topic.
- P8. Have customers' needs in mind: The package must demonstrate that the Agency operates with a knowledge of the issues and concerns facing the external customer for whom the answer is being prepared.
- P9. Exhibit Executive thinking: The package must be written with forthright language, stating a firm position, exhibit decisiveness, and not appear apologetic to any reader, especially the external customer.
- P10. Have 100% inclusion of all comments made by any Executive reviewer.

Target Audience: Executives and Staff Office heads who receive the packages directly from the authors for approval and signature.

Technique: Focus groups looking over samples of packages accepted and rejected by executive level reviewers in the approval process.

Results:

- F1. The good packages are "finals" --perfectly typed, fully complete, ready for signature.
- F2. The good packages have short notes attached to explain the main ideas and political thinking behind the response.
- F3. Poorer packages show signs of multiple authorship--not smoothly written.
- F4. The short notes attached are needed by the reviewer.
- F5. Sometimes authors and reviewers forget what drove the original request .
- F6. Recent political decisions, or events should be added to show how up-to-date the response is.
- F7. Sometimes the reviewers can tell who wrote it by a pet agenda showing up in the package.
- F8. Executives don't like packages that sound bureaucratic instead of executive in tone.
- F9. Poorer writing is a jumble of different types of opinions pasted together with connecting phrases of sentences.
- F10. Poorer packages are late in arriving at the office.
- F11. Poorer packages lack decisiveness--are wishy washy.
- F12. Some topics are so politically hot, that the only real answer is an executive answer and could never be adequately be formulated by staff personnel.
- F13. We must see our added points in the final response, or there will heads rolling.
- F14. We take about 2 working days each to look over a package. It depends on how many of us in the office need to review it. Sometimes 3 or 4 days.

- F15. Packages must show insight into the politics involved.
 - F16. Some are written poorly; we wonder how they survived the chop chain in their own offices.
 - F17. Some packages show no conception of what the original requestor wants--what he will or can do with the data (blow the whistle), what he can do with the data (publish it), or what he needs the data for (as another piece of input into a huge database). Sometimes our canned answers are really off base and appear insulting.
 - F18. Some packages blow the issues out of proportion and have to be toned down.
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Target Audience: External Customers
Technique: Survey of types of information desired by external customers
Results:

- S1. Estimates of project costs, budget, accounting data
- S2. Estimates of impact of austerity measures or proposals
- S3. Operational information (main mission, human resource management, organizational structure)
- S4. Evaluative data (operational, human resource management, effectiveness, administrative efficiency)
- S5. Clarification of existing policy (interpretation and application)
- S6. Future plans, goals, corporate strategy
- S7. Investigation, OSHA compliance, internal affairs
- S8. Collaboration data, memoranda of understanding (MOU), project sponsorship, co-sponsorship
- S9. Other requests for information (freedom of information, etc.)

SAMPLE

RAW DATA CUSTOMER REQUIREMENTS	QUALITY CRITERIA	OPERATIONAL DEFINITIONS
The package must be timely	• Allow enough time for review, revision and rewrite in time for signature • Must be time to meet the deadline	
The package does not forget what drove the original request	• The response is to the actual question posed by the external customer	• Questions of fact are answered with fact • Opinions are presented as such • Complex questions are broken down into component questions, and, answered individually with a summary answer to the original complex question • Secondary answers or issues are kept to a minimum or not raised
The package presented for approval and signature is a complete package	• Format is correct • Sensitive to external customer needs • Seen by the appropriate chain of reviewers	• Complies with format defined according to Agency Style Manual (rev April 1987) • Cites in the opening paragraph, an external customer need related to the requested information • Log sheet indicates that the chain of review called for in the tasking has been accomplished by time it gets to signatory
	• Other executive input has been considered	• Compatible ideas and data suggest by executive-level reviewers are incorporated into the final package • No minority opinions

DEFINE CUSTOMER REQUIREMENTS WORKSHEET

RAW DATA CUSTOMER REQUIREMENTS	QUALITY CRITERIA	OPERATIONAL DEFINITIONS
The package must be fully complete	• format is correct • shows awareness of the external customers' needs • received by appropriate chain of reviewers	1 [define your own]
The response needs to appear it was written by a single author	2 [develop criteria]	3 [define your own]
4 [select from raw data]	5 [develop criteria]	6 [define your own]

TQM

Process Action Team Workshop

Case Study 2-1

Flow Charting the Process

Scenario: After understanding quality improvement requirements, the PAT talked to the Author Directorate and Executives to learn how they move correspondence. Now, the PAT is ready to document the process based on what they have learned. The first step, Documenting the Process, involves flow charting, and identifying where customer requirements are being met. Given that the Review and Approval process is closely intertwined with the Response Development process, the PAT will study both processes.

Instructions

1. Develop *macro* flow charts for the Response Development and Review **and** Approval processes. Use the results of the focus groups and previous data you have received which gives process description. For now, keep your flow charts at the macro level, and save you micro thoughts for later.
2. *After* flow charting both processes, use the customer requirements matrix to denote which steps appear critical to successfully meeting the customer requirements listed. Use a dot or check to identify which step is critical for each requirement.

NOTES:

--A macro flow chart deals with general descriptions, not specific details of an activity.

--Suggestion: Have different team members read the results of different parties but build the flow chart as a team.

--You will have more data from the focus groups and interviews than needed for this task. For example, the problem information and solutions suggested by people may not be helpful at this stage of the study.

Activity: Develop macro flow charts of Response Development Process and Review and Approval processes (Steps III, IV in Controlled Correspondence System).

Identify where customer requirements are currently being met in the process flow.

Objective: Document how responses are developed, reviewed and approved, and how customer requirements are met

Materials Needed:

- Process Description Data
 - Focus group with Author data
 - Focus group with Director data
 - Interviews with Executives data (from Case Study 1-2)
 - QMB Data Collection Results (from Case Study 1-1)
- List of Customer Requirements (from Case Study 1-3)
- Customer Requirements Matrix
- Process Flow Worksheet

Output:

- Macro Flow Charts
 - Response Development Process
 - Review and Approval Process
- Macro Flow Charts aligned with customer requirements

DIRECTORS FOCUS GROUP RESULTS

Study Area: The steps in the Response Development Process needed to produce the draft document sent to executives for review and signature.

Study Activity: Ten Directors and Assistant Directors were brought together to describe the process the action officers (authors) use to develop the initial draft of a response.

The directors were asked to identify the steps in the process of response development including decision points. Any suggested problems were listed separately, as were any volunteered "solutions."

Study Results: The data has been reduced into three categories: Process Information, Problem Information, and Suggested Solutions .

Process Information: Tasking an Author (Project Action Officer)

Step 1. Directors assign a Project Action Officer (author) and provide special instructions.

Step 2. Project Action Officer then completes the following:

- Gathers data to define the problem
- Draws conclusions
- Analyzes the results, and
- Recommends how the correspondence should be handled.

Step 3. Project Action Officer has three options:

- a. Write it and submit it for signature.
- b. Float a draft response up the chain for comments prior to coordination with other Agency units (another Directorate, functional specialists outside the headquarter's staff organization.
- c. Forward the document to the appropriate parties for coordination. The author can do this either in serial (routine coordination) or parallel (concurrent coordination) fashion. Interested parties can respond to the request in one of four ways:

- (1) Sign off and concur,
- (2) State non-concurrence and why,
- (3) Suggest minor changes
- (4) Suggest major changes.

NOTE: *If a major change is involved*, for example, a change in Agency policy or legislation, the author will prepare a second draft with revisions and distribute it for re-coordination.

NOTE: *Non-concurrence further explained:* If someone's reply to the author is in non-concurrence, it can be forwarded with explanation of the coordination activities, description of who accepted, the identification of those who did not concur, and a rebuttal. The package forwarded for signature over the non-concurrence would then end with the phrase: "We recommend signature over the non-concurrence". This is not commonly done, because it is an invitation to starting a lengthy and possibly difficult documentation process. Problems of non-concurrence most often are resolved by having the parties negotiation on an appropriate response.

NOTE: *Delay factor:* Packages that must be coordinated with functional people, e.g., law enforcement will encounter delays. The functional person has to review and obtain approval through his chain too. Typical deadline granted for extensive coordination is 30 days outside of the Agency and 14 days for memoranda inside the Agency.

Problem Information

- D1. Among those with whom a package is coordinated, there is the operational assumption that everyone has to agree. There are a 1,000 people who can say "no," and effectively stop the train. I question if consensus is really needed on everything.
- D2. The role of the executive review process is not consistent from executive to executive. Each one often views it differently. One Assistant Secretary will deal with it in minute detail, a second will check the substance of it and let it go on without a delay, and a third will send it back for changes before letting anyone else see it. We must respond to them as they dictate.
- D3. The draft concept was rejected because drafts were ignored. Assistant Secretaries and Under Secretaries always get a finished product. A few years back we tried to have people working with the drafts and they would not take them seriously until they looked like they were ready to go out the door.
- D4. The author of the package is working for the boss (his next level up only). If the boss at the next level disagrees, the author is not held accountable for the disagreement. But please note, even Shakespeare would not survive eight levels of review without comments at the Agency.
- D5. A strong guy will concur alone; a weak guy will send up the chain for CYA purposes.
- D6. Integration of comments is difficult. Smart action officers don't try to integrate all comments into one writing style--its impossible.
- D7. Currently we have a 1-page rule--it is a dumb rule when applied to all types of packages that have to get processed--there are lots of cycles in terms of numbers of pages.
- D8. There is a reason that the process resists solution--Leaders change the rules. There is no consistent approach that lasts through different administrations.
- D9. Another problem is that the people adding changes to the draft get absolutely no

feedback on what they do to the packages. If it is good, they just assume it is; if it is bad ideas, obstructionist procedures, or inconsistent with other input, they do not know. The original action officer can't tell whether changes made by their seniors are a problem. Feedback does not exist.

- D10. There is a folded paper in the package that shows the changes that were made to the draft which the new revision now contains. Essentially, the folded paper is the marked up draft.
- D11. Some internal correspondence routines may have been started by the personal secretaries of executives and not the executives themselves. I am convinced that one reason the executives appear to be unsympathetic is that they only know the tip of the iceberg and are unaware of how much else has to be done to do some of the simplest things. And since they do not know, they are impatient with people trying to do things the way they have to be done. Every now and then, an executive gets close to finding out some of the nonsense and someone comes in and "protects" the executive from having to jump through the same hoops everyone else does. This defeats the executive's discovery of the real nature of the system that is supposed to be making things easier for people to do their work.
- D12. The Coversheet format changes too often (every 3.2 years).
- D13. Change requirements occur but are not applied consistently throughout the system. For example, the weekly activity report was supposed to be eliminated. This was a decision by a most senior person but the report is still being required by lower level executives.
- D14. Nobody knows the whole system. I'm not sure anyone really wants to know it.
- D15. Action officers at lower levels are told to write a reply to an outside group which involves the personal decision of a senior executive--the problem is that no one knows what the decision is going to be. Some people research into the situation in order to write both an agreement and a disagreement. Sometimes this will cause a decision to be made.
- D16. My estimate is that 50% of the rework is caused by the initial lack of guidance on what should be done or what is expected.
- D17. My estimate is that 50% of all rework time is spent retyping rejected correspondence.
- D18. People feel they have to comment or they are not doing their job.
- D19. There are NO rewards given to senior executives for making it easier for their people to do their work effectively or efficiently. Subordinate efficiency is not part of the evaluation process, or the accountability process.
- D20. There is a general lack of sensitivity to the work and plight of administrative, personal secretaries and subordinates. One Assistant Secretary sent back a 75 page document with the note: "There is a mistake in this document--find it and change it!" Needless to say, he did not volunteer the information about where the mistake was located.

- D21. The freedom to make a pen correction no longer exists. Few people will avoid retyping. It is not a matter of actual policy. There was a policy saying it was all right to make a 1-second pen change instead of a half-hour retyping change. But, when it was tried at a subordinate level, senior managers acted insulted and demanded a perfect document--no matter what the cost. Paper and pencil comments are perceived as poor quality--therefore it has to be perfect.
- D22. There is an attitude now--it must be perfect. Is the definition of quality correspondence that it be letter perfect, or is it something else. I am not sure the style and image of correspondence is the right place to define correspondence quality.
- D23. The correspondence manual is too complicated.
- D24. Danger exists in having to depend on secretaries to know the full or correct format for anything. The administrative people claim they know the formats, but they are not consistent from one package to the next.
- D25. Computer incompatibility from subordinates may mean that if we try to fix a transposed letter, we will have to either totally retype to correct the single word in the document, or decide to let the error stand. This would mean that the user office has to choose among several bad alternatives--send it back for a single word, retype it, or send it on with a known-error.

Suggested Solutions

- DS1. All secretaries, machines and authors should have the same style guides in the system.
- DS2. Don't let seniors change styles and formats which are ingrained eight levels down and which will not change in their lifetime anyway.
- DS3. Need consistent approach and goals used by leaders in administrative fields.
- DS4. One system needed. Administrative officers don't know what 'the' system is--even down to the detail of how many copies to make of an action.
- DS5. Paperwork needs a plan laid out for it to work.
- DS6. The internal correspondence is sometimes as burdensome as the external. In any event, all correspondence should be handled at the level of the action or officer actually involved. It tends to get sent down to be acted on.
- DS7. There is no way to do paperwork improvements without streamlining its processes.
- DS8. Too much paper used for too many purposes--including making appointments to see people in the operational chain. This is not part of the correspondence control problem but does represent an attitude about paperwork. Volume needs to be reduced. Why not use telephone. Everyone wants it documented on paper (CYA).
- DS9. We need to challenge the need for a piece of paper instead of assuming there is a need for it.

DS10. Improvements have to be made with everyone involved.

DS11. You got to get the personal and unit administrative secretaries together. If for no other reason than to convince them that other secretaries are not being stubborn, or stupid. In some cases the frustration one administrative secretary has with one from another office is based on system problems they do not know exist or which are not able to be solved by either of them. For example, there are two secretaries in our unit that hate each other. I'm convinced that its really because they give each other rework to do involving formatting of correspondence.

These two people work with word processing equipment that has different style guides in the computers they use. Their original or root cause problem is not their real personalities but the personalities created by the problems they have with where they are in the system. And what the system's unplanned impact is both of them cannot do a good job the first time.

DS12. We need to define "value-added comments" vs. any comments a reviewer adds to a draft.

DS13. The cost of changes needs to be documented. eg., pencil changes. If people knew what it was costing, maybe the pen and ink changes or comments would be accepted.

DS14. Another thing we need, is a simple standard model for formats for different types of correspondence. I would like to see a style package which gives examples of:

- Letters going outside the Agency
- Letters going to chief executives
- Letters going to staff members here at the Agency
- Letters going to memorandum distribution
- Use these as a guide and have them on-line.

DS15. We should also survey the styles and formats in the computers. The secretaries don't always know what each one has.

DS16. We need a guide that says, "This one is right!"

DS17. We must change the people's attitudes toward correspondence.

DS18. We need to tie-in the lowest level clerk with the highest level SES. They do not understand the format.

DS19. Tell people where and what the errors are in the rejected document so we can begin to see where we have to make improvements and also get a sense of progress.

AUTHOR/ ACTION OFFICER
FOCUS GROUP RESULTS

Study Area: To identify areas of possible improvement in the way responses are developed or approved.

Study Activity: Nine authors attended the focus group.

Study Results: The authors concurred with the Director's description of the process. The data has been reduced into two categories: Problem Information and Suggested Solutions.

Problem Information

- A1. Each content and style rejection at the Secretary level more than triples the "straight through" time for the Response Development process. Rejection criteria at Secretary level are too severe and not anticipated during the response development stage where we have to consolidate our inputs, collect our data and develop an approach for the response.
- A2. Style rejections by Executive reviewers seem to be a matter of more than just poor organization and writing skills. Many times, what is called a "Style" rejection is really a rejection of the attempt to integrate inputs of Executives which are derived from different assumptions. It is hard to aggregate comments clearly and concisely as if they flowed from the same concept or approach. Many "committee responses" fail the "style" criteria.
- A3. We sometimes are totally surprised to find out what an executive reviewer was expecting in the response. We had no way of knowing what was in his head when we gathered the data and issues to draft the response.
- A4. It is difficult to send a package through even when a reviewer just adds insignificant comments (eg., change "happy" to "glad").
- A5. Technical experts in certain fields are thrown into Agency writing positions without training in how to write in this policy-oriented environment.
- A6. Decisions are sometimes made by Executives during the review cycle as a result of reading the existing policy and not agreeing with the policy. With a new decision comes a new policy which has to be drafted as part of the response. This takes time.
- A7. Some data is added during the Executive's review. Unless the Executive reviewer had the foresight to anticipate and share it with the authors, this data should not be expected as part of the original draft.
- A8. Due dates do not reflect the extent of "new" work that policy packages require. Due dates seem to assume that the data is on the shelf and only needs to be typed. Sometimes writing policy implications takes a lot of time because the issues are hard to

identify up front.

- A9. Some authors do not know in the issue identification step that they possess insufficient knowledge about the content area to write credibly. Or, the input received from the reviewer is a rush job to make the package appear knowledge-based.
- A10. Authors sometimes guess the protocols that have to be followed, especially when congressional or foreign writers have initiated the contact with the Agency.
- A11. The "real" knowledge about certain topics reside in several heads, not in one person or in one Directorate.
- A12. Executive comments are trivial sometimes; but, incorporating the comments trivial rewrites take as long as substantive rewrites.

Suggested Solutions (The areas listed below were nominated as areas of needed improvement. The number after each statement indicates how many (of nine) agreed that it was something which would directly impact delays.)

- S1. Reduce the rejection rate. Delays may be bad for the system, but rejection after rejection demoralizes everyone and creates desperate people. (9)
- S2. Standardize the format in which information is to be presented. (8)
- S3. Clarify expectations. (9)
- S4. Prevent trivial comments from holding up the document. (8)
- S5. Train technical specialists who are asked to write (4)
- S6. Get all decisions made before writing. It seems documents act as a fuse for new rounds of decision-making. (6)
- S7. Find ways to get more information to us before we develop the draft. (9)
- S8. Establish realistic start dates and due dates. (7)
- S9. Prompt writers that they are will be writing about a topic that they do not know about. Often the task was given to them because no one else wants to write on that topic. (3)
- S.10 Develop form letters for responses. (4)
- S.11 Catalogue previous responses to provide writers with examples of proper etiquette or protocol, especially in responding to foreign dignitaries, or businesses. (3)
- S.12 Task groups of authors to help each other out with ideas. Individuals sometimes feel like the Lone Ranger out there--everyone wants the results

but no one wants to help develop them. (7)

S.13 Develop a writers group--people tasked with coming together for an hour to explain their development of issues and providing feedback on other writer's issues. (5)

S.14 Train Executives to clarify the correct role of a reviewer. I saw this sign that said: "There is a primordial need deeper than food or sex--to modify copy." (9)

Process Flow Worksheet

[illegible]

Customer Requirements Matrix

Sample Customer Requirement							
	Ⓐ Prepare Action Officer	Ⓑ Develop Approach	Ⓒ Draft Response	Ⓓ Select Forwarding Procedure	Ⓔ Send Direct Reply	Ⓕ Coordinate Input	Ⓖ Ready for Review?
1. Style							
2. Summary Note							
3. Terminology							
4. Executive Thinking							
5. Timely							
6. External Customer Needs							
7. Well Documented							
8. Format							

Customer Requirements Matrix

OPTIONAL

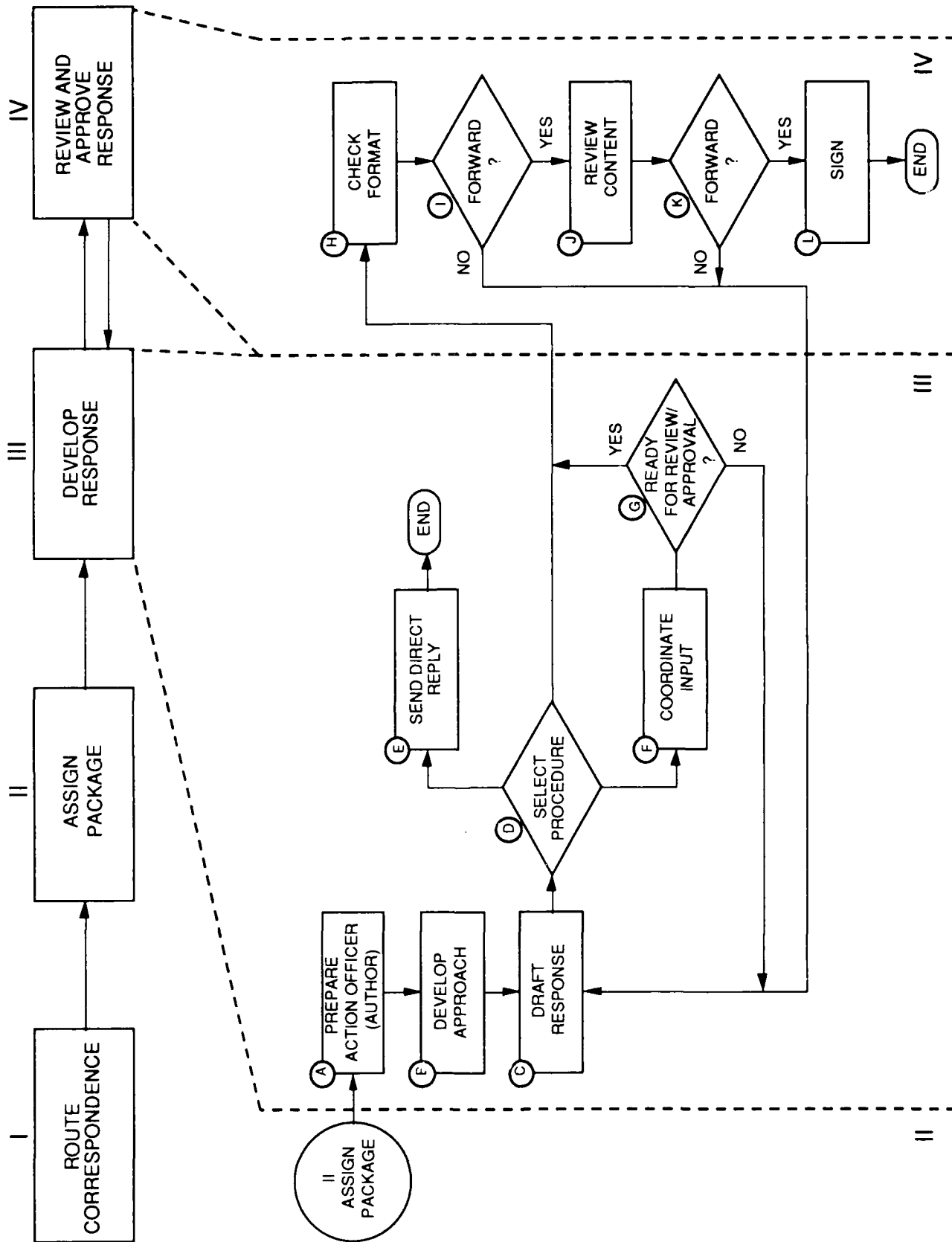
Process Steps

[illegible]

NORM DATA

Case Study 2-1
Flow Chart the Process

Controlled Correspondence System



Customer Requirements Matrix

Sample Customer Requirement							
	(A) Prepare Action Officer	(B) Develop Approach	(C) Draft Response	(D) Select Forwarding Procedure	(E) Send Direct Reply	(F) Coordinate Input	(G) Ready for Review?
1. Style			•				
2. Summary Note		•	•				
3. Terminology			•			•	
4. Executive Thinking		•	•				
5. Timely	•	•	•	•	•	•	•
6. External Customer Needs	•		•				
7. Well Documented		•	•				
8. Format			•				

TQM

Process Action Team Workshop

Case Study 2-2

Cause and Effect Diagramming

Scenario: You have just documented the Response Development and Review and Approval processes by developing macro process flow charts. The next step in learning about these processes is to understand problem areas. Recall that the PAT has been chartered to study delays.

Instructions

1. Develop a Cause and Effect Diagram (CED) for causes of delays in the Response Development process. The effect you are trying to understand is the "delays" in packages for executive signature. Refer to your Student Manual for Cause and Effect Diagramming techniques, and use the diagram shell to guide your development. Use the free form brainstorming technique to nominate upon the input (contributing causal factors).
2. Assign a spokesperson to present your diagram to the large group.
3. Circle five (5) of the biggest contributing causal factors.

NOTE:

--Inputs on the CED should be as specific as possible (e.g. Incompatible Style Guide in computers)

Activity: Use Cause and Effect diagramming to nominate potential causes of delay.

Objective: Study causes of delay in the Response Development and Review and Approval processes.

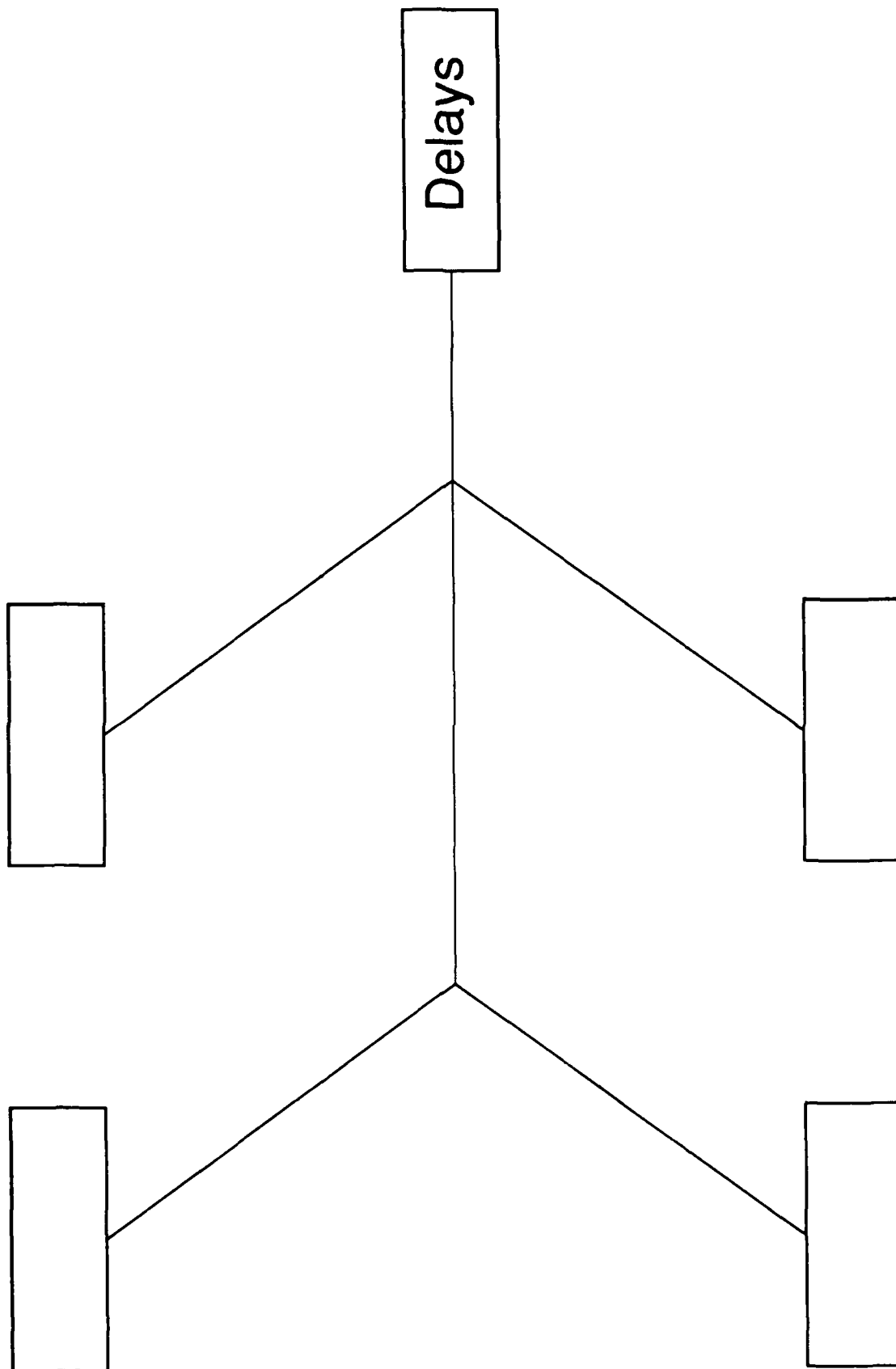
Materials Needed:

- Descriptive data from previous studies
 - QMB Data Collection results
 - Focus Group with Author data
 - Interviews with Executive data
 - Focus Group with Director data

- Cause and Effect Diagram (CED) shell

Output: Cause and Effect Diagram (CED) for delays.

Cause and Effect Diagram Shell



TQM

Process Action Team Workshop

Case Study 2-3

Identifying Units of Analysis

Scenario: You have just generated a list of potential causes of delays affecting the Response Development process. The next step is to study these causes in order to discriminate root causes from symptoms. First, you must determine *what* you need to study.

Instructions

1. Refer to your Cause and Effect diagram to identify what you want to know more about.
2. Make a list of the variables that need to be studied and how you will define them so everyone understands what you are trying to measure and learn. This becomes your "unit of analysis".

SAMPLE: You believe "too many levels of review" is a key contribution to delays. You want to study that as a variable. Your next step would be to define "levels of review" so everyone has the same idea of what you mean.

"Levels of review" can be understood in any of the following ways:

- a. The different occupational ranks of people reviewing a response package.
- b. The number of reviewers who review a package.
- c. The number of people who can "disapprove" a response package and send it back.
- d. The offices, codes, directorates, agencies which review the package after it leaves the Directorate.
- e. The number of cycles of rewrite and review the package goes through before the package is signed.

You will have to decide which one you mean when you decide that your unit of analysis is "levels of review".

Activity: Generate a list of units of analysis.

Objective: Determine target areas for further study.

Materials • Cause and Effect diagram
Needed:

Output: List of units of analysis.

NORM DATA

Case Study 2-3

Identifying Units of Analysis

List of Units of Analysis

<u>Title</u>	<u>Title</u>												
1. Cycle Time	Number of calendar days from receipt of assigned correspondence package by the Directorate to signature of package.												
2. Process step time	Number of calendar days through each step (refer to macro flow diagram) in Response Development and Review and Approval processes.												
3. Type of action	Packages categorized by type of action: <table> <tr> <td>Direct reply to external customer by Directorate</td><td>10 days</td></tr> <tr> <td>Respond to internal memo by Executive</td><td>10 days</td></tr> <tr> <td>Respond to external memo by Secretary</td><td>4 days</td></tr> <tr> <td>Prepare reply for Secretary signature (non-coordinated)</td><td>4 days</td></tr> <tr> <td>General Action Item</td><td>10 days</td></tr> <tr> <td>Prepare reply for Secretary signature (coordinated)</td><td>3 days</td></tr> </table>	Direct reply to external customer by Directorate	10 days	Respond to internal memo by Executive	10 days	Respond to external memo by Secretary	4 days	Prepare reply for Secretary signature (non-coordinated)	4 days	General Action Item	10 days	Prepare reply for Secretary signature (coordinated)	3 days
Direct reply to external customer by Directorate	10 days												
Respond to internal memo by Executive	10 days												
Respond to external memo by Secretary	4 days												
Prepare reply for Secretary signature (non-coordinated)	4 days												
General Action Item	10 days												
Prepare reply for Secretary signature (coordinated)	3 days												
4. Type of information requested	Packages categorized by type of information requested: • Estimates of project costs, budget, accounting data • Estimates of impact of austerity measures or proposals • Operational information (main mission, human resource management, organizational structure) • Evaluative data (operational, human resource management, effectiveness, administrative efficiency) • Clarification of existing policy (interpretation and application) • Future plans, goals, corporate strategy • Investigation, OSHA compliance, internal affairs • Collaboration data, memoranda of understanding (MOU), project sponsorship/co-sponsorship • Other requests for information (Freedom of Information Act, etc.)												
5. Directorates	Packages categorized by assigned development Directorate (Directorates A, B, C, D, E, F)												

TQM

Process Action Team Workshop

Case Study 2-4

Developing Study Plans

Scenario: After determining *what* to study, the next step is to determine *how* to study causes of delays in the Response Development and the Review and Approval processes.

Instructions

1. Develop a study plan for each of the five units of analysis using the study plan matrix format. Refer to your student manual as necessary. The correspondence control cover sheet, included in this package, may be a useful data source.
2. Develop check sheet formats as necessary to support your data collection/study plans.
3. Select a team member to present your plans to the large group.

Activity: Develop data gathering/study plans for each of the five units of analysis:

- Cycle time
- Process step
- Type of action
- Type of information request
- Directorate

Objective: Plan data gathering objectives, activities and tools.

Materials Needed:

- List of normed units of analysis (Case Study 2-3)
- Data gathering/study plan format (matrix)
- Correspondence control cover sheet

Output: Data gathering/study plans, one for each of the five units of analysis

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Sample Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
What is the question we need answered to help us understand the process or the problem better?	How will we pose questions so it can be answered with <u>data</u> ?	What data display or analytic tools will we use with the data we collect? How will we show it to others in a presentation?	How many items need sampled? For how long a period? From where?	Where will we get the data? Do we have to generate it or modify it? Can we use existing data sources?	What we suspect the answer will be to our "questions" and our "activities"
EXAMPLE:					
What types of requests are delayed the most?	• Develop standard types of info requests • Determine frequency of each type of request among delays.	• Check sheets • Pareto chart	• Sample 100 delayed packages over 4 month period of time	• Correspondence control office • Log and subject matter headings	• requests will be 1st among delays; austerity projections will be 2nd among delays. • There will be no difference among Directorates.
Measurement Definitions: Delay types will be: Project Estimates, Austerity Projections, Operations Evaluations, Policy Decisions, Plans & Goals, Accounting data, Collaboration Requirements, Safety and Health					

This form must remain with the document until final signature

Final Review/Signature/Action Level: _____

() Orig Correspondence () Attached () Held By: _____
 () Tasking Memo () Attached () Held By: _____
 () Requires Coordination with :
 Code: _____ Code: _____
 Code: _____ Code: _____
 () Direct Reply by (Office Code: _____)

(Due to final review on:_____. CTN #:_____)

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Case Study 2-4
Developing Study Plans

NORM
DATA

Study Plan

Unit of Analysis: Cycle Time

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. How long does it take to get through the Response Development and the Review and Approval processes?	Monitor the length of time through the process for selected sample	- Check sheet - Run/control charts	Two samples of 25 items each - one with overdue packages only, the other with all packages (on time and overdue)	- Correspondence Control Cover sheets - Correspondence Office Logs	Sixteen percent of correspondence will be overdue
2. How long does it take delayed packages to get through the Response Development and the Review and Approval processes?	Monitor the length of time through the process for delayed packages		Each sample selected to represent different directorates, types of actions, and information requests	- Directorate logs - Action Officer interviews	
What type of variation exists?	- Assess variation - Assess process control - Assess process capability				
Measurement Definitions: Time through process - number of calendar days from receipt of package by Directorate to signature of package. All partial days are rounded up to one day.					

Check Sheet for: Cycle Time

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Size of Sample: 25

Sample Number	Length of Time
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____
11	_____
12	_____
13	_____
14	_____
15	_____
16	_____
17	_____
18	_____
19	_____
20	_____
21	_____
22	_____
23	_____
24	_____
25	_____
Total Time:	_____

Study Plan

Unit of Analysis: Process Step

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. How long does it take to move through each step of the Response Development and the Review and Approval processes?	Monitor the length of time through each process step.	- Check sheet - Pareto chart - Run/control charts	- One sample with 25 overdue packages. - Sample selected to represent different directorates, types of actions, and information requests.	- Correspondence Control Cover sheets. - Correspondence Office logs. - Directorate logs. - Interviews with Action Officers or executive staff.	- Draft response (C) will take the longest time. - Coordinate input (F) will take the second longest time.
2. Which step takes the longest?	Compare average processing times for each step.				
What type of	Assess variation of time through each process step.				
Measurement Definitions: Time through each process step - number of calendar days through each step. All partial days are rounded up to one day. Recycling time is included in the step in which activity originates (e.g., if executive sends package back during content review to draft response, time is included in content review). Start and end points for each process are defined by flow chart.					

Check Sheet for: Time Through Each Process Step

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Size of Sample: 25

Sample Number	Process Step												Total Time
	A	B	C	D	E	F	G	H	I	J	K	L	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
Total Time:													
Average per step													

Study Plan

Unit of Analysis: Type of Information Request

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. How long does it take to process different types of information requests? 2. Which type of information requests takes the longest to process? What type of	• Monitor the length of time required for each information request • Compare average processing times for each type of request. • Assess variation of time for each type of request.	• Check sheet • Pareto chart • Run/control charts	• Nine samples of 25 overdue packages each, one for each type of information request. • Each sample selected to represent different directorates and types of actions.	• Correspondence office logs • Correspondence Control Cover sheets • Directorate logs • Executive logs	• data requests will take the longest time to process. • Policy clarifications will take the least amount of time to process.
Measurement Definitions: • Time through process - number of calendar days from receipt of package by Directorate to signature of package. All partial days are rounded up to one day.					

Check Sheet for: Type of Information Request Step

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Size of Sample: 25

Sample Number	Type of Information Request Step									Total Time
	A	B	C	D	E	F	G	H	I	
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
Total Time:										
Average per type of request										

- A - Estimates of project costs, budget, accounting data
- B - Estimates of impact of austerity measures or proposals
- C - Operational information (main mission, human resources management, organizational structure)
- D - Evaluative data (operational effectiveness, administrative efficiency)
- E - Clarification of existing policy - interpretation and application
- F - Further plans, goals, corporate strategy
- G - Investigations, OSHA compliance, internal affairs
- H - Collaboration data, memoranda of understanding (MOUs), project sponsorship/co-sponsorship
- I - Other requests for information (freedom of information act, etc)

Study Plan

Unit of Analysis: Directorate

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. How long does it take each directorate to process controlled correspondence? 2. Which directorate takes the longest to process its correspondence? What type of variation exists	• Monitor the length of time through process in each directorate. • Compare average processing times for each directorate. • Assess variation of time through process for each directorate.	• Check sheet • Pareto chart • Run/control charts	• Six samples of 25 overdue packages each, one for each directorate. • Each sample selected to represent different types of actions and information requests.	• Correspondence office logs • Automated logs • Directorate logs • Executive logs • Interviews with directorates	• No drastic difference in processing average time and variation patterns by directorate.
Measurement Definitions: • Time through process - number of calendar days from receipt of package by Directorate to signature of package. All partial days are rounded up to one day.					

Check Sheet for: Directorate Efficiency

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Size of Sample: 25

Sample Number	Directorate						Total Time
	A	B	C	D	E	F	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
Total Time:							
Average time per directorate							

Study Plan

Unit of Analysis: Type of Action

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. How long does it take to process different types of actions? 2. Which type of action takes the longest to process? What type of variation (or cause) is at work	• Monitor length of time through process for each type of action • Compare average processing times for each type of action. • Assess variation of time through process for each type of action.	• Check sheet • Pareto chart • Run/control charts	• Six samples of 25 overdue packages each, one for each type of action. • Sample selected to represent different directorates and types of information requests.	• Correspondence office logs • Correspondence control cover sheets • Directorate logs • Executive logs	• take the longest amount of time. • Direct response to external request for information, and internal responses to secretary and executive requests for information will take the shortest amount of time.
Measurement Definitions: • Time through process - number of calendar days from receipt of package by Directorate to signature of package. All partial days are rounded up to one day.					

Check Sheet for: Type of Action

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Size of Sample: 25

Sample Number	Type of Action						Total Time
	A	B	C	D	E	F	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
Total Time:							
Average per type of action							

A- Executive Request
B- Secretary Request
C- General Action Item

D- Direct response
E- Secretary signature (coordinated)
F- Secretary signature (non-coordinated)

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Process Action Team Workshop

Case Study 2-5

Analyzing Data

PART I

**Cycle Time
Process Steps**

Scenario: After developing your study plans, the next step is to collect data according to your plans. For the purpose of this case study, you will be provided with the data. Your next activity will be to analyze the results. You will do it in two parts: Part I is the analysis of Cycle Time and Process Steps and Part II is the analysis of Directorates' performance.

Instructions

1. Perform the analytic tasks given on the data collection results sheets. Put displays you create on chart paper for presentation to the class.
2. Refer back to the questions in the study plan for each unit of analysis. How can you respond to each of the questions, given the data collection results?
3. What do you suggest to study next? Why? List next study steps.
4. Prepare a team brief of 8 minutes according to the Briefing Instructions which summarize your findings.

Activity: Review data for each unit of analysis and develop responses to discussion questions.

Objective: Analyze data to understand causes and determine issues for further study.

- Materials Needed:
- Study Plans.
 - Data collection results for each unit of analysis
 - Completed check sheet
 - Graphic displays (pareto charts, run/control charts) as specified in study plan. (NOTE: The data packages do not include all the control charts. Representative charts have been selected.)
- Output:
- Responses to study plan questions
 - List of next study steps

Cycle Time

Analytic Tasks for Cycle Time Data

1. Create a graphic display showing the relationship between the longest suspense time (10 days) and the samples used from these two studies.
2. Create at least two graphic displays which show the variation in "on-time" packages. Use the data from the first study (all tracked packages).
3. Based on your analysis, what do you conclude about the assignment of suspense dates. Do you have any preliminary recommendations.

Check Sheet for: Cycle Time

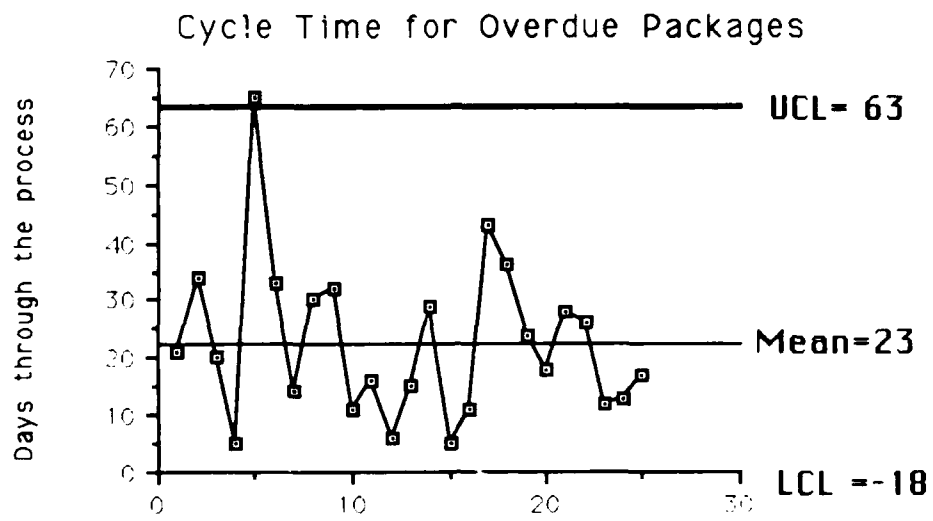
Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Sample: 25 Items

Measurement: Time Through Process

Item Number	All Tracked Packages	Overdue Packages
1	21	21
2	3	34
3	20	20
4	4	5
5	4	65
6	3	33
7	14	14
8	30	30
9	10	32
10	7	11
11	6	16
12	3	6
13	9	15
14	8	29
15	7	5
16	9	11
17	1	43
18	8	36
19	8	24
20	8	18
21	9	28
22	4	26
23	3	12
24	3	13
25	4	17
Total Time:	206	554
Average Time:	8.24 days	22.16 days



Process Steps

Analytic Tasks for Process Steps Study

4. Do you believe that the sample of 25 packages used in the "process steps" study and the sample used in the Cycle Time (overdue) study were drawn from the same population of packages?
 - a. Display the evidence for your position.
5. The packages which took 65 days and 58 days were from Directorate A and found to be examples of multiple-agency coordination packages requiring combined policy decisions. Since they took so long, should they be considered part of the data describing the process? Why or why not?
6. What "causes" does the data refute as prime reasons for the delays?
7. What percentage of the delay time is traceable to the Response Development process?
8. Since a PERT chart uses the longest time for a step in order to plan a project, how long would the Response Development process have to be on a PERT chart? The Review and Approval process? The combined processes?

Check Sheet for: Process Step

Date of Collection: _____ Name of Researcher: _____

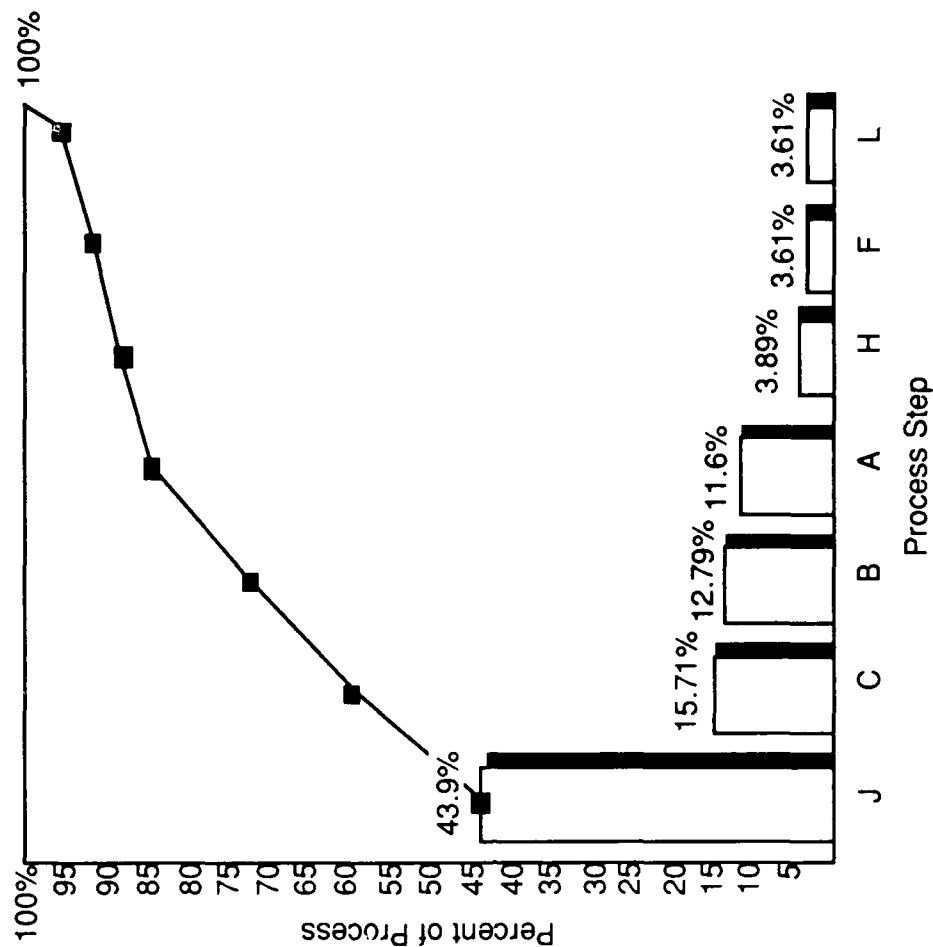
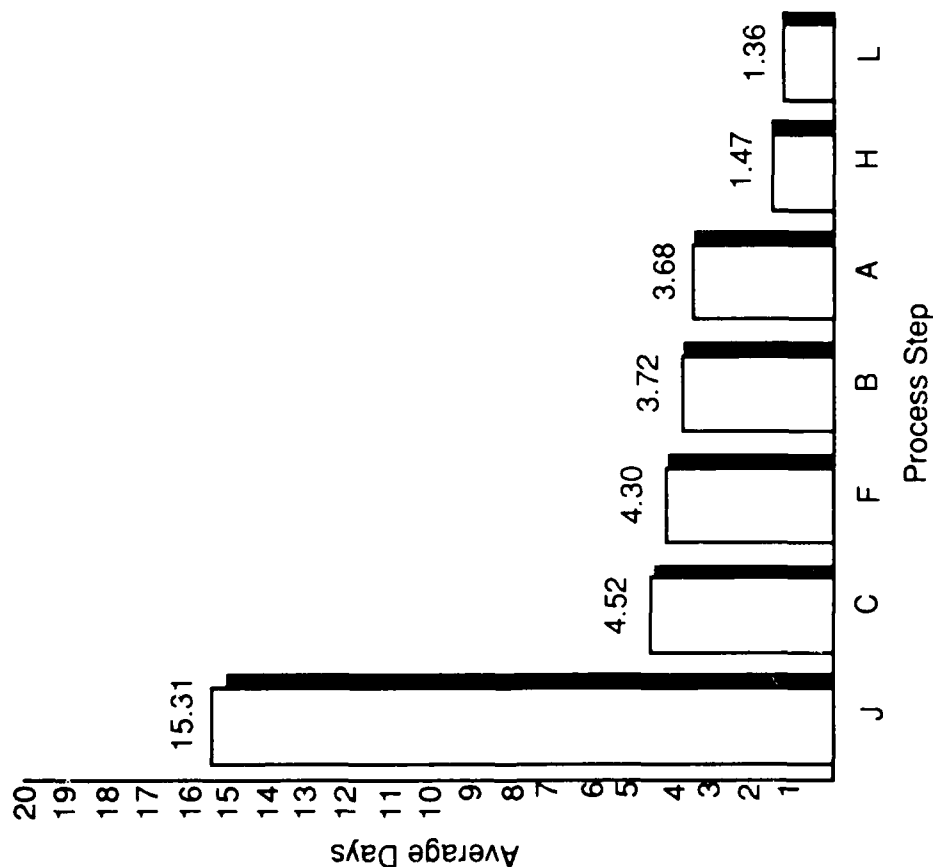
Period Covered By Data: FROM: _____ TO: _____

Sample: 25 Overdue Items

Measurement: Time Through Process

Item Number	Process Step												Total Time
	A	B	C	D	E	F	G	H	I	J	K	L	
1	2	7	3	1				3		41		1	58
2	1	2	7	1	1								12
3	1	1	2	1		4		1		5		1	16
4	2	5	15	1	1								24
5	3	2	1	1				1		8		1	16
6	4	3	1	1				1		6		2	18
7	5	3	1	1				1		19		2	32
8	4	3	26	1	1								39
9	6	3	1	1				1		13		1	26
10	1	4	1	1		3		1		3		1	15
11	6	2	2	1				2		18		1	32
12	3	2	2	1		3		2		13		1	27
13	2	8	9	1	1								21
14	2	2	1	1				1		9		1	17
15	3	2	1	1				1		10		2	20
16	2	1	1	1		4		1		9		2	20
17	5	4	2	1		7		1		19		1	40
18	4	3	2	1				1		21		2	34
19	5	3	3	1				3		49		1	65
20	2	1	6	1	1								11
21	9	4	2	1				3		26		1	46
22	3	3	1	1				1		17		2	28
23	4	3	2	1		5		2		22		2	41
24	3	19	19	1	1								43
25	2	3	2	1				1		8		1	18
Total Time:	84	92	113	25	6	26	--	28	--	316	--	26	719
Average per step	3.68	3.72	4.52	1	1	4.3	--	1.47	--	15.31	--	1.36	29.12

Average Time to Process Delayed Packages Through Each Step

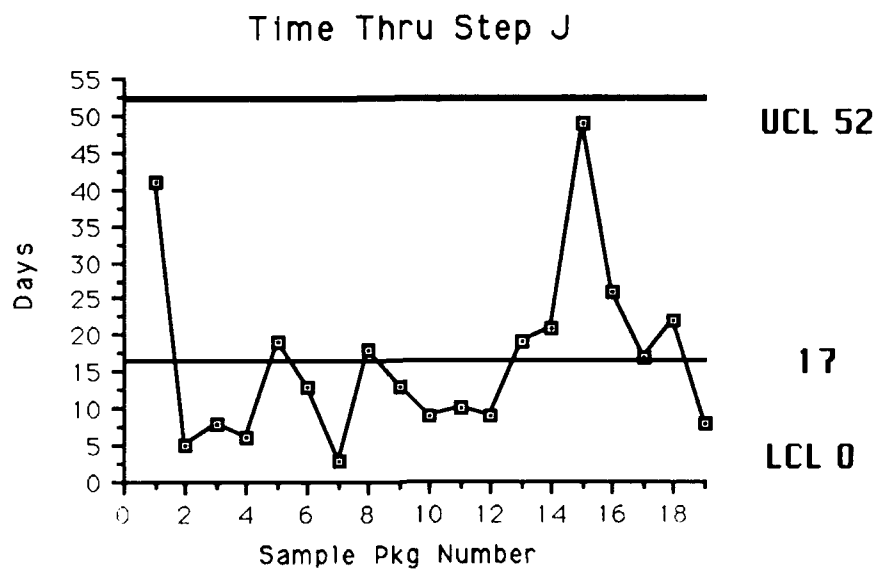


KEY:

A = Prepare Action Officer H = Check Format
 B = Develop Approach J = Review Content
 C = Draft Response L = Sign
 F = Coordinate Input

NOTES:

- Decision and Routing Steps D, E, G, I and K are not included in the charts, as each accounts for a nominal amount of time.
- Step F: Coordinating Comments and Remarks, is used in only 6 of the 25 sampled packages.



Case Study 2-5

Analyzing Data

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DATA

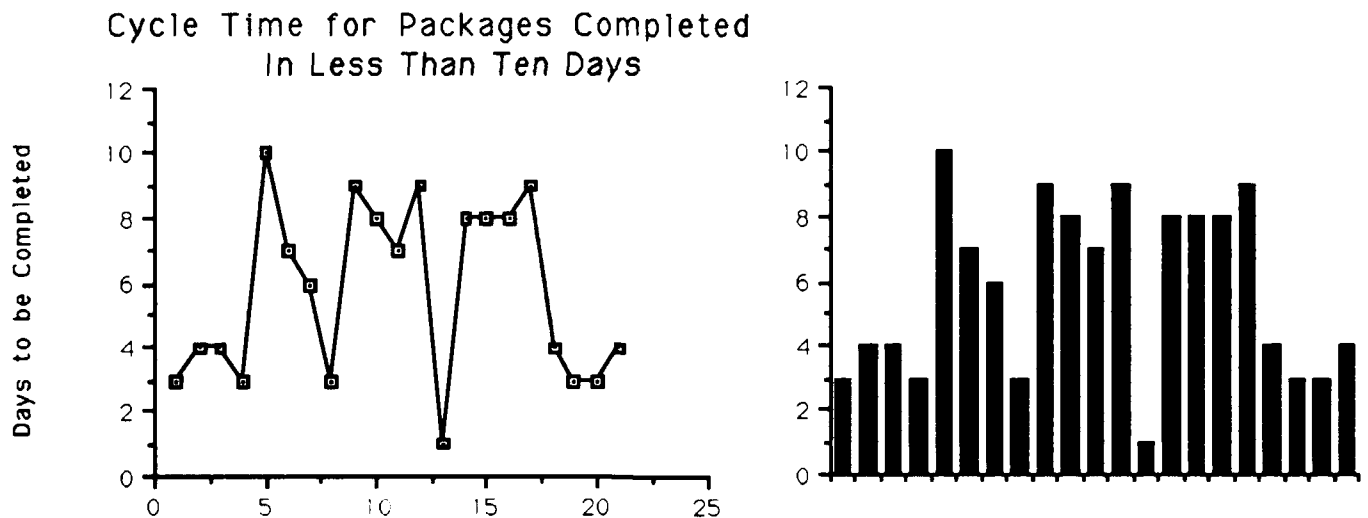
Next Study Steps

- Focus on process step unit of analysis.
- Refined unit of analysis: causes of delays in process step J: Review Content. The study results show that the most delays occur in step J.

Analytic Tasks

Cycle Time

1. Any graphic display (such as a run chart, control chart, bar graph) could have the 10-day zone highlighted to show that:
 - a. The Cycle Time for a random selection of packages show 4 packages definitely above the longest suspense date (10 days). This would indicate that the process is not capable of meeting the suspense dates.
2. A run chart, control chart, pareto chart, histogram or bar graph could be used. Below is a bar graph and a run chart showing how much variation there is in packages which are "on-time".

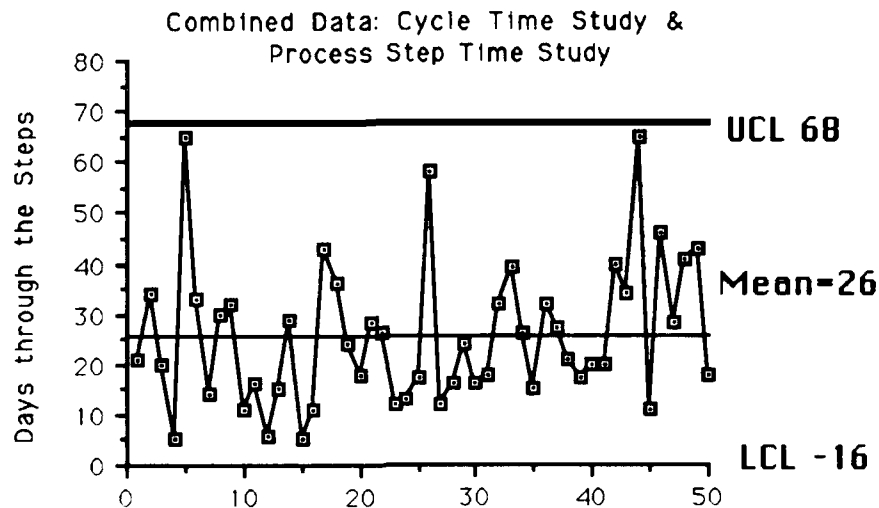


3. The suspense dates are not realistic for all packages. The process has a wide degree of variation as is. Suspense dates should be linked to the nature of the task rather than just the rank of the intended external customer.

Process Steps

4. They are definitely drawn from the same population. When plotted together they form a consistent pattern of response times. The sampling appears to be valid.

5. The sampling captured 3 long-term packages. We can assume they exist in the population. There is no reason to believe that the process failed to work the same way for these three as it did for other overdue packages. Thus, the packages are all part of the same system.



6. The data refutes the idea that the coordination step is the prime cause.
7. The response development process is responsible for at least 40% of the delay time.
8. The PERT chart time needed to plan for the Response Development process would have to be 54 days. The Review and Approval process would take 54 days too. The combined process would take 108 days.

Interim Brief Instructions

Scenario

The QMB wants to know what you have found out so far. They want a presentation of interim findings. You are expected to use graphics to support your briefing. The briefing will take 8 minutes to give and must cover the agenda.

Task

Assign team members parts of the brief. Cover the following with data you have collected or analyzed:

AGENDA

1. Define the delay problem more specifically.
2. Illustrate the data and processes involved using visual aids and graphic displays.
3. Identify where the problem is occurring.
4. Provide your interim assessment of causes (as best as the data will support).

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Process Action Team Workshop

Case Study 2-5

Analyzing Data

PART II

Directorates

INTRODUCTION TO PART II

1. The QMB was impressed with your brief. As a result of your work, the QMB saw that the delay problem has its origins in both the development phase and the executive review phase.
2. Based on your insights, the QMB has decided to charter a second PAT and give them the job of clarifying and negotiating the executive review roles in the Review and Approval process.
3. Your charter has been scoped down. You are directed to closely examine Directorate A's draft development process to eliminate the cause of its delays. The process you are to focus on is the one in Directorate A because it has the worst turnaround time.
4. You are being supplied with the following supplemental information to help you start on your task:
 - a. Notes on Directorate A's "Draft Response" process
 - b. The "Draft Response" process interview results.

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Process Action Team Workshop

**Case Study 2-5
Analyzing Data**

PART II

Supplemental Information

Notes on Directorate A's Draft Development Process
(Based on interviews with Directorate A personnel)

- N1. The Director's notes are the first things used by the author to draft the response. This is almost the entire method Directorate A has of selecting its basic approach. It is largely dictated by the Director.
- N2. The drafting of the response involves the author developing a seed approach through his personal research of the topic. He has to conduct research to augment the Director's guidance.
- N3. The seed approach is expanded to include problems and issues the author believes should be mentioned. This expanded approach is the draft sent through the process.
- N4. The author tries to extract any purely operational or technical issues if the requestor is interested in policy or agency intentions. This is done before the seed approach is finalized. The author analyzes available data to support issues chosen for the draft.
- N5. The author's knowledge of the external customer is the basis of the persuasive strategy he selects for the executive to use. Selecting a persuasive strategy for the external customer is done.
- N6. The author focuses a lot on his original internal research on the ultimate signor's known opinions or personal style preferences.
- N7. The author is expected to adopt an "expert writer" role and view each draft as advice to the executive who will sign it.
- N8. The author takes the seed approach and develops a "logical argument"--in Directorate A, the bullet-version of the response has to follow a logical flow of ideas and development. The author's logical argument is designed to make the persuasive approach be very clear and powerful. The Director examines the bulletized argument and approves it for further formulation.
- N9. The main work of the author is integrating the Director's instructions and his expert knowledge of the topic. Later on, the author may have to incorporate some key buzz words of others who review or coordinate the draft on its way up to the ultimate signor.
- N10. After the response has been purged of operational or overly technical data, the draft is typed and ready for forwarding to the executive or coordination chain of review.

"Draft Response" Process Interview Results

Study Area: Source of variation within controlled correspondence

Study Activity: Interviews with three Correspondence Control Office Administrators

Study Results: The interview results are summarized in three categories: Process data, problem data, and suggested solutions.

Process Data

1. The requests are not all similar. There are very different types of requests that everyone has to handle. Routine requests use easily available information, but some ask for data which require a lot of work, opinion-development, and coordination.
2. About a fifth to a sixth of the packages received deal with policy creation issues or with non-standard data requests that require creation of a data base or special research.
3. Directorates C and F use pre-draft networking (called by various names, such as "crash meetings") to get early consensus and develop their original drafts. In one such crash meeting in Directorate F, the parties agreed on an approach, assigned joint responsibilities for data gathering, and developed different ways to persuade and prepare those who would be reviewing the draft when it came to their office.
4. The way Directorates A and E work is very individualistic. Each person gets a package and has total freedom to get it through any way then can. Of course, they have to take responsibility for the results.
5. Directorate A gets a lot of policy-integration tasks. They often have to use extensive coordination to develop their packages.

Problem Data

1. Each directorate uses agency general development guidelines, but then applies the guidelines in different ways.
2. Bill Ferns, in Directorate D, was trying to get more people involved in the draft creation process, but that stopped when he went to another Agency and Directorate B and D got new Directors. The head of D is trying to take personal control of things now. Directorate B has got a new mission and has brought in many new people that do not know the process well.
3. In Directorate A, they have the worst problem. There has been leadership turnover and they answered five successive congressional committee probes.
4. There are people who have quit the Agency because they did not know how to respond to constant rejections which they tried to fix several times. Mike Begal was the most recent--he was a branch chief in Directorate A.

5. Some information that executives and secretariat level people want to see in the responses requires a very large perspective which only top-level people can possibly have.
6. The rejections are getting worse. We have seen some packages ride a long time on the "Rubber run" -- back and forth between directorates and executives who get increasingly agitated by the repeat cycles.
7. During one of our responses to Congress about austerity measures we could adopt, we were delayed because the head of the directorate took the package with him to Geneva in order to talk about it with the Congressman who would be there too. Both of their travel plans changed and we totally lost track of the package.

Suggested Solutions

1. Some directorates have a little luck in using pre-draft networking input methods to develop an approach to sensitive issues. They call a meeting of people who will be getting the draft and determine what will be the most likely response from the different parties. This is factored into the original draft. The people then test out the chosen approach informally with those who will review it. They then call the author and warn him about difficulties in time for him/her to adjust the package before it goes to the reviewing parties.
2. People need to pay attention to what works for other people.
3. Use pre-formatted responses.
4. Have less reviews or control the number of reviews.
5. Reward executives who make few changes to drafts.
6. Need more time for development.
7. Get more research support.

Analytic Tasks for PART II

Analytic Tasks: PART II

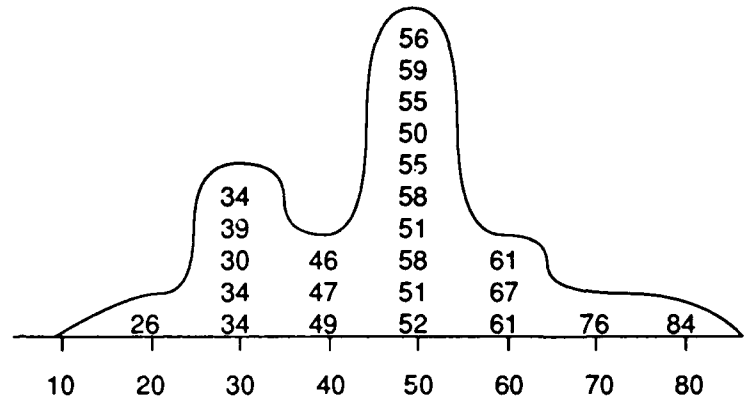
Directorate Study

1. Use the data on the check sheet. Create a "stem-and-leaf" plot for each directorate. Draw a rough curve which describes the distribution of the data for each directorate. The following example is from Directorate B's data.

DATA:

49	51	50	47	46
52	58	59	55	56
51	55	67	76	61
58	84	34	59	39
34	61	26	30	34

STEM AND LEAF PLOT



2. Use the interview results to explain the different patterns in the Directorate's control charts, bar charts and stem-and-leaf plots. Pay attention to both the obvious pattern of the data and the changes within the patterns. Try to interpret as much as possible using the narrative data. Suggestion: Assign different team members different parts of the analytic task.

3. Use two different types of data displays with directorate information. Compare Directorate A's performance with any other Directorate your team feels should be used for comparison. For example,

- Which directorates are most similar to A?
- Which directorates are most different from A?

Check Sheet for: Directorate

Date of Collection: _____ Name of Researcher: _____

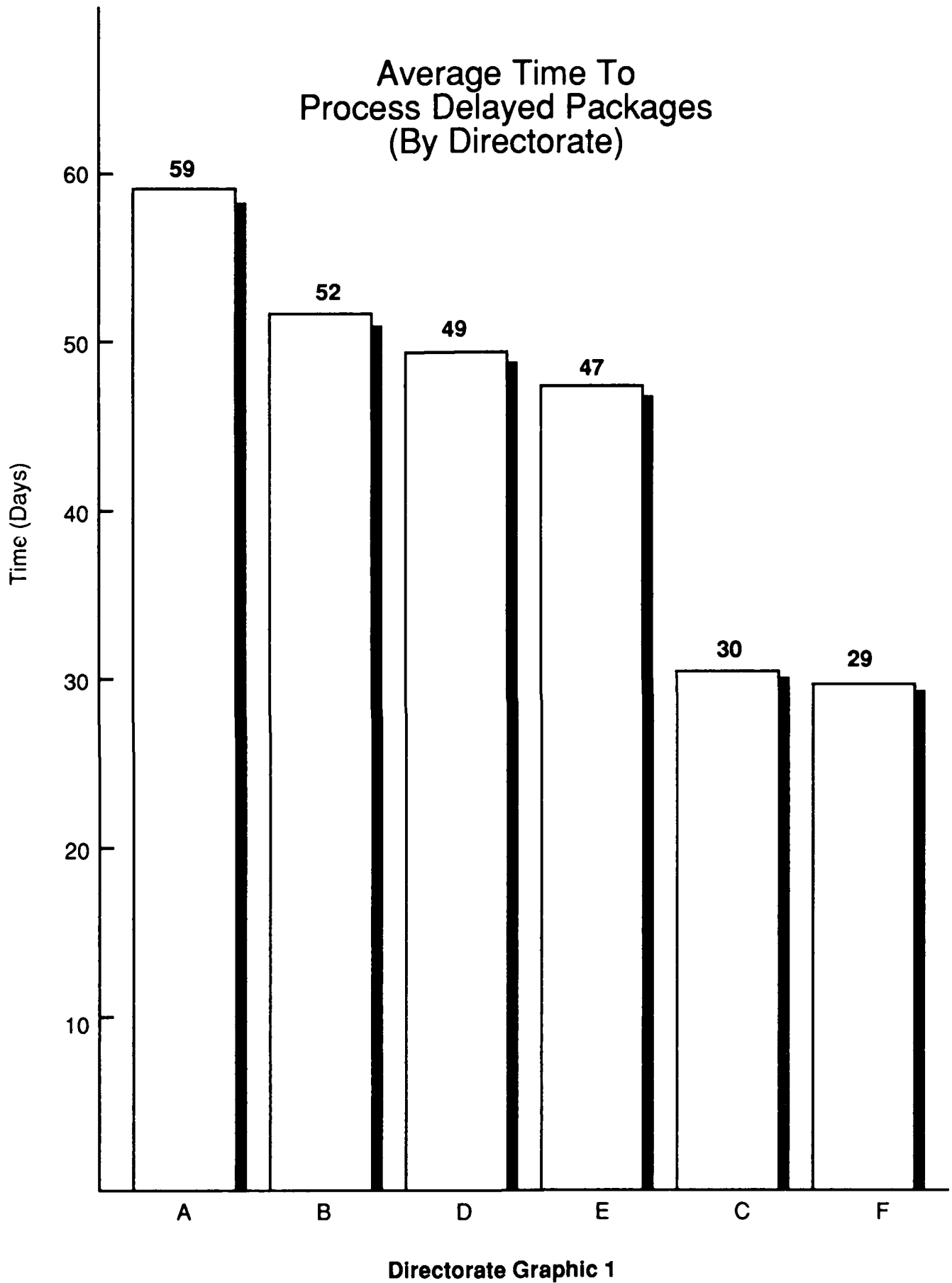
Period Covered By Data: FROM: _____ TO: _____

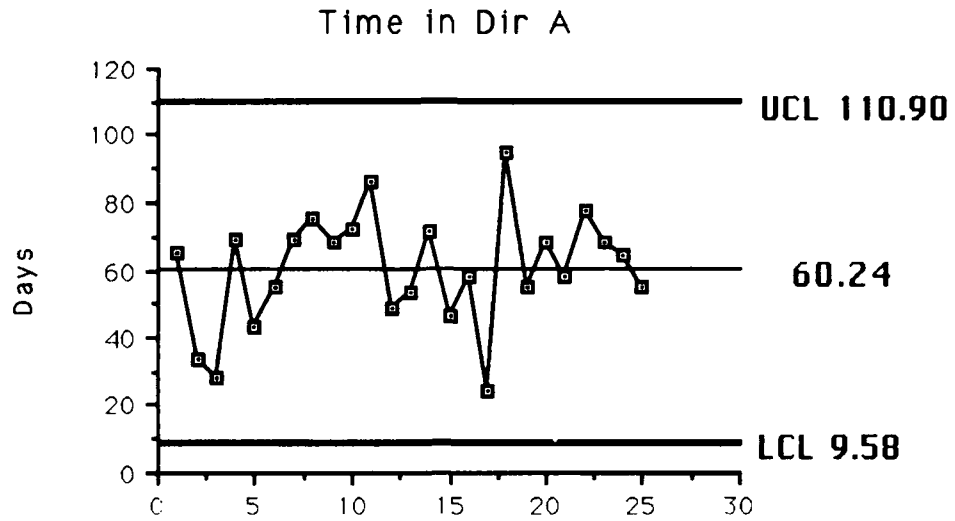
Sample: Six Samples of 25 Items

Measurement: Time Through Process

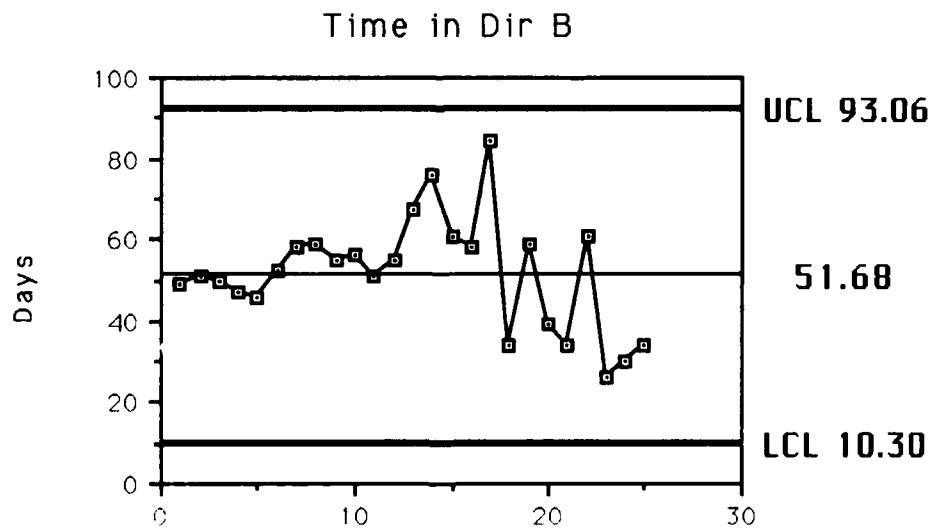
Item Number	Directorate					
	A	B	C	D	E	F
1	65	49	36	34	52	21
2	34	51	33	28	55	23
3	28	50	35	39	56	30
4	39	47	31	43	45	32
5	43	46	20	29	42	20
6	55	52	23	38	47	26
7	69	58	22	34	58	30
8	75	59	45	49	41	21
9	68	55	50	15	35	42
10	72	56	23	40	29	31
11	86	51	38	47	72	33
12	49	55	31	46	68	22
13	53	67	32	53	64	31
14	71	76	34	58	58	36
15	46	61	35	64	51	29
16	58	58	24	56	42	28
17	24	84	28	57	43	34
18	95	34	21	68	41	29
19	55	59	26	58	44	21
20	68	39	26	62	62	25
21	58	34	24	59	42	34
22	78	61	35	70	38	25
23	68	26	30	59	25	42
24	64	30	31	61	45	33
25	55	34	28	65	26	30
Total Time:	1,476	1,292	761	1,232	1,181	728
Average time per directorate	59.04	51.68	30.44	49.28	47.24	29.12

Average Time To Process Delayed Packages (By Directorate)

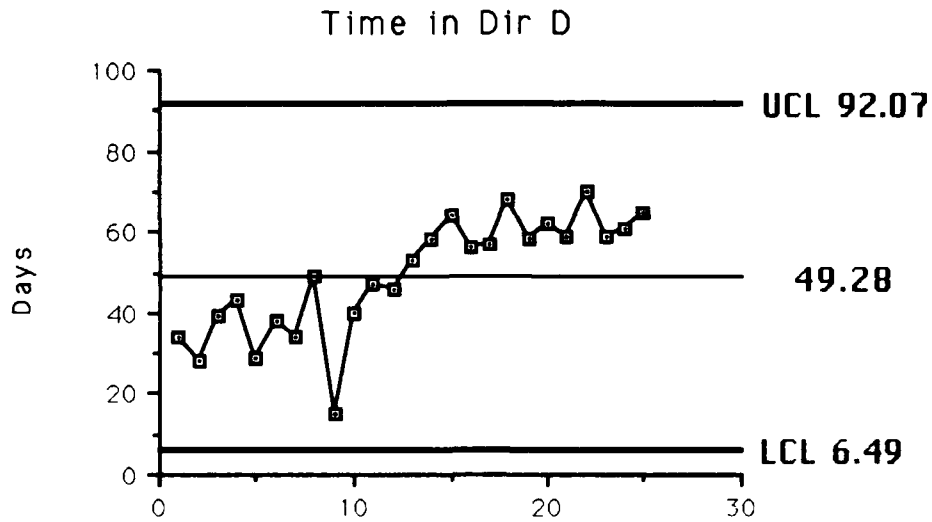




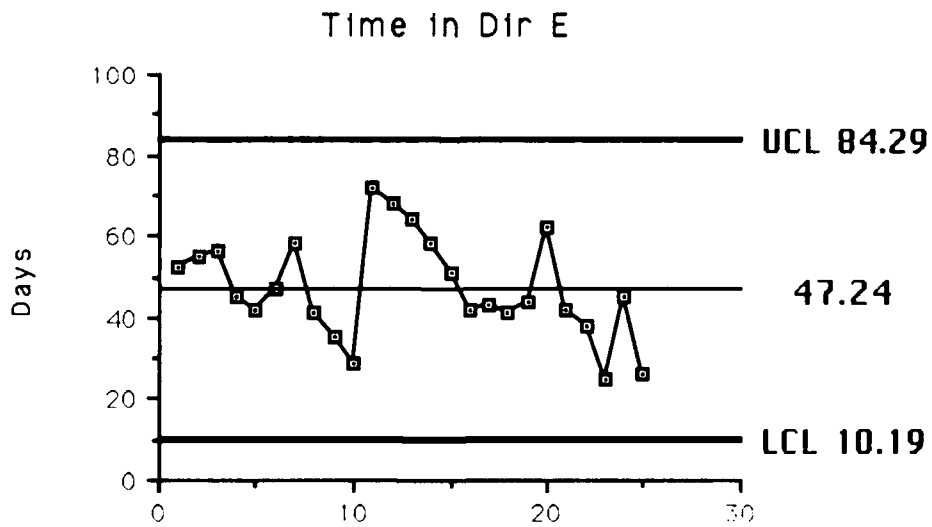
Directorate Graphic 2



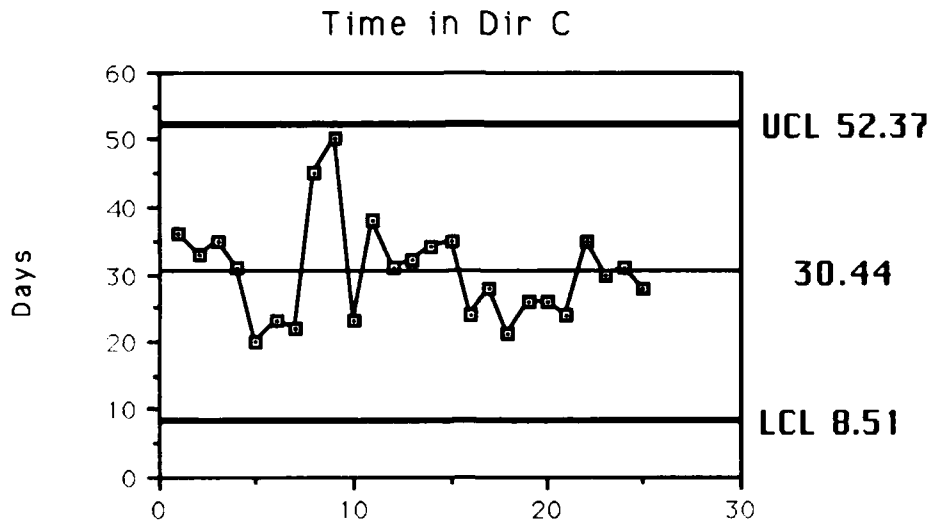
Directorate Graphic 3



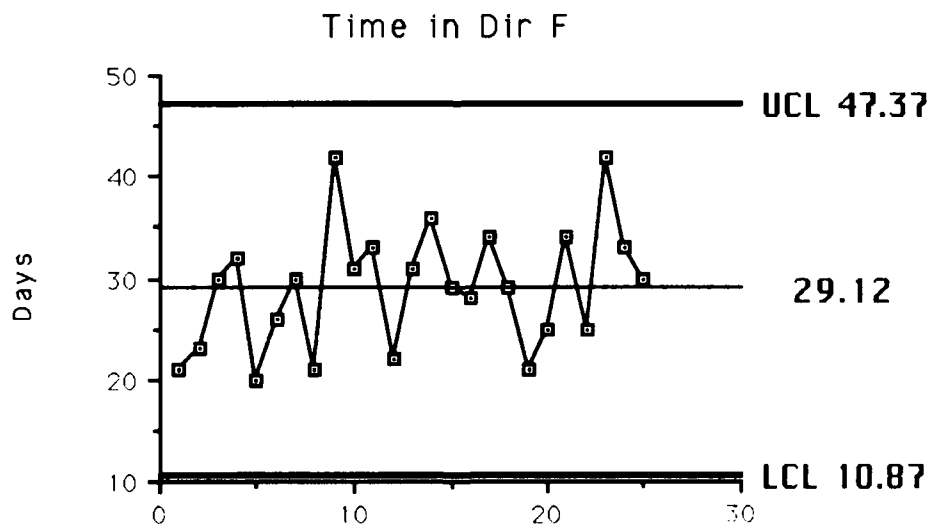
Directorate Graphic 4



Directorate Graphic 5



Directorate Graphic 6



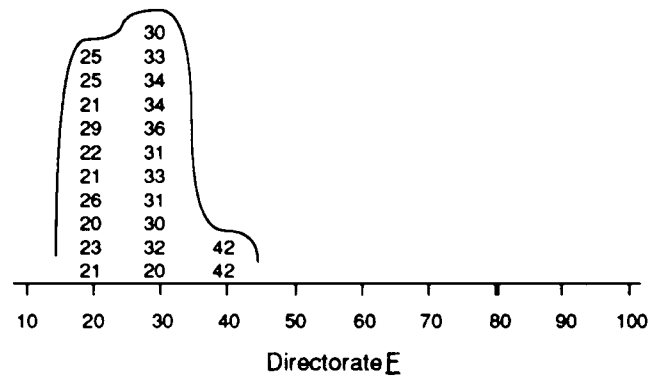
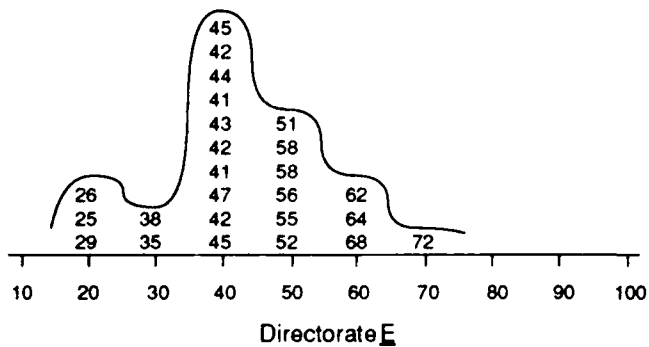
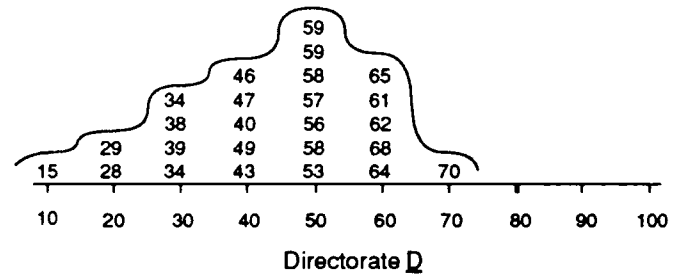
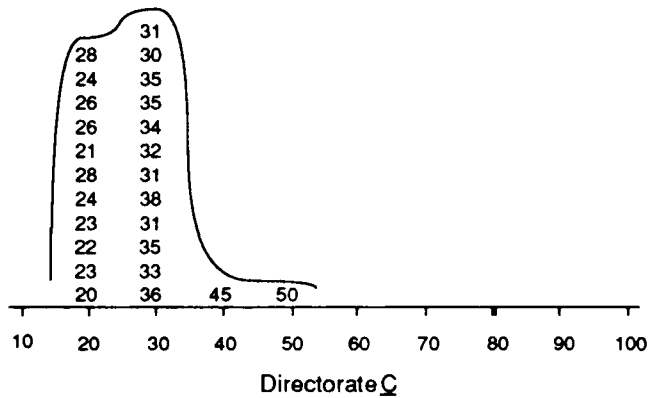
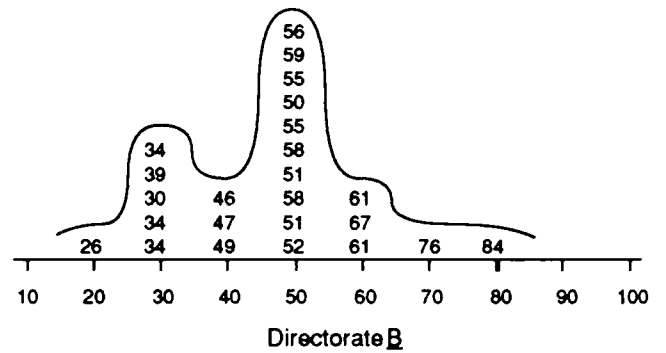
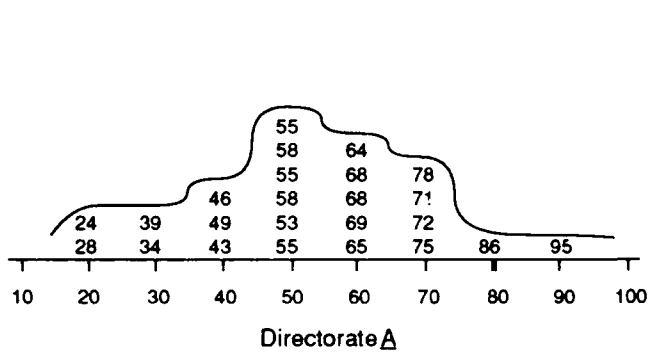
Directorate Graphic 7

Case Study 2-5 Analyzing Data

NORM DATA PART II

Analytic Tasks: PART II

Stem and Leaf Plots for Directorate A-E



Analytic Tasks: PART II

Using interview results to explain the different patterns in the Directorate's graphics.

Graphic 1:

C,F Use pre-draft networking to get consensus

A Has lots of policy-integration packages

Graphic 2:

Average overdue is 60 days

Graphic 3:

The new mission and new personnel which recently occurred shows up as increased variation. The new energy shows promise in reducing the time to do packages.

Graphic 4:

The former director had a lower variation rate. The new director is getting consistently higher time delays.

Graphic 5:

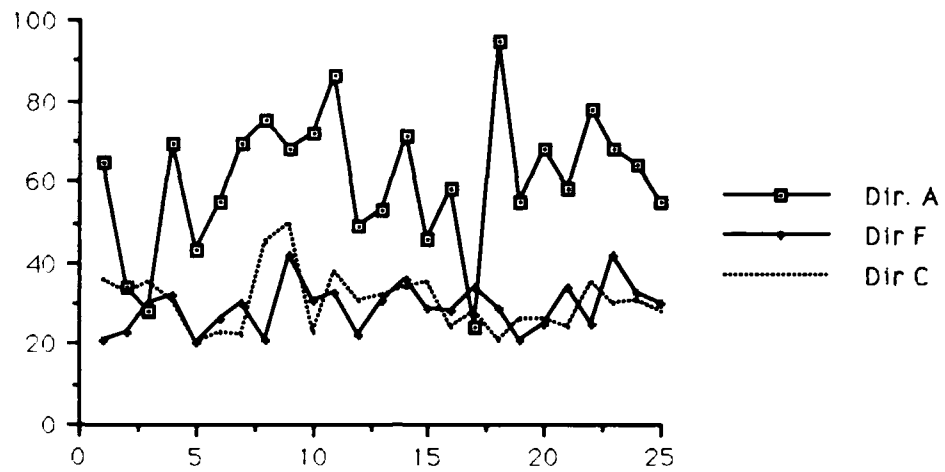
Directorate E shows signs of having worked through a backlog of packages. They have individualistic approaches like Directorate A but do a better job a getting package through. The average overdue is 47 days.

Graphic 6:

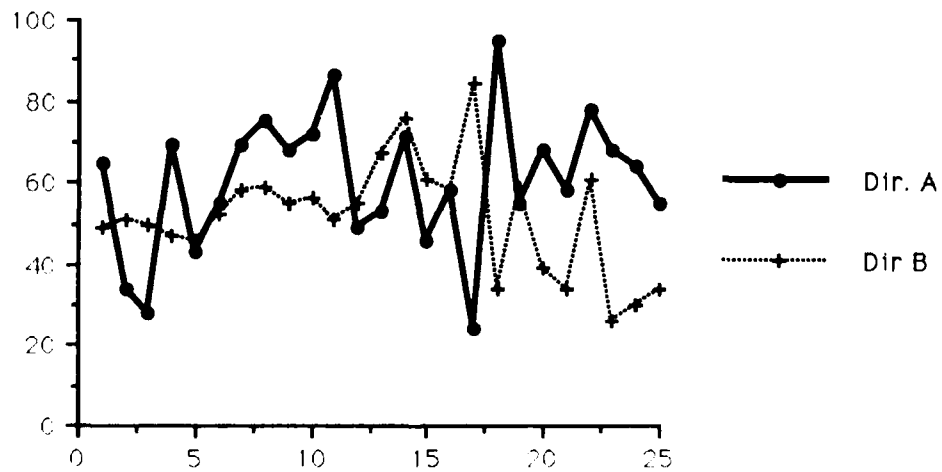
Directorate C shows signs of high efficiency and continuous improvement efforts. The "run" of lowered time delays and the overall lower average time (30 days) indicates attention is being paid to their processes.

Graphic 7:

Directorate F also shows signs of improvement. But the higher degree of variation might suggest some inconsistent approaches on projects are being experienced. Overall average is 29 days.



**Comparing A with F and C
Most Dissimilar**



**Comparing A with B
Most Similar**

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Process Action Team Workshop

Case Study 2-6

Recycling: Micro Flow Charting

Scenario: We have decided to study the causes of delays in the Response Development process, because the pareto chart showed that this is where 40% of the delays occur. The PAT has decided to examine the Draft Response Step more closely.

Instructions

1. Develop a micro flow chart of the "Develop the Approach" step.
2. Use the modified Delphi technique, as described in the student manual. Adapt the technique for flow charting.
3. Assign a spokesperson to present your flow chart to the large group.

Activity: Develop micro flow chart of the Draft Response process used by Directorate A.

Objective: Document the "Develop the Approach" step to help understand where delays occur.

Materials Needed:

- Macro flow chart of the Response Development and the Review and Approval Processes (Case Study 2-1)
- Study Data

Output: Micro flow chart of "Develop the Approach" step in the Review and Approval Process.

Content Review Study

Study Area: Causes of delays in the Content Review Step in the Review and Approval Process.

Study Activity: Interviews with three Executive Assistants.

Study Results: The interview results are summarized in three categories: Process data, problem data, and suggested solutions.

Process Data

1. When the executive's office receives the package, the clerks will make sure it has all the right pieces, is in the correct style, has correct security markings, proper distribution, and physical structure. The clerk also determines if the package uses an acceptable protocol. If it does not meet all these criteria, it is returned for correction. Otherwise, it is passed to the executive assistant for content review.
2. The first thing the executive assistant (EA) does is compare the response with the original request to see if it was correctly interpreted. This is called "reading the mail."
3. The EA determines if all the implied requests have been met.
4. The EA then determines if the policy implications have been addressed.
5. The EA takes into account the role, biases, and projects of the requestor in determining if the response is adequate.
6. The EA also determines if the response is consistent with any other policy or current remarks made by key agency personnel.
7. If there is a predominant theme which the executive or secretary level reviewer is pursuing, the EA determines if the response reflects the key theme. The EA attempts to avoid the appearance that the response appears to reflect unchanging methods or ideas. The EA attempts to present a "dynamic agency."
8. The EA also considers where the response sides with multi-approach issues or those being debated.
9. The EA moves along with the analysis to prepare the "fact page" that accompanies the critique. The EA determines the factual accuracy of the material. If unsure, the EA may task the author to validate the facts. The EA also checks to see that the most current facts are presented.
10. The final phase of the EA's review is the stakeholders' review in which the EA attempts to anticipate if the various stakeholders in the policy will be able to live with the response's commitments. Sometimes the EA will demand that the response reflect the Agency's awareness of the needs of the stakeholders, especially the original requestor of the information.

11. The EA tries to anticipate the executive's mind and biases. He will return the package for change if it does not meet his idea of what the executive wants.
13. The EA, when satisfied, will forward the package to the signature person.
14. The signature person will, of course, probably duplicate the same review steps which the EA has already done. If the EA read the boss right, the package should be signed without delay.

Problem Data

1. Sometimes the information explicitly asked for is only part of what the requestor seeks.
2. The EA can be surprised by what the boss expects, especially if some late-breaking events are involved.
3. The EA may dismiss other executive's comments. The EA will avoid dismissing or contradicting other executive comments, unless they totally contradict or distract from the boss' approach.
4. EA's do not like to be surprised, so they will be reluctant to get their boss' opinion for someone else if they have not already determined it for themselves.
5. EA's are not eager to be approached for ideas until they see the actual document and the context in which it will be discussed.

Suggested Solutions

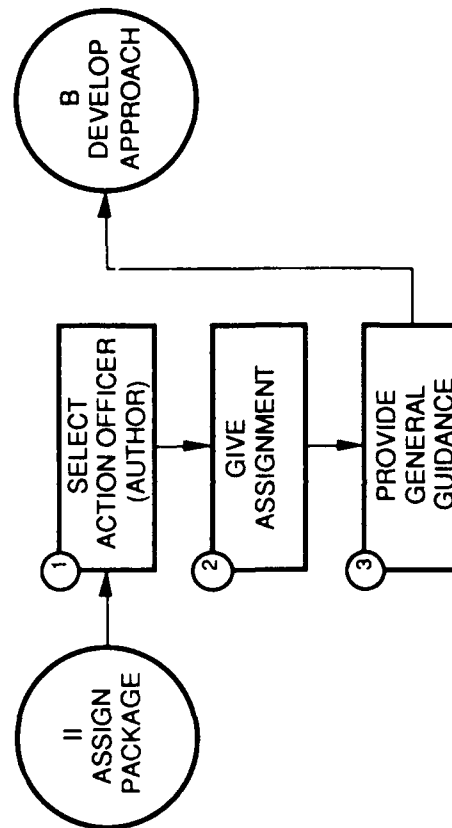
1. Informal methods to gain EA ideas often are more effective than formal requests for meetings or reviews.

Case Study 2-6

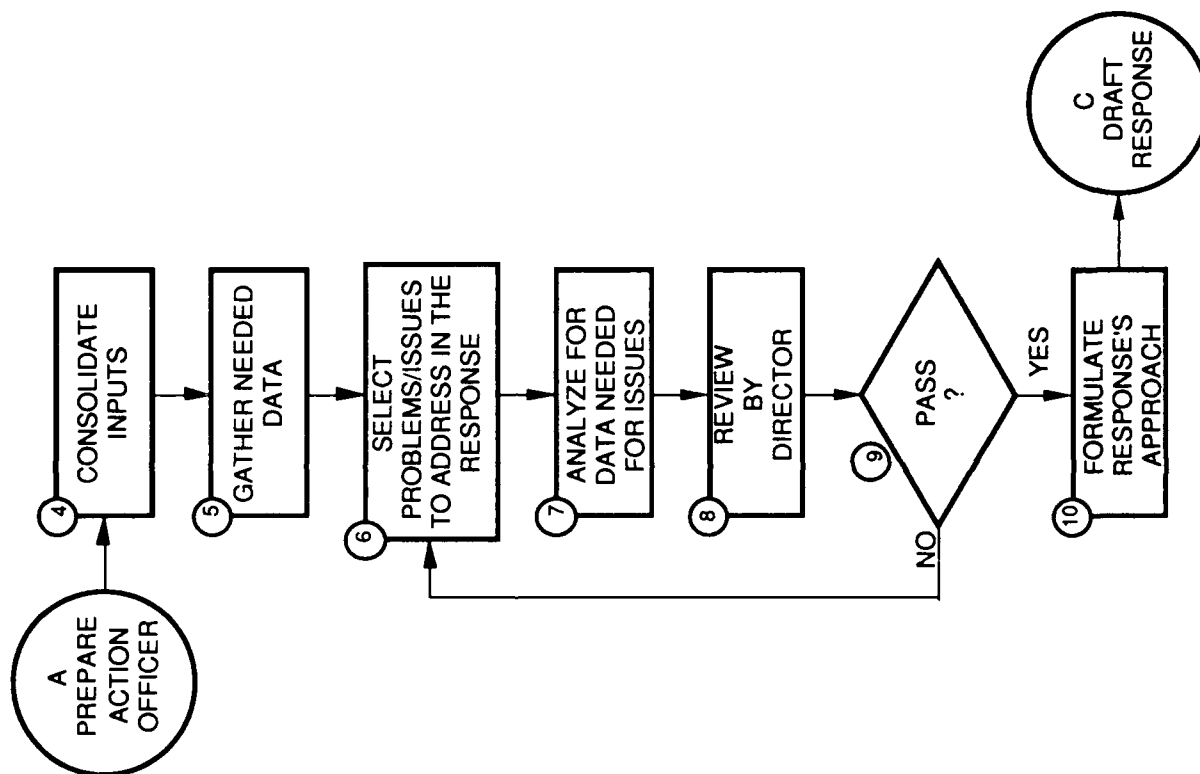
Recycling: Micro Flow Charting

NORM
DATA

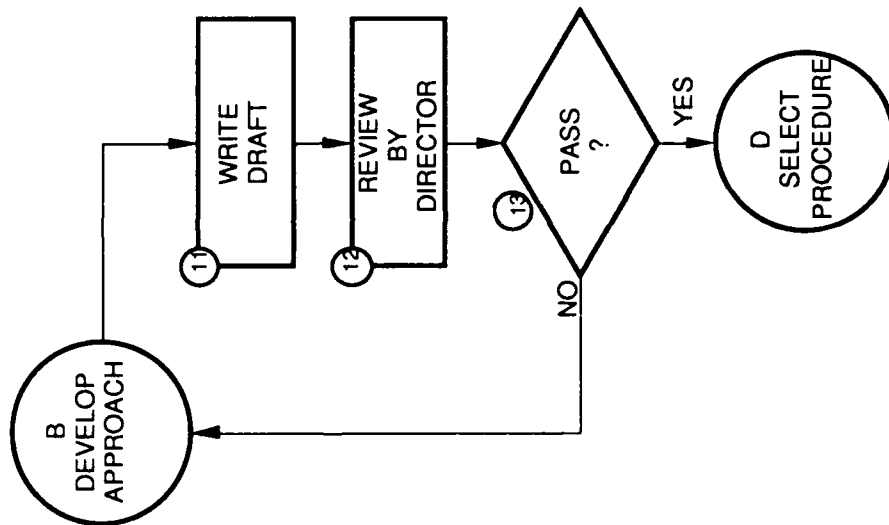
**III. DEVELOP RESPONSE PROCESS
STEP A "PREPARE ACTION OFFICER"**



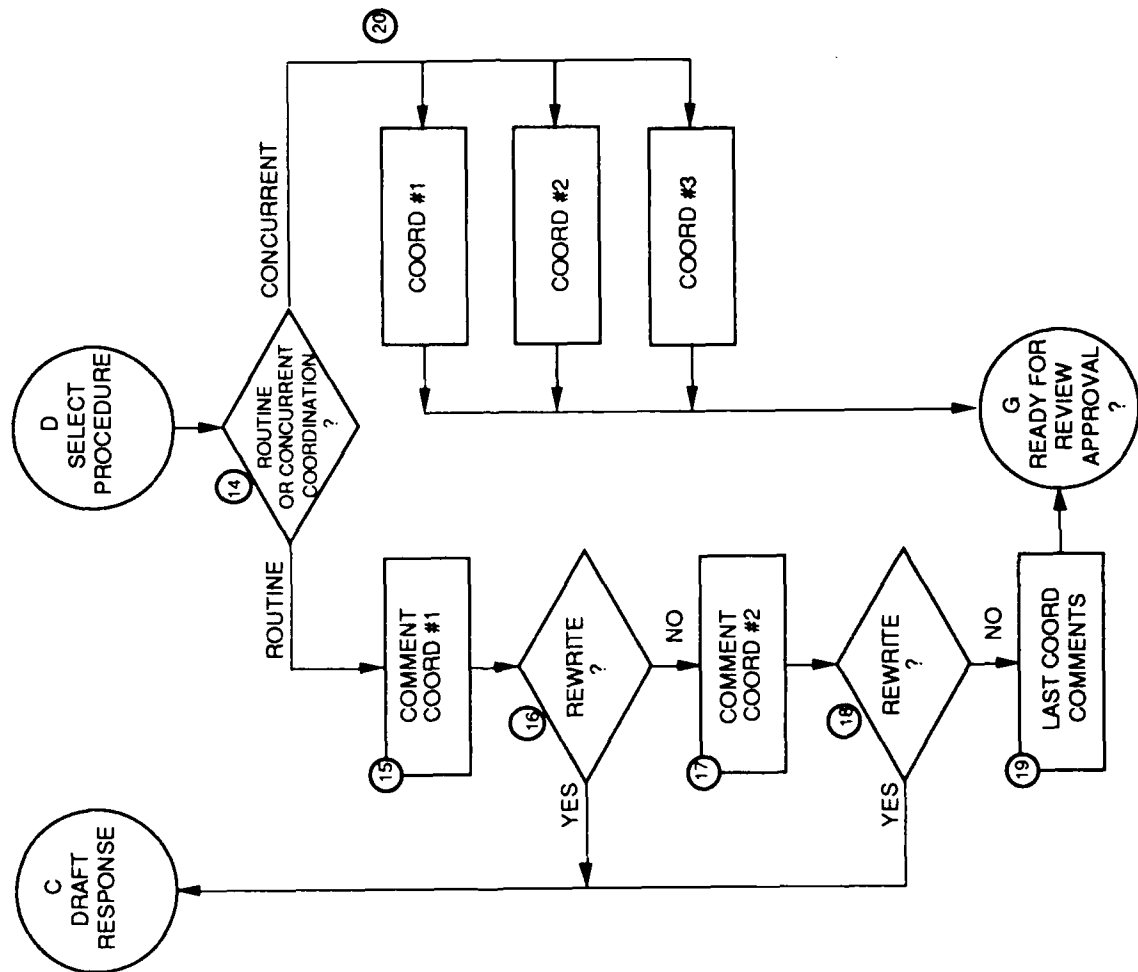
III. DEVELOP RESPONSE PROCESS
STEP B "DEVELOP THE APPROACH"



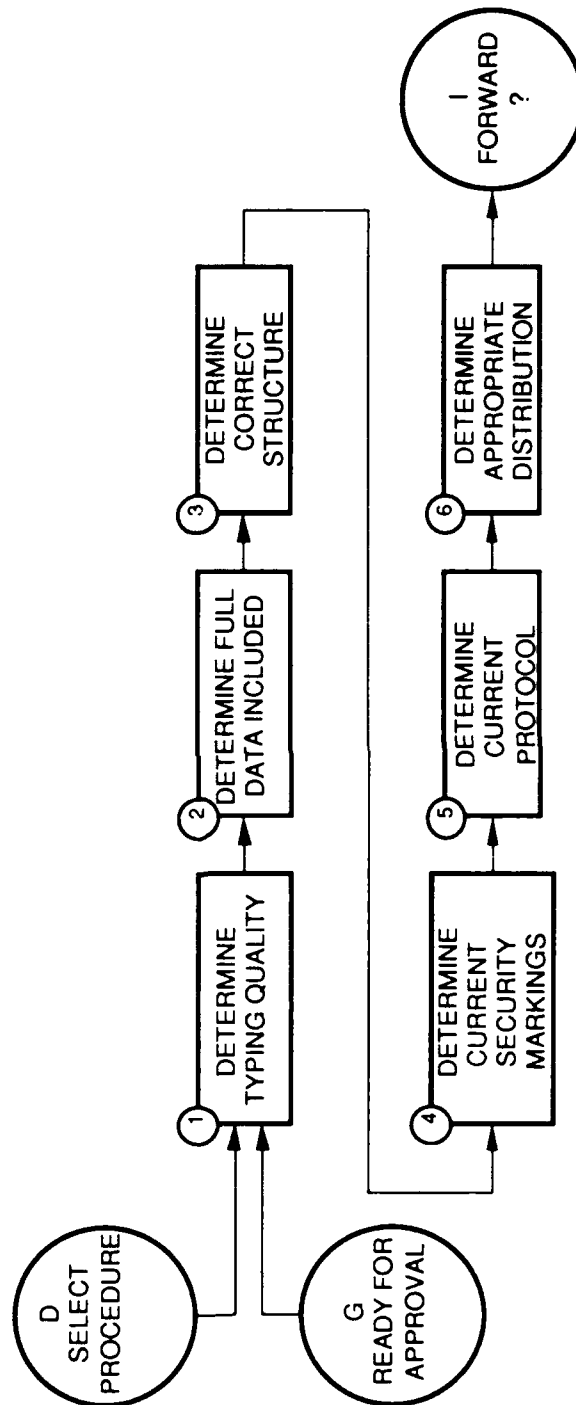
III DEVELOP RESPONSE PROCESS
STEP C "DRAFT RESPONSE"



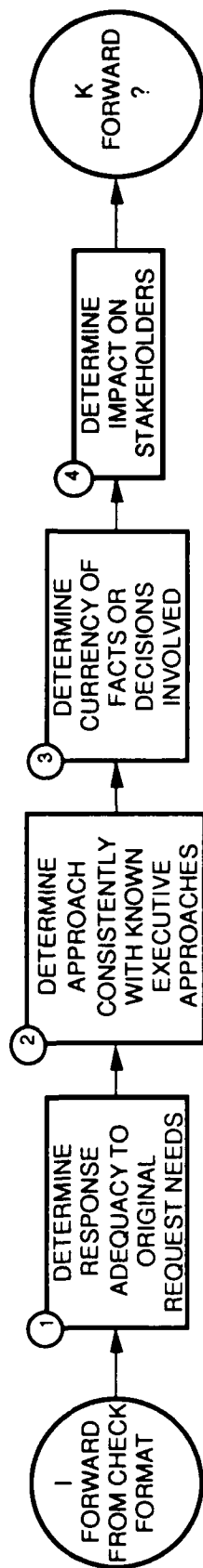
III. DEVELOP RESPONSE PROCESS STEP F "COORDINATE INPUT"



IV. REVIEW AND APPROVE RESPONSE PROCESS STEP H "CHECK FORMAT"



IV. REVIEW AND APPROVE RESPONSE PROCESS
STEP J "REVIEW CONTENT"



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Case Study 2-7

**Recycling: Cause and
Effect Diagramming**

Scenario: After documenting the Draft Development process using interviews and flow charts, you are ready to study process problem areas. As you recycle through the learning process, focusing on the Draft Development process, you will further refine the scope of your cause analysis.

Instructions

1. Construct a cause and effect diagram for causes of delays in the Draft Development process, using the cause and effect diagram shell in this package. Use the free-form brainstorming method.
2. Assign a spokesperson to present your diagram to the group.

Activity: Develop a cause and effect diagram to generate potential causes of delays in the Draft Development process.

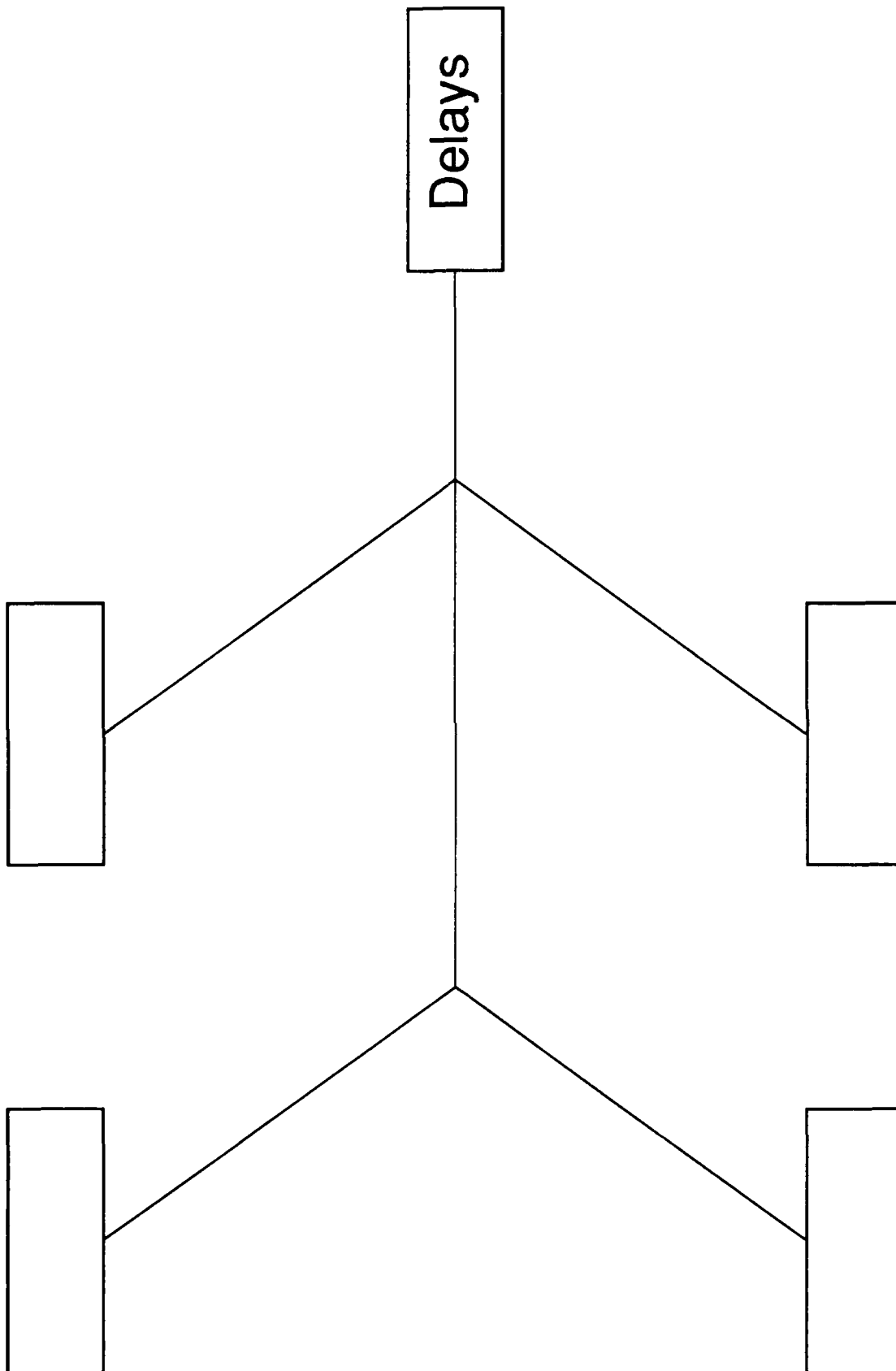
Objective: Determine causes of delays in the Draft Development process.

Materials Needed:

- Micro flow chart of Draft Development process (Case Study 2-6 norm data)
- Cause and effect diagram shell

Output: Cause and effect diagram for causes of delays in Draft Development process.

Cause and Effect Diagram Shell



Case Study 2-7

Recycling: Cause and Effect Diagramming

NORM DATA

NORM DATA

Personnel

1. Authors seldom have executive's big picture, so they must find it out by trial-and-error.
2. Authors may not really be expert in the topic.
3. Author often begins approach as a technical rather than a policy approach.
4. Executive writing skills often lacking.

Methods

1. Response development begins with Director's ideas and invites the strawman cycle of delays.
2. Over-reliance on expert status of authors in all things assigned to them to develop.
3. Integration of comments comes *after* basic approach has been developed and committed to by the author.
4. Deleting technical bias in draft development process is a waste of time--it builds in rework.
5. The short development time breeds errors of fact on approach.
6. Directorate level reviews don't cover what executive reviewers will expect.
7. The expectation that there is a total inclusion of all comments burdens development efficiency.
8. The Director's first review is of a bulletized version which may miss style problems that the more developed version can have.
9. The serial nature of coordinating comments invites delays.

Machinery

1. Directorate A's structures for author support demand too much knowledge and insight from every author.

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Process Action Team Workshop

Case Study 2-8

Recycling: Developing a Study Plan

Scenario: You have just generated a list of potential causes of delays in the Draft Development process. You discovered the leading cause of delays in Directorate A is rejection of the draft package by the Directorate. The next step is to develop a plan for further study of the cause of these rejections.

Instructions

1. Identify a measure(s) (unit of analysis), referring to the "Types of Delays Study" as necessary to study the causes for Directorate rejection.
2. Develop a study plan for your selected measure(s) unit of analysis, using the study plan matrix format.
3. Create a check sheet for data gathering.

Activity: Identify unit of analysis and develop a study plan.

Objective: Plan refined study of rejections in the Draft Development process.

Materials Needed:

- Types of Delays Study
- Study plan format (matrix)

Output:

- Unit of analysis
- Study plan
- Check sheet format

Document Review Results
Directorate A Delays Study

Study Area: Types of Delays.

Study Activity: Estimate which type of delays have the greatest impact, based on:

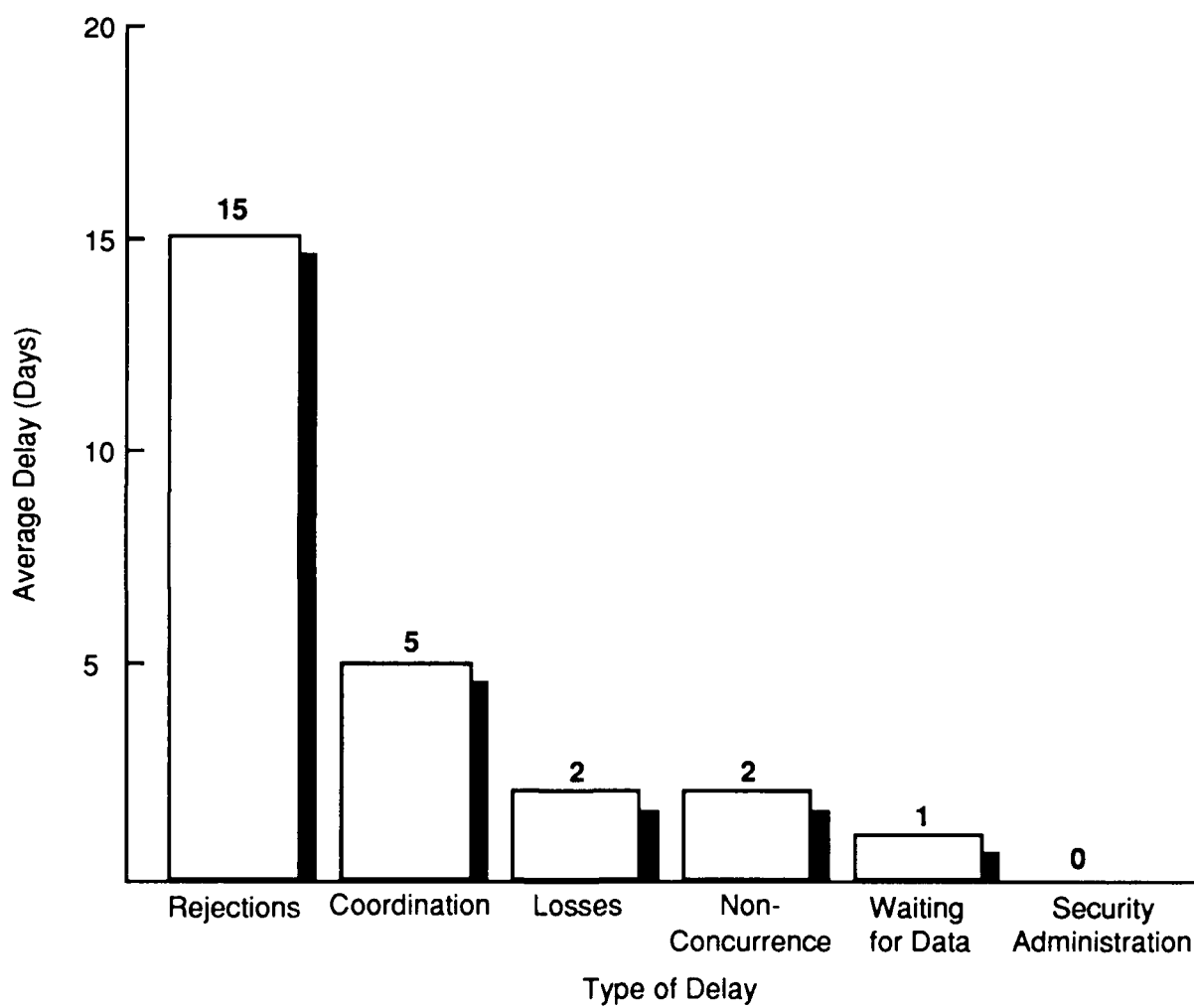
- Study of cover sheets attached to delayed packages (two-month period)
- Interviews with Action Officers.

Study Results: Six types of delays were identified:

- 1) Waiting for data
- 2) External coordination of remarks
- 3) Working out nonconcurrence issues
- 4) Rejections by Director
- 5) Misroutings, losses, and reassignments
- 6) Security administration.

The following page provides the study results in a Pareto chart.

Types of Delays



Study Plan

Unit of Analysis: Types of Rejections by Director

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Sample Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
What is the question we need answered to help us understand the process or the problem better?	How will we pose questions so it can be answered with data?	What data display or analytic tools will we use with the data we collect? How will we show it to others in a presentation?	How many items need sampled? For how long a period? From where?	Where will we get the data? Do we have to generate it or modify it? Can we use existing data sources?	What we suspect the answer will be to our "questions" and our "activities"
EXAMPLE: What types of requests are delayed the most?	- Develop standard types of info requests - Determine frequency of each type of request among delays.	- Check sheets - Pareto chart	Sample 100 delayed packages over 4 month period of time	- Correspondence control office - Log and subject matter headings	- requests will be 1st among delays; austerity projections will be 2nd among delays. - There will be no difference among Directorates.
Measurement Definitions: Delay types will be: Project Estimates, Austerity Projections, Operations Evaluations, Policy Decisions, Plans & Goals, Accounting data, Collaboration Requirements, Safety and Health					

Case Study 2-8

Recycling: Developing a Study Plan

NORM
DATA

Units of Analysis: Type of Rejection

- A. Key Agency decisions not represented in response.
- B. Approach (type of persuasion, data, recommendations, findings, or conclusions) selected not acceptable.
- C. Poor writing style.
- D. Key data are missing or data used are obsolete.
- E. Final format not acceptable (not in compliance with Secretariat Style Manual - April 87, or incomplete).
- F. Facts are erroneous or incorrect as presented in context.

Note: Poor style, C, is the category used for presentation and persuasion criticisms in the Directors' rejection for example:

- Erroneous grammar
- Unimpressive
- Non-executive thinking
- Weak or lost main points
- Inconclusive evidence used
- Lack of conclusion or recommendation
- Rambling logic or words
- Overwhelming narrative
- Apologetic tone
- Contradictory.

Study Plan

Unit of Analysis: Types of Rejections

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
1. Which type of rejection accounts for the greatest number of rejected packages?	Determine frequency of reasons cited for each type of rejection.	- Check sheet - Pareto chart	Sample of 210 rejected packages over 1 yr period.	- Correspondence control cover sheets - Directorate working files	"Poor style" and "final format" will be the major reasons for rejection.
Measurement Definitions: Types of rejections as defined in unit of analysis					

Check Sheet for: Type of Rejection

Date of Collection: _____ Name of Researcher: _____

Period Covered By Data: FROM: _____ TO: _____

Sample: 210 Rejected Packages

Measurement: Frequency of Type of Rejection

Type of Rejection	Frequency	Total	Percent- age
A: Agency Direction			
B: Approach			
C: Poor Style			
D: Data			
E: Format			
F: Facts			
TOTAL			

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Process Action Team Workshop

Case Study 2-9

Recycling: Analyzing Data

Scenario: The PAT developed a plan to study the causes of rejections the primary source of delays. After collecting data, you now have data for analysis of causes of rejections in the Development Response process.

Instructions

1. Analyze rejection study data.
2. Refer to the rejection study plan. How would you respond to the study question?
3. What steps would you take next to understand causes of rejections? Develop a list of next study steps.

Activity: Analyze rejection study data.

Objective: Understand causes of rejections.

Materials Needed:

- Rejection study plan (Case Study 2-8 norm data)
- Rejection study data

Output:

- List of next study steps

Check Sheet for: Type of Rejection

Date of Collection: _____ Name of Researcher: _____

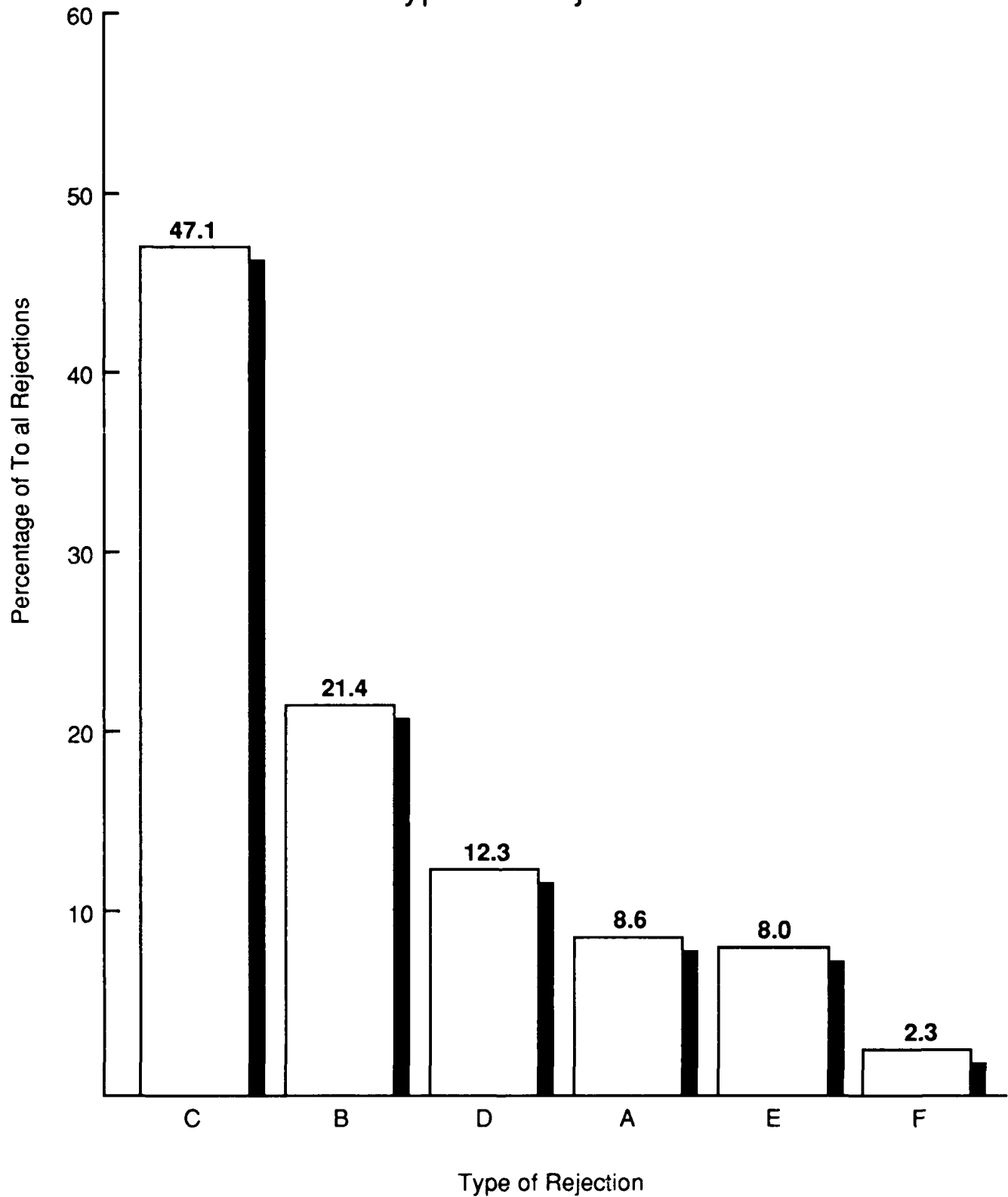
Period Covered By Data: FROM:_____ TO:_____

Sample: 210 Rejected Packages

Measurement: Frequency of Type of Rejection

Type of Rejection	Frequency	Total	Percent-age
A: Agency Direction		18	8.6%
B: Approach		45	21.4%
C: Poor Style	 	99	47.1%
D: Data		26	12.3%
E: Format		17	8.0%
F: Facts		5	2.3%
TOTAL		210	100%

Types of Rejections



A- Agency Decision
B- Approach
C- Poor Style

D- Data
E- Format
F- Facts

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Process Action Team Workshop

Case Study 2-10

Root Cause Analysis

Scenario: You began the learning process by studying delays in the Response Development Process. You then studied causes of delays by investigating cycle time, process step, type of action, type of information request, and directorate. From there, you decided to further investigate the draft development process. You recycled back through the learning process to study types of delays, and determined that "Directorate's rejection" was the cause of most of the delays in draft development process.

After analyzing the different types of rejections, you found that "poor style" was cited most often as the reason for rejection. You wished to understand the caused of "poor style". You conducted a panel to determine why packages are rejected for "poor style". The next step is to conduct a root cause analysis.

Instructions

1. Use a CED to nominate causes of "poor style" in packages which are rejected by Directors. You may use as many CEDs as needed to get root type causes.
2. Generate a list of root causes for delays caused by "Poor Style".
2. Use NGT to select the top four root causes for delays caused by rejections for "poor style".

Activity: Generate list of root causes of the existence of "poor style" in Directorate A's packages.

Objective: Determine the root causes of rejections for "poor style" in the Response Development Process.

Materials • "Poor Style" Panel Results
Needed: • Other data collection results as appropriate

Output: • List of root causes

"Poor Style" Panel

Study Area: Causes of poor style as reason for rejection.

Study Activity: Convene panel of authors and reviewers to discuss why packages are rejected for poor style.

1. Reviewers and authors review sample of documentation rejected for poor style the past three months.
2. Reviewers identify why packages were rejected for poor style.
3. Authors respond to reviewer analysis of packages.

Study Results: The panel results are summarized in tabular form, with the reviewer remarks on the left and the author responses on the right.

Reviewer Remarks (Reasons Rejected for Poor Style)

1. The rationale passage has so many different ideas mixed together that the reader wonders if there is any particular reason that has more weight than any of the others.
2. The logic of this discussion makes no sense. What was it you wanted to support or conclude? Was it a project? A policy? What?
3. The grammar is poor in the passage about the evaluation of demonstration projects.

Author Remarks (Response to Reviewer Remarks)

1. The Directors wanted to ensure that all the bases were covered. The list of ideas is an aggregation of 5 reviewers' inputs.
2. The original logic was: "The Agency has a law enforcement role in certain circumstances. Most agency people know this provision but lack a true appreciation of what guides a true law enforcement official. To prevent embarrassment and injustice, we proposed a series of joint panels and temporary assignments to the Law Enforcement Agencies". The logic was sacrificed in order to mention a law enforcement project currently underway.
3. I was trying to tie the budget request rationale into two other issues that the end-reader already liked. It was an attempt to merge the two concepts into the same sentence so the already-accepted program would be associated with the one we were requesting.

Reviewer Remarks
(Reasons Rejected for Poor Style)

4. The overall effect of the page is dull and pedantic.
5. The passage marshals a ton of data to make an obvious point. Why?
6. The paragraph explaining the Agency's position on foreign investment convinced me that the Japanese market is really penetrable by Western investors. But it was marked "irrelevant." Why?
7. The package does not reflect current Agency trends.

Author Remarks
(Response to Reviewer Remarks)

4. Agreed. It was actually a description pulled out of a technical document that was used because it was the only information we had on that part of the topic. There were no subject matter experts available.
5. The point was one that goes against the Under Secretary's known opinion. It was an attempt to persuade him to reconsider.
6. An agreement exists that federal officials will not publicly attack institutions of a foreign sovereign nation with which we have ties. I felt the opinion was backed sufficiently by commercial commentators for it to be considered a comment on a U.S. public sentiment.
7. We often have to rely on past precedents because we do not have a clear vision of new dynamics and decisions in the Agency.

General Author Remarks:

- Insufficient time to reconcile many inputs from coordination efforts that preceded final integration.
- Wrong person assigned to a topic—usually a junior person, or one with time available (at the moment).
- Expectations of the reviewer were not known until after he reviewed the document.
- Agency-specific format is different from the model provided to the author at time of writing.
- Structure of request was weak. As a result, response is equally unstructured.
- Knowledge about the end reader is not available. The writer is often writing for the immediate boss.
- End reader needs are not evident and are sometimes dismissed by the reviewers during the revision process.

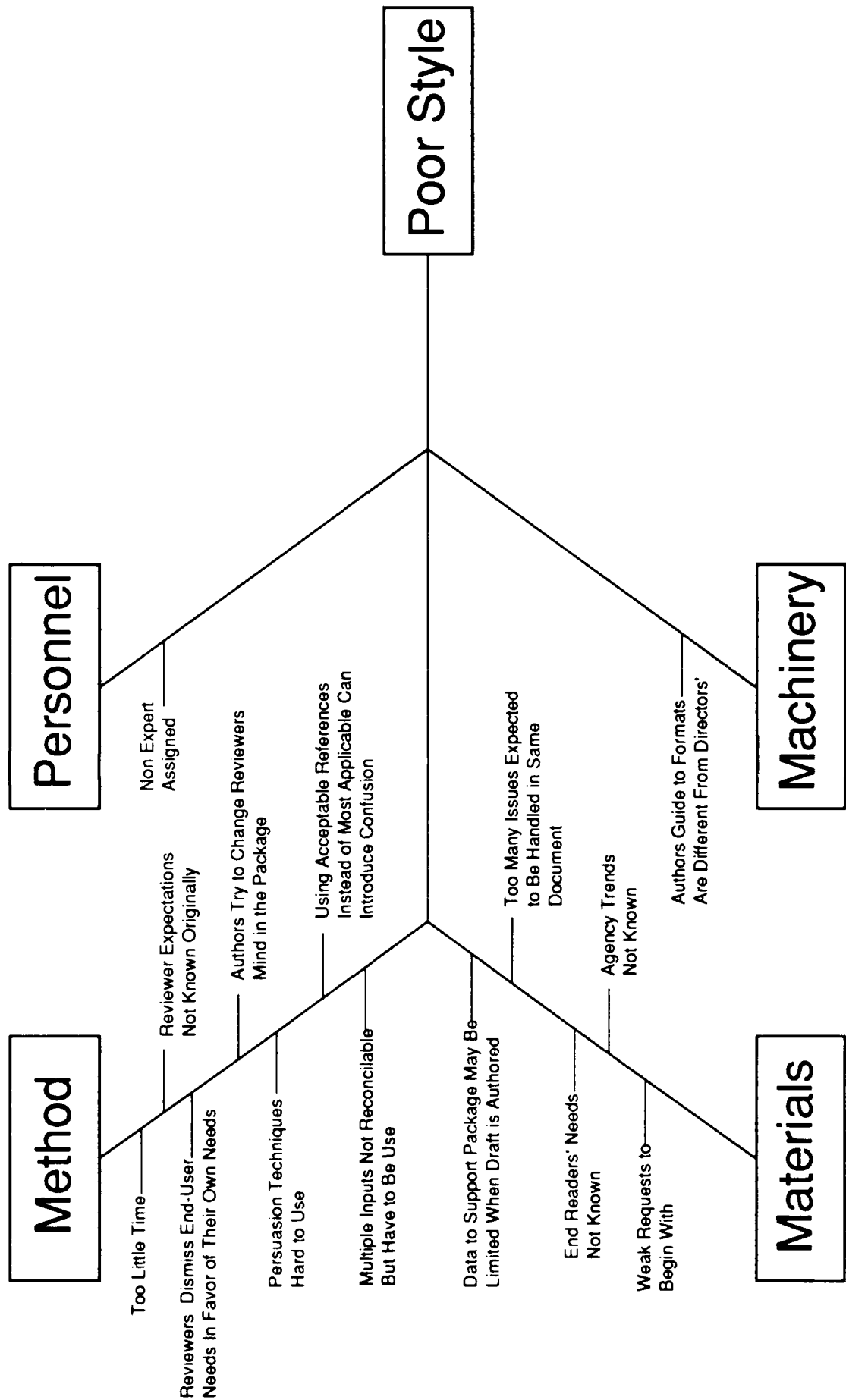
- Difficult strategies of persuasion are employed infrequently, and when they are attempted, they are done poorly.
- Insufficient time to do research or structure work.
- Lack of familiarity with structured writing approaches by some action officers (authors).
- Projects assigned to individuals are sometimes much too complex for single individual with little experience or native strengths for complex, short-fused projects.
- Too few opportunities to anticipate executive reaction or opinion to a novel request.
- Agency formats are not oriented to provide easy-to-use vehicle to develop persuasion, clarity, and writing structure.
- Information needed for pre-analysis of the writing task, its goal, and end reader's purposes is often not readily available, especially if there are matters that need to be researched.
- Time lines and current formats support about 70% of the writing work. The other writing work is different in character and requires special support, which is not readily available.

Case Study 2-10

Root Cause Analysis

NORM
DATA

Cause and Effect Diagram (CED) "Poor Style"



CED: Causes for "Poor Style"

List of Root Causes of
Poor Style

1. Too little time.
2. Reviewers can dismiss or delete critical information that does not favor their own position.
3. Persuasion and presentation techniques are too hard to use when used infrequently -- lack of practice.
4. Too many irreconcilable points added by reviewers to the original package -- too hard to simplify.
5. Review expectations not known originally
6. Authors try to change reviewers' minds rather than reflecting their decisions.
7. Authors not aware of current policy-level decisions until Director rejects draft.

Top Four Root Causes
For Rejections

1. The expectations, perspective, or unique data of the reviewers is often not known until after the draft is written and being critiqued.
2. There is not enough time to get complete research data.
3. The authors do not feel free to simplify documents in which reviewers added perspectives and other hard-to-reconcile data requirements to the original response package.
4. Authors are not fully aware of the current dynamics and decisions occurring in the agency.

TQM

Process Action Team Workshop

Case Study 2-11

Root Cause Audit

Scenario: Before moving on to identifying and selecting solutions, you need to determine where the root causes are impacting the processes. For the purposes of this case study, you will audit the process based on one root cause.

Instructions

1. Select one of the top four root causes to audit.
2. Identify any implications or effects of the root cause on each process step or its product. The analysis should focus on how the root cause would lead to delays in each step. You may find the root cause audit format useful in recording the results of your audit.
3. Select a spokesperson to present your audit to the large group.

Activity: Conduct a root cause audit.

Objective: Determine where the root cause affects the Response Development Process.

Materials Needed:

- Micro flow charts for Response Development and Review and Approval Processes (Case Study 2-6, Norm Data)

- Root cause audit format

Output:

- Root cause audit for selected root cause.

Root Cause Audit Worksheet

Root Cause: _____

Process Step	Implications or Effects of Root Cause On the Step/Product

Remember: Limit your analysis to just the root cause you are examining.

TQM

Process Action Team Workshop

Case Study 3-1

**Develop a
Value-Added Flow Diagram**

Scenario: The PAT has already determined the root cause on which it will focus its efforts. The first step in generating solutions to the root cause is determining which activities in the current process are necessary to produce (customer) required outputs.

Instructions

Collect the materials and background information you will need to determine the process activities that directly support customer requirements (that is, are value-added activities). Develop the value-added flow diagram.

Activity: Analyze the current process flow diagram to begin identifying solutions to root causes.

Objective: Identify the process elements that directly support customer requirements.

Materials Needed:

- Current process flow diagrams (2-1, 2-6)
- Customer requirements list (1-3)

Output: A flow diagram that identifies process activities as value-added or nonvalue-added.

Value-Added Flow Worksheet

Value-Added Steps or Action	Non-Value Added Steps
• A step which is critical to transforming the input to what the customer requires. • A step which the customer would "pay" you to do because it directly affects his/her product.	• A step which only checks, monitors or administratively processes the input. • A step that a customer would consider an "internal" step--not directly producing his/her product.

TQM

Process Action Team Workshop

Case Study 3-2

Envisioning an Optimum Flow Diagram

Scenario: Now that the activities necessary to support customer requirements have been determined, the PAT needs to imagine the process so that it flows optimally (that is, as many nonvalue-added activities are eliminated as possible).

Instructions

1. Collect the materials and background information you will need to design your optimum process flow.
2. Use the Optimal Flow Worksheet to draw an optimal flow and to identify improvement opportunities.

Activity: Analyze the value-added flow diagram and develop an optimum flow diagram.

Objective: Analyze and design the process "as it should work" in the ideal conditions.

Materials Needed:

- Value-added flow diagram (3-1)
- Root cause analysis (2-10)
- Cause effect diagram (2-2, 2-7)
- Root cause audit (2-11)

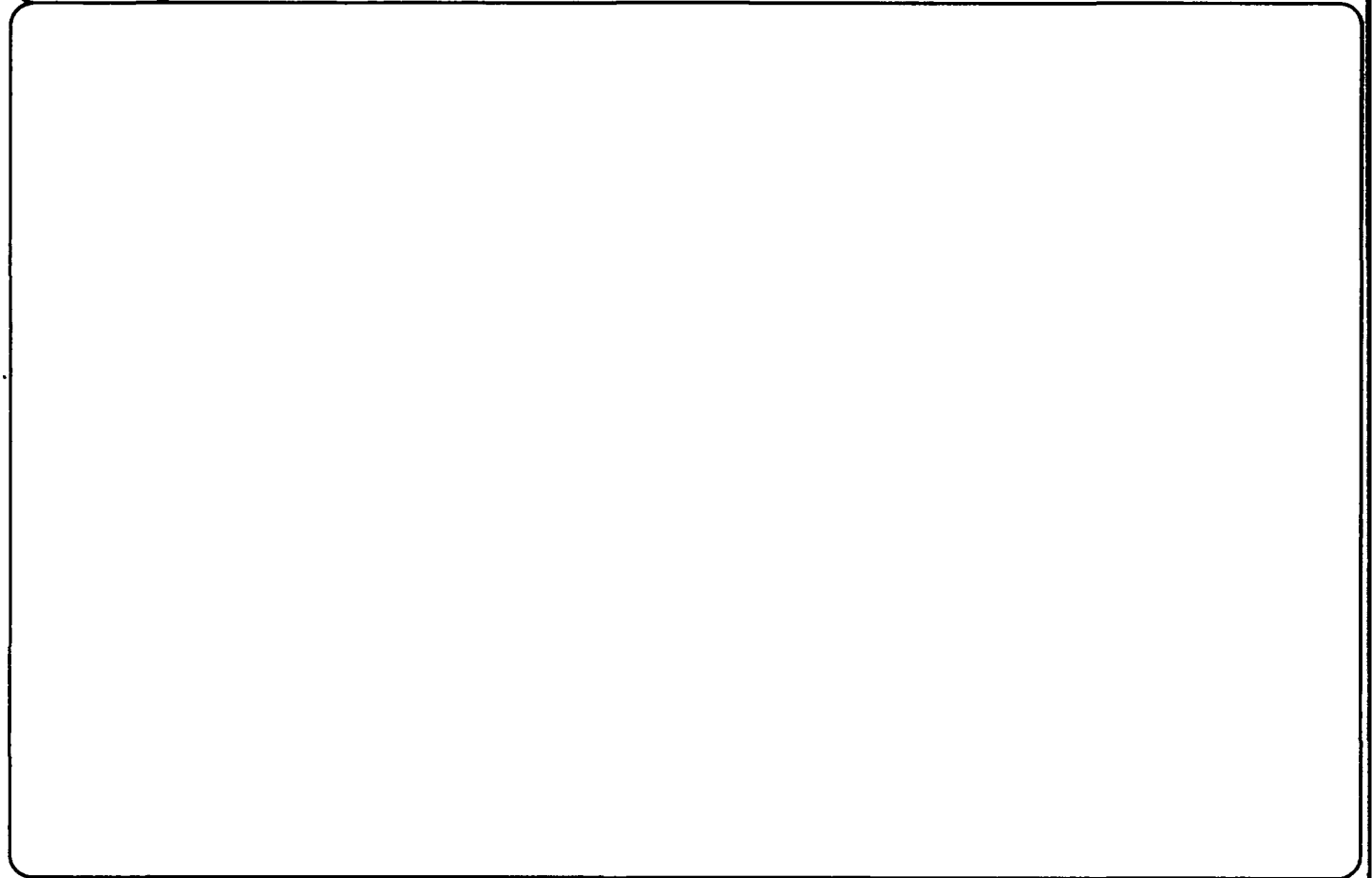
Output: A flow diagram that details the optimum process flow in an ideal set of circumstances.

Optimal Flow Worksheet
(Perfect, Ideal)

DIAGRAM

From Step: _____

To Step: _____



Improvements needed to current process which an optimal flow requires be solved:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

TQM

Process Action Team Workshop

Case Study 3-3

Generate Solutions

Scenario: The PAT has finished developing the optimum process flow and must now identify how the process could be changed to better resemble the optimum flow. The PAT members will generate solutions to the improvement opportunities they identify.

Instructions

1. Identify the process improvement opportunities.
2. Identify the goals implied.
3. Make a list of alternative solutions.

Activity: Once the improvement areas are identified, PAT members must brainstorm to generate alternative solutions for each of the improvement areas.

Objective: Analyze and determine process elements that must be modified to eliminate root causes.

Materials Needed:

- Generate solutions worksheet (summary)
- Current process flow diagram (2-1, 2-6)
- Value-added flow diagram (3-1)
- Optimum flow diagram (3-2)
- Root cause analysis (2-10)
- Cause effect diagram (2-2, 2-7)

Output: A list of improvement opportunities and alternative solutions.

Generating Solutions Worksheet (Summary)

Process Improvement Opportunities (Sources: Root Cause Audit, Option Flow, Value-Added Flow)	Process Goal Implied (What We Are Trying to Achieve If We Work On This Improvement Opportunity)	Alternative Ways (Solutions) to Achieve the Process goal
1.	G ₁	Att. 1.1 1.2
2.	G ₂	Att. 2.1 2.2
3.	G ₃	Att. 3.1 3.2
4.	G ₄	Att. 4.1 4.2

TQM

Process Action Team Workshop

Case Study 3-4

**Identify Goals, Criteria,
and Constraints**

Scenario: The PAT has compared the current process with the optimum process and has identified improvement opportunities.

Instructions

1. For each proposed solution, conduct a brainstorming session to determine the goals of the improvement process. Brainstorm criteria the solution should meet, and constraints that may interfere with the successful implementation of each proposed solution.
2. Record several sets using the provided worksheet format.

Activity: Identify goals of, criteria for, and constraints to the proposed solutions.

Objective: To generate alternative solutions.

Materials Needed: List of improvement opportunities (3-3)

Output: Statement of goals, list of criteria, and list constraints for each proposed solution.

WORKSHEET
GOALS, CRITERIA AND CONSTRAINTS

PROCESS IMPROVEMENT

GOAL

Success
Criterion 1

Success
Criterion 2

Success
Criterion 3

CONSTRAINTS TO MANAGE IN THE SOLUTION

- 1.
- 2.
- 3.

TQM

Process Action Team Workshop

Case Study 3-5

Select Best Solutions

Scenario: The PAT has generated potential solutions and now must decide which solutions would be the best solutions to implement.

Instructions

Use group process tools to identify the solutions that would meet the goals and criteria of solutions, eliminate root causes, meet or improve the quality of service or product that the customer requires.

Activity: Use process tools such as multivoting to choose the solutions that will be implemented.

Objective: Analyze information to choose the best solutions.

Materials Needed: Statement of goals, criteria, and constraints for each proposed solution (3-4)

Output: A list of solutions that will be implemented.

TQM

Process Action Team Workshop

Case Study 4-1

**Making an ESC/QMB Presentation
of the Findings and Test Plan**

Scenario: You have generated alternatives and chosen a recommended solution. You are now ready to design a Change Plan that focuses on how you will test the proposed solution. After designing the **Test Plan**, you will present your recommendations to the ESC/QMB to gain approval to proceed with the test.

Instructions

1. Write a Test Plan using the accompanying guide. You may want to use the planning grid to assist in recording information.
2. After the Test Plan is completed, develop a 20 minute team presentation. Remember each team member must participate in the team presentation. Visualize as much of your learning process as possible with graphics and aids.
3. After the Test Plan and team presentation are developed, each team will take turns giving their presentation while the other teams observe. In this observation role, each team will be responsible for:
 - Asking questions of the team presenting
 - Critiquing presentation content using critique sheet provided
 - Providing feedback to presentation team
4. When giving your presentation, each team will be responsible for:
 - Responding to questions from the audience
 - Listening and processing feedback from the audience
 - Critiquing their own presentation
 - What went well?
 - What didn't go well?
 - What would you change if you could do it over?

Objective: To obtain approval to test the proposed solution.

Activity: To write a Test Plan
To develop a team presentation
To practice giving team presentation
To critique presentation content
To provide feedback to other PATs

Materials Needed:

- Blank vu-graphs
- Vu-graph pens
- Planning grid
- Critique sheet
- Case Study 2-10

Output:

- 20 minute ESC/QMB presentation

TEST PLAN GUIDE

Answer all of the following questions as they relate to the case study. The answers to these questions will be the basis for developing your team presentation.

1. Write a statement that precisely identifies what change is to be made.
2. Describe how you know the planned change is appropriate and identify the other alternatives that have been explored.
3. Describe who the change will affect and who will need to change the way they do their jobs. Decide how these individuals will be trained and who is qualified to train them? Consider how the effects of the training will be checked.

4. Identify the sequence of major steps and sub-steps needed for the change.

- 4

THE TEST:

8. Decide how to measure performance during the test period. Identify the key points to monitor to determine if the change is proceeding as expected. How will you collect and review this information?
9. What are some things you need to take into consideration when evaluating various test sites? Where will you test your proposed solution?

BARRIERS AND AIDS:

10. What can be done to increase the likelihood of success of your test?

TIPS ON PUTTING TOGETHER THE PRESENTATION

1. Present a logical flow of data displayed through tools and techniques used (pareto charts, fishbone diagrams, control charts...)
2. Show all steps of quality improvement process up to this point.
3. Involve everyone in the presentation (some team members can draw graphics for the vu-graphs)
4. Use graphics, charts, graphs

PRESENTATION CRITIQUE SHEET

1. Was the problem area clearly identified? Visualized?
2. Was the reason for working on the problem area explained?
3. How was the specific problem selected?
4. How was data collected and interpreted? Visualized?
5. Were causes of the problem identified? Visualized?
6. Were root causes identified and verified? Visualized?
7. What alternative solutions to problems were identified? Visualized?
8. Which solution is recommended and why?
9. Where will the solution be tested? Visualized?
10. Was it explained why that particular site was chosen?
11. Would you grant the PAT permission to test the solution?
 - Why?
 - Why not?
12. What did the presentation team do well?
13. What did the presentation not do well?
14. What is one thing the presentation team could do better next time?



**PLAN OF INSTRUCTION
FOR
TOTAL QUALITY MANAGEMENT
(TQM)**

Process Action Team

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Prepared By:
Booz • Allen & Hamilton Inc.
Human Resources Management Practice
4330 East West Highway
Bethesda, Maryland 20814

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Preface

The Total Quality Management (TQM) Process Action Team Workshop consists of six (6) modules of training. The modules are designed to be delivered in forty (40) hours of instruction and encompass five (5) complete training days.

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Table of Contents

<u>Topic</u>	<u>Page Number</u>
<u>Course Design</u>	
Purpose	3
Course Objectives	4
<u>Course Management</u>	
Instructor Qualifications	7
Target Audience	7
Course Materials	7
Course Instructional Methods	8

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

COURSE DESIGN

Purpose

The purpose of this workshop is to provide process action team training for designated Department of Defense civilian and military personnel. The course provides participants with the skills necessary for successful improvement opportunity implementation and details the specific activities the process action team member performs to ensure a successful effort in solving a process problem. The course specializes in knowledge-worker process improvement skills.

Each of the modules in this course addresses a major aspect regarding the implementation of TQM via the Process Action Team. Module One contains a brief review of major TQM concepts and principles as detailed in the TQM Awareness Seminar. Module Two provides participants with an understanding of the Booz, Allen Process Improvement Model which will be used to guide the participants through problem solving. Participants will also be introduced to the case study, its structure and how it will be used throughout the course. Finally, an overview of several leadership roles and the team's administrative activities is provided.

Module Three provides participants with the requisite knowledge and practical methods to review and comment on a PAT charter, develop a Customer Dialogue Plan and identify customer-based quality standards. Module Four describes the four steps in Learning the Process, the third phase, of the process improvement model. Module Five focuses on the major steps in the generating and selecting solutions and how to apply the concepts in a practical process improvement experience. Module Six describes Phase IV, Planning and Executing Solutions, in the process improvement model.

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Course Objectives

Upon completion of the course, participants will be able to:

1. Describe the start-up procedures, responsibilities and member roles.
2. Apply the Process Improvement Model in PAT assignments.
3. Conduct activities to understand the scope and requirements for quality improvement.
4. Study the process using TQM tools and techniques
5. Generate and select solutions through the use of methodologies and decision techniques.
6. Design and execute a plan for pilot and organization-wide implementation.

Module Sub-Objectives

Upon completion of each module, participants will be able to:

Module I

1. Identify and explain key TQM concepts and principles.
2. Summarize how the TQM infrastructure and its components (particularly PATs) fit into an organization.
3. Describe key functions of an ESC, QMB and PAT.

Module II

1. Identify and explain the Booz, Allen Process Improvement Model.
2. Summarize how the case study is structured and how it will be used in this course.
3. Distinguish between a PAT and a committee
4. Describe the roles of individual team members and basic administrative procedures.

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Module III

1. Describe the characteristics of a well-written PAT charter
2. Develop a Customer Dialogue Plan to identify and collect information on customer requirements.
3. Analyze customer data to establish customer requirements and the criteria/standards used by the customer to define quality.

Module IV

1. Describe the four steps in the learning phase of the process improvement model.
2. Document a process, using flow charting techniques.
3. Nominate potential causes, using cause and effect diagramming.
4. Develop a plan to study causes.
5. Analyze data to discriminate symptoms from root causes.
6. Conduct a root cause analysis.

Module V

1. Analyze a process as it is currently working; differentiate between value-added and nonvalue-added steps.
2. Develop a value-added flow diagram.
3. Develop an optimum process flow diagram, incorporating root cause audit data and customer requirements, to identify improvement areas.
4. Determine goals and criteria that the solutions must meet and identify constraints to implementing solutions.
5. Select the best solutions to implement from identified improvement areas.

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Module VI

1. Prepare a test plan.
2. Test the recommended solution.
3. Make standardization recommendations organization-wide
4. Prepare briefings for ESC/QMB.
5. Conduct close-out activities.

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

COURSE MANAGEMENT

Instructor Qualifications

Instructors for this course must have attended the TQM Awareness Course and completed the TQM Presenter's Course.

Target Audiences

The first target audience for the Process Action Team Course is DON civilian and military upper- and mid-level managers (SES, GS, Flag Officers, and senior officers -- 06 through 05) for those who will be commissioning PATs and QMBs. The second target audience is mid-level managers, supervisors, and technical experts who will be working on or closely with process action teams.

The course was designed to recognize the experience and leadership responsibilities of these high-level personnel, and to challenge their notions of effective management methods and the nature of systematic problems, quality and process improvement.

Course Materials

Instructor Materials

- Plan of Instruction
- TQM Process Action Team Course student manual (SM)
- Vu-graph set
- Case Study Exercise Handouts
- Overhead projector
- Participant evaluation forms
- Participant name tags and table name plates
- Markers and tape
- Index cards

Participant Materials

- TQM Process Action Team Course student manual (SM)
- Case Study Exercise Handouts

TQM PROCESS ACTION TEAM

PLAN OF INSTRUCTION

Course Instructional Methods

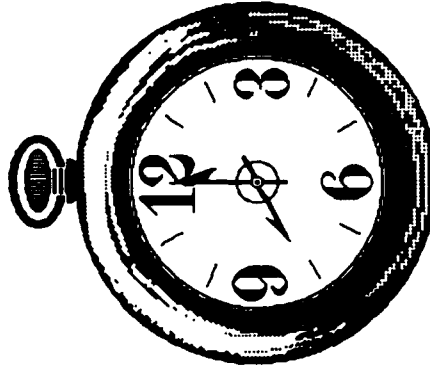
The instructional methodology for all six course modules will be a combination of lecture, guided group discussion, participant exercises, and case studies.

Participants will be encouraged to take notes in their TQM Process Action Team Course student manuals. The student manual provides a reduced copy of approximately 95% of the vu-graphs used in the Process Action Team Course and text related to the information in the vu-graphs.

TABLE OF CONTENTS

Module 1	TQM Review	1-1
Module 2	Process Improvement Model	2-1
Module 3	Understanding Quality Improvement Requirements	3-1
Module 4	Learning the Process	4-1
Module 5	Generating and Selecting Solutions	5-1

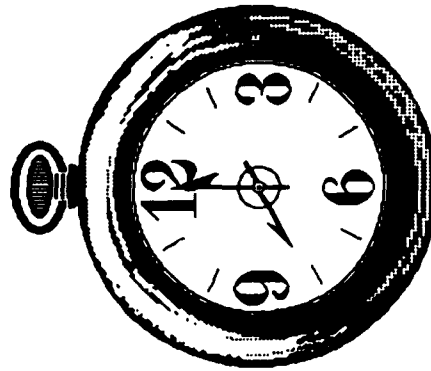
AGENDA



DAY ONE

8:30	INTRODUCTION AND LOGISTICS
8:45	MODULE 1: TQM REVIEW
9:30	MODULE 1: PROCESS IMPROVEMENT MODEL
10:15	BREAK
10:30	MODULE 3: UNDERSTANDING QUALITY IMPROVEMENT REQUIREMENTS
12:00	LUNCH
1:00	MODULE 3: CONTINUED
2:15	BREAK
2:30	MODULE 3: CONTINUED
3:45	FIRST DAY SUMMARY AND EVALUATION

AGENDA



DAY TWO

8:30 MODULE 4: LEARNING THE PROCESS

9:30 BREAK

9:40 MODULE 4: CONTINUED

10:45 BREAK

11:00 MODULE 4: CONTINUED

12:00 LUNCH

1:00 MODULE 4: CONTINUED

2:00 BREAK

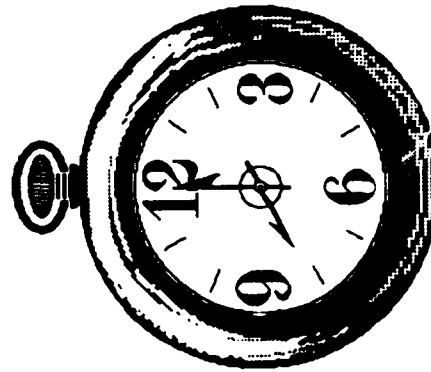
2:10 MODULE 4: CONTINUED

3:00 BREAK

3:10 MODULE 4: CONTINUED

3:45 SECOND DAY SUMMARY AND EVALUATION

AGENDA



DAY THREE

8:30 MODULE 4: CONTINUED

9:30 BREAK

9:40 MODULE 4: CONTINUED

10:45 BREAK

11:00 MODULE 4: CONTINUED

12:00 LUNCH

1:00 MODULE 4: CONTINUED

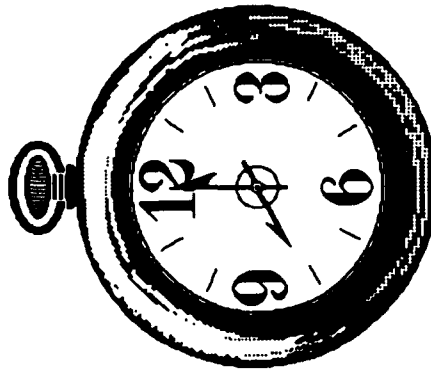
2:00 BREAK

2:10 MODULE 4: CONTINUED

3:00 BREAK

3:10 MODULE 4: CONTINUED

3:45 THIRD DAY SUMMARY AND EVALUATION



DAY FOUR

8:30 MODULE 5: GENERATING AND SELECTING
SOLUTIONS

9:30 BREAK

9:40 MODULE 5: CONTINUED

10:45 BREAK

11:00 MODULE 5: CONTINUED

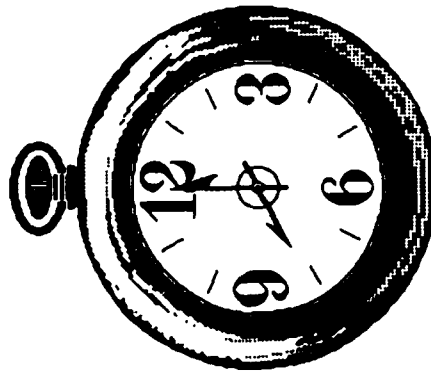
12:00 LUNCH

1:00 MODULE 5: CONTINUED

2:30 BREAK

2:45 MODULE 6: PLANNING AND EXECUTING
SOLUTIONS

3:45 FOURTH DAY SUMMARY AND EVALUATION



DAY FIVE

8:30	MODULE 6: CONTINUED, PREPARE TEST PLAN
9:00	BREAK
9:10	MODULE 6: CONTINUED, PREPARE PRESENTATION
10:00	MODULE 6: CONTINUED, PRESENTATION #1
11:00	BREAK
11:10	MODULE 6: CONTINUED, PRESENTATION #2 LUNCH
12:00	MODULE 6: CONTINUED, PRESENTATION #3
1:00	BREAK
1:50	MODULE 6: CONTINUED, PRESENTATION #4
2:00	MODULE 6: CONTINUED
2:50	COURSE WRAP-UP
3:30	

Notes

Course Objectives

Upon completion of this course, the participant will be able to:

- Apply the Process Improvement Model in PAT assignments
- Conduct activities to understand the scope and requirements for quality improvement
- Study the process using TQM tools and techniques
- Generate and select solutions through the use of methodologies and decision techniques
- Design and execute a plan for pilot and organization-wide implementation.

Course Summary

Now that you have completed this course, you should be able to:

- Apply the Process Improvement Model in PAT assignments
- Conduct activities to understand the scope and requirements for quality improvement
- Study the process using TQM tools and techniques
- Generate and select solutions through the use of methodologies and decision techniques
- Design and execute a plan for pilot and organization-wide implementation.

What will you do when you return to your work site that will incorporate things learned in this course?

MODULE ONE

TQM REVIEW

Module One Objectives

Upon completion of this module, the participant will be able to:

- Identify and explain key TQM concepts and principles.
- Summarize how the TQM infrastructure and its components (particularly PATs) fit into an organization.
- Describe key functions of an ESC, QMB, and PAT.

Key TQM Concepts and Principles

- Principle aspects of the TQM concept
- Common themes of TQM experts
- TQM emphasis on process
- Shewart (Plan, Do, Check, Act) Cycle
- Progression of American management styles

Key TQM Concepts and Principles

Principle Aspects of the TQM Concept

DOD TQM Definition:

Total Quality Management (TQM) is both a **philosophy** and a set of **guiding principles** that represent the foundation of a **continuously improving** organization. TQM is the application of **quantitative methods** and **human resources** to improve the material and services supplied to an organization, and the degree to which the **needs of the customer** are met, now and in the future. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a **disciplined approach** focused on continuous improvement.

Key TQM Concepts and Principles

Common Themes of TQM Experts

- Customer defines quality
- Customer is located internally and externally
- Management creates the quality culture.
- Management provides for system improvements.
- Quality becomes prevention-based
- Statistical thinking is used to study processes
- Team approach to problem-solving
- Continuous improvement
- Education and training are vital.

Key TQM Concepts and Principles

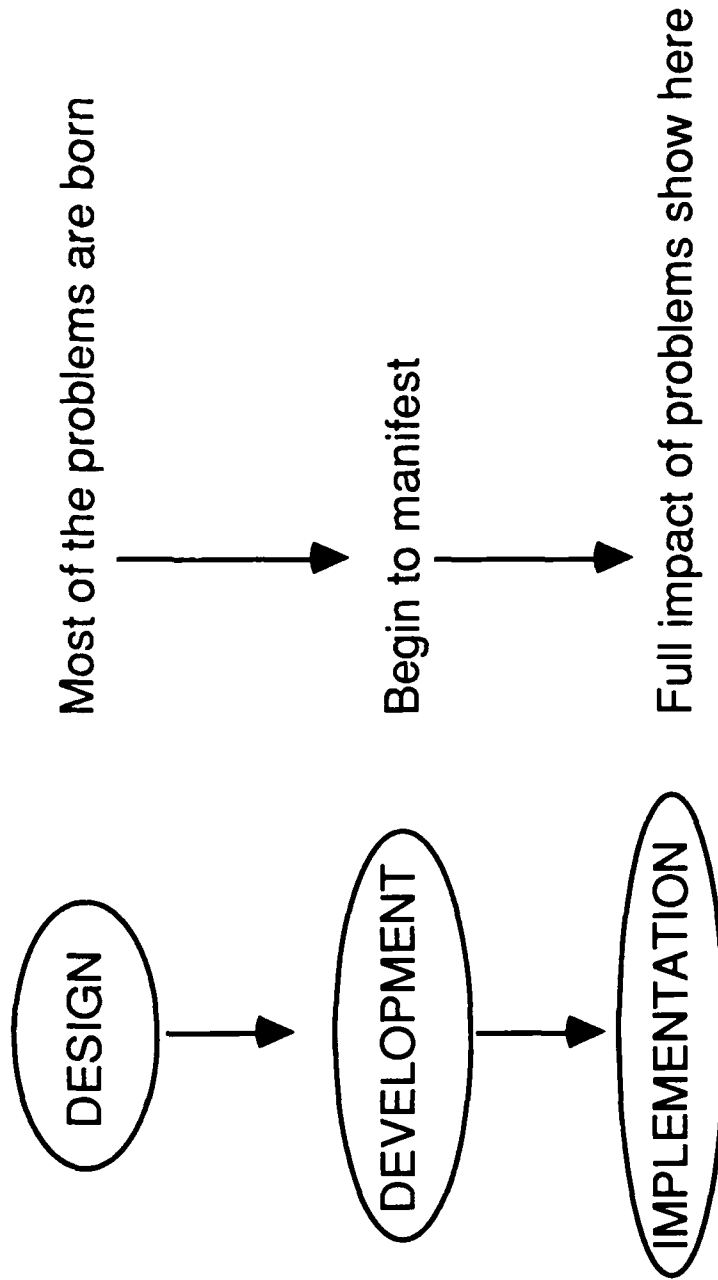
Emphasis on Process

CONTROL

NOT IN CONTROL

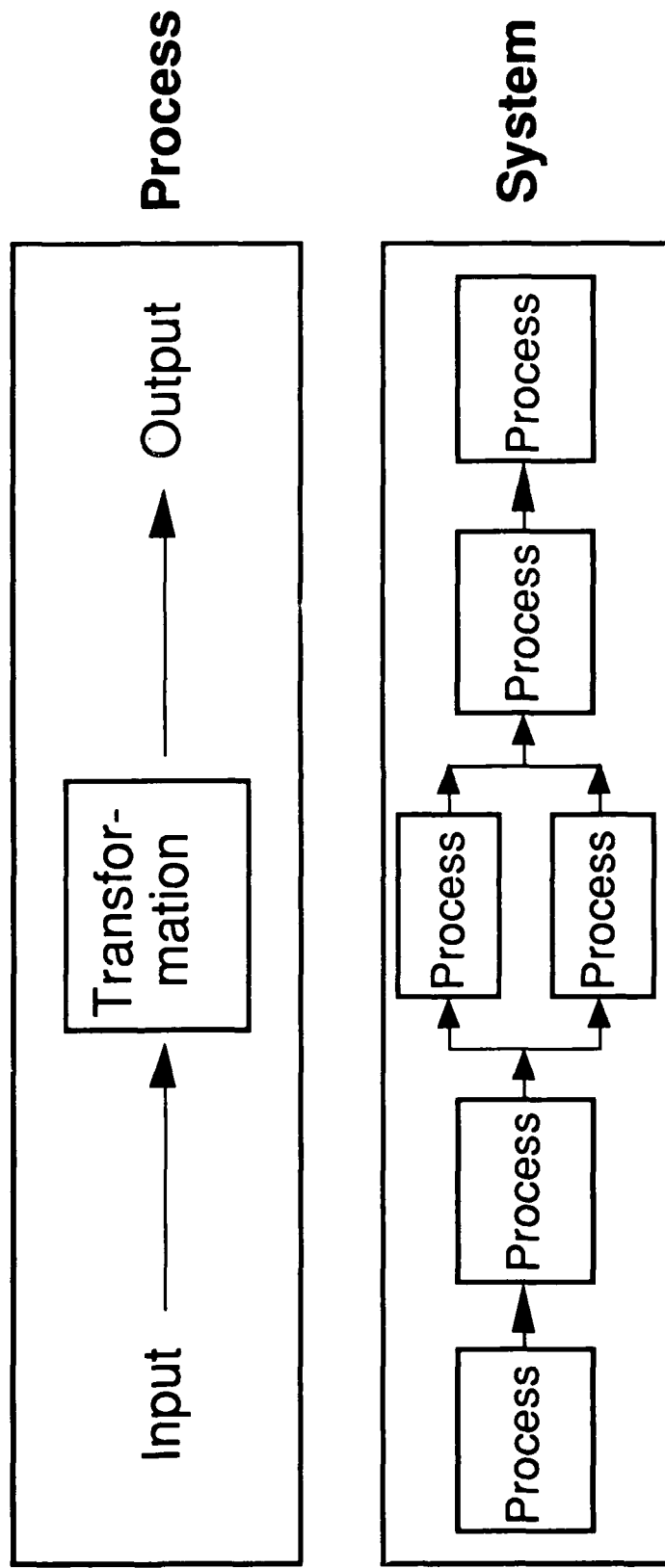
Key TQM Concepts and Principles

Emphasis on Process



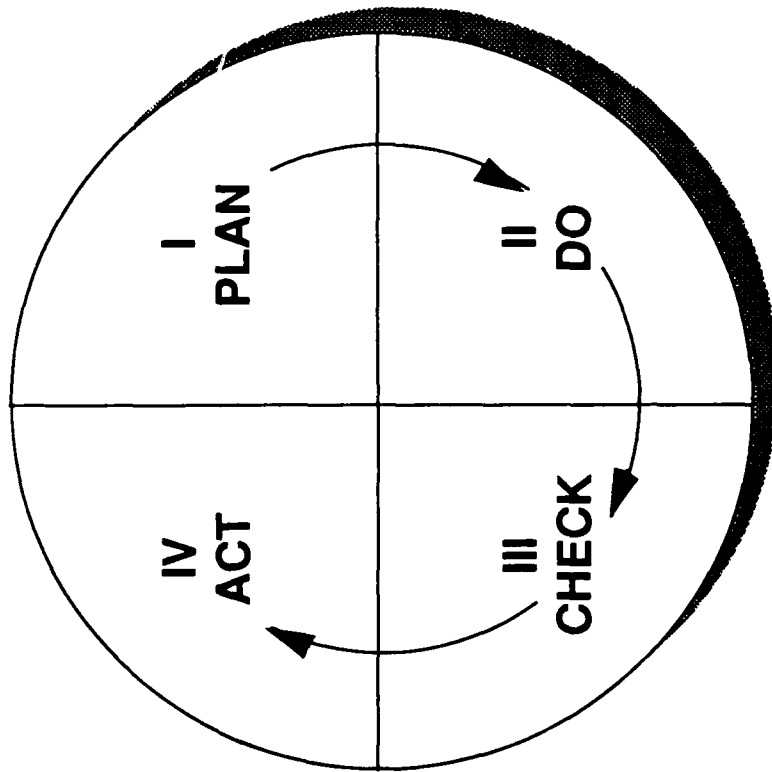
Key TQM Concepts and Principles

Focus on Process improvement



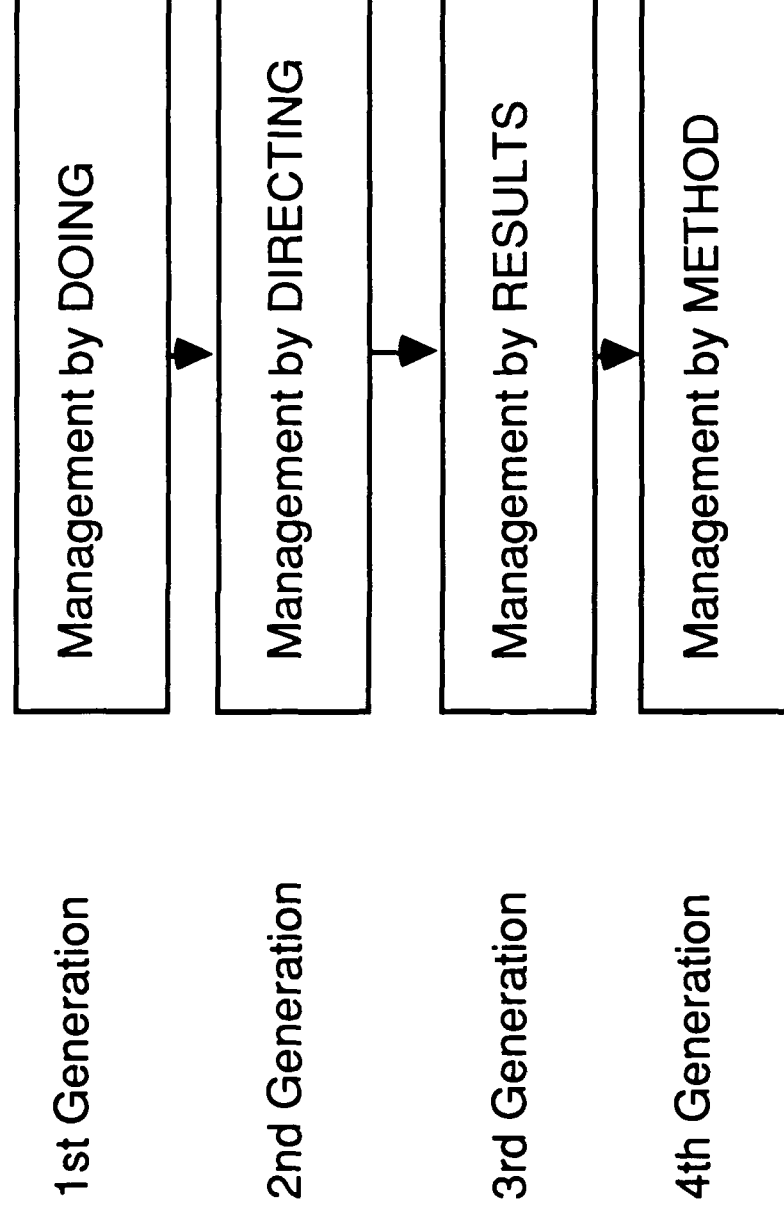
PDCA Cycle

Managing Process Improvement



Key TQM Concepts and Principles

Management's Progression Toward Management by Method



TQM Infrastructure and Organizational Structure

OSD Structure

SEC DEF

UNDER AND ASSISTANT SECRETARY LEVEL

DEPUTY ASSISTANT SECRETARY LEVEL

DIR LEVEL

STAFF LEVEL

TQM Infrastructure

ESC

QMBs

PATs

Workforce

TQM Infrastructure and Organizational Structure

Functions of the Executive Steering Committee (ESC)

- Develop philosophy, constancy of purpose, and guiding principles
- Focus on critical processes that affect customer satisfaction and/or major cost
- Identify an "owner" of each critical process
- Resolve organizational and functional barriers
- Provide resources, training and rewards
- Establish criteria for measuring outputs/customer requirements
- Measure progress vs. goals.

TQM Infrastructure and Organizational Structure

Functions of the Quality Management Board (QMB)

- Identify processes in assigned issue area
- Prioritize processes by improvement potential
- Develop improvement plans, methodology, and metrics to measure progress vs. goals
- Establish Process Action Teams when appropriate
- Provide Process Action Teams with training and resources
- Track and report progress and provide help if necessary
- Help remove barriers.

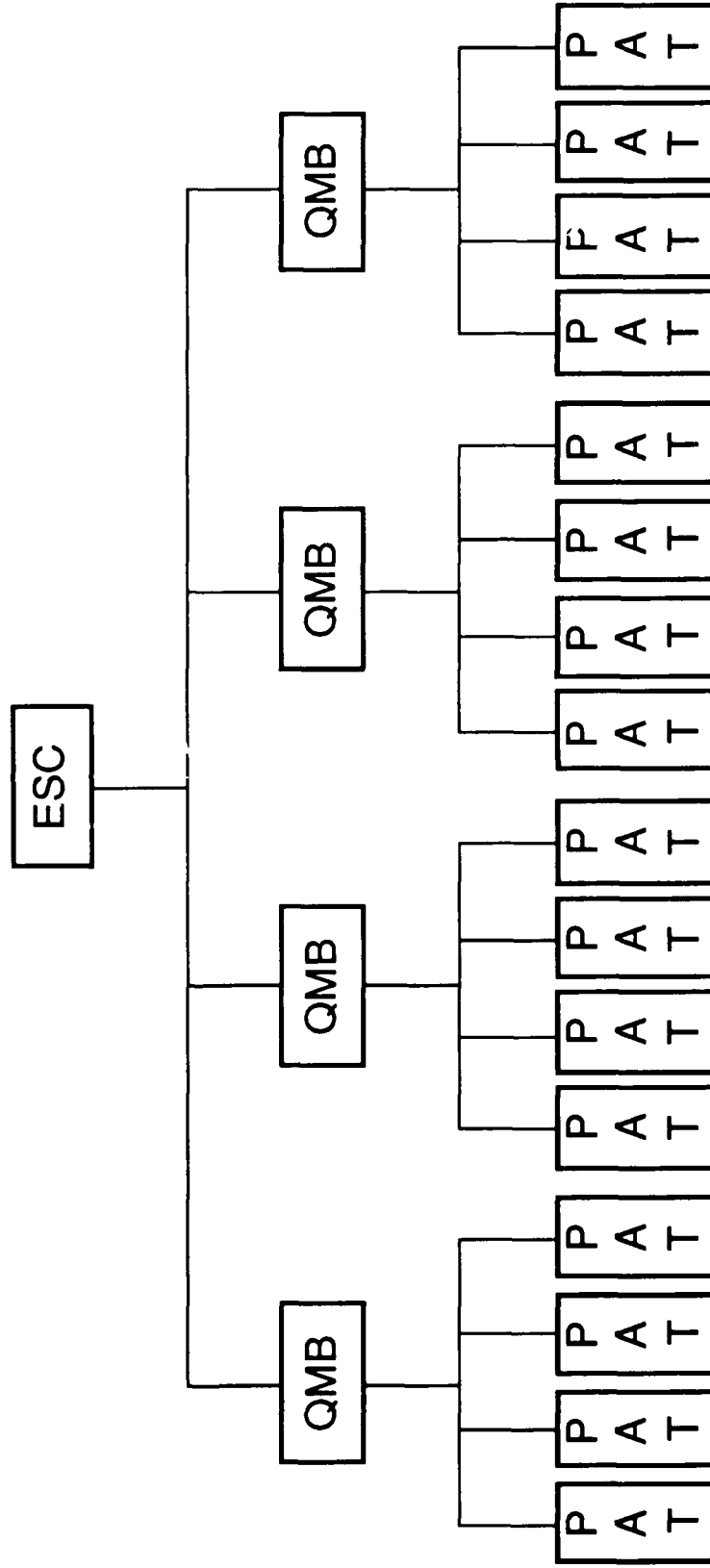
TQM Infrastructure and Organizational Structure

Functions of the Process Action Team (PAT)

- Apply a structured performance improvement methodology to deal with specific process problems
- Identify improvement changes based upon a root cause
- Recommend and pilot test a solution and measurement system for the process improvement
- Collaborate and support the QMB.

TQM Infrastructure and Organizational Structure

Transforming an Organization



Participant Exercise

THAT WAS THEN

THIS IS NOW

- What have you done to improve quality since awareness training?
- Have you seen TQM activity in your work place?

PLANNING SKILLS

Objective 1

Of all management functions, planning is often the least realistically performed. Some people cannot avoid the temptation to leap right into a project. As a result, they are more inclined to engage in crisis management, meaning they "roll with the punches" and focus only on today's problems instead of spending time on good up-front planning. Yet, establishing a predetermined course of action reduces time wasted on "firefighting" and increases the chances of success.

Eight effective planning skills:

1. & 2. Processing Information and Communicating

3. & 4. Negotiating for Resources and Securing Commitments

5. Planning Modules

6. Setting Reasonable Milestones

7. Revising Plans

8. Integrating budget components

MODULE TWO

**PROCESS IMPROVEMENT
MODEL**

Module Two Objectives

Upon completion of this module, the participant will be able to:

- Identify and explain the Booz, Allen Process Improvement Model
- Summarize how the case study is structured and how it will be used in this course.
- Distinguish between a PAT and a committee.
- Describe the roles of individual team members and basic administrative procedures.

Process Improvement Model

Understanding Quality Improvement Requirements

- Clarify PAT charter
- Develop customer dialogue plan
- Define customer requirements

Learning the Process

- Document the process
- Nominate potential causes
- Study causes
- Conduct root cause analysis

Generating and Selecting Solutions

- Identify improvement areas
- Generate solutions
- Choose best overall solution

Planning and Executing Solutions

- Plan the test solution
- Brief QMB/ESC
- Test solutions
- Analyze results
- Make standardization recommendations
- Brief QMB/ESC
- Close-out activities

Case Study Introduction

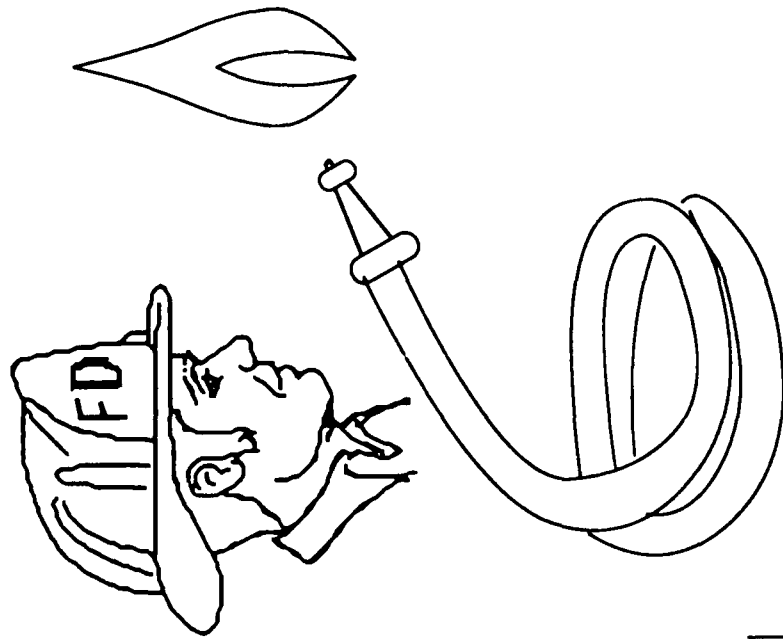
For the duration of this class you will be asked to imagine you are a member of a PAT. A case study will be used to simulate the activities that usually occur within the lifespan of the PAT. As you work your way through the case study, you will experience, to some degree, what an actual team goes through in solving a process problem.

Warm-Up Exercise*Exercise*

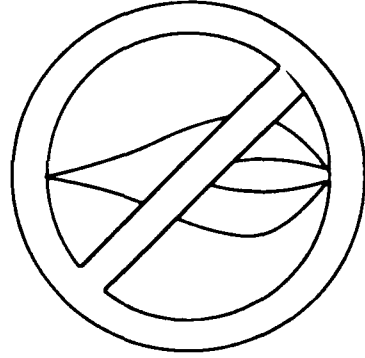
Objective: To learn organizational approaches to problem solving.

Purpose: To describe how your organization identifies and solves problems.

Differences Between a PAT and a Committee



Committee



PAT

MODULE THREE

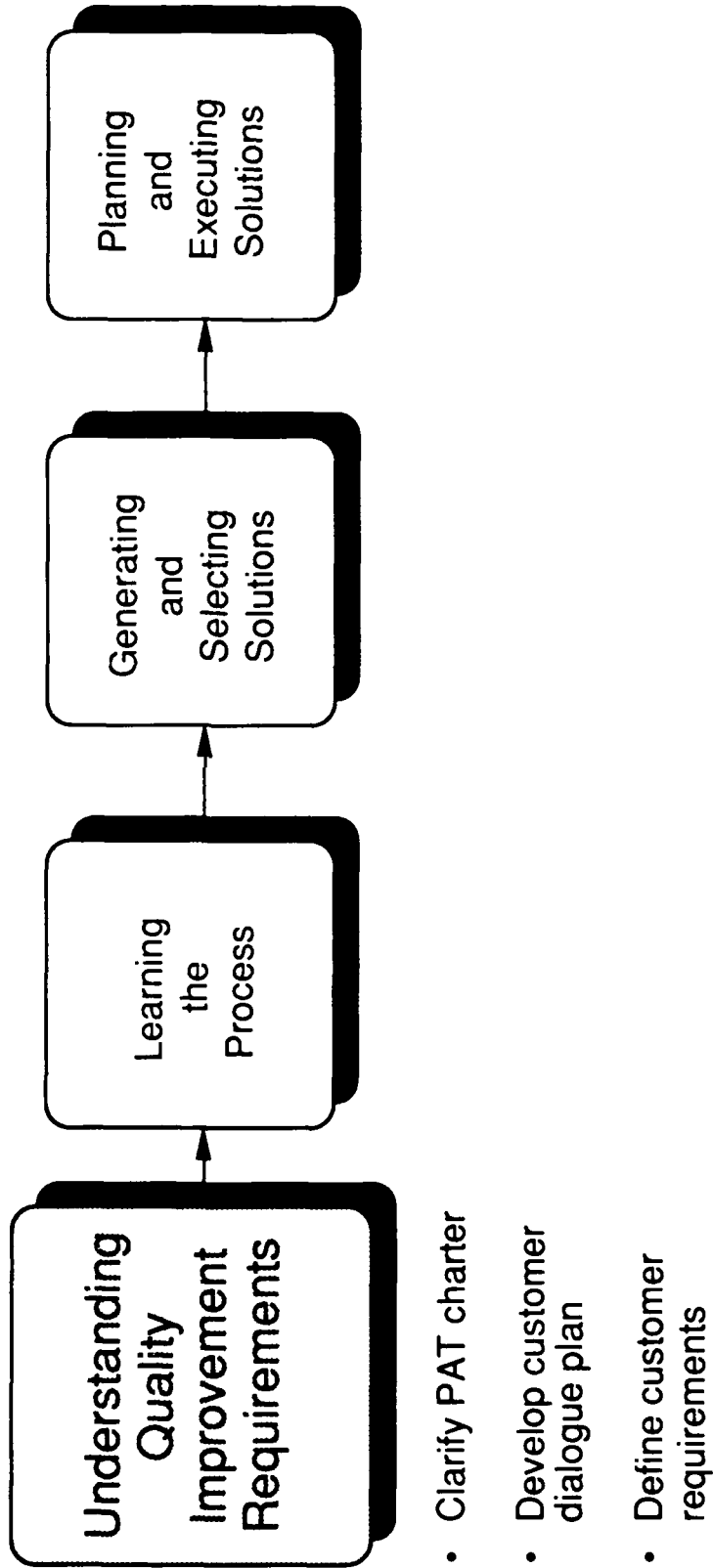
UNDERSTANDING QUALITY IMPROVEMENT REQUIREMENTS

Module Three Objectives

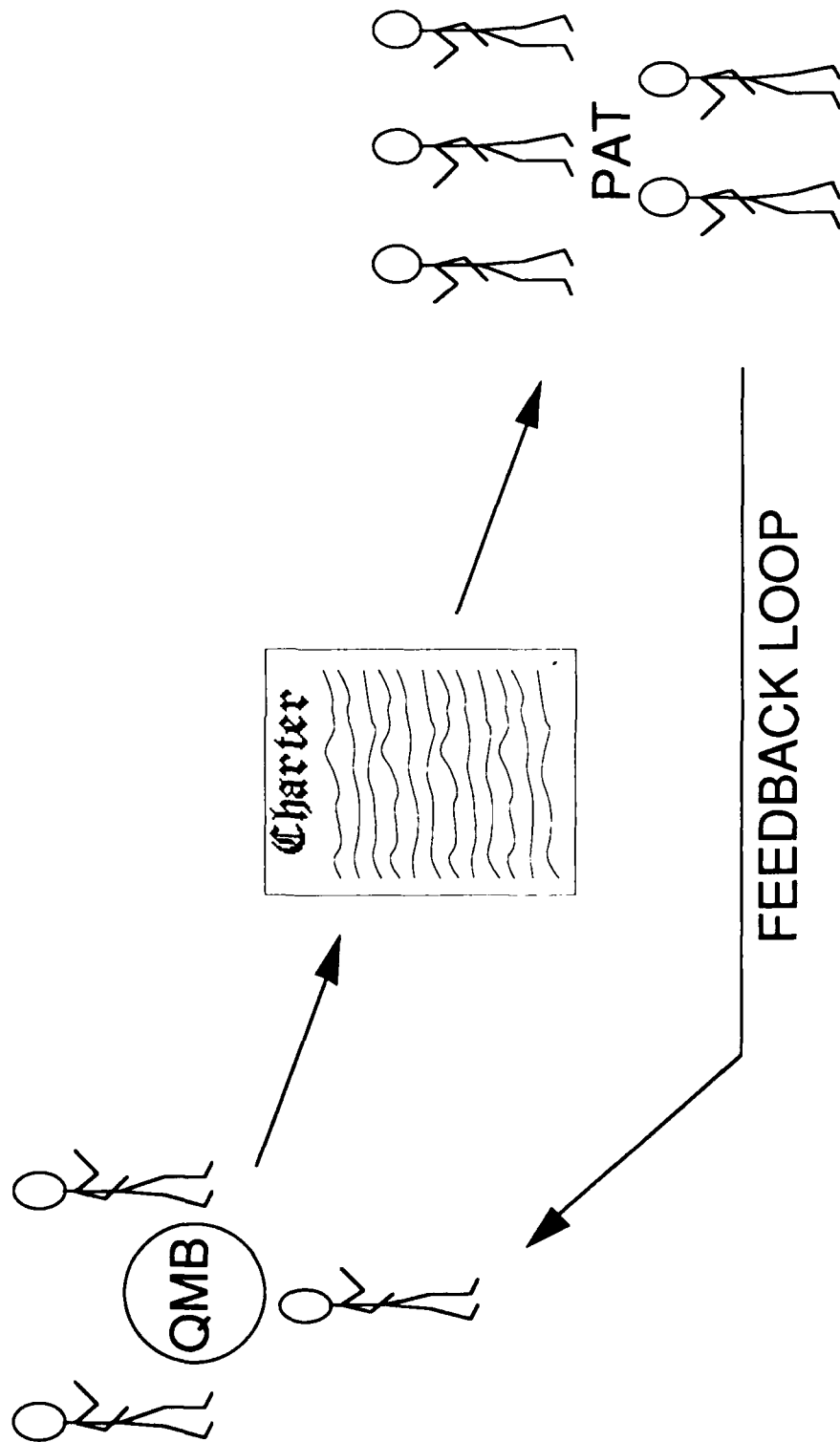
Upon completion of this module, the participant will be able to:

- Describe the characteristics of a well-written PAT Charter
- Develop a Customer Dialogue Plan to identify and collect information on customer requirements
- Analyze customer data to establish customer requirements and the criteria/standards used by the customer to define quality.

Booz, Allen Process Improvement Model



Clarify PAT Charter



Clarify PAT Charter

The Charter document should include the following ELEMENTS:

1. Strategic goal
2. Problem statement
3. Customer requirements
4. Specific process description
5. Project goals
6. Success factors.

Clarify PAT Charter

ELEMENT DETAILS:

1. Strategic goal
 - Vision
 - Contribution to organization's TQM mission
2. Problem statement
 - Specific problem
 - Delineates boundaries
 - Differentiates between system and process
 - Defines interrelationships

Clarify PAT Charter

ELEMENT DETAILS:

3. Customer requirements
 - Operational definitions
 - Measures of merit
4. Specific process description
 - Define functional start and end
 - Define levels of responsibility

Clarify PAT Charter

ELEMENT DETAILS:

5. Project goals
 - QMB expectations
6. Success factors
 - ESC/QMB expectations
 - Customer expectations

Case Study 1-1

Clarify PAT Charter

Develop Customer Dialogue Plan

Quality is defined by customer needs

- Converse with the customer to learn what they need
- Structure data collection effort with a Dialogue Plan

Develop Customer Dialogue Plan

"Needs" information should be collected in the following categories:

- Customer satisfaction
- Customer values
- Customer perceptions of strengths and weaknesses of process.

Develop Customer Dialogue Plan

The Customer Dialogue Plan should include the following components:

- I **Target Sources (Who)**
Identify customers in key areas, junctures, and specific job types
- II **Interview Protocol (What)**
Design questions to gather meaningful data and information expressed in terms ready for analysis.
- III **Technique (How)**
Choose the most appropriate method for collecting data
- IV **Results**
Develop ways to quantify and analyze data to assist in translating the data collection results into Quality Criteria.

Develop Customer Dialogue Plan

1. Target Sources

Choose personnel who form a "snapshot" of the customer requirements:

- Key functions
- Key junctures
- Various levels of responsibilities
- Internal and external

Develop Customer Dialogue Plan

II. Interview Protocol

Structure is important in all phases of the interview design. The same questions or topic areas should be addressed to each applicant. Standardization will help the PAT in the analysis of the data.

- Focus on three categories:
 - Customer satisfaction
 - Customer values
 - Customer perceptions of strengths and weaknesses of process
- Design questions to differentiate between perceptions and reality
- Train interviewers
- Pilot interview protocol.

Develop Customer Dialogue Plan

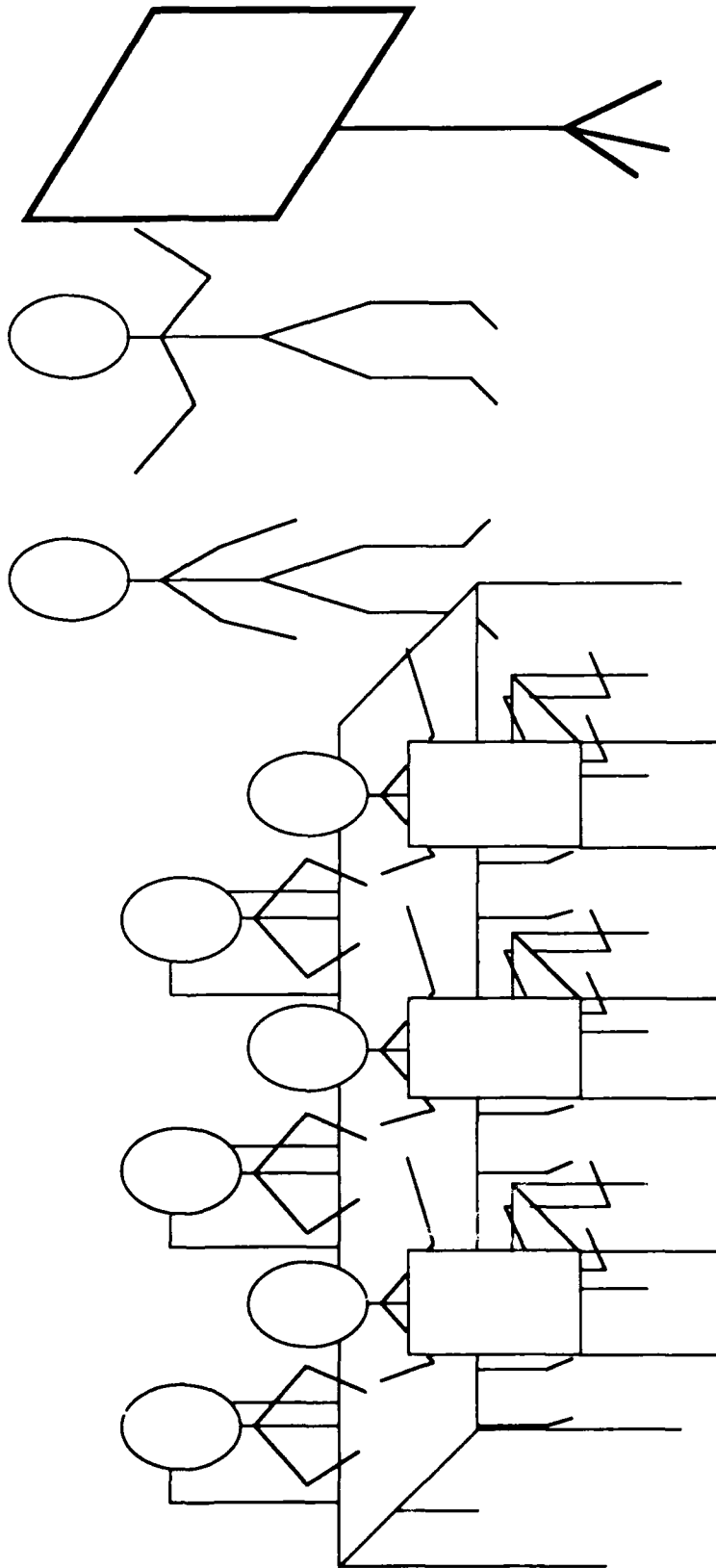
III. Techniques

There are three recommended methods to obtain the customer's needs. Interviewing techniques include:

- Focus groups
- Personal (one-to-one) interviewing
- Surveying.

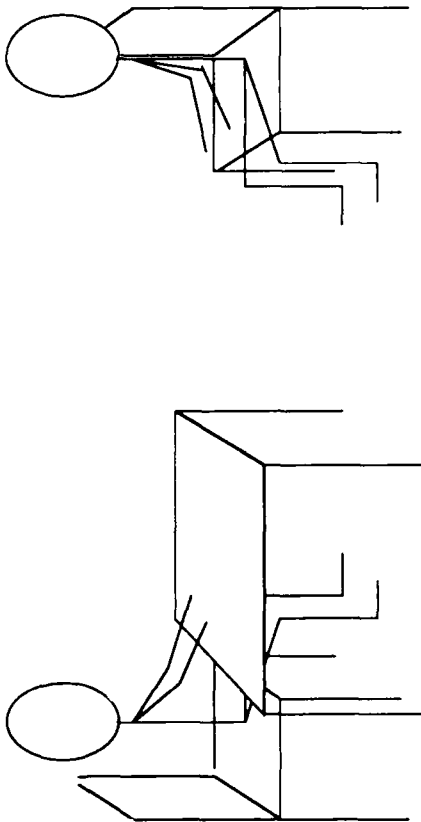
Develop Customer Dialogue Plan

III. Techniques: Focus Groups



Develop Customer Dialogue Plan

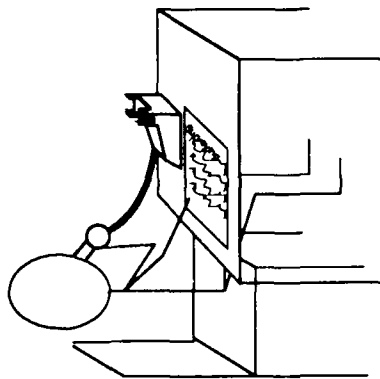
III. Techniques: *Personal (one-to-one) Interviewing*



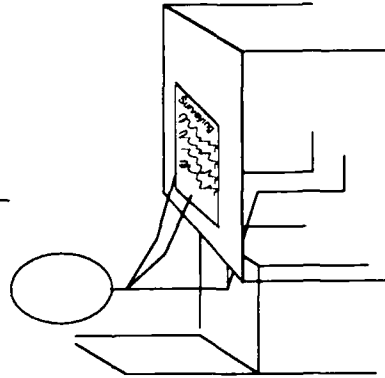
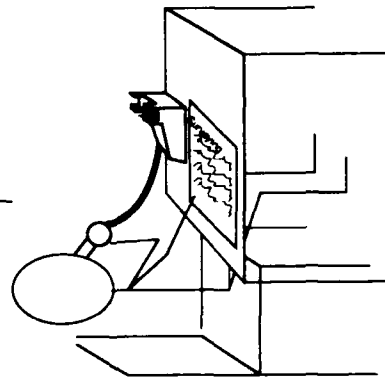
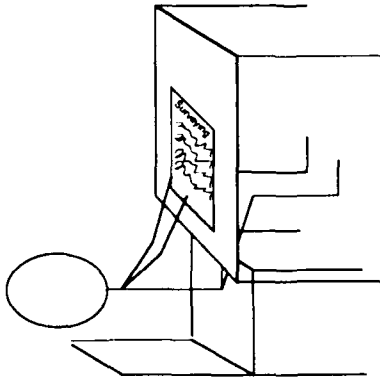
Develop Customer Dialogue Plan

III. Techniques: *Surveying*

Telephone surveys



Written Surveys



Develop Customer Dialogue Plan

IV. Results

- Conduct content analysis of interview data
 - Develop answers to your questions
 - Identify trends or patterns
 - Discriminate between facts and attitudes
- Combine interview data with QMB data collection findings
- Establish list of Quality Criteria or attributes for defining customer requirements.

Case Study 1-2

Develop Customer Dialogue Plan

Define Customer Requirements

The list of Quality Criteria generated through analysis of collected data will enable the team to define customer requirements to support the system and meet the QMB's goals. Two types of measures are operational definitions and measures of merit:

- OPERATIONAL DEFINITIONS -- a description of a Quality Criteria (attribute) in terms of what is considered acceptable by the customer (MEASURE OF MERIT).

Define Customer Requirements

Operational Definitions

Establish a link between the Quality Criteria (necessary attributes in producing a quality product) and a satisfaction level (quantifiable measurement) that meets customer requirements.

- Convert the Quality Criteria into an operational definition statement with a measure of merit or standard.

Quality Criteria

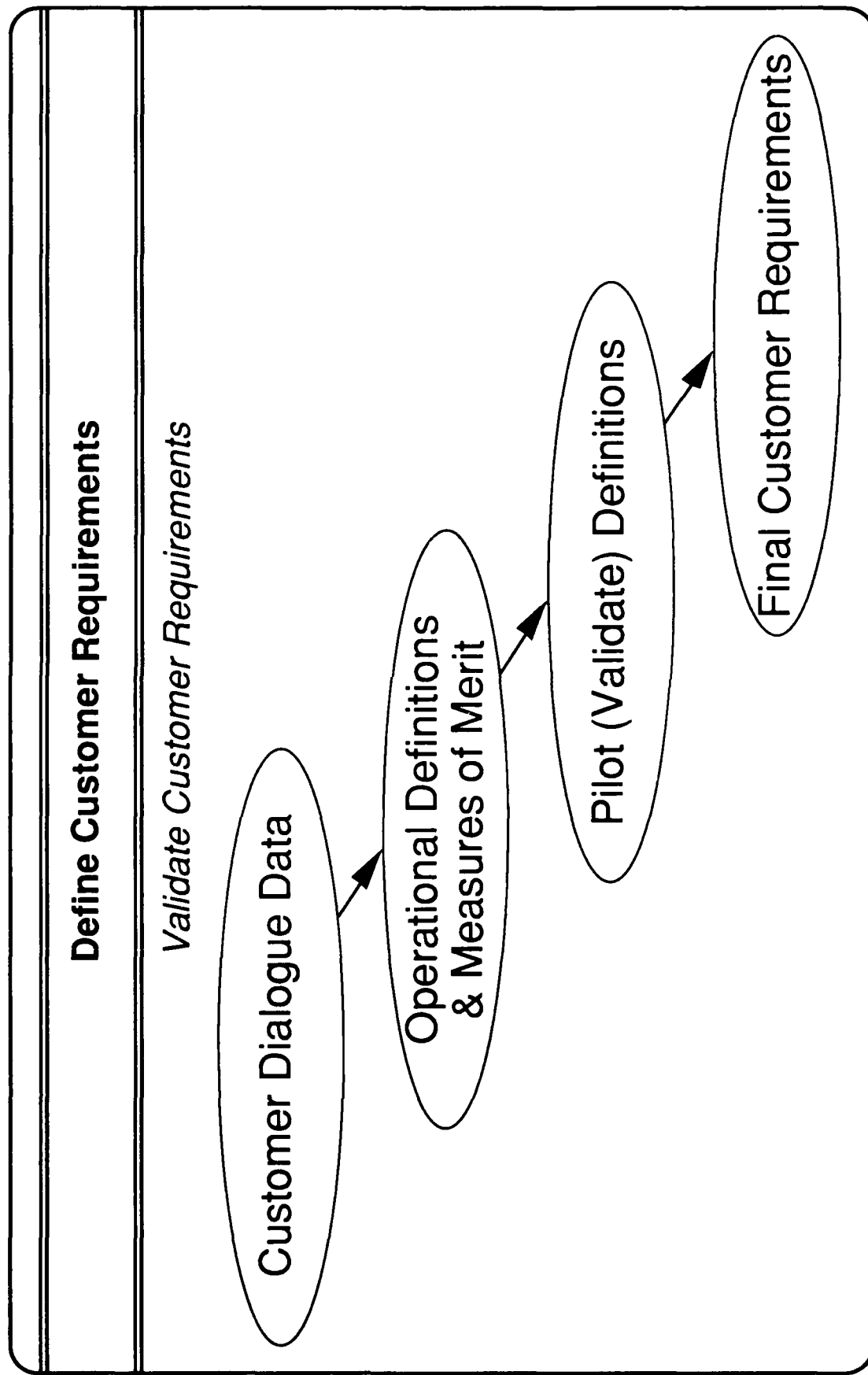
Deliverable should not be late

Operational Definition

Deliverable should not be received 1 (one) day after the deadline

Case Study 1-3

Define Customer Requirements



WORKSHEET : PLANNING COMPONENTS

Objective 3

INSERT CASE STUDY HERE

NEED

Definition: _____

DoL Project: _____

OBJECTIVE

Definition: _____

DoL Project: _____

BUDGET

Definition: _____

DoL Project: _____

STRATEGY

Definition: _____

MODULE FOUR

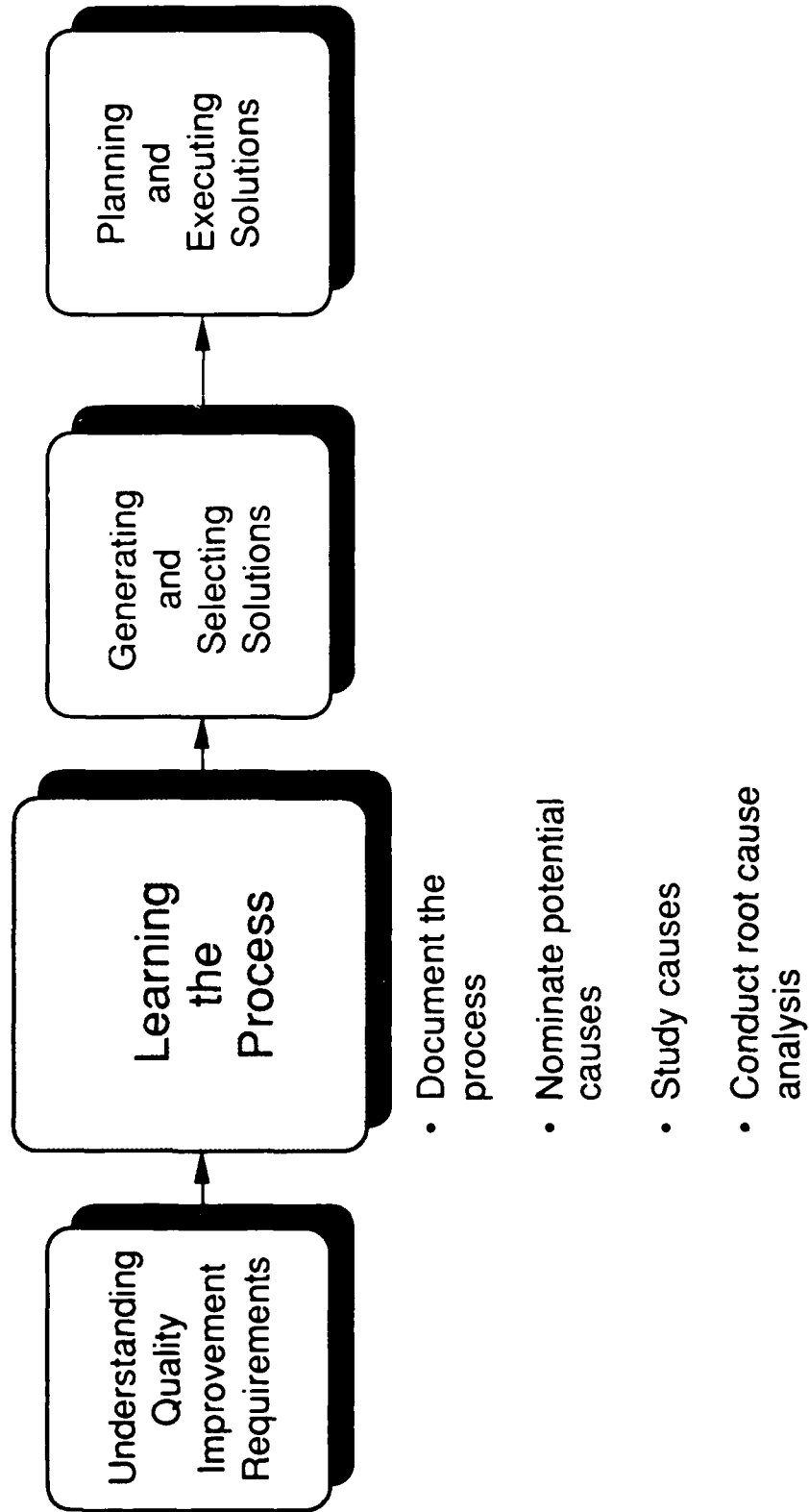
LEARNING THE PROCESS

Module Four Objectives

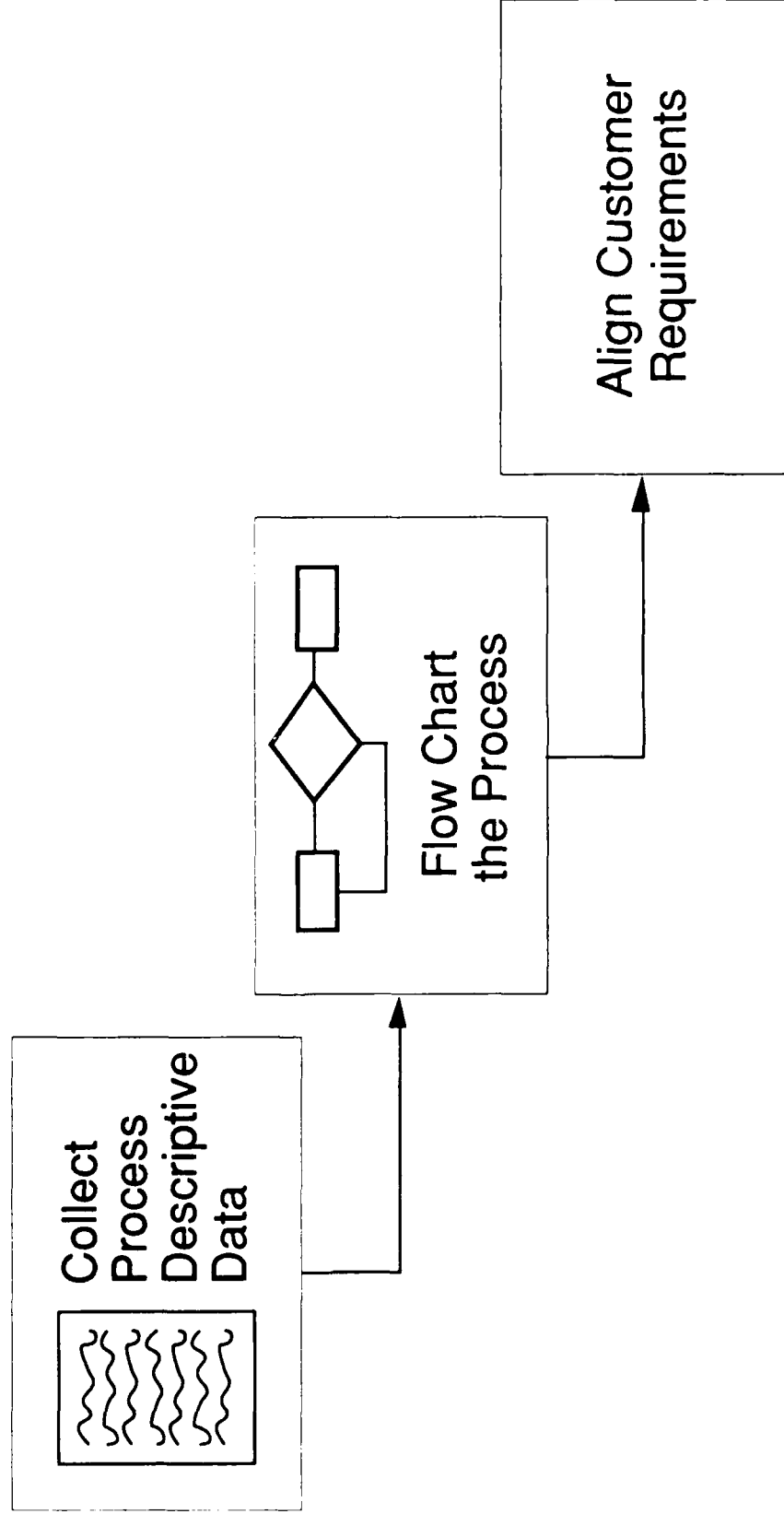
Upon completion of this module, the participant will be able to:

- Describe the four steps in the learning phase of the process improvement model.
- Document a process, using flow charting techniques.
- Nominate potential causes, using cause and effect diagramming.
- Develop a plan to study causes.
- Analyze data to discriminate symptoms from root causes.
- Conduct a root cause analysis.

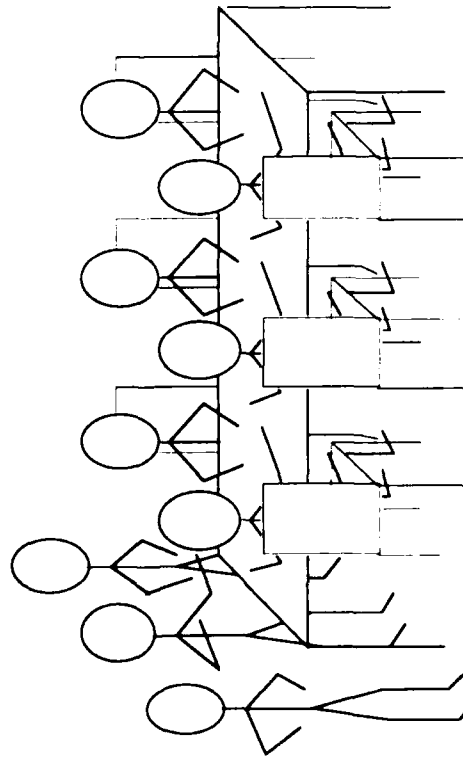
Process Improvement Model: Learning the Process



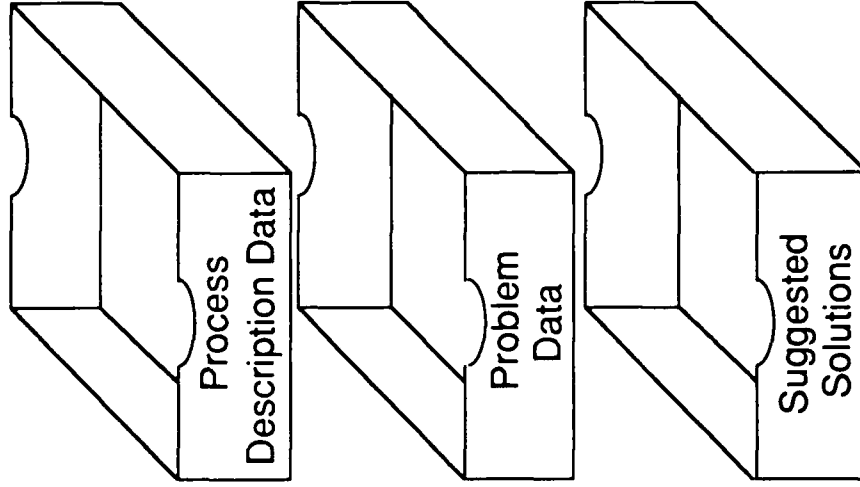
Document the Process



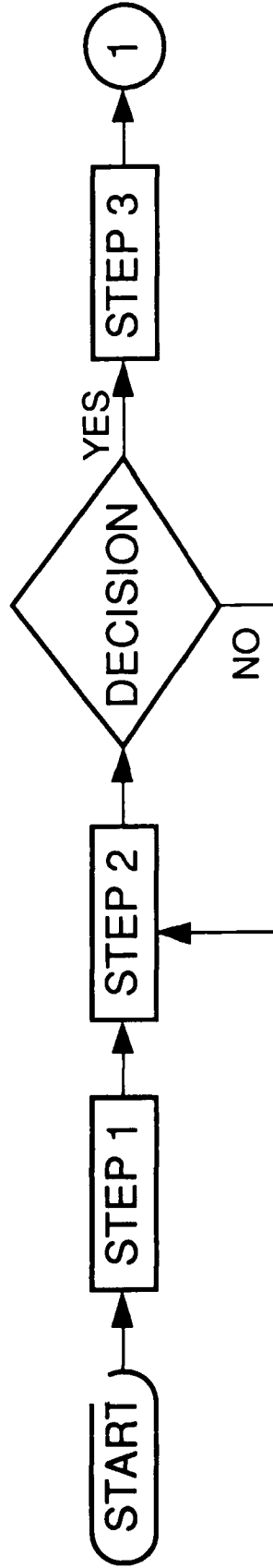
Collect Process Descriptive Data



- Interviews
- Focus Groups
- Directives and Regulations



Flow Chart the Process

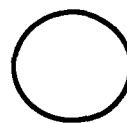
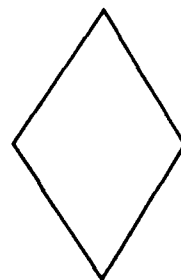


A flow chart is diagram of the steps in a process and their interrelationships.

Flow Chart the Process

Creating a Flow Chart

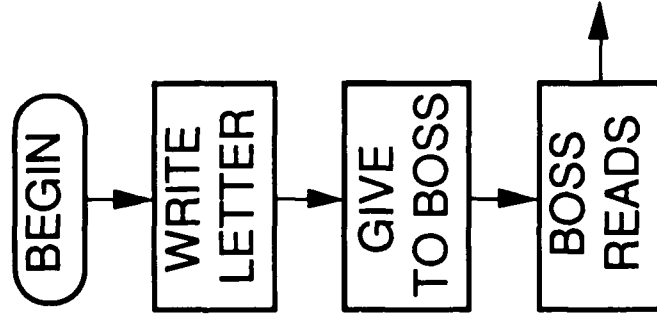
- **Flow charts do not need to be complicated.**
- **As few as four symbols can be used to create a good flow chart:**



Flow Chart the Process

Quick Flow Chart Exercise

FINISH THIS CHART:

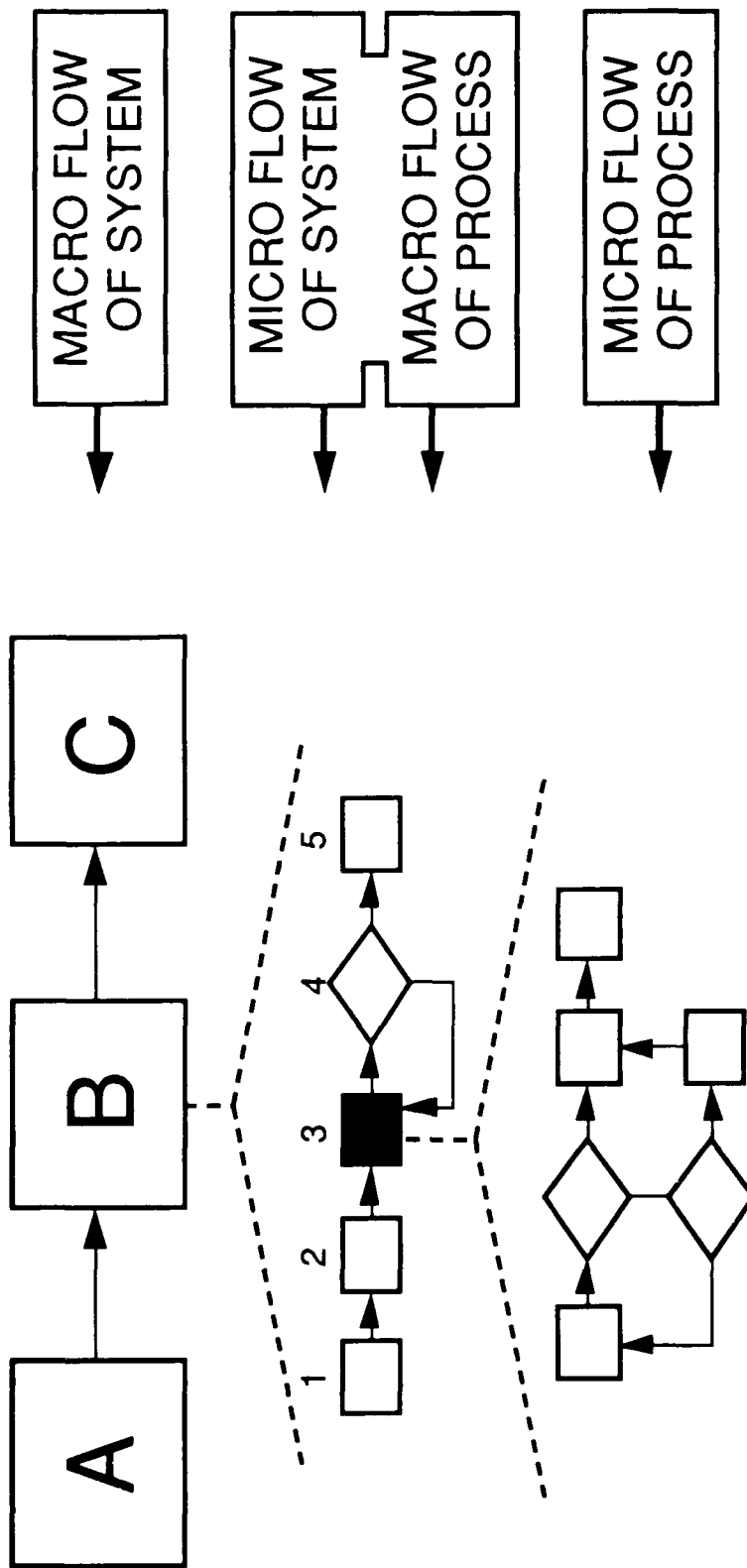


Process Flow Worksheet

[illegible]

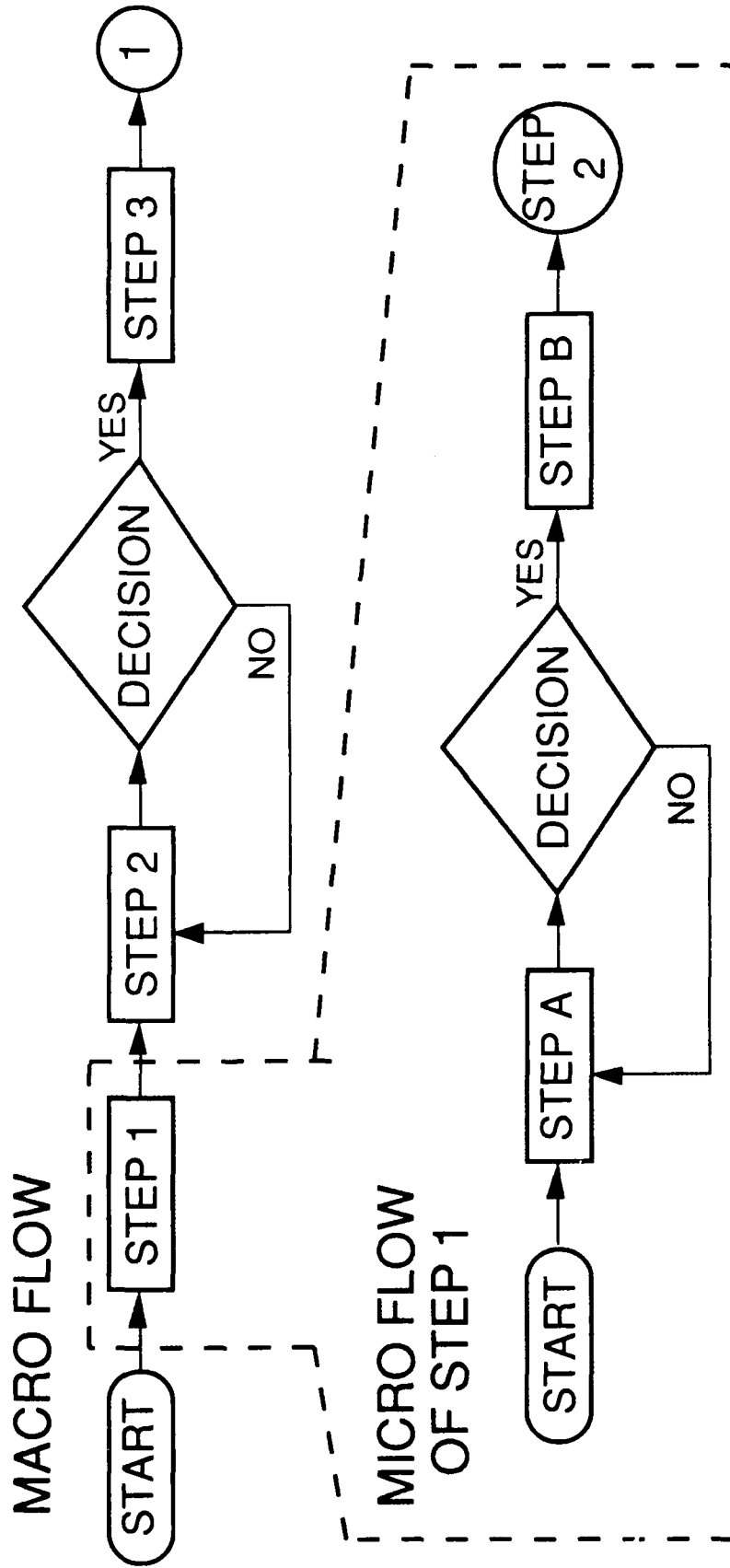
Flow Chart the Process

A System is a Series of Processes



Flow Chart the Process

Macro and Micro Flow Charting



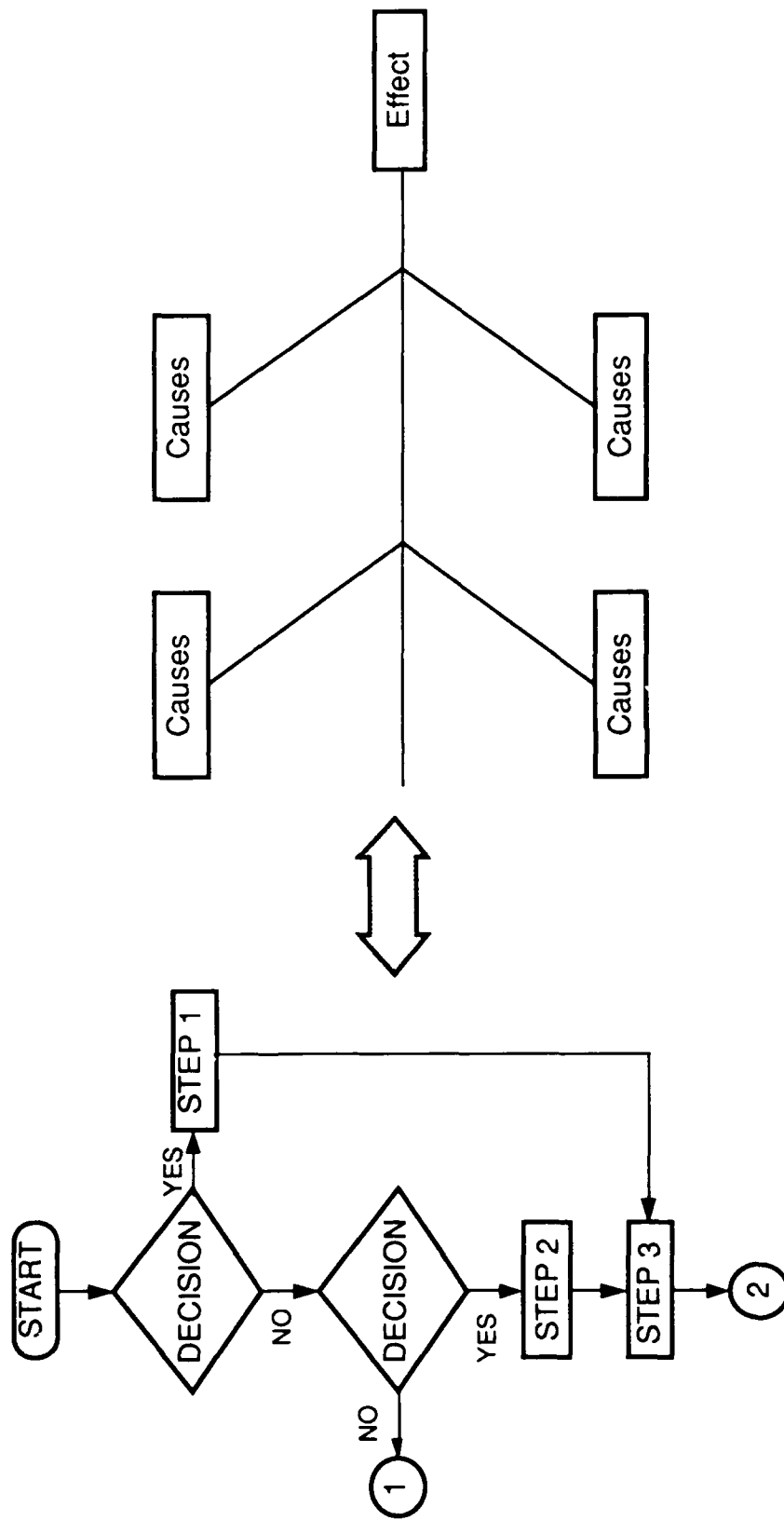
Align Customer Requirements

Customer Requirements	STEP A	STEP B	STEP C	STEP D
CR 1	•		•	
CR 2		•		
CR 3		•		
CR 4			•	•
CR 5	•	•		
CR 6	•	•	•	•

Case Study 2-1

Flow Chart the Process

Nominate Potential Causes

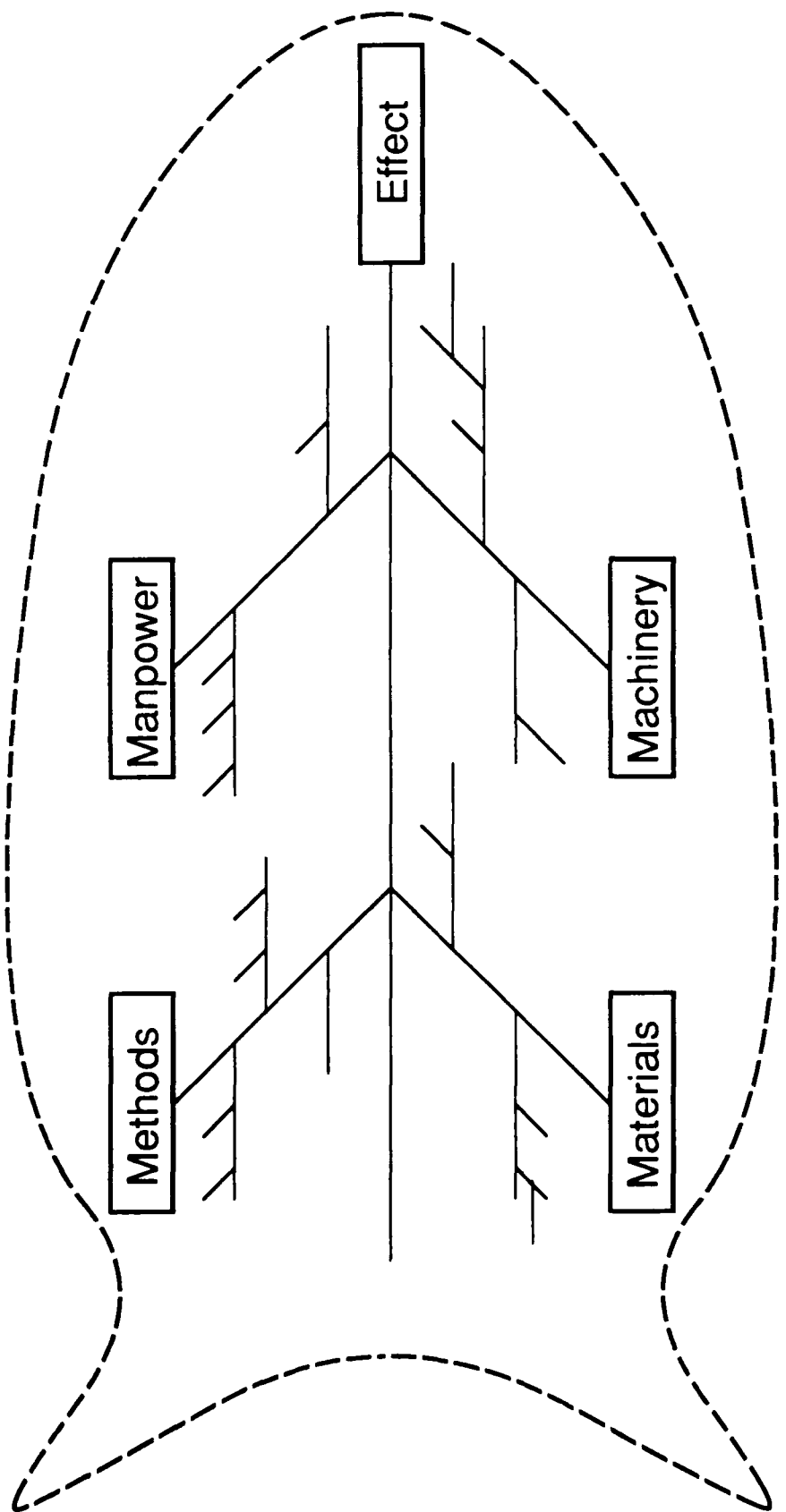


Nominate Potential Causes

CAUSE AND EFFECT DIAGRAM:

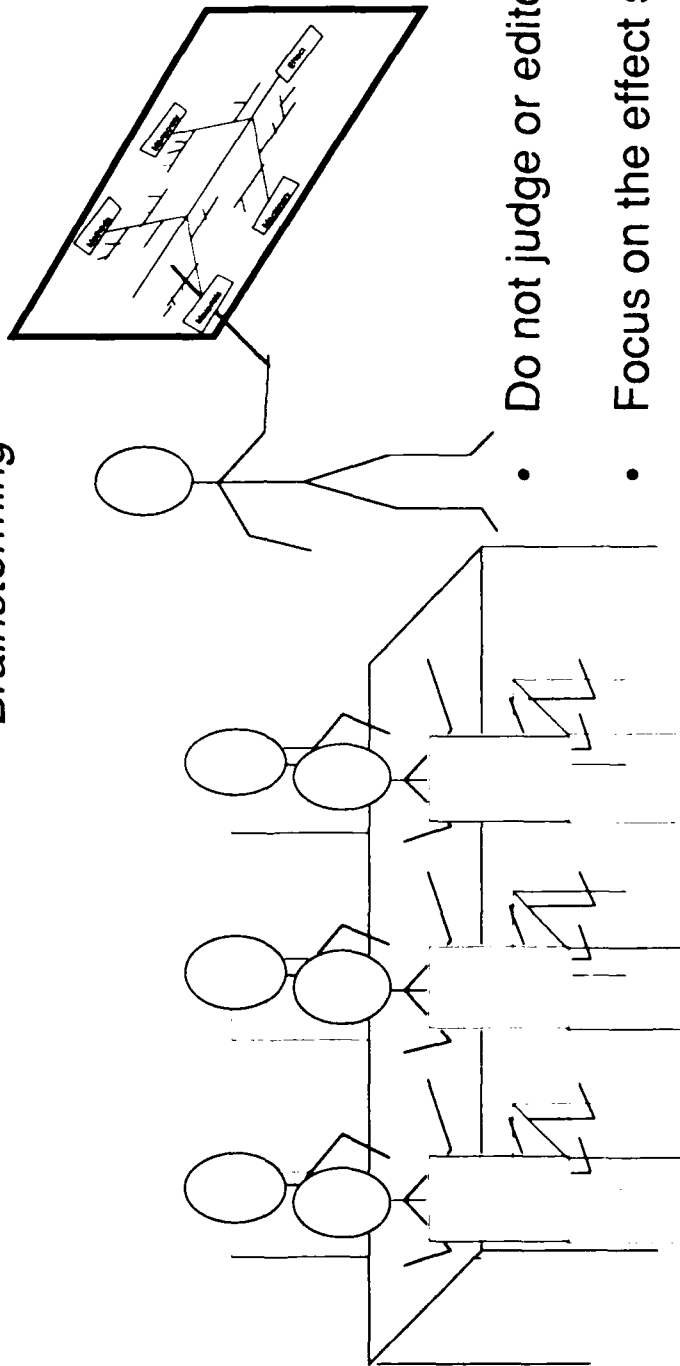
A graphic representation of the relationships between some "effect" and the possible causes of that "effect."

Nominate Potential Causes



Nominate Potential Causes

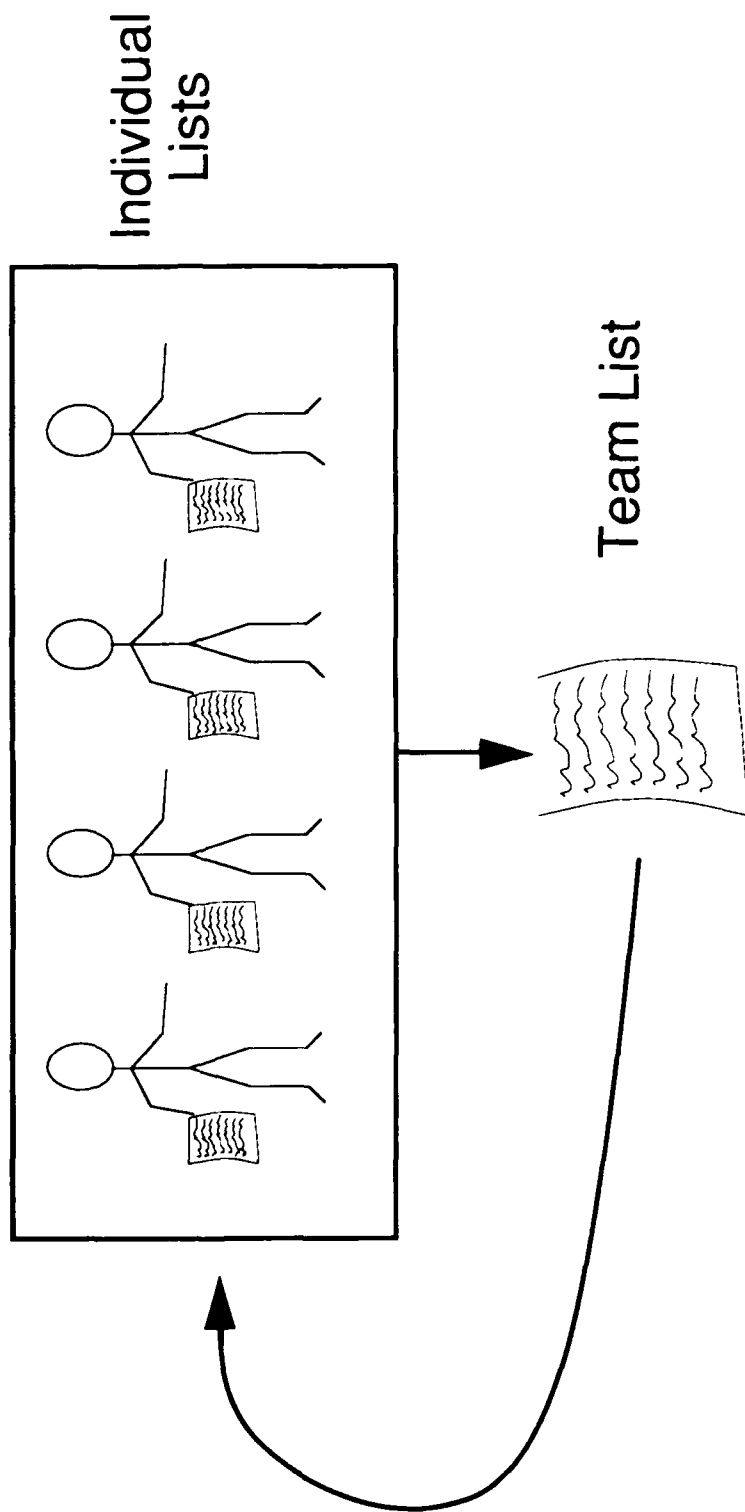
Brainstorming



- Do not judge or editorialize.
- Focus on the effect statement.
- Encourage the involvement of all team members.

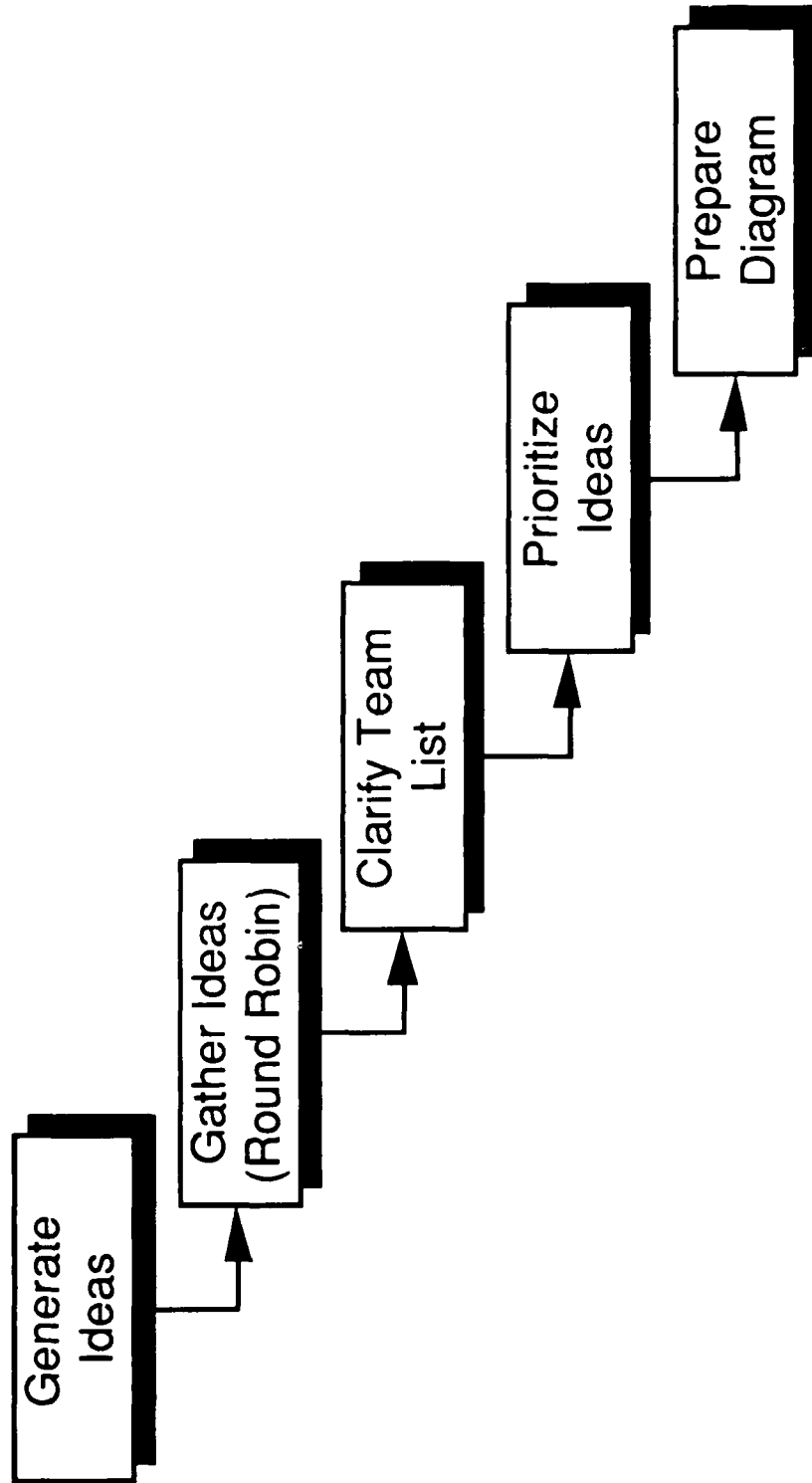
Nominate Potential Causes

Modified Delphi Method



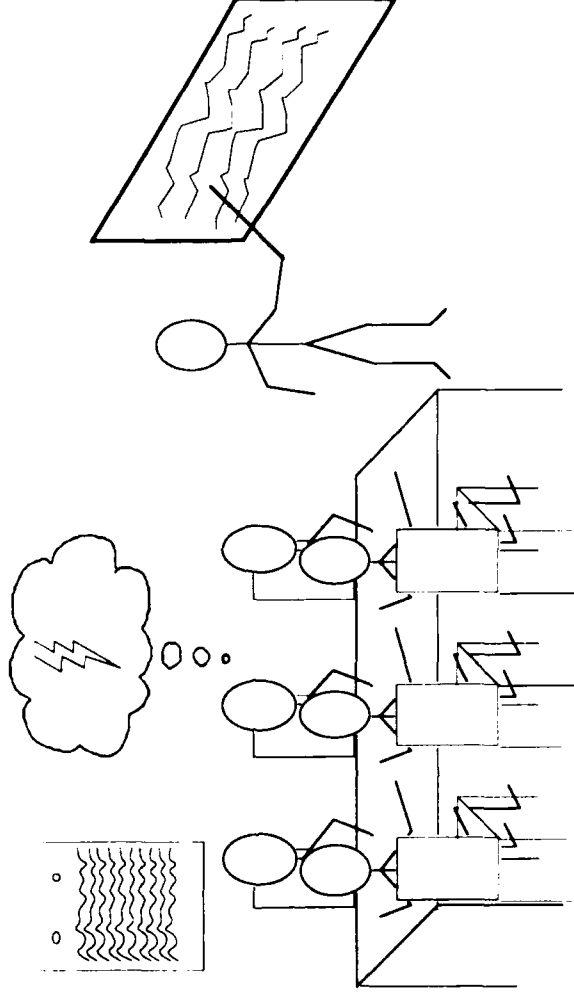
Nominate Potential Causes

Nominal Group Technique (NGT)



Nominate Potential Causes

Free-form Brainstorming Method



- Allows PAT members to be creative.
- Doesn't restrict participants' ideas.
- Can excite the group.
- Equalizes involvement.
- Can create original solutions to problems.

Nominate Potential Causes

Brainstorming Techniques

?

Modified
Aldephi
Method

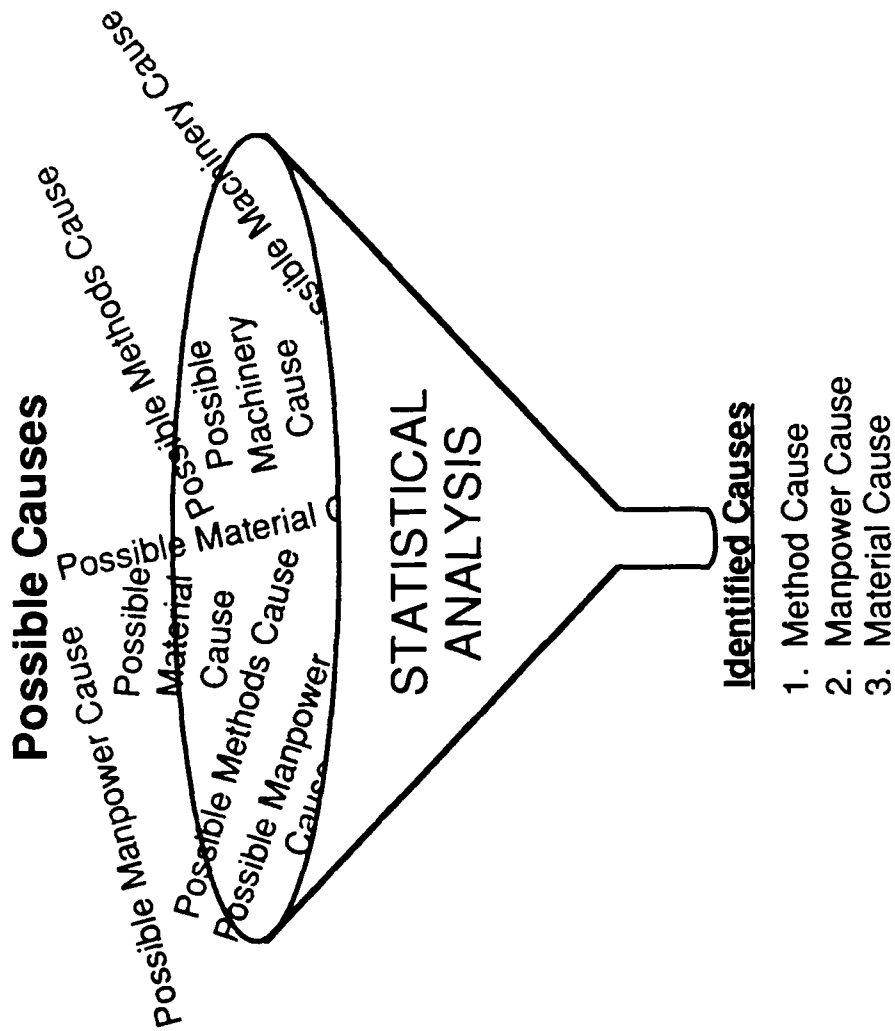
Nominal
Group
Techniques

?

Free-Form
Brainstorming
Method

?

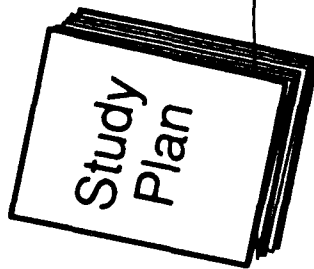
Nominate Potential Causes



Case Study 2-2

Cause and Effect Diagramming

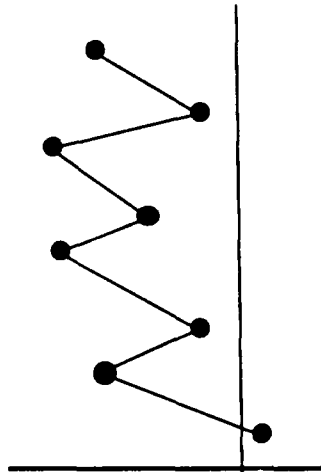
Study Causes: Symptoms vs Root



1. Develop
Study Plan

	1	2	3
A		<del> </del>	
B			
C			
D			<del> </del>

2. Collect
Data

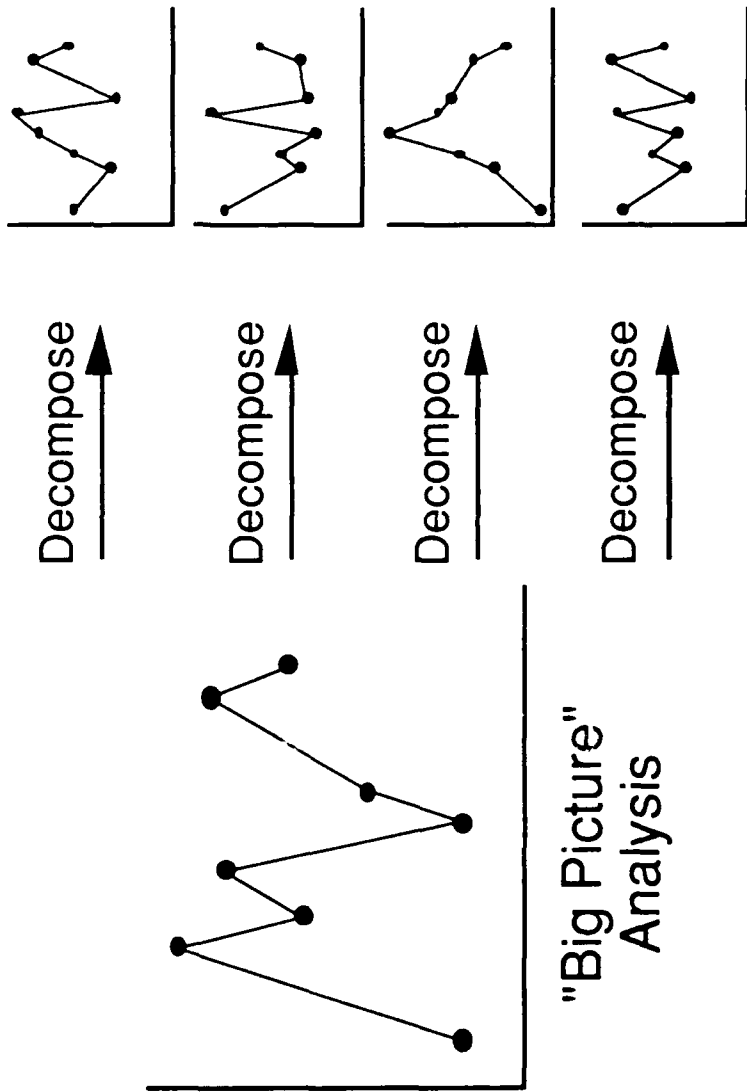


3. Analyze
Data

4. RECYCLE

Develop Study Plan

Identifying the Unit of Analysis



Develop Study Plan

Study Plan

Unit of Analysis: _____

Questions	Activities	Tools	Sample	Data Sources	Expected Outcomes
Measurement Definitions:					

Develop Study Plan

Problem	Week					Total
	1	2	3	4		
A					13	
B	<del> </del>			<del> </del>	15	
C					5	
D					8	
Total	12	7	8	14	41	

Check Sheet: Simple form that supplies factual data about how often certain events happen.

Develop Study Plan

Constructing a Check Sheet

Step 1

Define the Observation
Parameters

Step 2

Define the
Time Period

Step 3

Design a Clear and
Effective Form

Step 4

Collect the
Data Honestly

Develop Study Plan

PURPOSE	ANALYSIS TOOL
• Prioritize Problems —————>	Pareto Chart
• Determine Distribution of Data —————>	Histogram
• Identify Correlations —————>	Scatter Diagram
• Identify Trends —————>	Run Chart
• Determine Common and Special Causes of Variation —————>	Control Chart

Case Study 2-3

Identifying Units of Analysis

Case Study 2-4

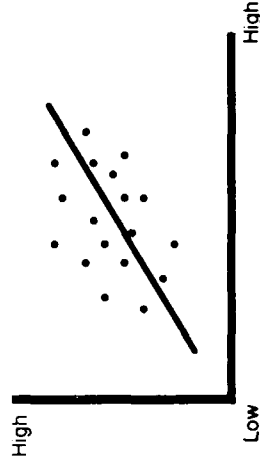
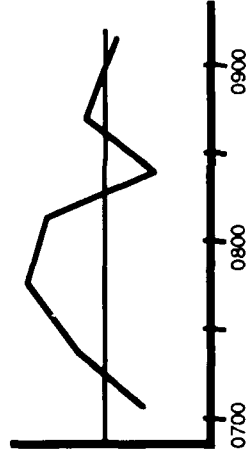
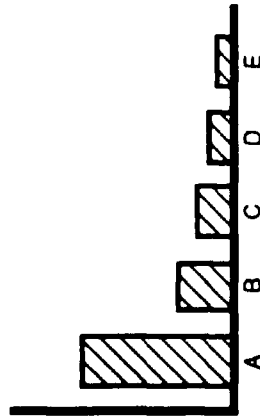
Developing Study Plans

Collect Data

UNIFORMITY

- Systematic process
- Operational definitions
- Standardized forms

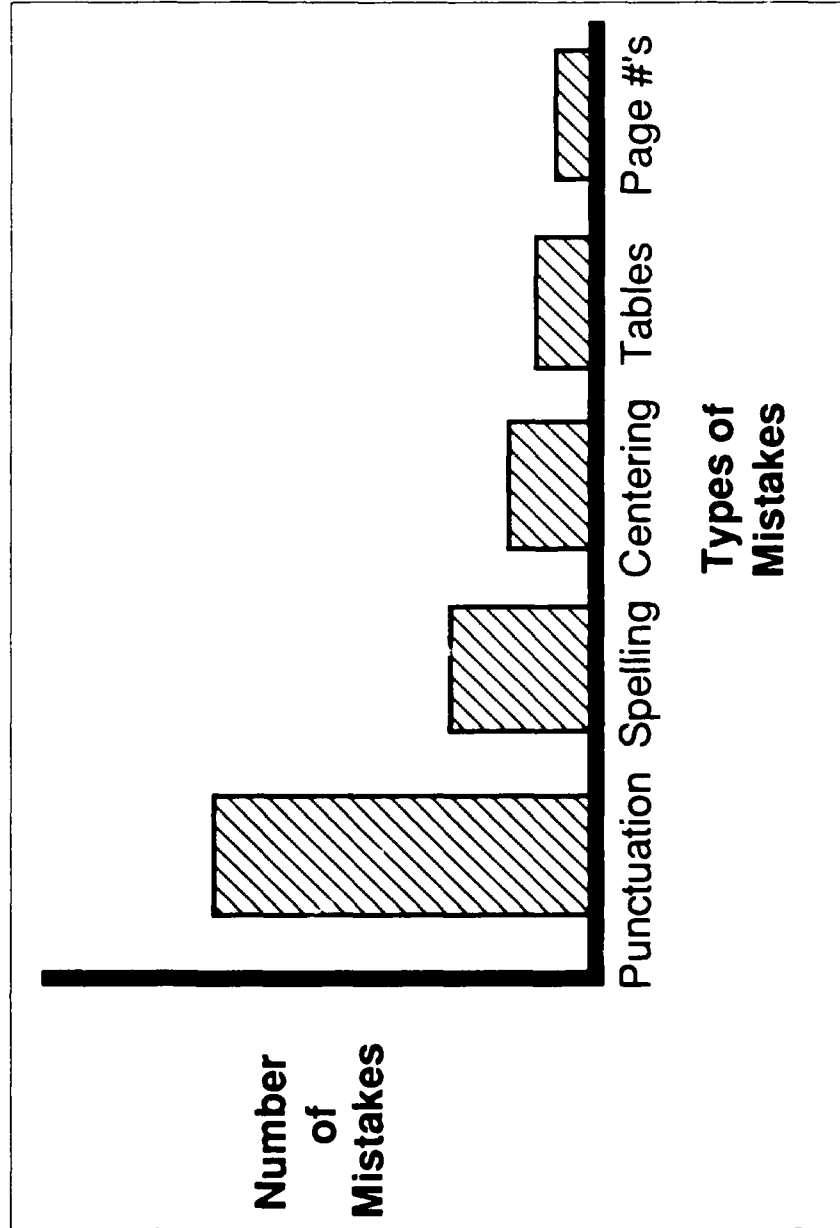
Analyze Data



- Identify problem areas
- Determine types and sources of variation in a process
- Identify and monitor trends
- Determine relative importance of problems to be solved
- Determine distribution of data
- Identify correlations
- Monitor process improvements
- Assess impacts

Analyze Data

Pareto Chart



A Pareto chart is used to:

- Prioritize problems.
- Analyze different groupings of data.
- Measure the impact of changes.
- Break down broad causes into subcauses.

Analyze Data

Application of The Pareto Principle

- The Pareto principle, or the 20-80 principle, states that 20% of the causes – the “*vital few*” – produce 80% of the results. The other 80% of the causes are the “*trivial many*,” which produce only 20% of the results.
- As applied to the analysis of a process, the Pareto principle states that 20% of the problems are responsible for 80% of the cost of rework.
- If the Pareto principle is not evident, refine your unit of analysis, change the measurement scale, or reaggregate your data.

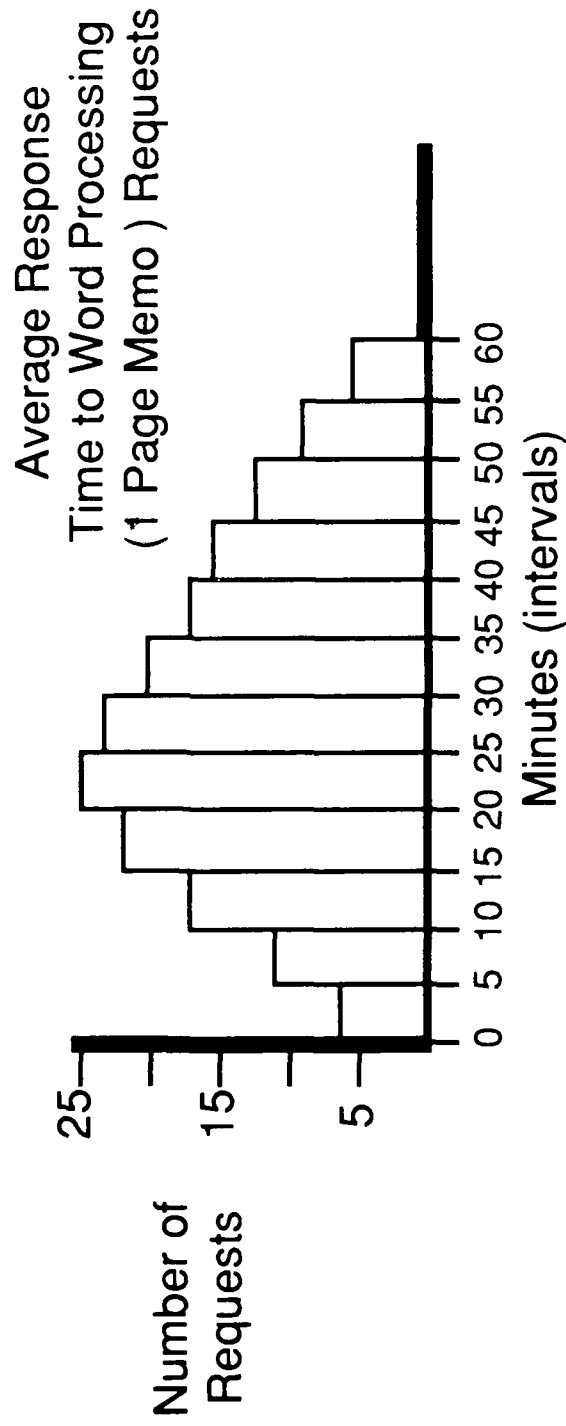
Analyze Data

Benefits of Pareto Charts

- We use Pareto analysis to distinguish the "vital few" from the "trivial many." This knowledge allows us to efficiently use our resources by attacking those problems with the greatest impact on the process.
- Pareto charts eliminate reliance on guesswork by providing quantitative information that allows us to determine which problems must be corrected.
- Pareto charts promote unity of effort by clearly illustrating which problems are most serious.

Analyze Data

Histogram

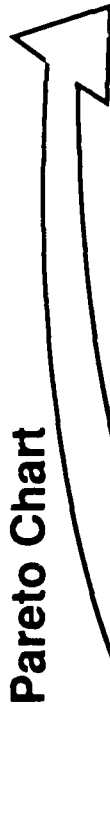


- Reveals the amount and distribution of variation within a process.

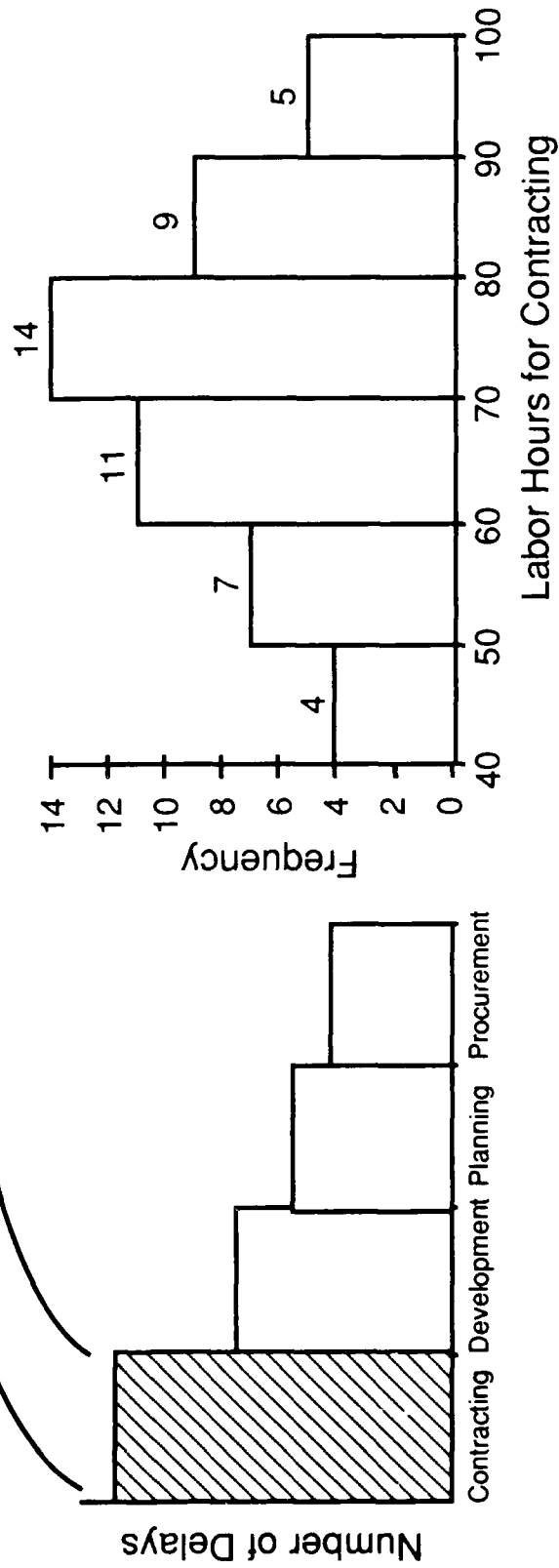
Analysis Data

Histogram

Pareto Chart



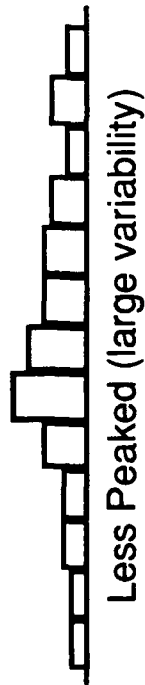
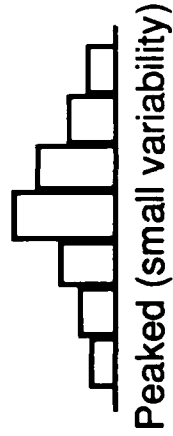
Histogram



Contracting Development Planning Procurement

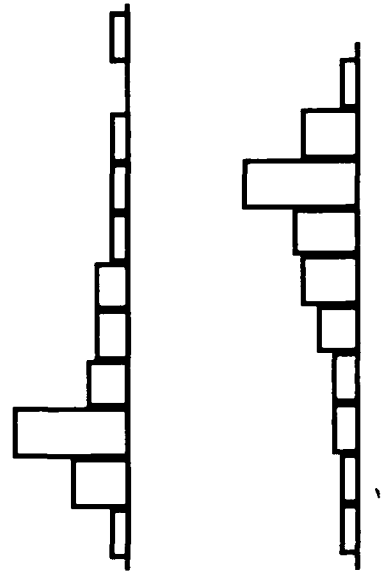
Acquisition Process

Analyze Data



Peakedness

Measure of variability - how tall and skinny the distribution is

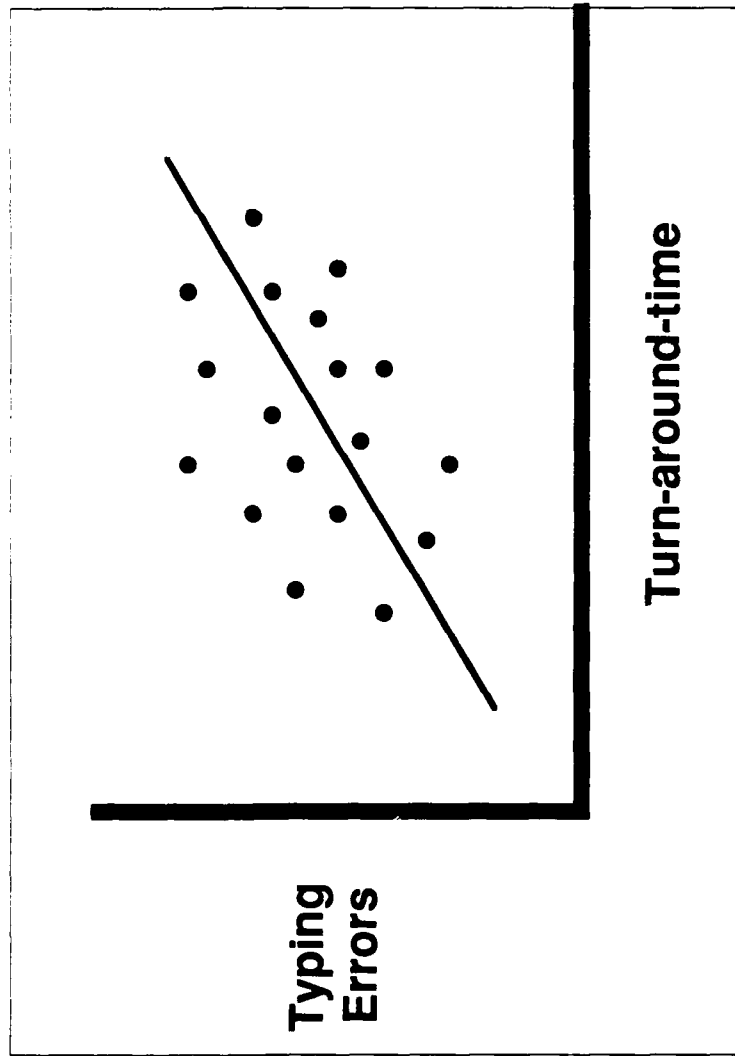


Skewedness

Measure of variability - how symmetrical the distribution is

Analyze Data

Scatter Diagram

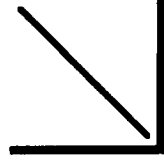


- Used to study the possible relationship between one variable and another.
- Tests for possible cause and effect relationships.

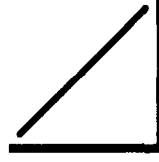
Analyze Data

Interpreting a Scatter Diagram

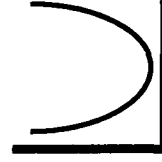
- POSITIVE



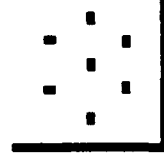
- NEGATIVE



- NONLINEAR

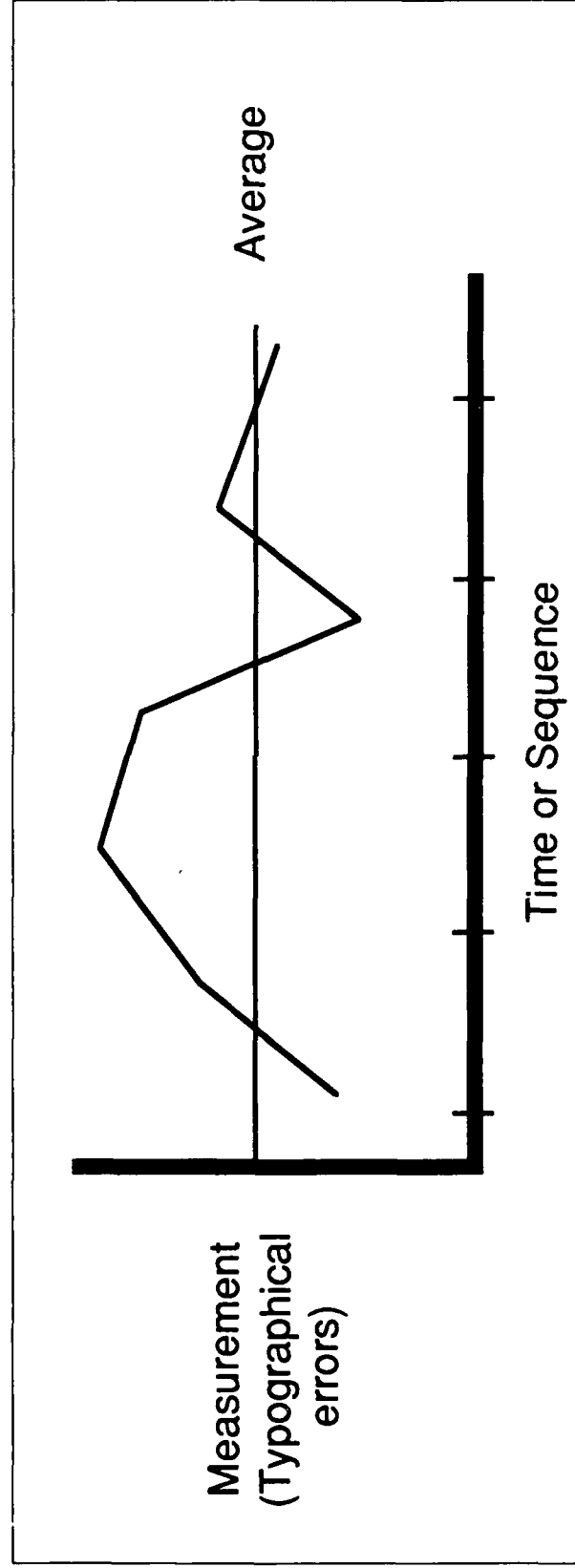


- NONE



Analyze Data

Run Chart



A run chart is used to:

- Illustrate trends over time.
- Understand the basic characteristics of a process.
- Focus attention on truly vital changes in the system.

JOB AID : PLANNING COMPONENTS

Objective 3

(Assignment's Name)

NEED

Definition: _____

DoL Project: _____

OBJECTIVE

Definition: _____

DoL Project: _____

BUDGET

Definition: _____

DoL Project: _____

STRATEGY

Definition: _____

DoL Project: _____

SCHEDULE

Definition: _____

DoL Project: _____

STAFFING

Definition: _____

DoL Project: _____

STANDARD

Definition: _____

DoL Project: _____

POLICY

Definition: _____

DoL Project: _____

PROCEDURE

Definition: _____

DoL Project: _____

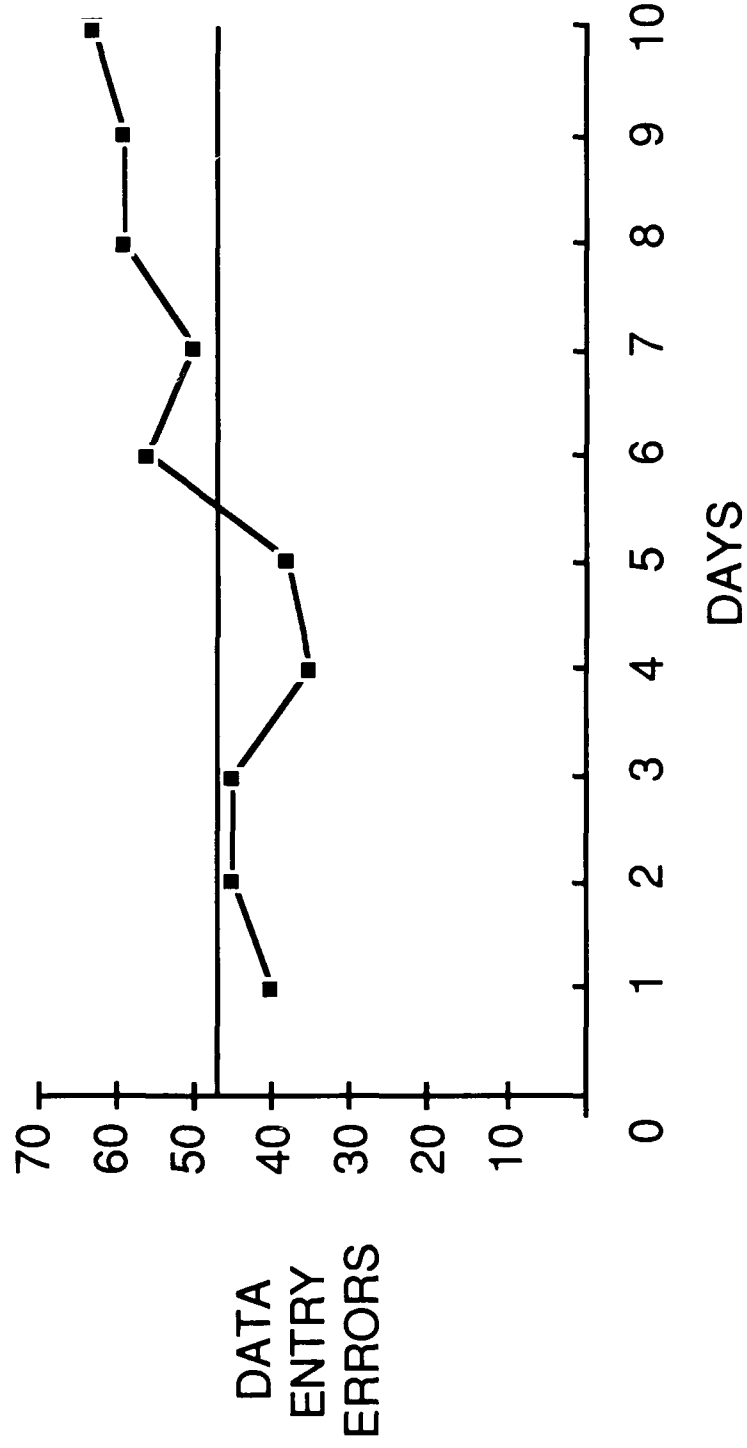
Analyze Data

Run Chart Patterns

- Trend
 - Shift in Level
 - Cyclical Pattern
 - Bunching
 - Two Groups, Shift in Level
 - Interaction Between Groups

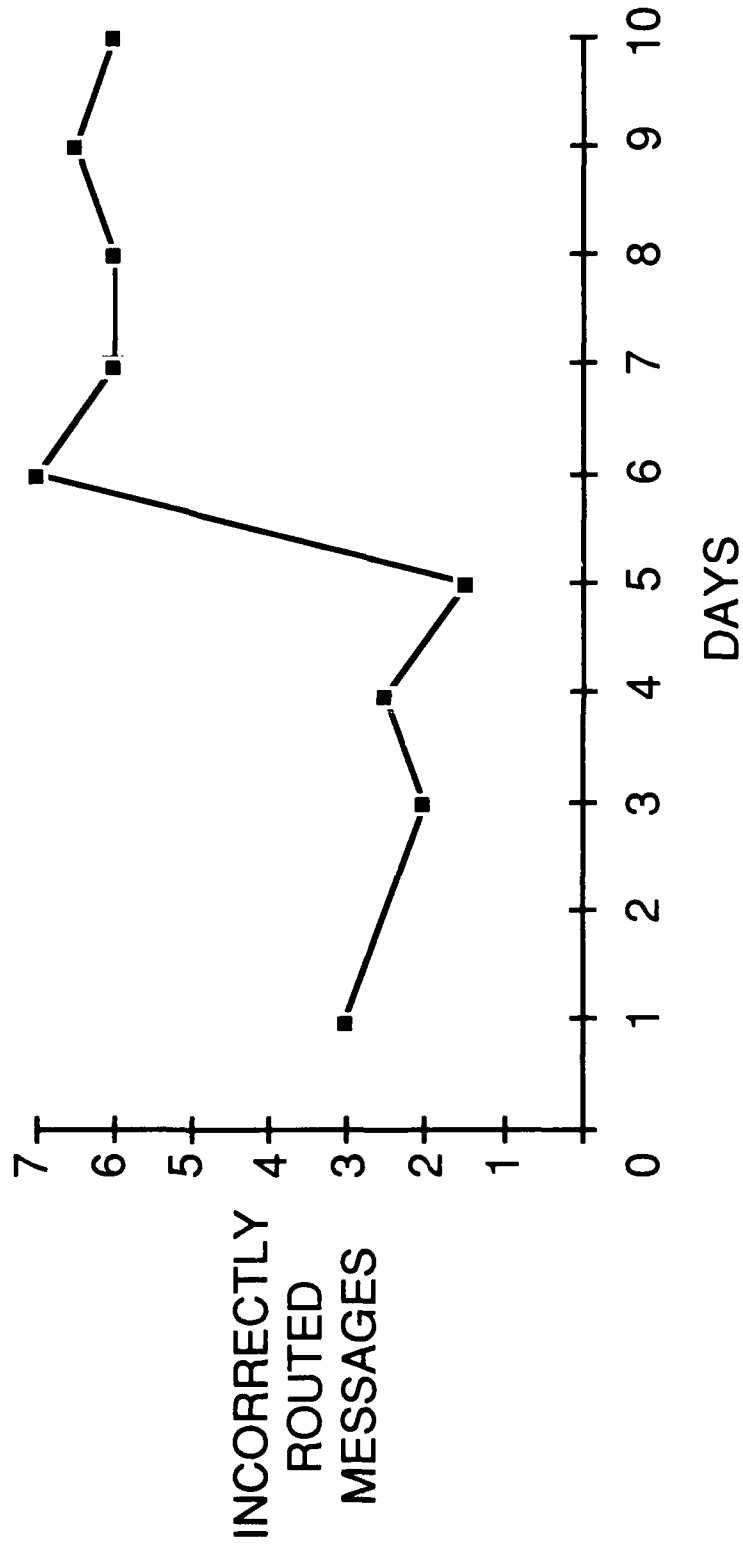
Analyze Data

TREND



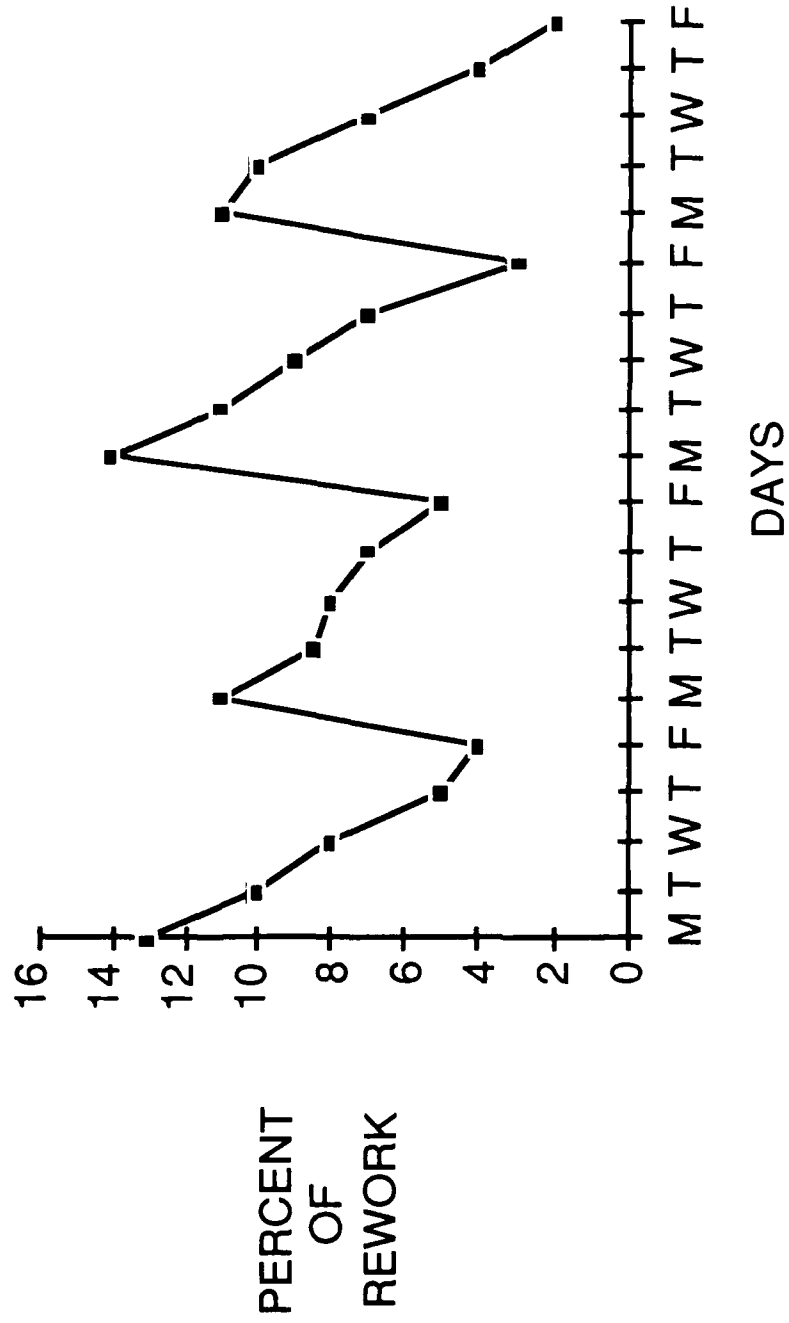
Analyze Data

SHIFT IN LEVEL



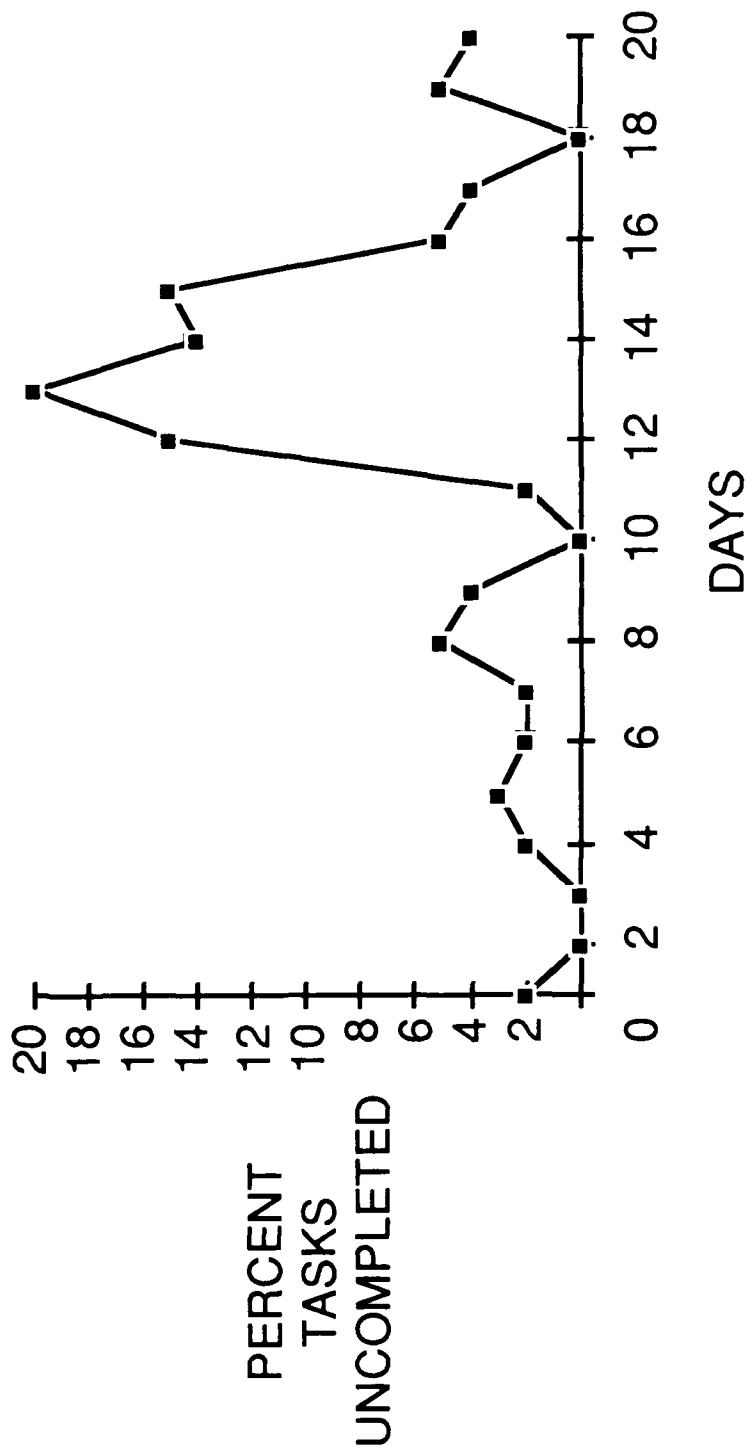
Analyze Data

CYCLICAL PATTERN



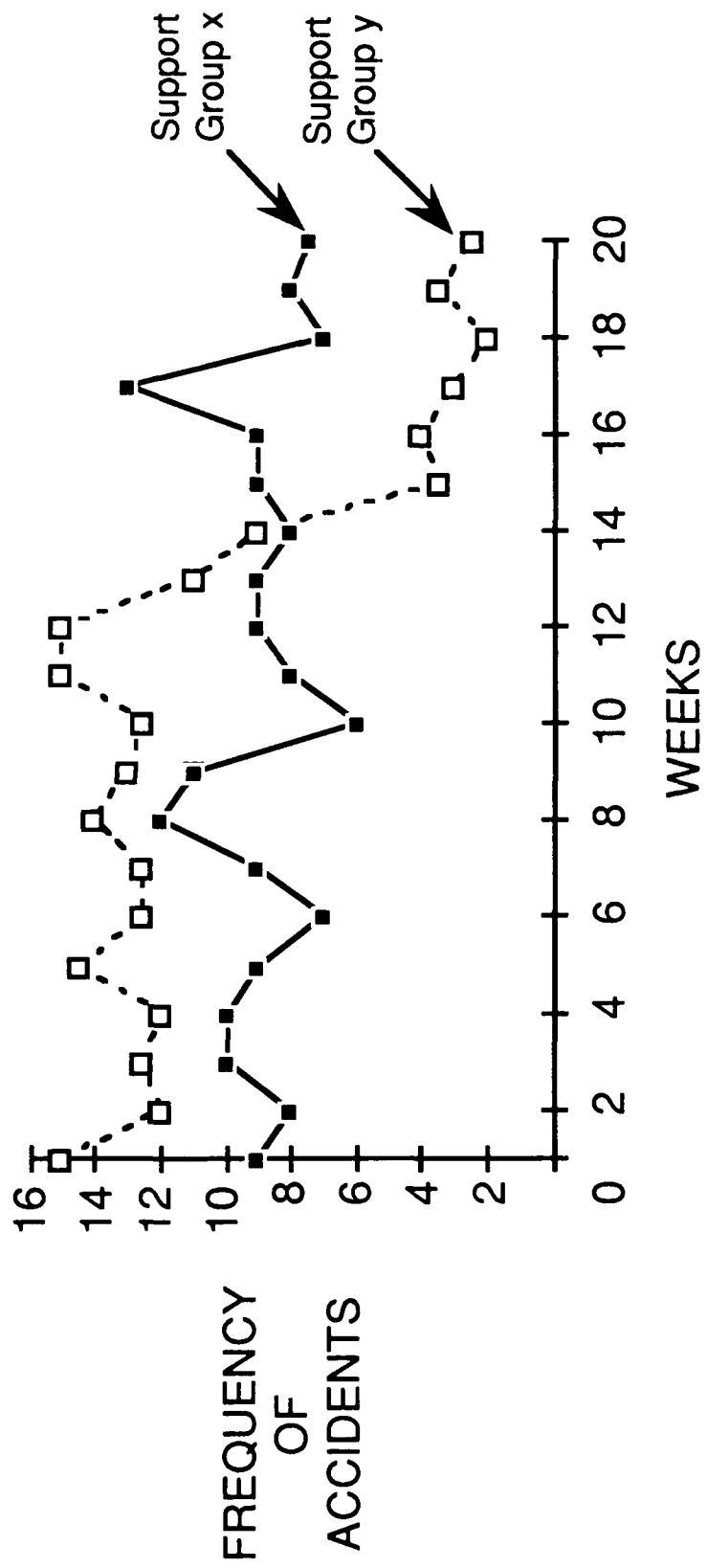
Analyze Data

BUNCHING



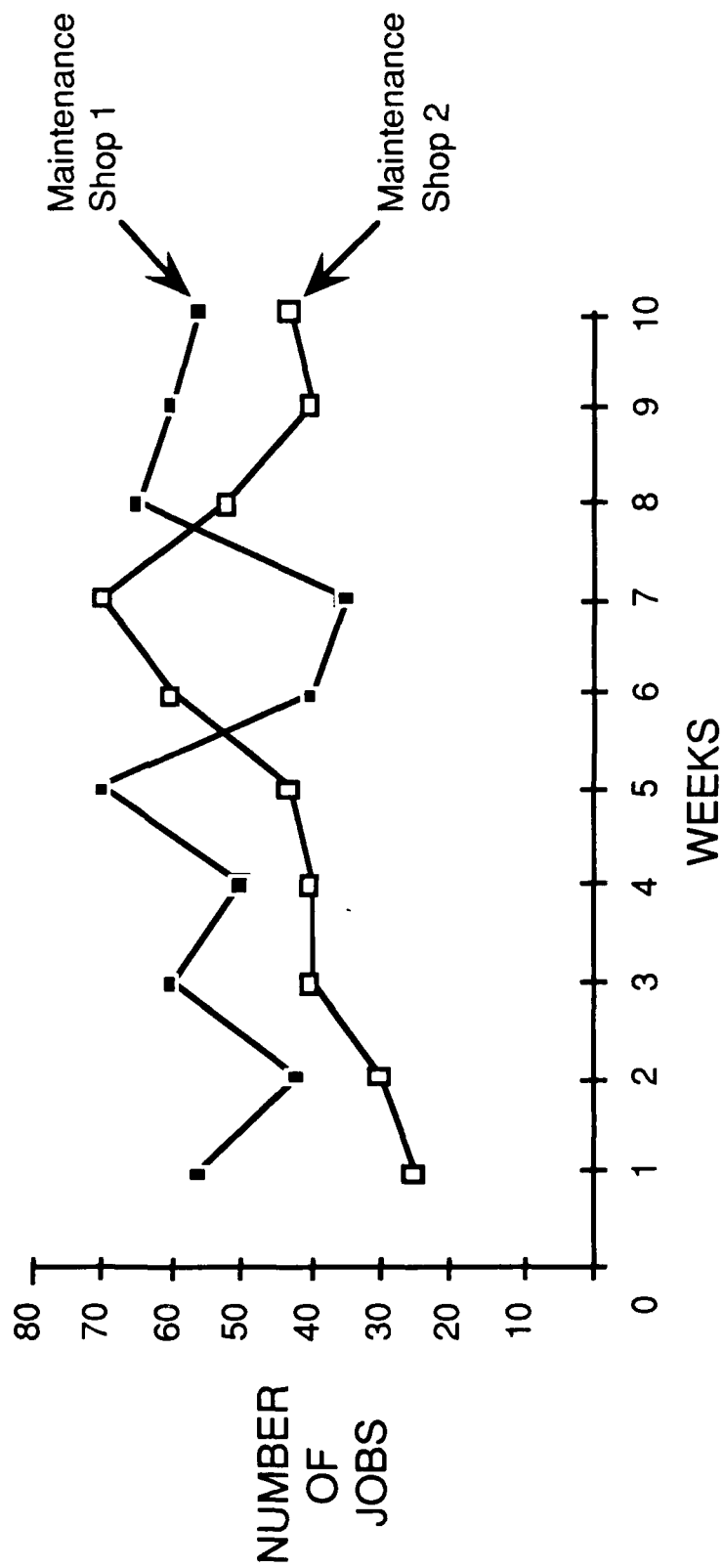
Analyze Data

TWO GROUPS, SHIFT IN LEVEL



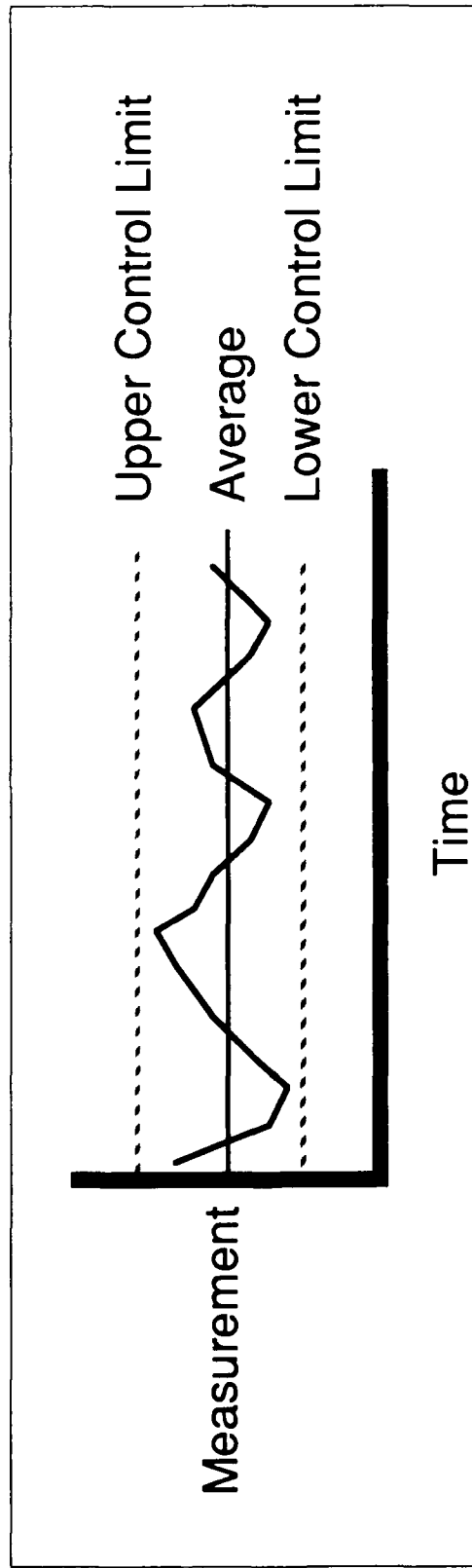
Analyze Data

INTERACTION BETWEEN GROUPS



Analyze Data

Control Chart

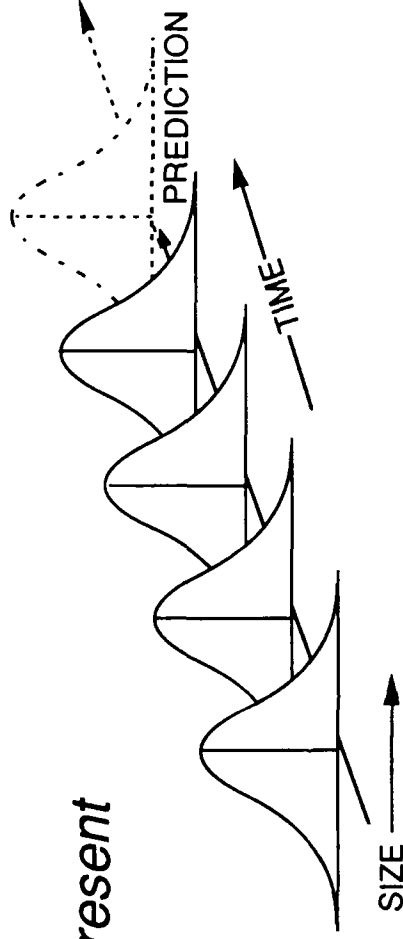


- Determine sources of variation:
 - Common causes
 - Special causes.
- Determine control/stability of system.

Analyze Data

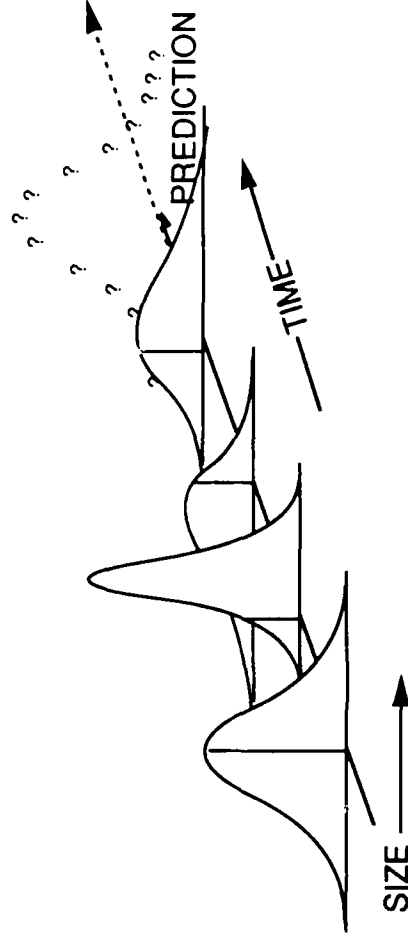
Common Causes Only Present

The process output forms a distribution that is stable over time and predictable.



Special Causes Present

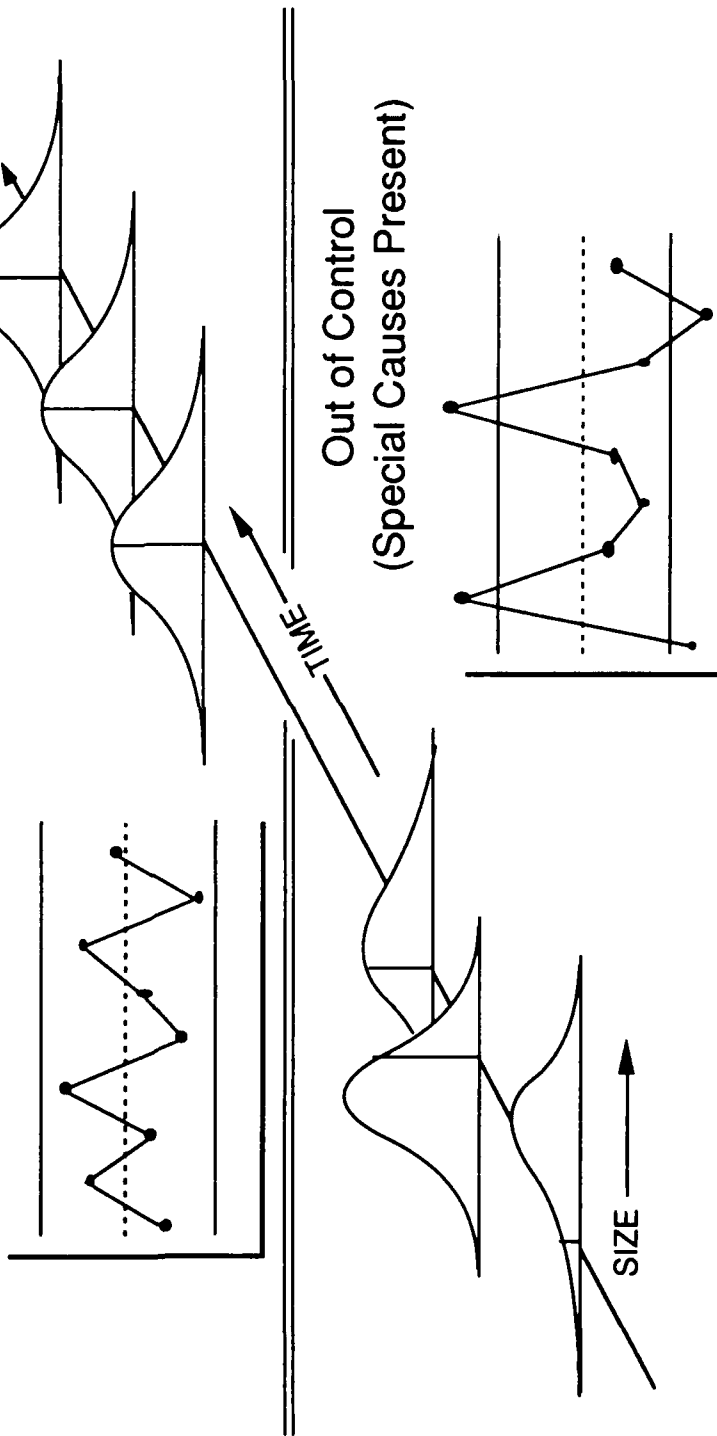
The process output is not stable over time and is not predictable.



Analyze Data

CONTROL

In Control
(Special Causes Eliminated)

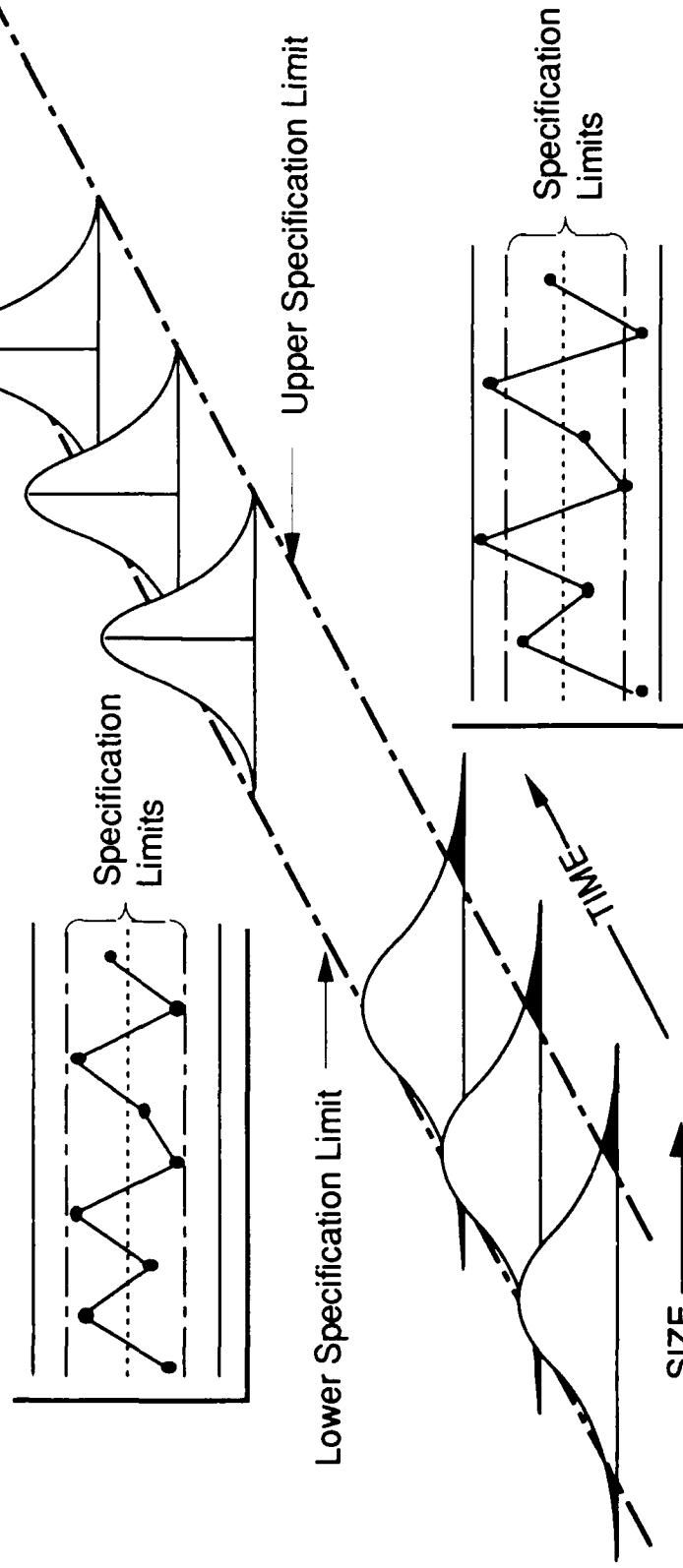


Analyze Data

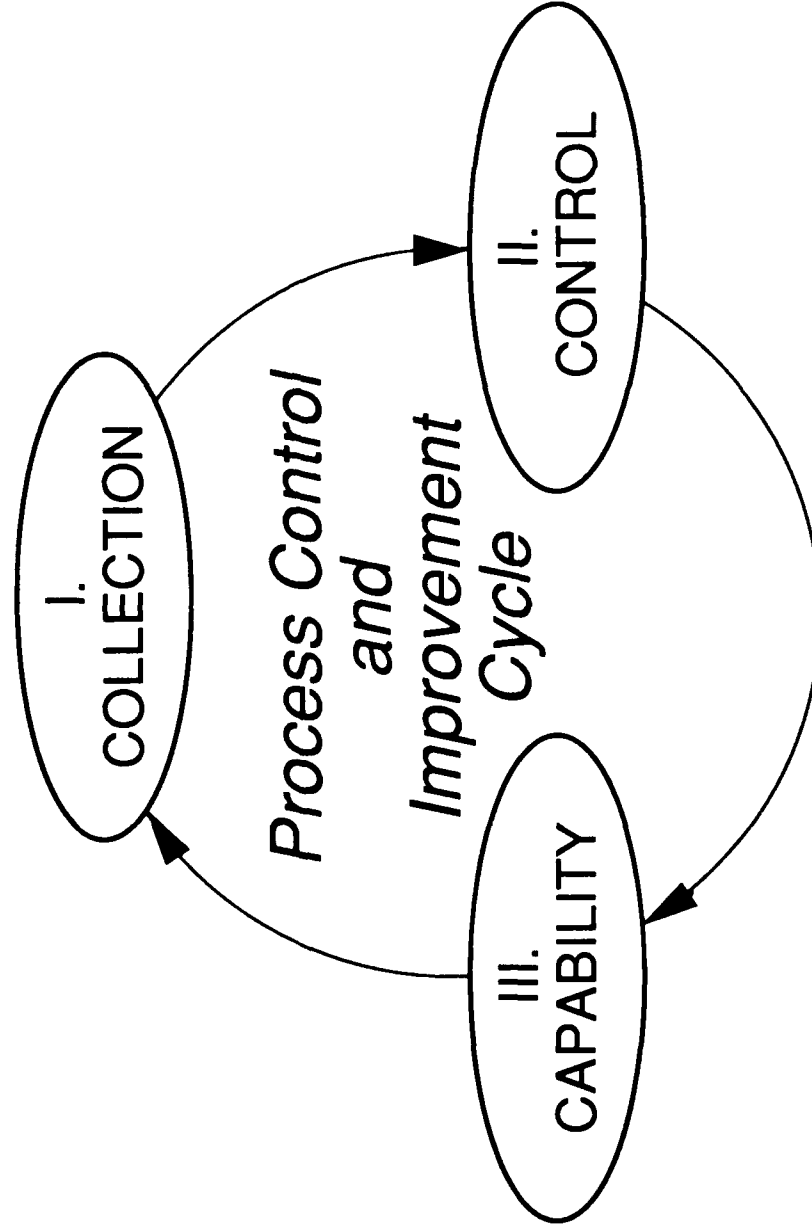
CAPABILITY

In Control and Capable

(Variation From Common Causes Reduced)



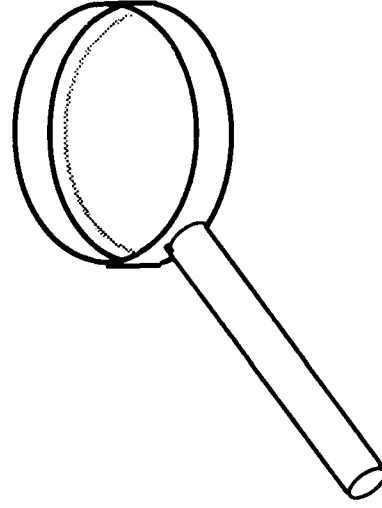
Analyze Data



Analyze Data

Final Tips and Reminders

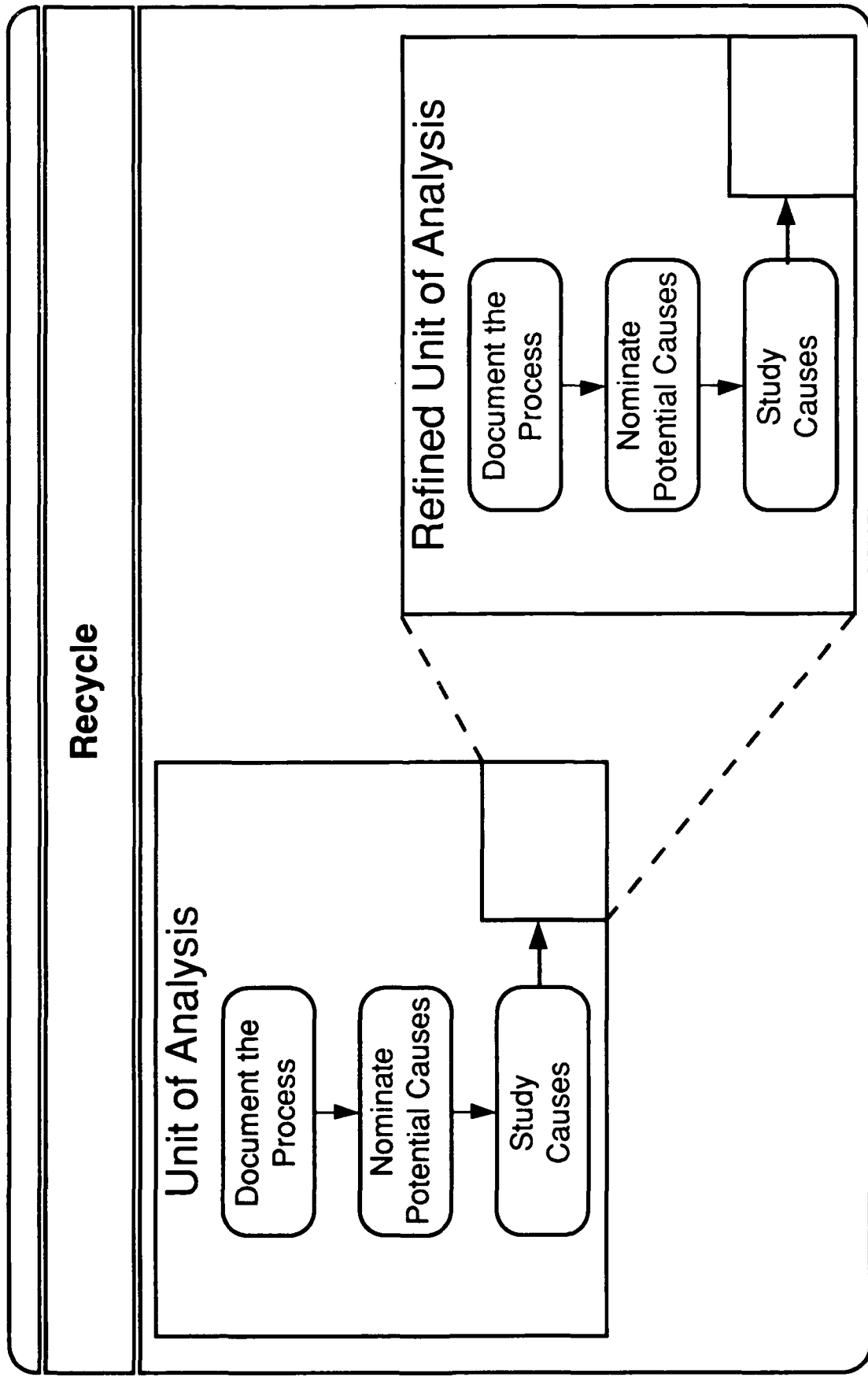
LOOK FOR:



- Patterns which indicate special causes
- Prioritize subcauses as defined by Pareto principle
- Relationships between variables

Case Study 2-5

Analyze Data



Case Study 2-6

**Recycling:
Micro Flow Charting**

Case Study 2-7

Recycling: Cause and Effect Diagramming

Case Study 2-8

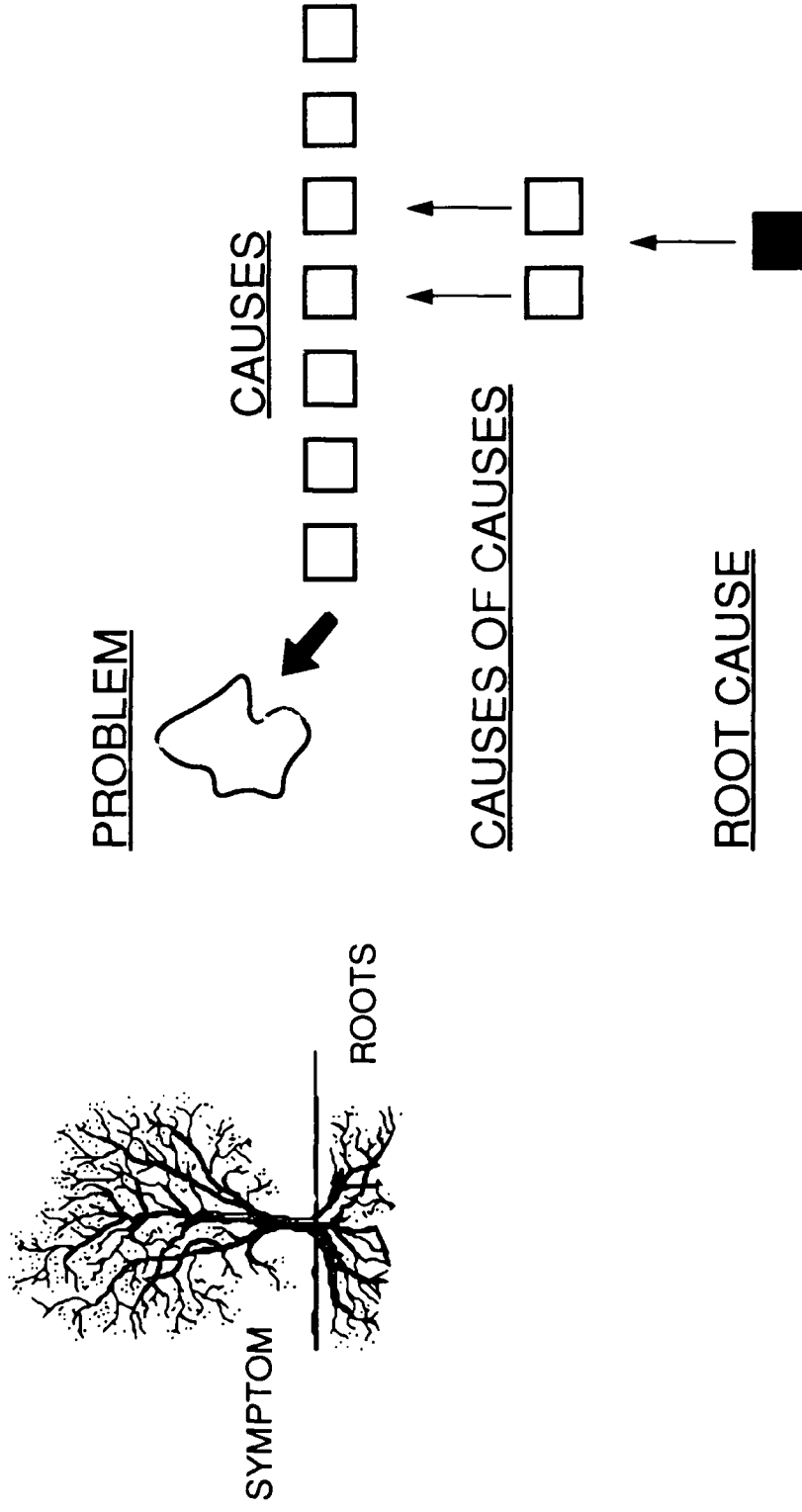
Recycling: Developing a Study Plan

Case Study 2-9

Recycling: Analyzing Data

Root Cause Analysis

Discriminating Root Causes from Symptoms



Root Cause Analysis

BEWARE OF "DISGUISED SOLUTIONS"

POSING

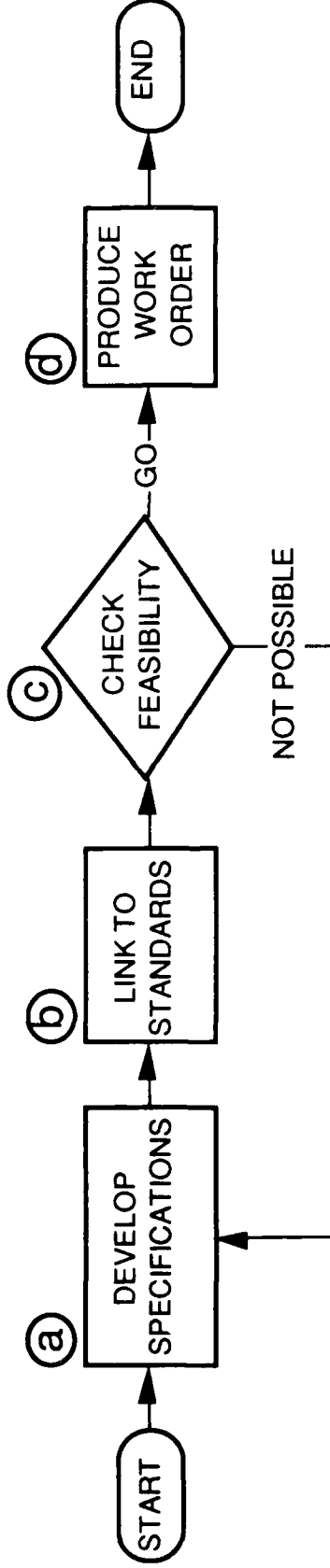
AS

PROBLEM OR CAUSE STATEMENTS

Problem: Not enough **training**
Cause: **Budget** insufficient to support operations

Root Cause Analysis

Root Cause Audit



Problem:

Too many rejections in the feasibility step

Symptomatic Causes:

- Specifications Incomplete (1)
- Standards Used Other Specs (2)
- Incomplete Work Processes Requested (3)

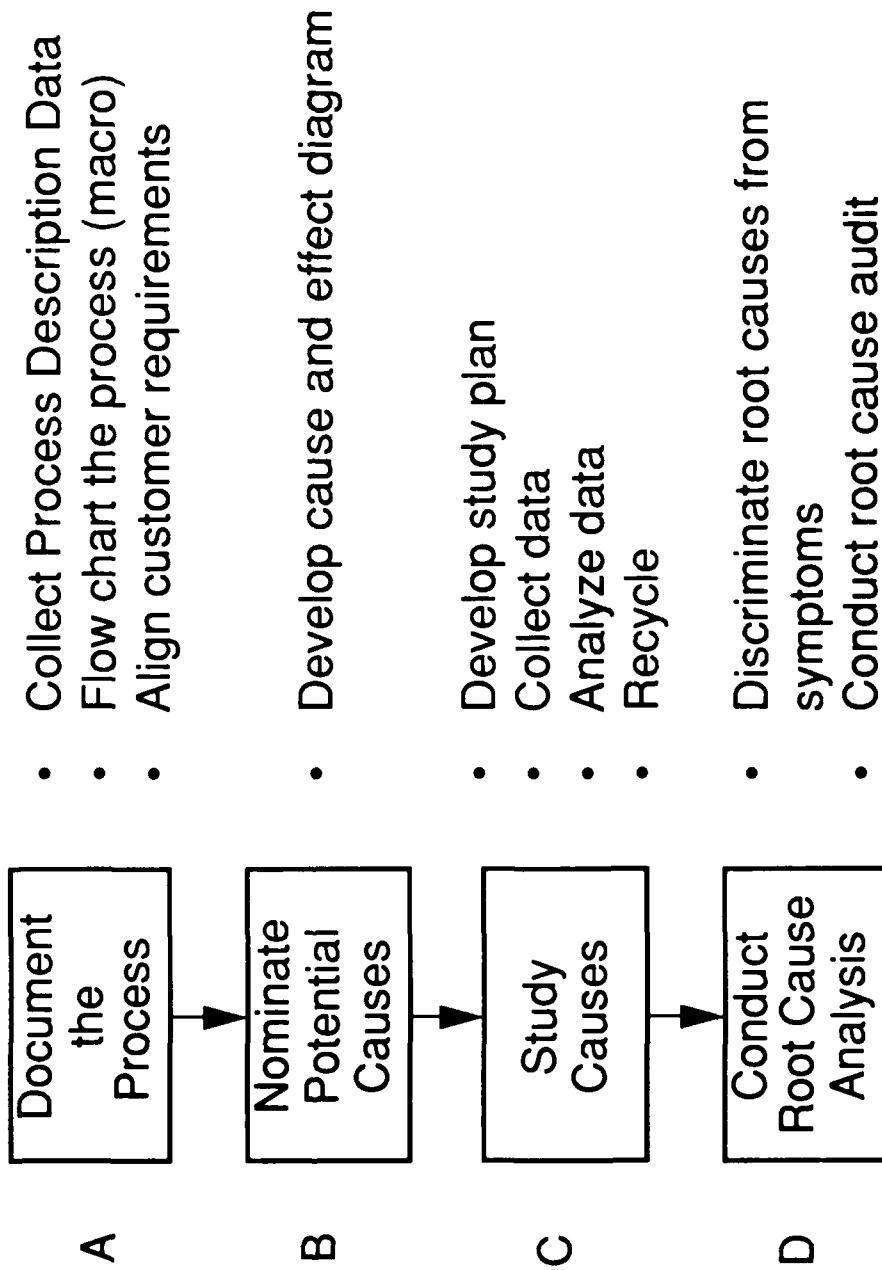
Case Study 2-10

Root Cause Analysis

Case Study 2-11

Root Cause Audit

Phase II: Learning the Process



MODULE FIVE

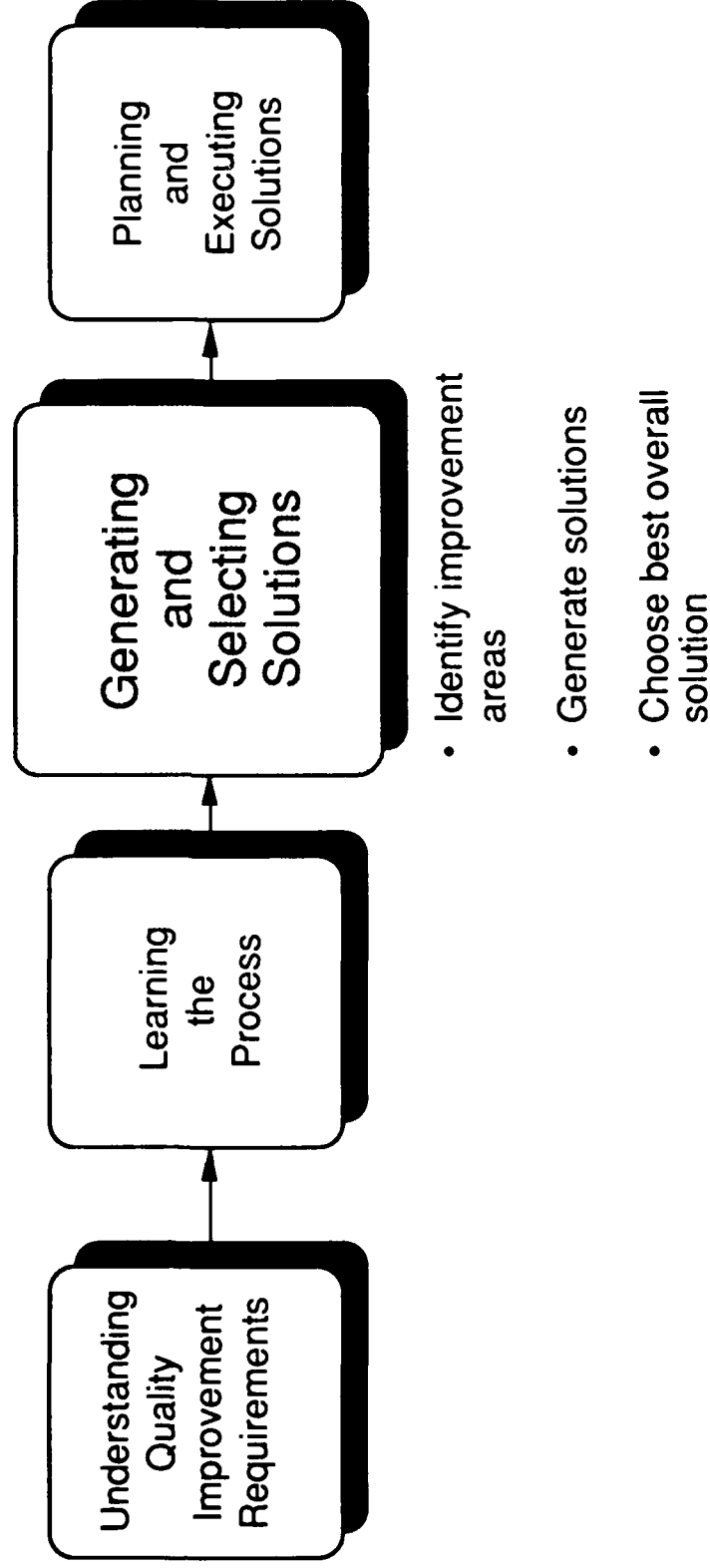
GENERATING AND SELECTING SOLUTIONS

Module Five Objectives

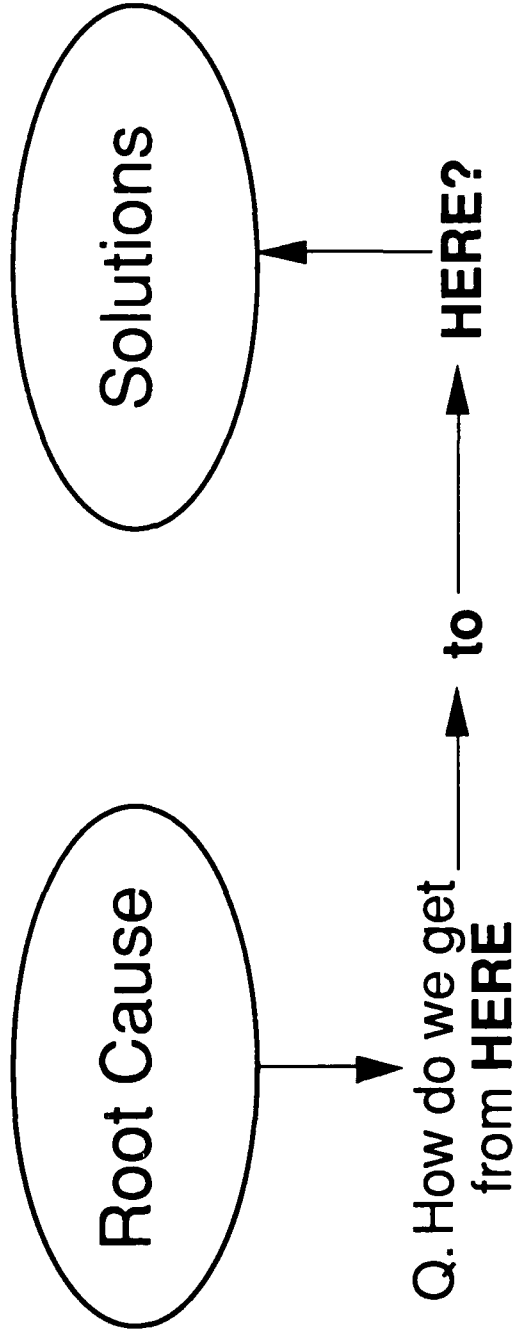
Upon completion of this module, the participant will be able to:

- Analyze a process as it is currently working; differentiate between value-added and nonvalue-added steps.
- Develop a value-added flow diagram.
- Develop an optimum process flow diagram, incorporating root cause audit data and customer requirements, to identify improvement areas
- Determine goals and criteria that the solutions must meet and identify constraints to implementing solutions.
- Select the best solutions to implement from identified improvement areas.

Booz, Allen Process Improvement Model



Develop a Value-Added Flow Diagram



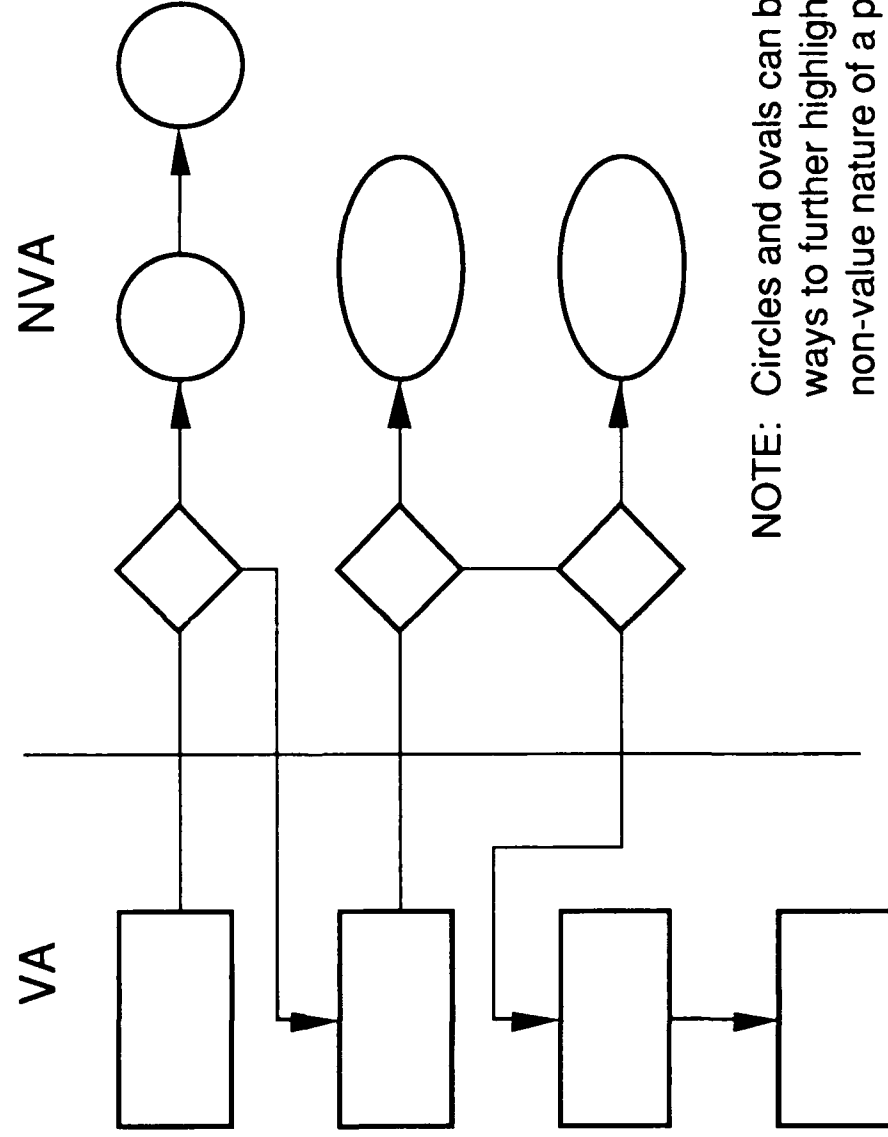
A. By Identifying Improvement Opportunities!

Develop a Value-Added Flow Diagram

A "Value-Added Step"

- Is critical to producing what the customer requires
- Is what the customer "pays" you to do
- Contributes directly to the transformation of the input to the output the customer requires

Develop a Value-Added Flow Diagram

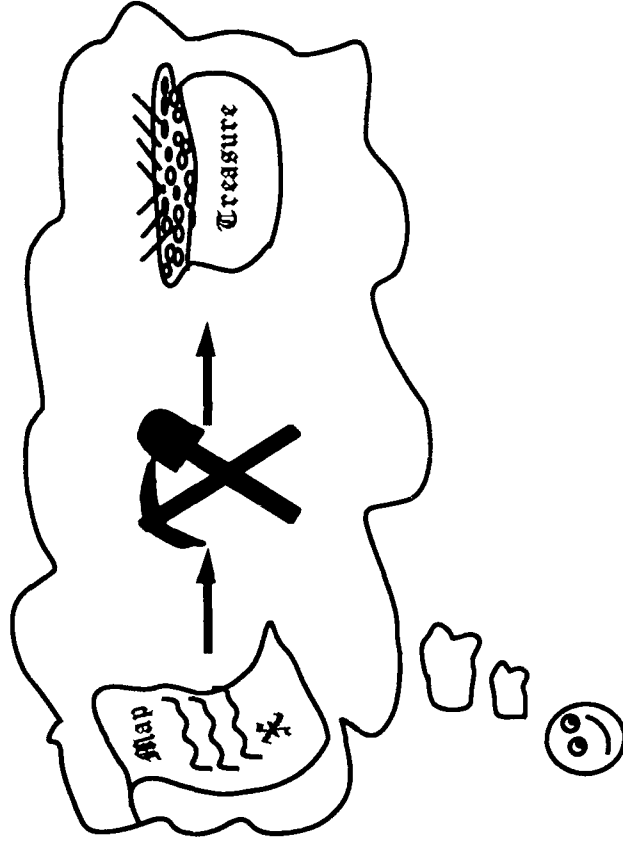


Case Study 3-1

Develop a Value-Added Flow Diagram

Develop an Optimum Flow Diagram

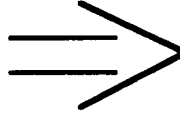
Envisioning The Optimum Process



Case Study 3-2

Develop an Optimum Flow Diagram

Generate Solutions

G A P 

**IMPROVEMENT
AREAS**

Current
Flow
Diagram

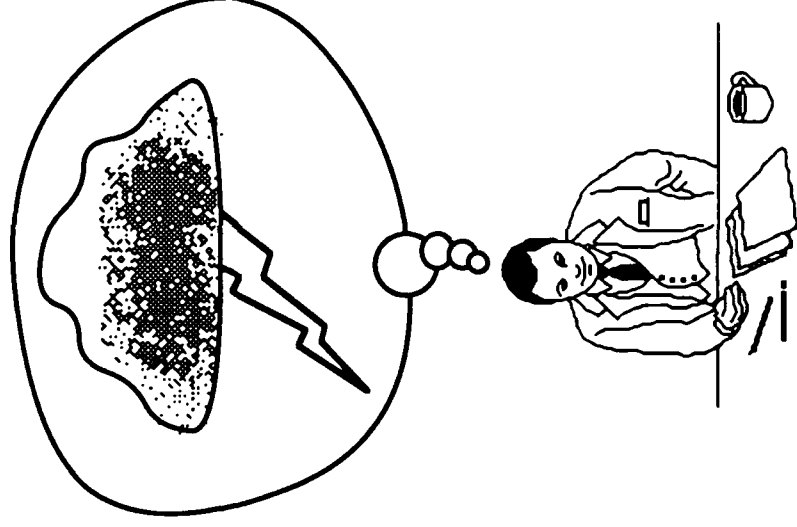
Customer
Requirements
Value Added
Flow Diagram
Optimum Flow
Diagram

Case Study 3-3

Identify Improvement Goals & Generate Solutions

Identify Goals, Criteria, and Constraints

Identifying Goals and Criteria



Identify Goals, Criteria, and Constraints

What is a Goal for Process Improvement?

- A GOAL is not a method (disguised solution)
- A GOAL can to identify by asking:

"No matter how we decide to improve this process, the thing we have to achieve is ...?"

Identify Goals, Criteria, and Constraints

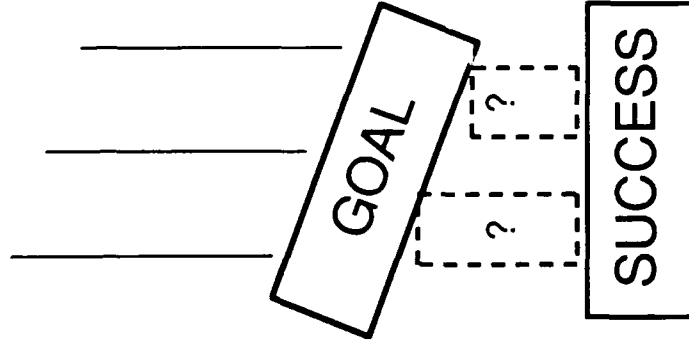
What is a Criterion in Process Improvement?

Criteria support a goal and define success.

GOAL

C C R I T E R I O N
C C R I T E R I O N
C C R I T E R I O N

SUCCESS



Identify Goals, Criteria, and Constraints*Identifying Constraints*

- Determine available resources (monies and manpower).
- Identify policies and procedures (both formal and informal) that determine the feasibility of the solution.
- Identify training requirements.
- Consider the history of the people and functional units involved in the process change.

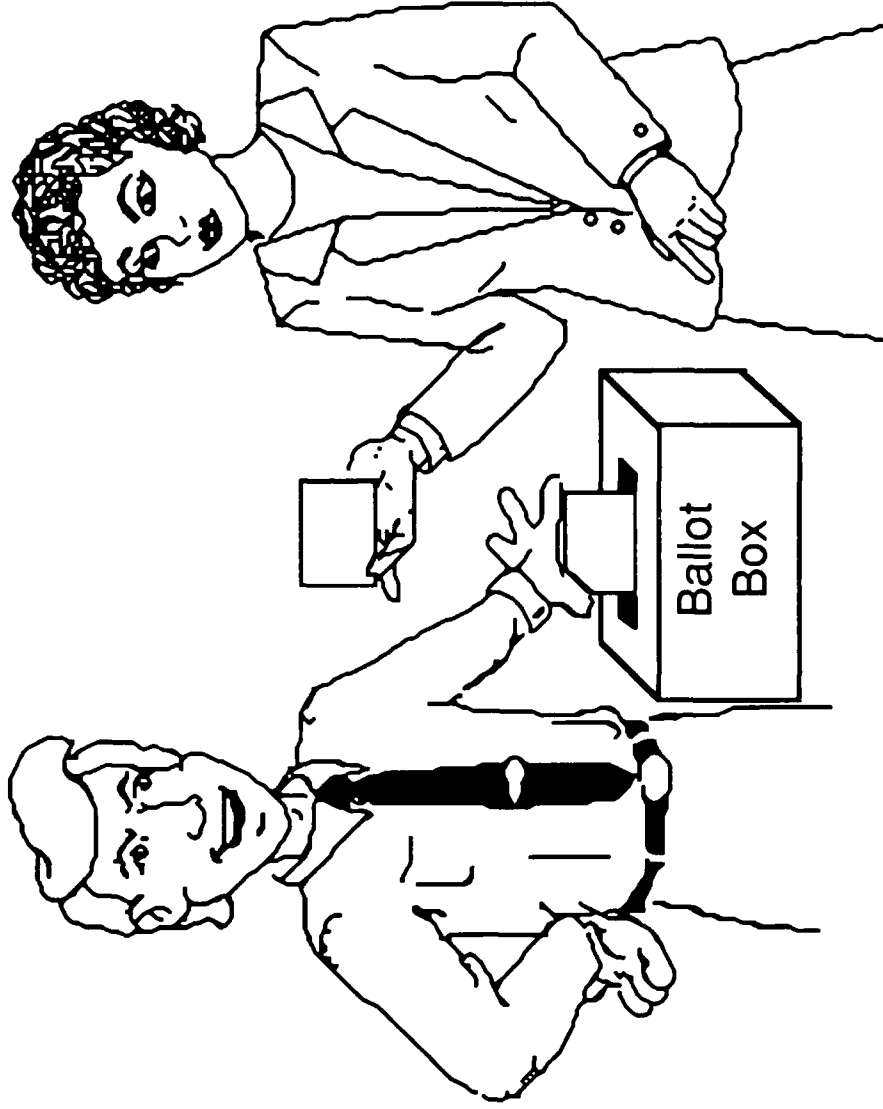
Case Study 3-4

Identify Goals, Criteria, and Constraints

Select Best Solutions

- Changes should be the most simple to make and maintain.
- Changes should address root causes.
- Changes that would increase the amount of work or complexity in the process should be avoided.
- Fix obvious errors with obvious solutions right away.

Select Best Solutions



Case Study 3-5

Select Best Solutions

MODULE SIX

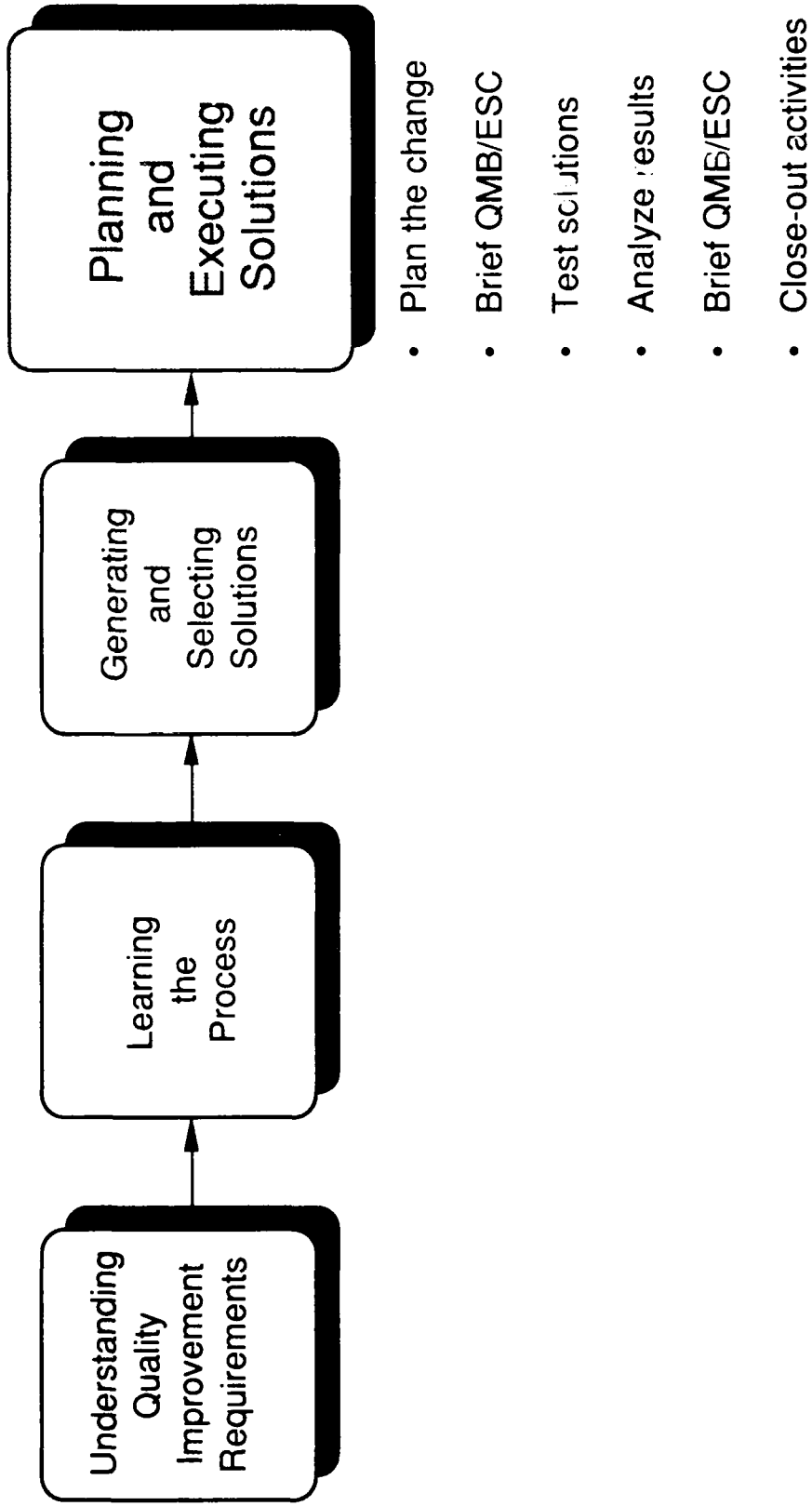
PLANNING AND EXECUTING SOLUTIONS

Module Six Objectives

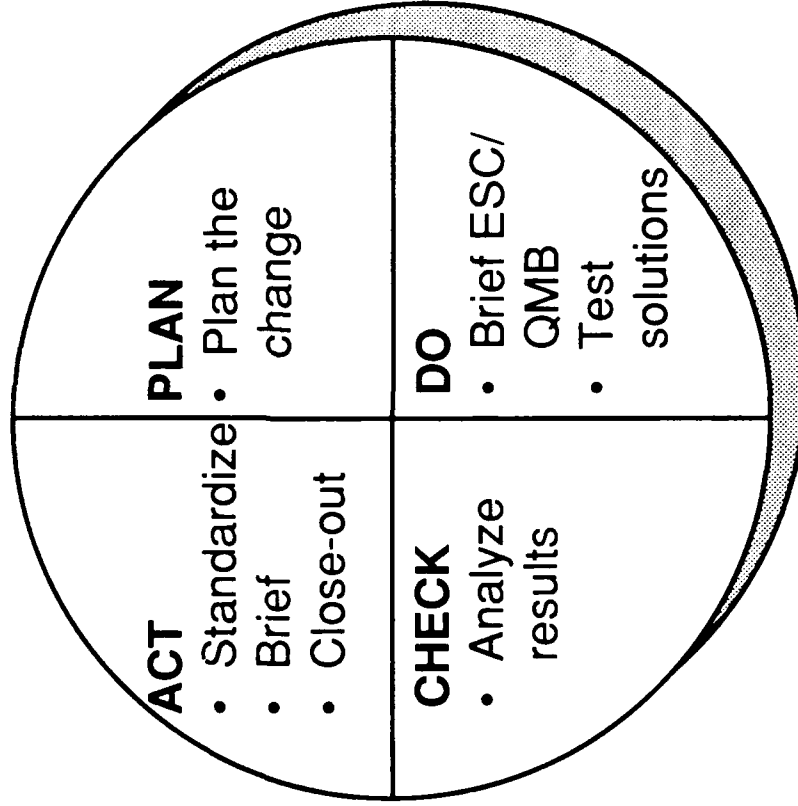
Upon completion of this module, the participant will be able to:

- Prepare a test plan.
- Test the recommended solution.
- Make standardization recommendations organization wide.
- Prepare briefings for ESC/QMB.
- Conduct close-out activities.

Booz Allen Process Improvement Model



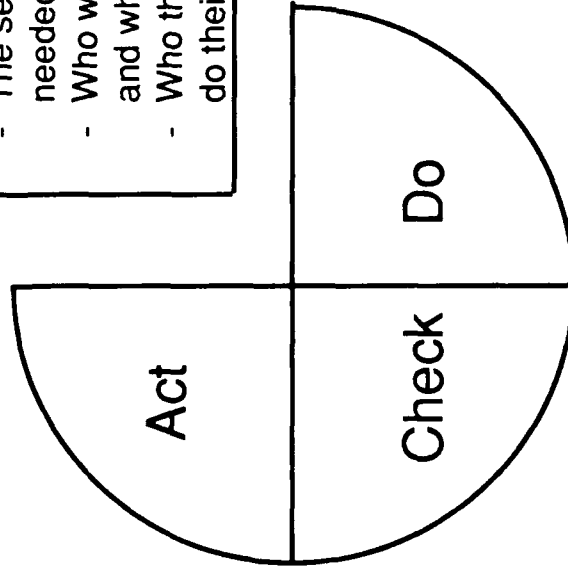
Planning and Executing Solutions



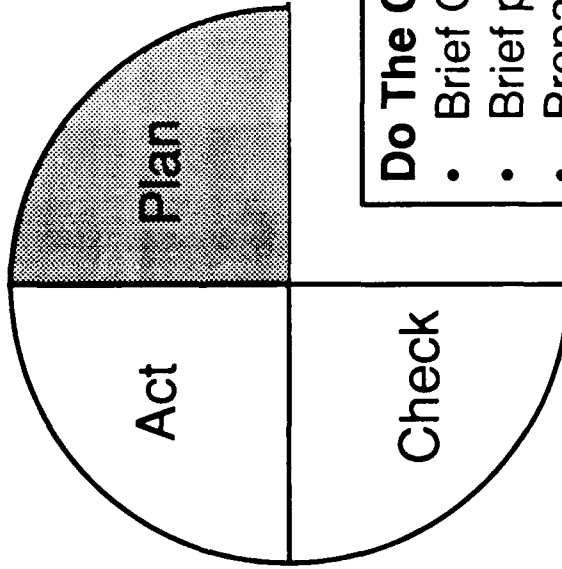
Plan the Change

Plan

- Write Test Plan
 - The sequence of major steps and substeps needed for the change
 - Who will be involved in carrying out each step and substep and who will need to be consulted.
 - Who the change will affect and who will need to change the way they do their jobs.



Brief ESC/QMB



Do The Change

- Brief QMB/ESC
- Brief pilot participants
- Prepare new process owners
- Conduct
- Monitor

Case Study 4-1

Making An ESC/QMB Presentation

Do the Change

What is a "Test"

An experimental implementation of a
chosen solution for process improvement.

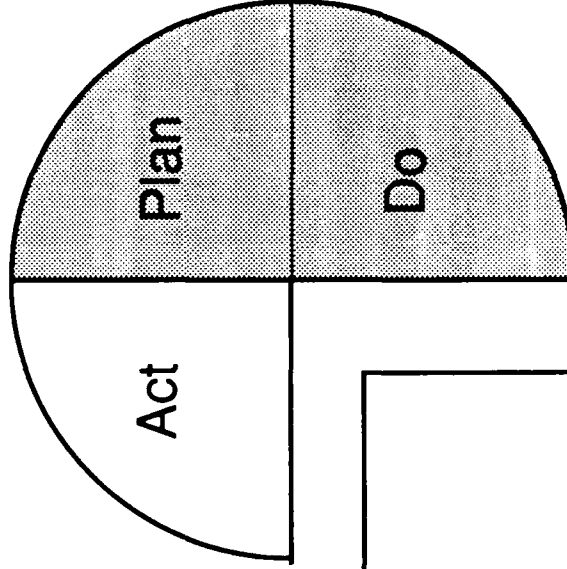
1. Experimental: short term, limited exposure
2. Implementation: enough to see if the solution solves the problem without creating new or worse ones.
3. Chose solution: usually not more than 1 solution at a time.

Do the Change

What will be going on during the test:

- Training test site participants, if necessary
- Collect data on process per change plan
- Monitoring key points to determine if change is proceeding as expected
- Resolve unexpected problems

Analyze Results



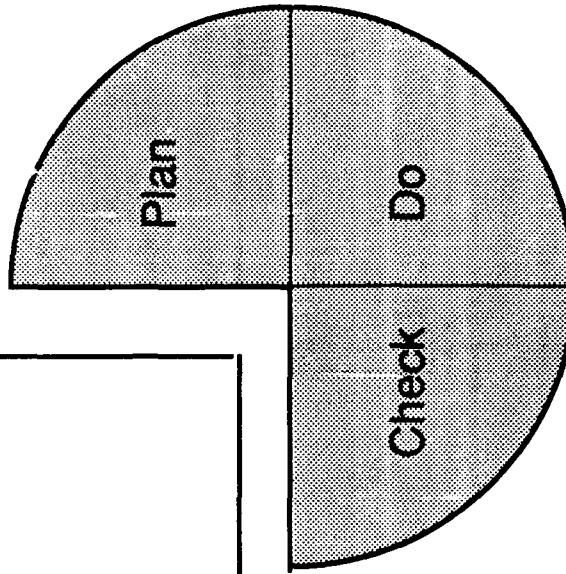
Check

- Analyze test results

Standardization

Act

- Standardize
- Brief
- Close out activities



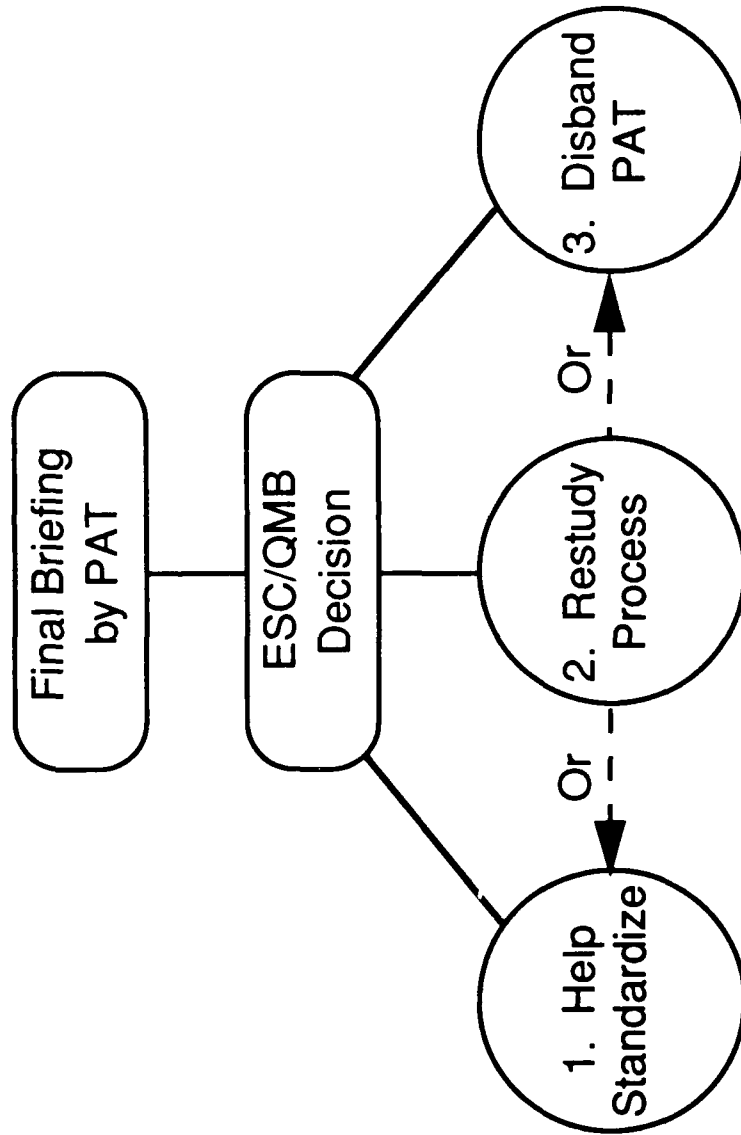
Brief ESC/QMB on Results of Pilot Test

A Final Presentation should be Organized as Follows:

- I. INTRODUCTION
- II. PROJECT DESCRIPTION
- III. TEST RESULTS
- IV. CONCLUSION

ESC/QMB Role

Results of Final Briefing



Assist ESC/QMB in Standardizing Process Organization-Wide*PAT Potential Responsibilities*

- Fine tune recommendations
- Oversee implementation
- Interface with process owners
- Monitor changes
- Document progress
- Train and empower employees

Close-Out Activities

- Team Review and Evaluation
- Team Recognition

Close-Out Activities

Team Review and Evaluation

Team review and evaluation can be accomplished by completing a survey or evaluation sheet:

- I. Internal workings
 - Summarize structure and maturation of interaction/group dynamics
 - Describe your PDCA process
 - Catalogue tools and techniques
- II. Value to continuous process improvement
 - Identify other problems uncovered but not analyzed
 - Advice to other PATs (lessons learned)
 - Benefits on organizational level
 - Benefits on group level
 - Benefits on individual level

Close-Out Activities

Team Recognition

Rewarding team and individual achievement is important to recognize contributions of individuals and to promote the success of PATs. Vehicles of recognition include:

Team/Individual

- Appreciation letter
- Certificate
- Finished project display
- Pictures of members
- Small gift

Promotion

- Monthly letter, posters, flyers
- Presentation

Close-Out Activities

Final PAT Member Responsibilities

- Advocate of process change
- Identify and remove barriers
- Share new skills

Close-Out Activities

Class Discussion

- How will you probably incorporate things learned in this course?
 - PAT related
 - Normal duties related
- What things are most valuable?